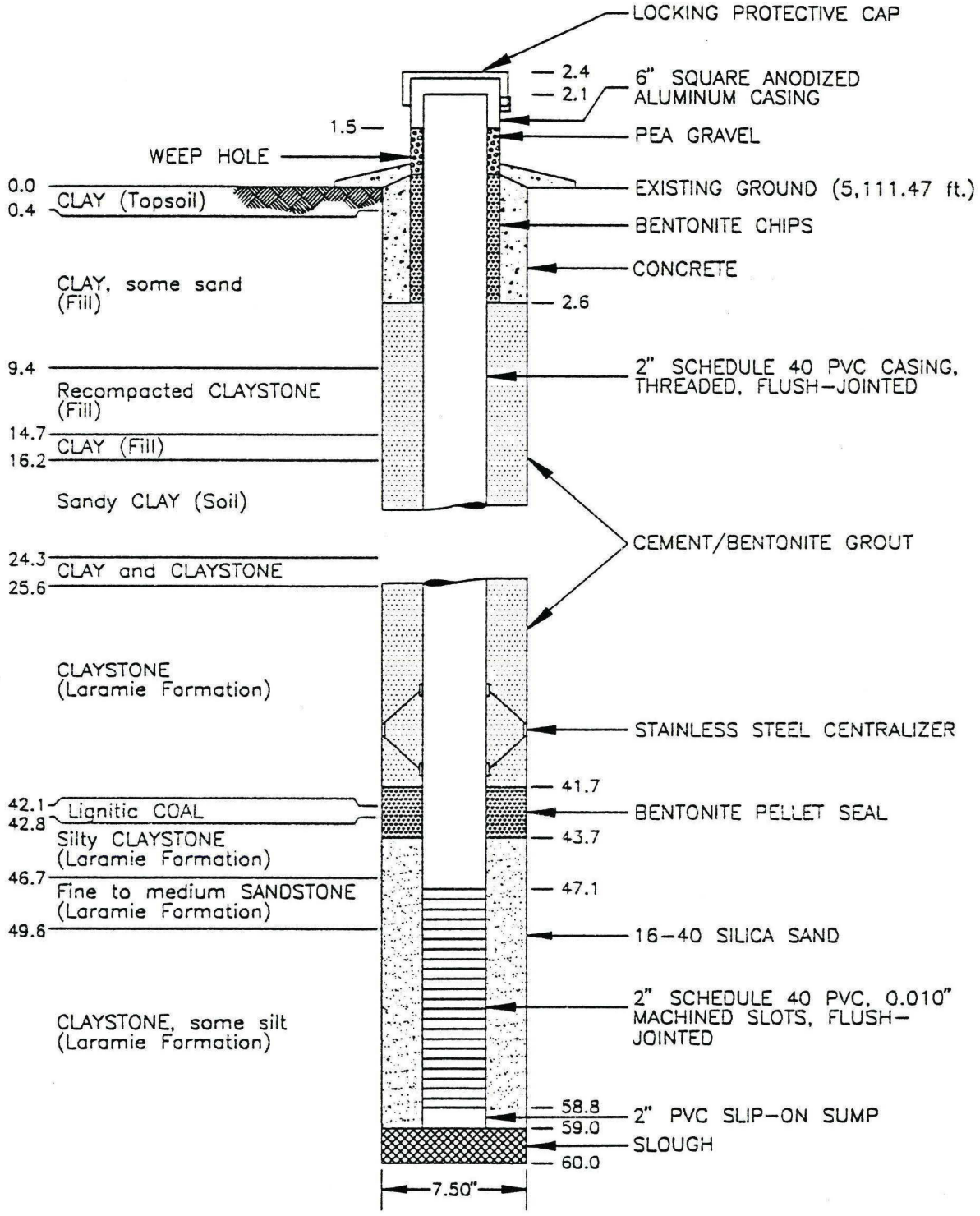
S-212 COMPLETION DIAGRAM



NOTES:

1. ALL DISTANCES IN FEET FROM GROUND SURFACE.
2. DRAWING NOT TO SCALE.
3. A 1/4-INCH HOLE WAS DRILLED IN THE BOTTOM OF THE SUMP.
4. WELL INSTALLED ON 11/11/93.

DOTY & ASSOCIATES | 1202-14 | 04/08/94

APPENDIX D

STATISTICAL PROGRAM

A Statistical Program for Ground-Water Detection Monitoring at the LWS Denver Regional Landfill (South)

Prepared for Laidlaw Waste Systems Inc.

by

Robert D. Gibbons Ph.D.

December 16, 1993

1 Purpose

The purpose of this report is to propose a statistical methodology for ground-water detection monitoring at the Denver Regional Landfill (South). To this end, we have proposed a statistical approach based on combined Shewart-CUSUM control charts applied to the data from each well individually, after removal of historical outliers. In this way, we can detect both major and gradual releases from the facility, unconfounded by spatial variation. Based on site-specific hydrogeology, constituents such as chloride, conductivity etc. often exhibit considerable well to well (*i.e.*, spatial) variability that has nothing to do with waste disposal activities at the landfill. At this facility in particular, there are no upgradient wells for the shallow system (*i.e.*, saturated soils do not occur uphill of the site) and the bedrock wells appear to be completed in different ground-water subsystems. In light of this, any observed differences between upgradient and downgradient water quality are confounded with spatial differences in the geology in which the wells are completed. Given the large historical record available at this facility, the intra-well comparison approach to be presented is the method of choice.

For volatile organic priority pollutants, which are rarely if ever detected in background water quality samples, we propose to set limits based on practical quantitation limits (PQLs).

After presenting details of all three procedures, a complete illustration of the proposed methodology using historical data from the facility is provided.

2 Overview

There are two general approaches to ground-water detection monitoring at waste disposal facilities. In the first, each additional downgradient monitoring measurement is compared to a series of n water quality measurements obtained from well(s) that are located hydraulically upgradient of the facility, hence the name upgradient versus downgradient comparisons. In the second, each additional downgradient measurement is compared to that well's own history, hence the name *intra-well* comparisons. There are advantages and disadvantages to both approaches.

Upgradient versus downgradient comparisons assume that the only difference between upgradient and downgradient water quality is the site, which sits in-between. This is often not the case. Large spatial fluctuations in water quality across the facility and surrounding area often exist. Considerable differences in water quality can be seen simply by drilling two holes in the ground, regardless of their positions relative to the site (*i.e.*, up or downgradient). This is further complicated by the fact that there are almost always far more downgradient wells than upgradient wells. Just by chance alone, spatial variation will be greater downgradient than upgradient simply due to the imbalance in number of wells. Also, in some areas, ground water moves so slowly that upgradient water may not pass below downgradient wells for years. This also confounds the integrity of this approach to testing ground-water quality. Finally, previous industrial and/or agricultural activities (*e.g.*, disposal of slag or application of herbicides and pesticides) may also contribute to widespread spatial

variability in ground-water quality, often invalidating upgradient versus downgradient comparisons.

In contrast, intra-well comparisons completely remove the spatial component of variation from the comparison (*i.e.*, each well is compared to it's own history). The problem here, however, is that if previous contamination exists, the method will not detect it unless it significantly increases. For this reason, intra-well comparisons are useful for new sites, or for those sites in which it can be documented that previous contamination does not exist, or for those sites in which pre-disposal data exist.

An alternative solution can be obtained through the use of control charts. Specifically, we considered Shewart-CUSUM control charts that detect releases both in terms of their absolute magnitude and cumulative increases (*i.e.*, trends). Although background data are collected for each well, and summary statistics computed, the cumulative sum includes the background data, hence even gradual trends in ground-water quality are identified. This procedure is specifically recommended in USEPA regulations, and it's computation is illustrated in the USEPA Interim Final Guidance Document *Statistical analysis of ground-water monitoring data at RCRA facilities* (April, 1989). In this report we go beyond the guidance to further insure a minimum false negative rate by removing outliers from the background database for each well prior to computing the historical mean and variance from which the limits are derived. Insuring that both false positive and false negative rates are at nominal levels for the site as a whole (*i.e.*, 5%) is critical to an effective ground-water detection monitoring program. Excessive false positive rates will lead to constant costly site-assessment in the absence of site-impact. Excessive false negative rates will lead to costly remediation because early signs of contamination will be missed.

3 Combined Shewart-CUSUM Control Charts

3.1 Assumptions

The combined Shewart-CUSUM control chart procedure assumes that the data are *independent* and *normally* distributed with a *fixed* mean (μ) and constant variance (σ^2). The most important assumption is independence, and as a result wells should be sampled *no more* frequently than quarterly. The assumption of normality is somewhat less of a concern than independence, and if problematic, natural log or square root transformation of the observed data should be adequate for most applications. For this method, nondetects can be replaced by the method detection limit without consequence. This procedure should *only* be applied to those constituents that are detected at least in 25% of all samples, otherwise, σ^2 is not adequately defined.

For those constituents in a well that have a detection frequency less than 25%, we will provide a graphical display of the data, until a sufficient number of measurements are available to provide a 99% confidence for a nonparametric prediction limit. In this context the nonparametric prediction limit is the maximum detected value out of the n historical measurements. Inspection of Table 1 in Gibbons (1991, *Ground Water*,29, 729-736) reveals that with one verification resample, $n = 13$ background measurements are required to provide 99% confidence for a single well and constituent, when the limit is set to the maximum detected value. If nothing is

detected in 13 independent samples, we will use the PQL for that constituent as the control limit.

3.2 Procedure

We begin by requiring that at least 8 historical independent samples are available to provide reliable estimates of the mean (μ) and standard deviation (σ), of the constituent's concentration in each well.

1. Select the three Shewart-CUSUM parameters h (the value against which the cumulative sum will be compared), k (a parameter related to the displacement that should be quickly detected), and SCL (the upper Shewart limit which is the number of standard deviation units for an immediate release). Lucas (1982, *Journal of Quality Technology*, 14, 51-59) and Starks (1988, Evaluation of control chart methodologies for RCRA waste sites, USEPA technical report) suggest that $k = 1$, $h = 5$, and $SCL = 4.5$ are most appropriate for ground-water monitoring applications. This sentiment is echoed by USEPA in their interim final guidance document *Statistical analysis of ground-water monitoring data at RCRA facilities* (April, 1989). For ease of application, however, we have selected $h = SCL = 4.5$, which is slightly more conservative than the value of $h = 5$ suggested by USEPA.

2. Denote the new measurement at time-point t_i as x_i.

3. Compute the standardized value z_i

$$z_i = \frac{x_i - \bar{x}}{s}$$

   where $\bar{x}$ and s are the mean and standard deviation of the at least 8 historical measurements for that well and constituent (collected in a period of at least one year). Note that the values on which the mean and standard deviation are based do not change (except as discussed in section 3.6).

4. At each time period, t_i, compute the cumulative sum S_i, as

$$S_i = \max[0, (z_i - k) + S_{i-1}]$$

   where max[A, B] is the maximum of A and B, starting with $S_0 = 0$.

5. Plot the values of S_i (y-axis) versus t_i (x-axis) on a time chart. Declare an "out-of-control" situation on sampling period t_i if for the first time, $S_i \geq h$ or $z_i \geq SCL$. Any such designation, however, must be verified on the next round of sampling, before further investigation is indicated.

It should be noted that unlike prediction limits which provide a fixed confidence level (*e.g.*, 95%) for a given number of future comparisons, control charts do not

provide explicit confidence levels, and do not adjust for the number of future comparisons. The selection of $h = SCL = 4.5$ and $k = 1$ is based on USEPA's own review of the literature and simulations (see Lucas, 1982; Starks, 1988; and USEPA, 1989). The USEPA indicates that using values of $h = SCL = 4.5$ and $k = 1$ these values "allow a displacement of two standard deviations to be detected quickly." Since 1.96 standard deviation units corresponds to 95% confidence on a normal distribution and the proposed combined Shewart-CUSUM control chart procedure allows a displacement of two standard deviations then we can say we have approximately 95% confidence for this method as well.

In terms of plotting the results, it is more intuitive to plot values in their original metric (*e.g.*, μg/l) rather than in standard deviation units. In this case $h = SCL = \bar{x} + 4.5s$ and the S_i are converted to the concentration metric by the transformation $S_i * s + \bar{x}$, noting that when normalized (*i.e.*, in standard deviation units) $\bar{x} = 0$ and $s = 1$ so that $h = SCL = 4.5$ and $S_i * 1 + 0 = S_i$.

note

3.3 Detection of Outliers

From time to time, inconsistently large or small values (outliers) can be observed due to sampling, laboratory, transportation, transcription errors, or even by chance alone. The verification resampling procedure that we have proposed will tremendously reduce the probability of concluding that an impact has occurred if such an anomalous value is obtained for any of these reasons (a false positive). However, nothing has eliminated the chance that such errors (false positives) might be included in the historical measurements for a particular well and constituent. If such erroneous values (either too high or too low) are included in the historical database, the result would be an artificial increase in the magnitude of the control limit, and a corresponding increase in the false negative rate of the statistical test (*i.e.*, conclude that there is no site impact when in fact there is). To remove the possibility of this type of error, the historical data are screened for each well and constituent for the existence of outliers using the well known method described by Dixon (*Biometrics*, 1953, **9**, 74-89). These outlying data points are indicated on the control charts (using a different symbol), but are excluded from the measurements that are used to compute the background mean and standard deviation. In the future, new measurements that turn out to be outliers, in that they exceed the control limit, will be dealt with by verification resampling but only in downgradient wells to confirm that the measurement is an outlier or will require additional study and possibly assessment monitoring. In practice, the verification resample will be the next quarterly sample.

This method is a form of Dixon's test for outlier values

If the control limit is exceed this would constitute a stat. sig increase and there is a requirement to report & resample for K.K.

3.4 Illustration

To illustrate the combined Shewart-CUSUM control chart procedure, consider the following hypothetical example in Table 1.

Table 1

Example Hypothetical Dataset Following Collection of 8 Background Samples
Constituent in μg/l
Background Levels $\bar{x} = 50$ and $s = 10$

Quarter	Year	Period t_i	Concentration x_i	Standardized z_i	$z_i - k$	CUSUM S_i
1	90	1	50	0	-1	0
2	90	2	40	-1	-2	0
3	90	3	60	1	0	0
4	90	4	50	0	-1	0
1	91	5	70	2	1	1
2	91	6	80	3	2	3
3	91	7	100	5^a	4	7^b
4	91	8	120	7^a	6	13^b

[a] Shewart "out-of-control" limit exceeded ($z_i > 4.5$).
[b] CUSUM "out-of-control" limit exceeded ($S_i > 4.5$).

The example illustrates a hypothetical case in which previous historical measurements were found to be distributed with a mean of 50 μg/l and standard deviation of 10 μg/l. The data listed represent the new levels obtained from 8 monitoring events following the establishment of background. Columns 5 (z_i) and 7 (s_i) reveal that the process is out of control both in terms of trend and absolute value on the third quarter of 1991. The result is confirmed as not just an outlier but requiring further investigation or possible assessment monitoring by the fourth quarter of 1991 sample and further investigation would be indicated. These same data and procedure are illustrated graphically in Figure 1.

Note that in Figure 1, the CUSUM and absolute measurements are reported in the original metric of μg/l. To do this, we transform the S_i by $S_i * s + \bar{x}$. Using the example with $\bar{x} = 50$ and $s = 10$, the final value of $S_i = 13$ in standard deviation units relates to a concentration of $13 * 10 + 50 = 180$ μg/l. The horizontal line in Figure 1 represents the control limit. Values above this line are significantly elevated.

3.5 A Note on Verification Sampling

It should be noted that when a new monitoring value is an outlier, perhaps due to a transcription error, sampling error, or analytical error (false positive), the Shewart and CUSUM portions of the control chart are affected quite differently. The Shewart portion of the control chart compares each individual new measurement to the control limit, therefore, the next monitoring event measurement constitutes an independent verification of the original result. In contrast, however, the CUSUM procedure incorporates *all* historical values in the computation, therefore, the effect of the outlier will be present for both the initial and verification sample; hence the statistical test will be invalid unless the verification sample value replaces the suspected outlier sample value (*i.e.*, the unverified and out-of-control value will be replaced the valé obtained in the following sampling event.

For example, assume $\bar{x} = 50$, and $s = 10$. On quarter 1 the new monitoring value is 50, so $z = (50 - 50)/10 = 0$ and $S_i = \max[0, (z - 1) + 0] = 0$. On quarter 2, a sampling error occurs and the reported value is 200, yielding $z = (200 - 50)/10 = 15$ and $S_i = \max[0, (15 - 1) + 0] = 14$, which is considerably larger than 4.5; hence an initial exceedance is recorded. On the next round of sampling, the previous result is not confirmed, because the result is back to 50. Inspection of the CUSUM, however, yields $z = (50 - 50)/10 = 0$ and $S_i = \max[0, (0 - 1) + 14] = 13$, which would be taken as a confirmation of the exceedance, when in fact, no such confirmation was observed. For this reason, the verification result must *replace* the suspected result in order to have an unbiased confirmation.

3.6 Updating the Control Chart

As monitoring continues and the process is shown to be in control, the background mean and variance should be updated periodically to incorporate these new data. Every two years, all new data that are *in control* will be pooled with the initial samples and $\bar{x}$ and s recomputed. These new values of $\bar{x}$ and s will then be used in constructing future control charts.

3.7 Statistical Power

To better understand the operating characteristics of this procedure, two simulation studies were conducted. In the first study (increasing release), a release was introduced beginning in month 1 at varying rates of .1 to 5 standard deviation (sd) units per month. For example, following 8 quarters of background monitoring at a particular well for a hypothetical constituent with mean 100 μg/l and sd of 10 μg/l, a release of 1 sd unit per month is introduced. On month 1 the mean of the sampled distribution is increased to 110 μg/l, on month 2 the mean is 120 μg/l, and so on; however the background data for which the control limit was computed remain unchanged. The question of interest is how long does it take to detect this increasing release using this statistical method? The answer is obtained by simulating this process 1000 times and computing the median time to detection in months. As the rate of the release increases (*e.g.*, 1 sd unit per month versus 0.1 sd units per month) the time it takes to detect the release decreases. The simulation used one verification resample, a background sample of 8 measurements, $k = 1$, and $h = SCL = 4.5$. As a comparison, these same simulated data were evaluated using a 99% prediction limit and corresponding median detection times recorded. Note that the 99% confidence prediction limit is the procedure used in establishing USEPA's reference power curve (see Addendum to Statistical Guidance, July 1992)

In the second study, all conditions were identical, except that the release was constant (*i.e.*, not increasing over time). The second study used various constant rates in the amount of .1 to 5 sd units. For those simulations that did not result in a verified exceedance in 5 years, the value of 5 years was recorded (*i.e.*, 5 years or more).

Figure 2 displays the result of the first simulation study. Inspection of Figure 2 reveals that for a tiny release of only 0.1 sd units per month (*i.e.*, for our previous

example, an increase from 100 μg/l to 101μg/l in month one to 102 μg/l in month two etc. following the release) it would take 30 months (over two years) to detect it using a 99% prediction limit and 27 months using the combined Shewart-CUSUM control chart procedure. In contrast, an increasing release of one standard deviation unit per month would be detected on the second quarterly sampling event, and an increasing release of 2 sd units per month on the very next quarterly sampling event. These detection periods were the same whether using the 99% prediction limit method or the combined Shewart-CUSUM control chart procedure with the exception of a 1.5 sd unit release which was detected in 1 quarter by the prediction limit and 2 quarters by the control chart.

Results of the second simulation study (*i.e.*, constant release) are displayed in Figure 3. For a constant release, the control chart outperforms the prediction limit for small releases (*i.e.*, .1 to 2 sd units), whereas the prediction limit appears to be slightly more sensitive to larger releases (*i.e.*, releases in the range of 3 to 4 sd units are detected about a quarter faster by the prediction limit). Overall, constant releases in the amount of 2.5 sd units are detected within a year and releases of approximately 3 sd units within 6 months.

4 Application at the Denver Regional Landfill (South)

4.1 VOCs

Priority pollutant list volatile organic compounds will be routinely monitored. A statistically significant increase is indicated if any single VOC exceeds the PQL initially and confirmed in the verification resample in that well. Upgradient wells will be monitored for informational purposes and will not be part of the verification resampling program. Table 3 displays a listing of all historical quantitations of VOCs since 1990.

Table 3

Historical VOC Detections

Compound	Well	Result	PQL	Date	Units
Benzene	GW-1	2.0	1.0	3/19/91	ug/l
Benzene	GW-8	9.0	1.0	3/19/91	ug/l
Benzene	GW-8	17.0	1.0	9/04/92	ug/l
Benzene	GW-8	1.0	1.0	12/16/92	ug/l
Benzene	GW-8	26.0	1.0	3/08/93	ug/l
Benzene	GW-8	15.0	1.0	6/07/93	ug/l
Benzene	GW-8	25.0	1.0	11/02/93	ug/l
Benzene	P3	2.0	1.0	9/04/92	ug/l
Benzene	P3	11.0	1.0	6/07/93	ug/l
Benzene	S-203	52.0	1.0	9/04/92	ug/l
Benzene	S-203	47.0	1.0	11/02/93	ug/l
Benzene	S-208	1.0	1.0	9/10/92	ug/l
Benzene	S-208	1.0	1.0	3/08/93	ug/l
Benzene	S-208	2.0	1.0	6/14/93	ug/l
Benzene	Leachate	8.0	1.0	2/25/93	ug/l
Benzene	Leachate	12.0	100.0	3/11/93	ug/l
11,DCA	GW-8	16.0	5.0	3/19/91	ug/l
11,DCA	GW-8	21.0	5.0	9/04/92	ug/l
11,DCA	GW-8	8.0	5.0	12/16/92	ug/l
11,DCA	GW-8	18.0	5.0	3/08/93	ug/l
11,DCA	GW-8	16.0	5.0	6/07/93	ug/l
11,DCA	GW-8	20.0	5.0	11/02/93	ug/l
11,DCA	Leachate	4.0	5.0	2/25/93	ug/l
11,DCA	Leachate	ND	5.0	3/11/93	ug/l
Carbon Disulfide	GW-8	17.0	5.0	9/04/92	ug/l
Carbon Disulfide	GW-8	9.0	5.0	3/08/93	ug/l
Carbon Disulfide	GW-8	73.0	5.0	11/02/93	ug/l
Carbon Disulfide	S-208	21.0	5.0	9/10/92	ug/l
Carbon Disulfide	S-208	8.0	5.0	3/08/93	ug/l
Carbon Disulfide	Leachate	2.0	5.0	2/25/93	ug/l
Carbon Disulfide	Leachate	ND	100.0	3/11/93	ug/l
Vinyl Chloride	GW-8	11.0	10.0	11/02/93	ug/l
Vinyl Chloride	Leachate	ND	10.0	2/25/93	ug/l
Vinyl Chloride	Leachate	ND	200.0	3/11/93	ug/l

Inspection of Table 3 reveals several VOC detections for well GW-8 for benzene, 11-DCA and carbon disulfide. More sporadic quantifications of these compounds were observed in wells P-3, S-203, and S-208. Note that none of these three compounds are characteristic of the leachate obtained from the Cell A Sump. Leakage from Cell A should be characterized by quantification of methylene chloride (1700 - 5800 ug/l in leachate), 111-TCA (390 - 1000 ug/l in leachate), toluene (230 - 490 ug/l in leachate), acetone (120 - 300 ug/l in leachate), MEK (110 - 300 ug/l in leachate) and chlorobenzene (97 - 220 ug/l in leachate). In light of this, the source of these quantifications in ground-water monitoring wells must be further examined for either alternative site-related sources or contamination from sources other than waste disposal (*e.g.*, glued PVC wells).

4.1.1 Inorganics - Intra-Well Comparisons

Specific monitoring wells used in the analysis are listed below.

Monitoring Wells Used in Analysis
GW-1
GW-8
P-2
P-3
S-203
S-204
S-205
S-208
S-209
S-210

A list of all detection monitoring constituents (excluding VOCs) is given below.

Inorganic Constituents
SC
TOC
TOH
TDS
CA
NA
K
SO4
CL
FE
PB
PH
MG
HCO3
CO3
NO2
NO3
MN
ZN
COD
NH4
CD
HG

The 230 well and constituent combinations (*i.e.*, 23 constituents and 10 wells) were analyzed using the previously described combined Shewart-CUSUM control

chart methodology. The 230 control charts are presented graphically in the Appendix. The horizontal line in each control chart represents the control limit. Values above this line are significantly elevated. For the purpose of this illustration, the background mean and standard deviation was computed on only the first 8 measurements. This provides comparison of as many as 16 subsequent measurements for certain wells and constituents that have been monitored on a regular basis since 1986. For those constituents and wells with less than 8 historical measurements, the data are displayed graphically, but no control limit is computed. For wells and constituents with detection frequencies less than 25%, the control limit is set at the largest quantified concentration or the PQL as long as at least 13 historical measurements are available. If the detection frequency is less than 25% but fewer than 13 samples are available, the data are displayed graphically but no limit is computed. A statistically significant increase is only recorded if both the initial sample and the verification sample exceed the control limit for either the absolute value or the cumulative sum.

Inspection of the control charts reveals a single statistically significant increase out of the 230 comparisons performed (MN in well GW-8, see Figure at end of report and in the Appendix). This result is consistent with the VOC detections in this well, although the source of this statistical exceedance remains unclear.

5 False Positive and False Negative Rates for the Proposed Detection Monitoring Program

In this section we describe the results of a simulation study designed to represent the existing conditions found at the facility. The simulation is based on the same number of constituents and monitoring wells at the facility. The primary objective of the simulation study was to determine if the current number of background measurements for each constituent will provide a reasonable balance of false positive and false negative results for all 230 comparisons (*i.e.*, 23 constituents at each of 10 wells).

The result of the simulation study is a power curve (see Figure 4) that illustrate the balance between false positive and false negative results that is achieved by the *current* detection monitoring program. With respect to the false positive rate, the power curve illustrates the percentage of monitoring events in which a verified statistically significant result would be obtained when the true difference between upgradient and downgradient water quality for each constituent was zero. Graphically, this percentage is given by the point at which the power curve intersects the y-axis (see Figure 4). In addition, the remainder of the power curve illustrates the percentage of monitoring events in which a verified statistically significant result would be obtained for upgradient versus downgradient differences ranging from 1 to 5 standard deviation units (*i.e.*, the false negative rate for effect sizes (*i.e.*, upgradient versus downgradient differences) ranging from 1 to 5 standard deviation units, see Figure 4). To provide the most conservative case, contamination (*i.e.*, the 1 to 5 sd unit increase over the upgradient mean concentration) was introduced into a single well and constituent, *i.e.*, only one of the 230 comparisons (*i.e.*, 23 constituents and

10 monitoring wells) were contaminated. To incorporate the cumulative sum, one year of monitoring was simulated prior to testing for a significant increase.

In the following, more specific details of the simulation study and results are presented.

1. All data were simulated under the assumption of normality using the same number of available measurements for each well and constituent and combined Shewart-CUSUM control chart or nonparametric limit that would be used for the proposed monitoring system. The data were simulated using the method of Schrage, L. (A portable FORTRAN normal random number generator. *ACM Transactions on Mathematical Software*, *5,2*, 1979, 132-138). This algorithm produces observations x_i from a standard normal distribution (*i.e.*, mean zero and variance one). To eliminate negative values, the constant 5 was added to each simulated value (*i.e.*, $x_i + 5$). The resulting values are now distributed normally with mean of five and sd of one. Contamination was introduced by adding a constant (in sd units) to each simulated value (*i.e.*, $x_i + 5 + c$, where c represents the number of standard deviation unit increase in new measurements relative to background).

2. Background sample sizes ranged from a low of 8 to a high of 28, reflecting the number of available measurements for each well and constituent. (see Appendix).

3. A series of 10 monitoring measurements (*i.e.*, one for each well) were generated for each constituent on a given monitoring event. Four quarterly measurements were simulated to establish the cumulative sum. On the fifth simulated quarterly event, each of the simulated measurements (absolute value and cumulative sum) was then compared to the corresponding control limit computed from the simulated background data.

4. Given an initial significant result, a new value was simulated for that well and constituent which replaced the initial value, and if it also exceeded the corresponding limit, a failure was recorded.

5. Contamination was introduced into a single well and constituent for effects of $c = 0$ through $c = 5$ sd units; where an effect of $c = 0$ sd units represents the false positive rate. This represents the most conservative case (*i.e.*, "finding a needle in a haystack").

6. The entire simulation was repeated 1000 times and corresponding error rates displayed in Figure 4.

7. Inspection of Figure 4 reveals that the current false positive rate for all 230 comparisons is 16%.

8. Even if contamination is restricted to a single well and constituent, false negative results become rare (*i.e.*, 4%) for effects of the 3 sd units. These effects represent upper bounds since in practice, contamination is typically observed by increases in multiple constituents and monitoring wells.

9. Further simulation revealed that the overall site-wide false positive rate decreased to 5.1% once a minimum of 16 background measurements were available in each well.

6 Summary

Given the consistent spatial differences in concentrations of some of the monitoring constituents and wells at the facility, and the absence of representative upgradient wells and/or representative hydrogeology upgradient of the facility, a detection monitoring program based on intra-well comparisons is proposed. To reduce the chance of existing contamination being masked, we have proposed a combined Shewart-CUSUM control chart procedure as illustrated in the USEPA interim final guidance document on statistical methods for ground-water monitoring. This statistical/graphical method is sensitive to both absolute levels and consistent trends produced by more gradual releases. All historical data are evaluated, including those data used in computing the background mean and sd for a given well and constituent. Statistical power characteristics of the method indicate that even modest releases of one sd unit per month will be detected within two rounds of sampling. The ability to verify an initial exceedance, dramatically decreases the probability of a false positive result. In terms of false negative results, we further decrease this risk by eliminating the effects of outliers from the computation of the background mean and variance. This decreases the control limits dramatically when historical outliers are present.

Results of the statistical power study reveal that given the current monitoring system, the overall site-wide false positive rate is 16% per monitoring event (*i.e.*, a verified statistical exceedance by chance alone). This false positive rate is larger than the projected 5% level due to the large number of inorganic constituents and small number of historical measurements available in some wells. Reduction in the number of inorganic indicator constituents will reduce the false positive rate accordingly. Leachate data are currently unavailable for most of the inorganic constituents but should be collected to determine which indicators are good differentiators of leachate and background ground-water quality. Alternatively, additional data can be collected and incorporated into the background database. Once 16 background measurements are available per well and constituent, the overall site-wide false positive rate will be approximately 5%.

References

[1] Dixon, W. J. (1953). Processing data for outliers. *Biometrics,* **9**, 74-89.

[2] Gibbons, R. D. Some additional nonparametric prediction limits for groundwater monitoring at waste disposal facilities. *Ground Water*, **29**, 729-736, 1991.

[3] Gibbons, R. D. Grams, N. Jarke, F. H., & Stoub, K. P.(1992). Practical quantitation limits. *Chemometrics and Intelligent Laboratory Systems.* **12**, 225-235.

[4] Lucas, J. M. (1982). Combined Shewart-CUSUM quality control schemes. *Journal of Quality Technology*, **14**, 51-59.

[5] Starks T. H. (1988). Evaluation of control chart methodologies for RCRA waste sites. USEPA technical report CR814342-01-3.

[6] USEPA, 40CFR Part 264: Statistical methods for evaluating ground-water monitoring from hazardous waste facilities; final rule. *Federal Register,* 53, 196 (1988) 39720-39731.

[7] USEPA, Interim Final Guidance Document *Statistical analysis of ground-water monitoring data at RCRA facilities* (April, 1989).

FIG 1: EXAMPLE IN TABLE 1

COMBINED SHEWART–CUSUM CONTROL CHART

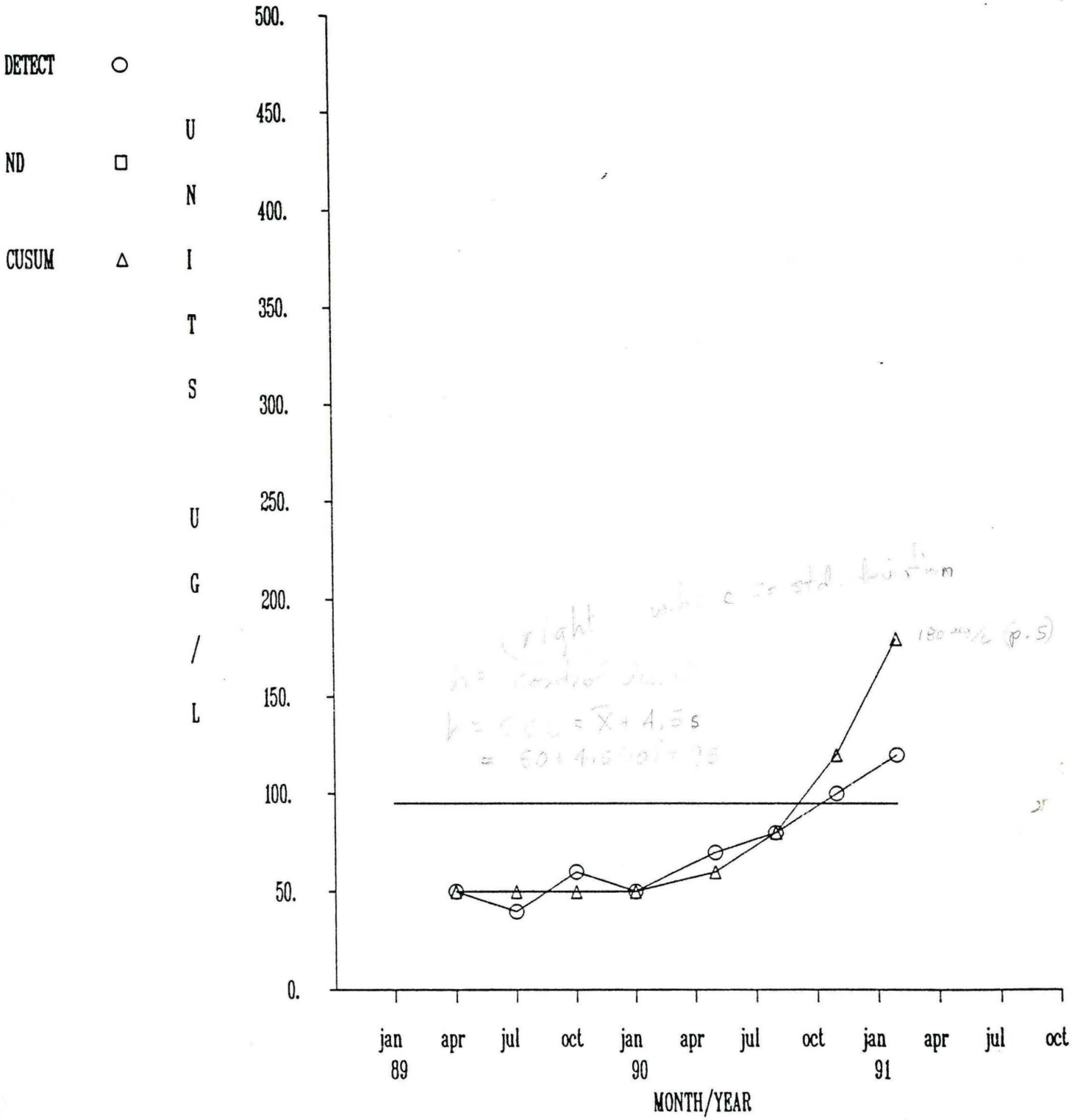


FIG 2: MEDIAN TIME TO DETECTION OF AN INCREASING RELEASE RATE OF RELEASE IN STANDARD DEVIATION UNITS PER MONTH

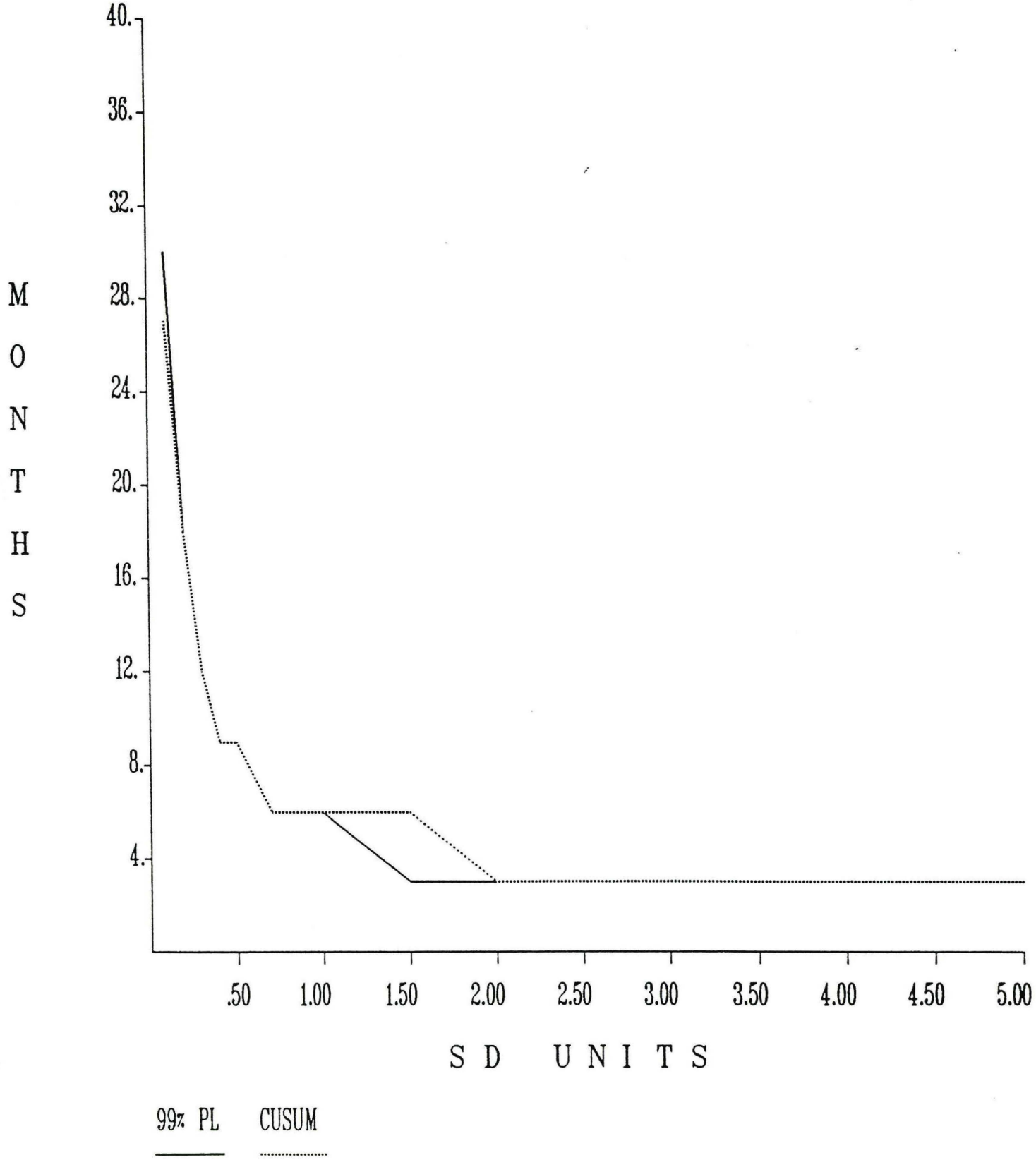


FIG 3: MEDIAN TIME TO DETECTION OF A CONSTANT RELEASE RATE OF RELEASE IN STANDARD DEVIATION UNITS PER MONTH

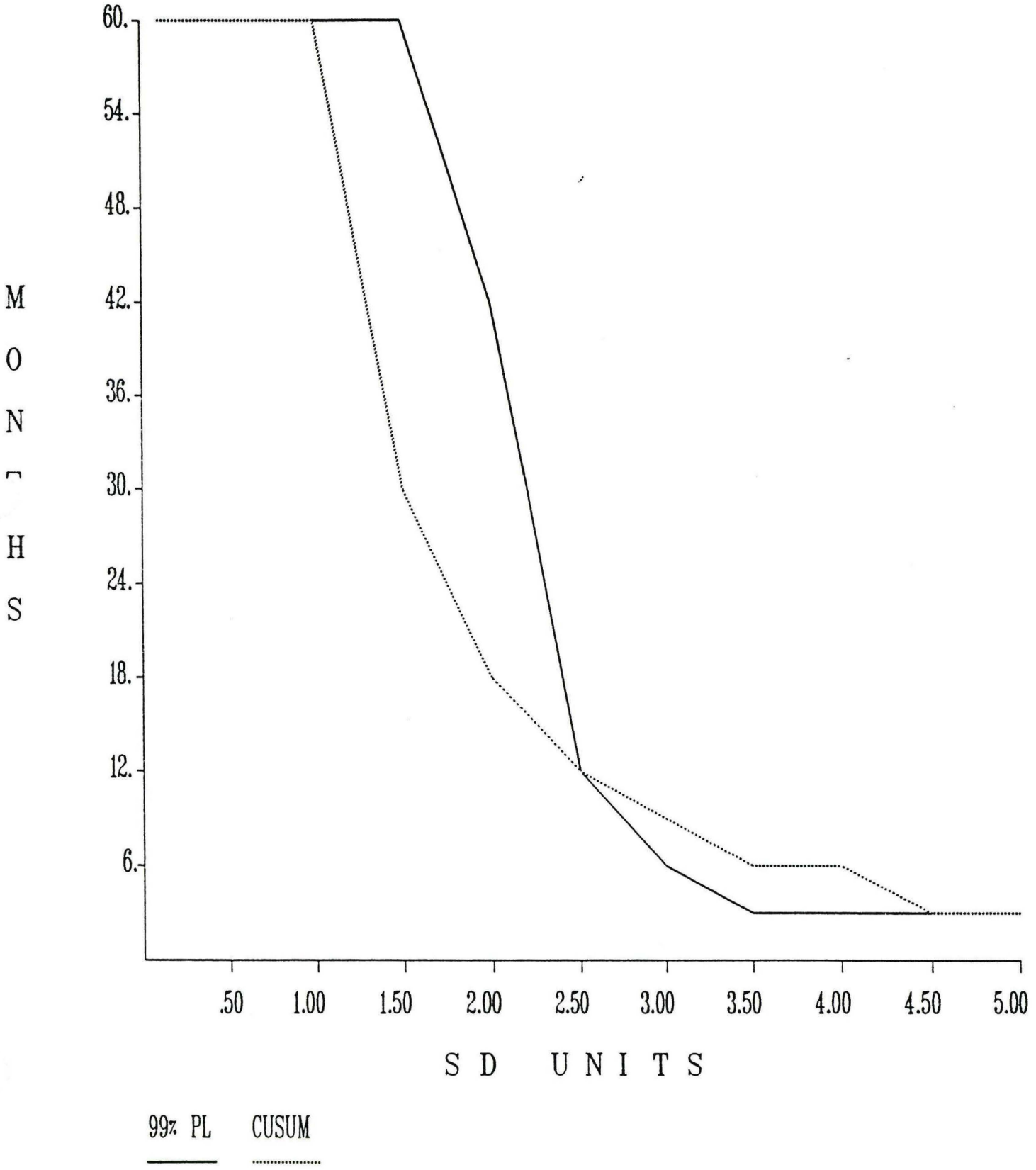
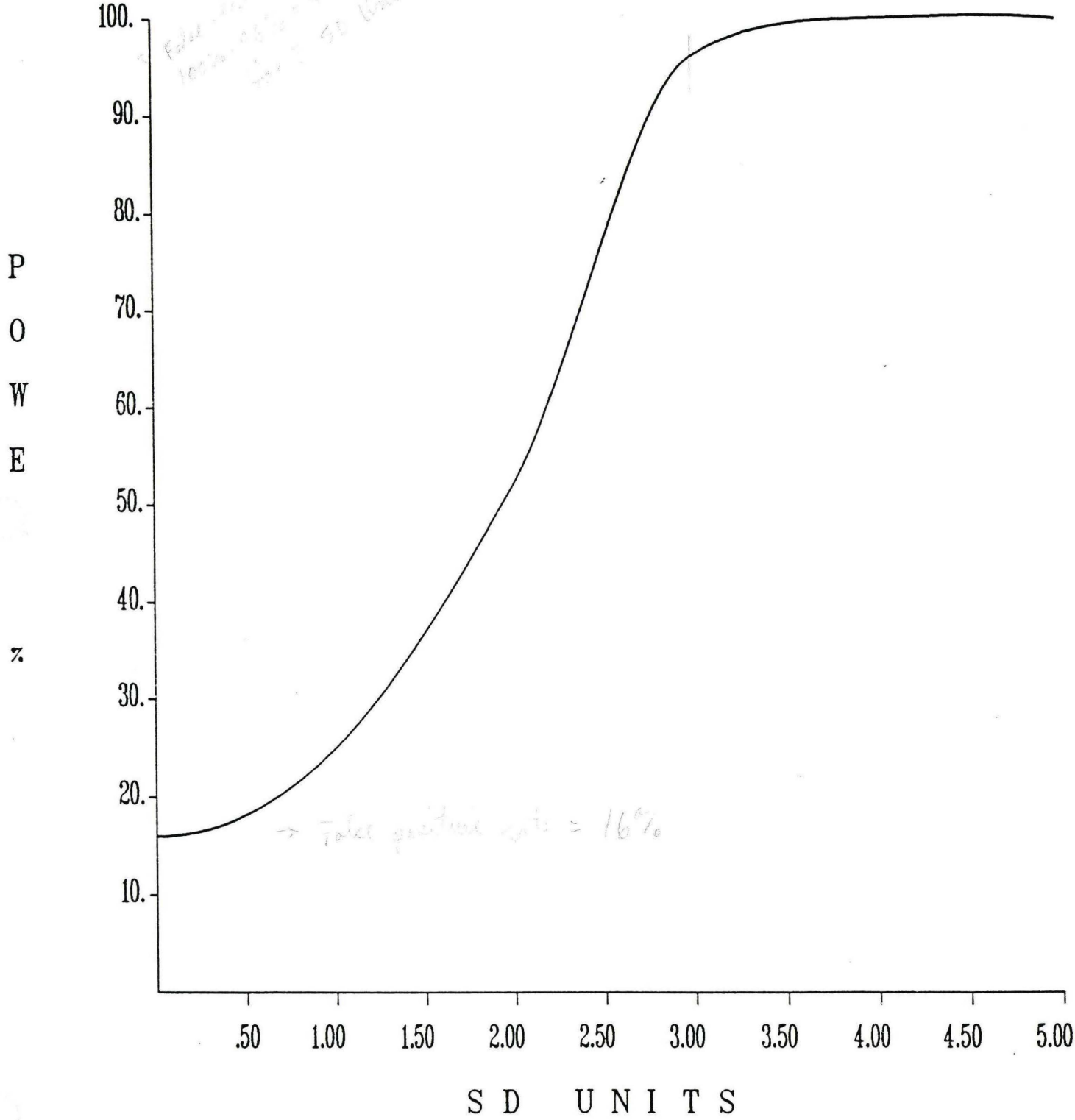
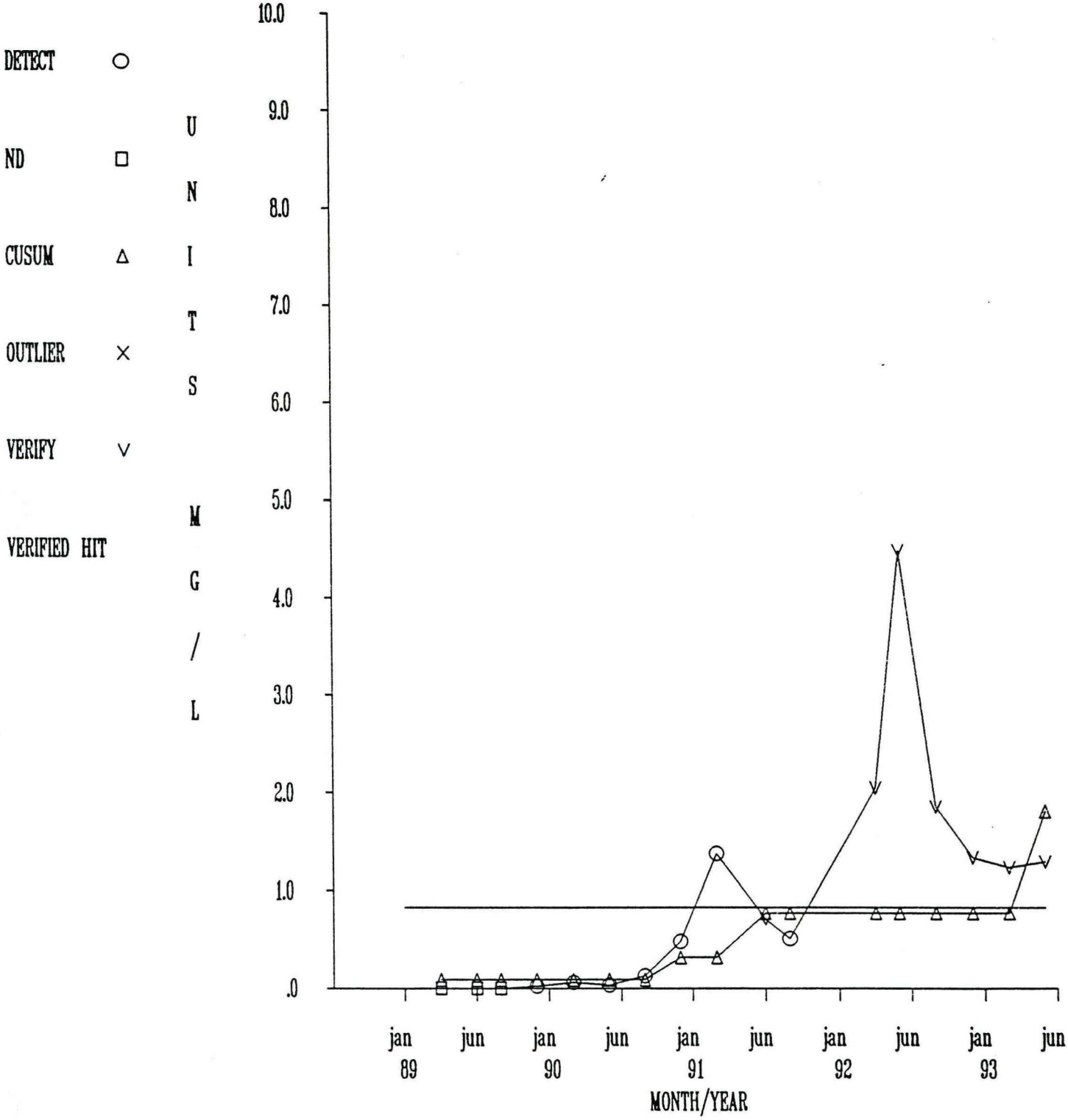


FIGURE 4 - CURRENT FALSE POSITIVE AND NEGATIVE RATES WITH 23 COMPOUNDS AND 10 MONITORING WELLS



MN

FOR WELL GW-8



APPENDIX

Denver Regional Landfill (South)

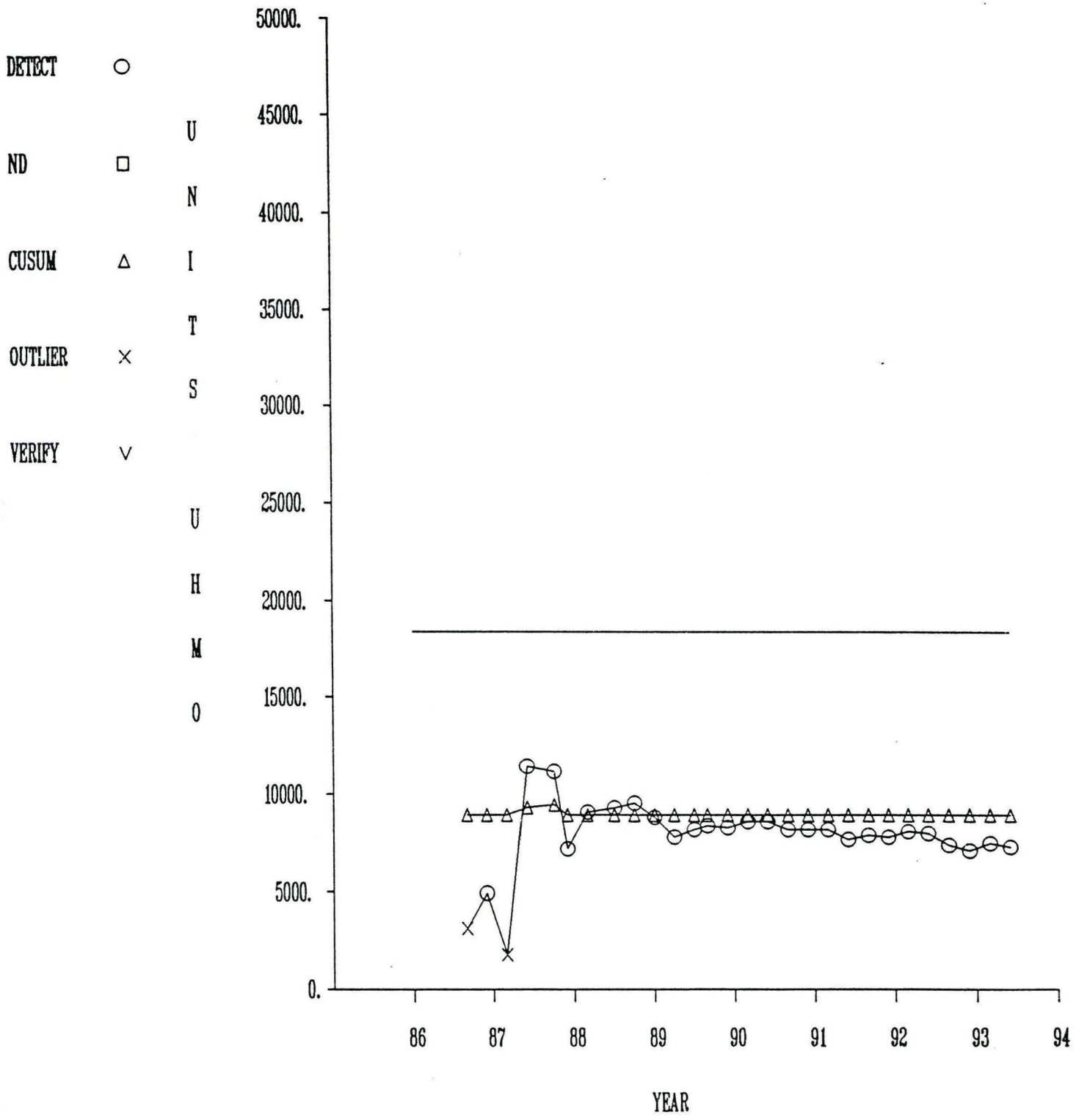
Combined Shewart-CUSUM Control Charts

Outliers Indicated and

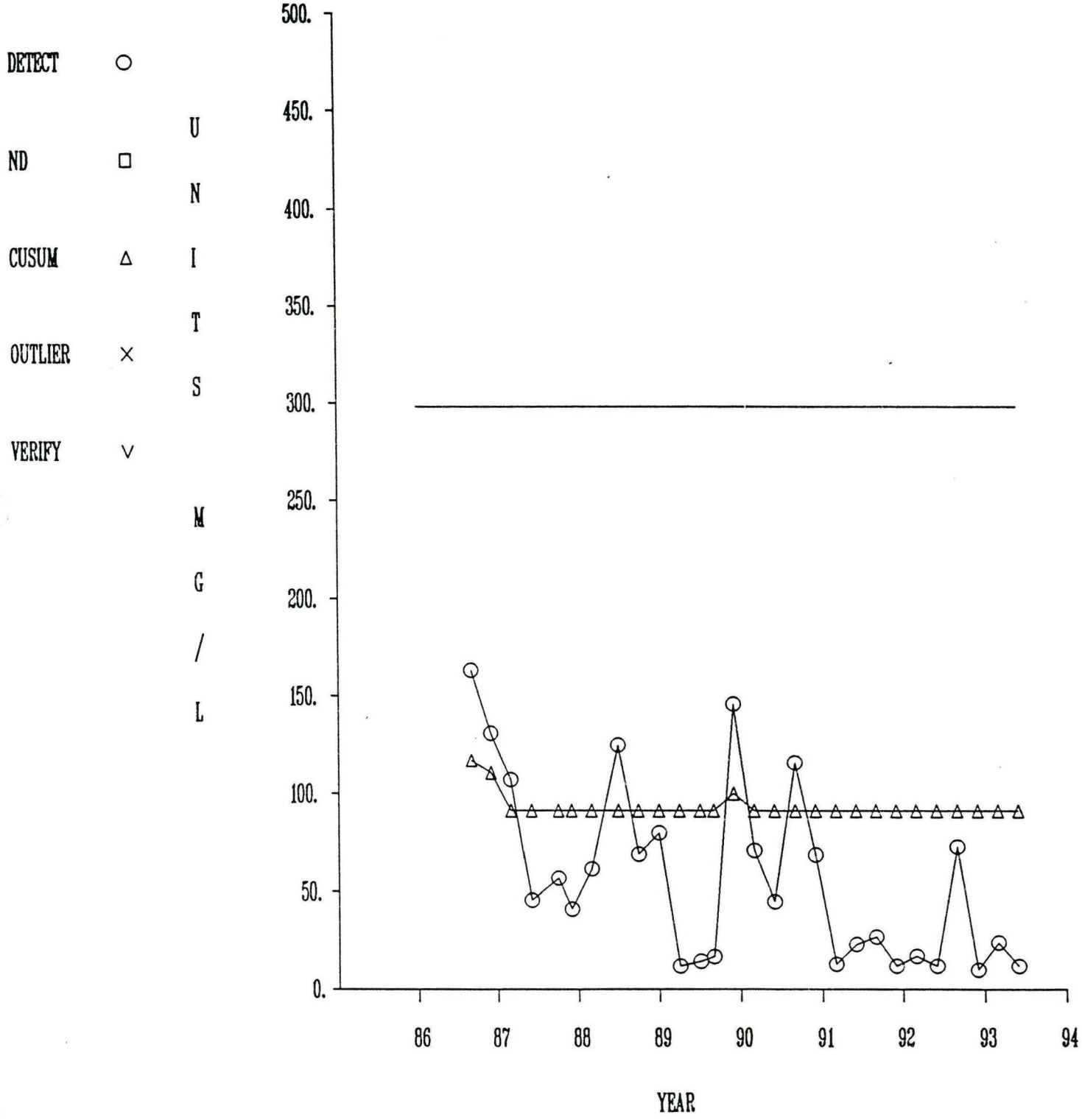
Removed from Background Computations

SC

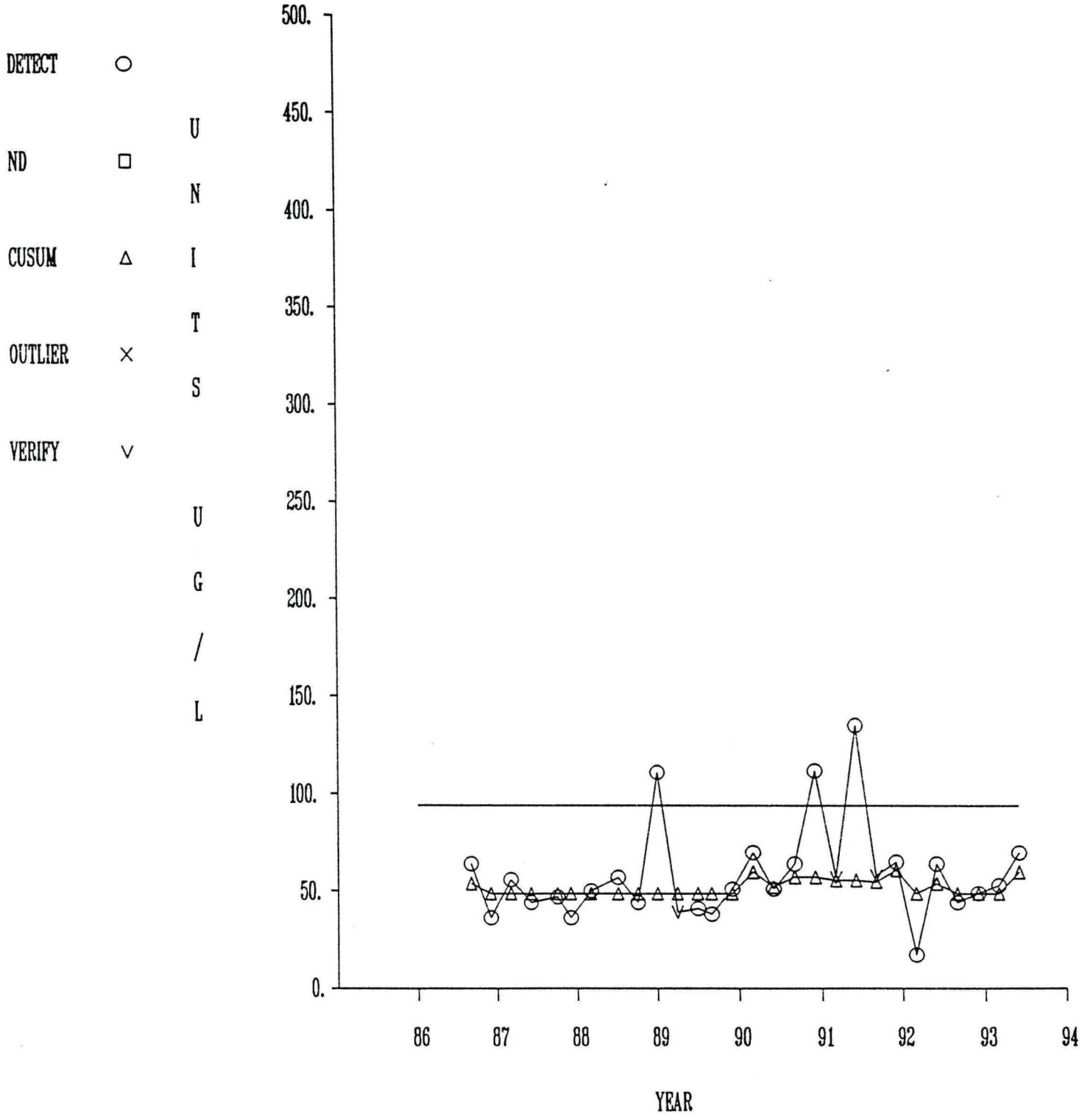
FOR WELL GW-1



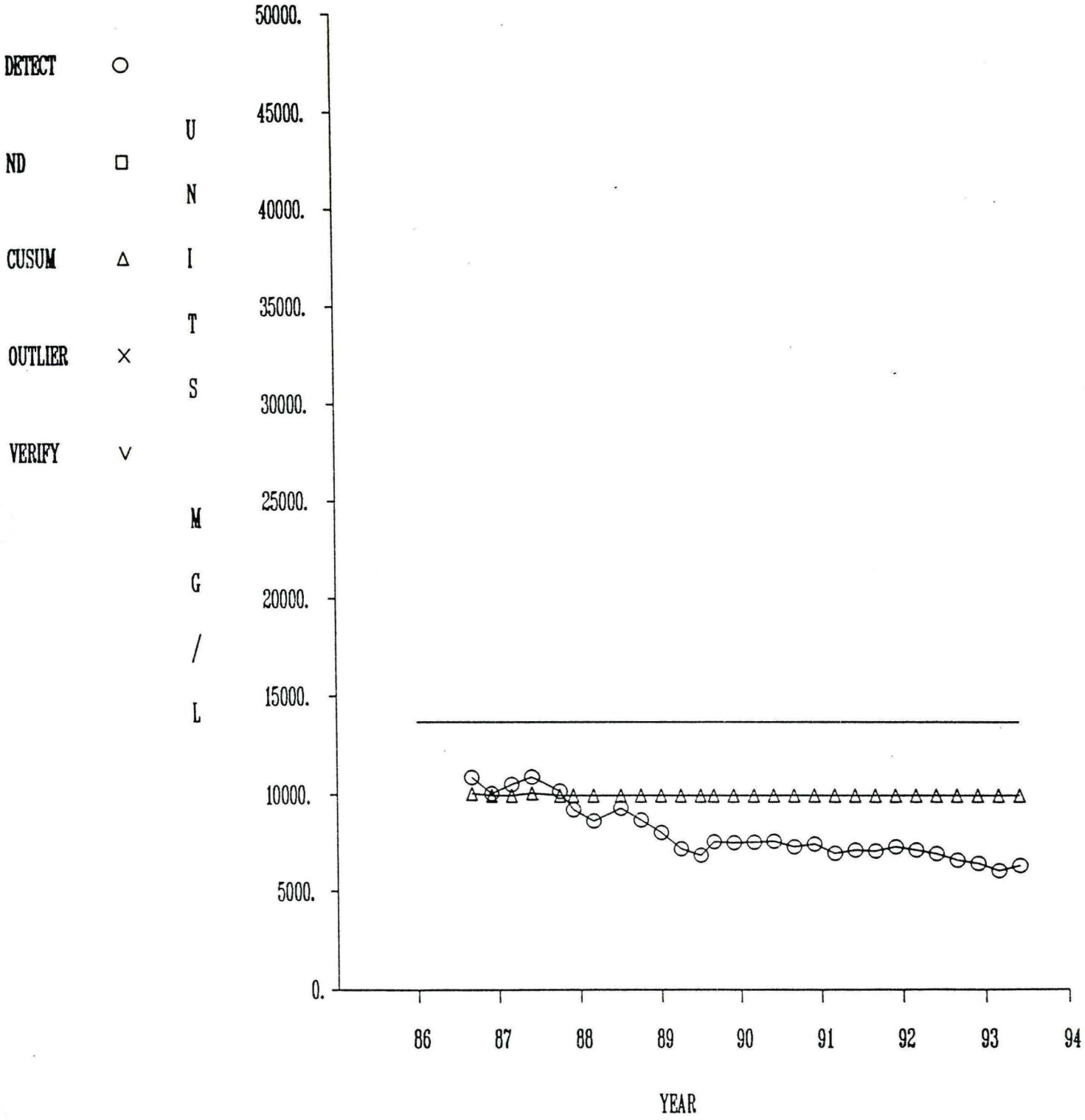
TOC
FOR WELL GW-1



TOH
FOR WELL GW-1



TDS
FOR WELL GW-1



SUPPLEMENTAL RESPONSE OF INTERNATIONAL BUSINESS MACHINES CORPORATION TO THE INFORMATION REQUEST OF THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY RELATING TO THE NEUHAUSER LANDFILL SITE, WELD COUNTY, COLORADO

In response to the Information Request (collectively the "Questions") of the United States Environmental Protection Agency ("EPA") relating to the Neuhauser Landfill Site in Weld County, Colorado (the "Site"), International Business Machines Corporation ("IBM"), through counsel, writes and responds pursuant to 104(e) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. § 9601 *et seq.* ("CERCLA"). IBM provided detailed responses to EPA's 104(e) requests in 1991, including a substantial production of documents (the "1991 Response"). IBM also provided responses to the above-referenced Information Request on October 10, 2017 (the "2017 Response"). IBM has become aware of additional information responsive to Request Nos. 1, 2, 3, 4, 7, and 8 and accordingly provides this Supplemental Response. This Supplemental Response is intended to supplement, rather than replace, the 2017 Response. All responses are made to the best of IBM's knowledge based on document searches, document reviews, and interviews.

In response to the Questions, IBM states as follows:

GENERAL OBJECTIONS

1. IBM objects to the Questions to the extent that they seek information subject to the attorney-client privilege, the attorney work-product doctrine, or any other applicable privilege, as well as documents and information which are proprietary, trade secrets, or confidential business information.

2. IBM objects to the Questions to the extent that they seek information beyond the scope of IBM's control, including information about entities and individuals beyond IBM's control.

3. IBM objects to the Questions to the extent they are overbroad.

4. IBM objects to each Question to the extent such Question is duplicative and/or vague; imposes an undue burden on IBM; calls for production of documents that are not in IBM's custody of control or which are publicly available or otherwise readily available to EPA through other less burdensome means; requests legal conclusions; seeks information or documents beyond the scope of EPA's authority under CERCLA § 104(e); or seeks personal information that may compromise the privacy of IBM's employees or counsel.

5. The objections in Paragraphs 1–4 are henceforth referred to in this response as IBM's "General Objections."

QUESTIONS AND RESPONSES

1. **Identify the person(s) answering these questions by providing their name, address, and telephone number.**

Supplemental Response:

Subject to, limited by, and without waiving its General Objections, IBM responds as follows:

Answers to these questions were prepared by the following individuals:

- Kevin G. W. Olson, Senior Attorney, IBM Corporation, 1 North Castle Drive, Armonk, New York, 10504, (914) 765-4517.

- Brandon Ashby, Program Manager- Environmental Engineering, IBM Corporation, 8976 Wellington Road, Manassas, Virginia, 20109, (703) 257-2582.

- Outside counsel: Scott H. Reisch, Hogan Lovells US LLP, 1601 Wewatta Street, Suite 900, Denver, Colorado 80202, (303) 899-7355.

2. **Identify the person(s) whom you wish to receive all further communications from the EPA related to the Site.**

Supplemental Response:

Subject to, limited by, and without waiving its General Objections, IBM responds as follows:

Please direct all correspondence to outside counsel at the contact information provided in response to Request No. 1.

3. **For each and every question contained herein, identify all persons consulted in the preparation of the answer.**

Supplemental Response:

IBM objects to Request No. 3 to the extent it seeks privileged information. IBM further objects to Request No. 3 because the definition of "identify" seeks personal information that may compromise the privacy of individuals, and the request is unnecessary and unduly burdensome given EPA's ability to reach these individuals through IBM's counsel. Subject to, limited by, and without waiving its specific objections or its General Objections, IBM supplements its 2017 Response as follows:

IBM consulted the persons listed in its response to Request No. 1 in preparing its Supplemental Response to Requests No. 1, 2, 3, 4, 7, and 8. IBM consulted the following persons in preparing its Supplemental Response to Request Nos. 4, 7, and 8:

John Neuhauser
7677 AL Highway 28 E
Livingston, Alabama 35470
Phone: 205-652-7512

Josh Lichtman
Lynx Insights
2716 North Broadway, Suite 207
Los Angeles, CA 90031
(213) 792-2320

In the event EPA has questions about IBM's 1991 Response, 2017 Response, or Supplemental Response to EPA's Request for Information, please contact IBM's outside counsel, Scott Reisch, at the address and phone number provided in response to Request No. 1.

4. **For each and every question contained herein, identify documents consulted, examined, or referred to in the preparation of the answer, or that contain information responsive to the question, and provide accurate copies of all such documents.**

<u>Supplemental Response:</u>

IBM objects to Request No. 4 to the extent that it seeks privileged information and to the extent that the requested information is beyond IBM's custody or control. Moreover, IBM objects to Request No. 4 as overly burdensome to the extent it requests copies of documents that IBM consulted, examined, or referred to in preparing responses to the Questions but which it found to be unresponsive.

Subject to, limited by, and without waiving its specific objections or its General Objections, IBM supplements its 2017 Response as follows:

IBM identifies the enclosed declaration of John Neuhauser, dated April 13, 2018, describing Sanitation Engineering Corporation's disposal at the Site from approximately 1966 to 1968 (hereinafter the "Neuhauser Declaration").

7. **Identify any individuals and/or businesses IBM is aware of that sent materials to the Site between 1965 and 1975.**

Supplemental Response:

IBM objects to Request No. 7 as vague and burdensome because the term "is aware of" is undefined. Moreover, IBM objects to Request No. 7 to the extent that the definition of the word "identify" seeks information beyond IBM's custody and control. Subject to, limited by, and without waiving its specific objections or its General Objections, IBM supplements its 2017 Response as follows:

IBM has no first-hand knowledge of any individuals and/or businesses that sent materials to the Site between 1965 and 1975. The Neuhauser Declaration identifies the following individuals and/or businesses as among those who may have sent materials to the Site between 1965 and 1975:

- Safeway
- Arapahoe Chemicals
- U.S. Geological Survey
- Pizza Hut
- Sundstrand Aviation
- Numerous small and unidentified "mom & pop" type businesses

In addition, the Neuhauser Declaration identifies the following haulers that may have transported waste to the Site between 1965 and 1975:

- Bestway Disposal
- Gurbitz Disposal
- Town & Country Disposal
- 5-7 as yet unidentified waste hauling companies

8. **If you have reason to believe that there may be persons able to provide a more detailed or complete response to any Question contained herein or who may be able to provide additional responsive documents, identify such persons and the additional information or documents that they may have.**

Supplemental Response:

IBM objects to Request No. 8 because the definition of "identify" seeks personal information that may compromise the privacy of individuals. Subject to, limited by, and without waiving its specific objections or its General Objections, IBM responds as follows:

IBM identifies the following person as potentially able to provide a more detailed or complete response to Request No. 7:

John Neuhauser
Former Operator of Sanitation Engineering Corporation
7677 AL Highway 28 E
Livingston, Alabama 35470
Phone: 205-652-7512

NOTARIZED CERTIFICATE

I, Kevin G. W. Olson, having been duly sworn and being of legal age, hereby state:

1. I am a person authorized by IBM Corporation (IBM) to respond to the Environmental Protection Agency's (EPA's) Request for Information concerning the Neuhauser Landfill Site located in Weld County, Colorado.

2. This response was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate information in IBM's custody and control responsive to this request.

3. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, this response is, to the best of my knowledge and belief, true, accurate and complete.

(Signature)

Kevin G. W. Olson
(Name)

Senior Attorney, IBM
(Title)

CYNTHIA SCOTT BARNES
Notary Public, State of New York
No. 01BA6285285
Qualified in Westchester County
Term Expires July 1, ~~2017~~ 2021

(SEAL)

Subscribed and sworn to me this 15th day of May, 2018.
Notary Public

My Commission expires July 1, 2021

My address is 6 Meadowlark Circle, Peekskill, NY 10566

I, John Neuhauser, state the following:

I operated a business in Colorado called Sanitation Engineering Corporation from about 1966 to 1968. The purpose of the business was to haul waste from clients and dispose of that waste. I had a lease with the Pratt family to dispose of waste on their property near Erie, Colorado. Sanitation Engineering, on behalf of its clients, disposed of waste on this property. My original company was called L&L Disposal, which I later changed to Town & Country Sanitation Engineering was a merger of Boulder Disposal,

When I operated Sanitation Engineering from around 1966 to 1968, I had numerous customers whose waste I hauled only to the Pratt property, including:

- Safeway, for which I hauled and disposed of around a half a truck load of waste per day from the largest store located in downtown Boulder.
- Arapahoe Chemicals, for which I hauled 25-30 paper and metal drums twice per month from their plant at 28th Street and Walnut/Pearl in Boulder, Colorado, for disposal at the Pratt property.
- U.S. Geological Survey, for which I hauled and disposed of office waste from 25-30 locations at the Pratt property.
- Pizza Hut, for which I hauled and disposed of waste from a large metal container.
- IBM, for which I hauled and disposed of waste at the Pratt property.
- Sundstrand Aviation, for which I hauled waste including burnt ~~auto~~ otto fuel, diesel-based fuel and oil from 2480 W. 70th Ave, Denver, Colorado, to the Pratt property
- Numerous small "mom & pop" type businesses, for which I hauled and disposed of waste at the Pratt property.

In about 1968-1969, I divested my interests in Sanitation Engineering and sold the company to Carl Smith.

There were an additional 8-10 hauling companies that were also disposing of waste at the Pratt property at the same time period of 1966 to 1968. These included Bestway Disposal, Gurbitz Disposal, and Town & Country Disposal, which was operated by A.L. Pritschau at the time I left Colorado for Alabama in 1968.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this

Date: 4-2-18, 2018.

Signature: [signature]

Name: John Neuhauser

Address: 7677 AL Hwy 28 E

Telephone: 205-652-9512

This is the best of my knowledge that I can remember. The dates might be a little off.

OFFICE OF THE ILLINOIS SECRETARY OF STATE

JESSE WHITE
SECRETARY OF STATE

CORPORATION FILE DETAIL REPORT

File Number	60591482		
Entity Name	HAMILTON SUNDSTRAND CORPORATION		
Status	ACTIVE		
Entity Type	CORPORATION	Type of Corp	FOREIGN BCA
Qualification Date (Foreign)	07/21/1999	State	DELAWARE
Agent Name	C T CORPORATION SYSTEM	Agent Change Date	07/21/1999
Agent Street Address	208 SO LASALLE ST, SUITE 814	President Name & Address	DAVID L LAWRENCE GITLIN 2730 W TYVOLA RD 4 COL CTR CHARLOTTE
Agent City	CHICAGO	Secretary Name & Address	CHRISTOPH T FEDDERSEN SAME NC 28217
Agent Zip	60604	Duration Date	PERPETUAL
Annual Report Filing Date	06/25/2018	For Year	2018
Assumed Name	ACTIVE - UTC AEROSPACE SYSTEMS		

Return to the Search Screen

Select Certificate of Good Standing for Purchase

(One Certificate per Transaction)

BACK TO CYBERDRIVEILLINOIS.COM HOME PAGE

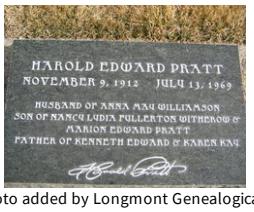


Photo added by Longmont Genealogical...

Harold Edward Pratt

BIRTH	9 Nov 1912
DEATH	13 Jul 1969 (aged 56)
BURIAL	Pratt Cemetery Longmont, Boulder County, Colorado, USA
MEMORIAL ID	69532790 · View Source

Family Members

Parents

Marion Edward Pratt
1879–1947

Nancy Lydia Fullerton *Witherow* Pratt
1879–1961

Spouse

Anna May *Williamson* Pratt*
1912–1992

Siblings

Frances E. Pratt*
1899–1908

Henry W. Pratt*
1905–1949

Donald Pratt*
1911–1911

Children

Kenneth Edward Pratt*
1941–1995

*Calculated Relationship

See more **Pratt** memorials in:

- Pratt Cemetery
- Longmont
- Boulder County
- Colorado
- USA
- Find A Grave

Sponsor and Remove Ads

Created by: Longmont Genealogical Society
Added: 8 May 2011
Find A Grave Memorial **69532790**

Find A Grave, database and images (https://www.findagrave.com : accessed 11 April 2018), memorial page for Harold Edward Pratt (9 Nov 1912–13 Jul 1969), Find A Grave Memorial no. 69532790, citing Pratt Cemetery, Longmont, Boulder County, Colorado, USA ; Maintained by Longmont Genealogical Society (contributor 47368000) .

Copyright © 2018 Find A Grave · Privacy Statement · Terms of Service

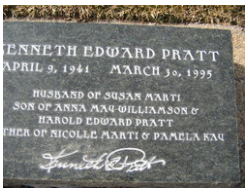


Photo added by Longmont Genealogical...

Kenneth Edward Pratt

BIRTH	9 Apr 1941
DEATH	30 Mar 1995 (aged 53)
BURIAL	Pratt Cemetery Longmont, Boulder County, Colorado, USA
MEMORIAL ID	69532834 · View Source

Family Members

Parents

Harold Edward Pratt
1912–1969

Anna May *Williamson* Pratt
1912–1992

*Calculated Relationship

See more **Pratt** memorials in:

- Pratt Cemetery
- Longmont
- Boulder County
- Colorado
- USA
- Find A Grave

Sponsor and Remove Ads

Created by: Longmont Genealogical Society
Added: 8 May 2011
Find A Grave Memorial **69532834**

Find A Grave, database and images (https://www.findagrave.com : accessed 11 April 2018), memorial page for Kenneth Edward Pratt (9 Apr 1941–30 Mar 1995), Find A Grave Memorial no. 69532834, citing Pratt Cemetery, Longmont, Boulder County, Colorado, USA ; Maintained by Longmont Genealogical Society (contributor 47368000) .

Copyright © 2018 Find A Grave · Privacy Statement · Terms of Service

As you're driving throughout the town of Longmont, you'll no doubt notice how many streets are named after the Pratt Family. The Pratt family has lived and worked in Longmont since 1912, and has done quite a bit to get the community to where it is today. The Plaza Event Center, which consists of the Best Western Plus Plaza Hotel, the Plaza Convention Center, and Harold's were all conceived and started by the Pratt family. Here's a little bit of background on this amazing Colorado family.

The Beginning

The beginning of "Pratt" as a company started with Marion Pratt in 1912. He provided the community of Longmont with its first Real Estate and insurance business, both of which were a very new concept for the times.

The way in which you bought and sold houses in the early 1900s was much different than today. Back then you didn't have a broker or real estate agent. When you wanted to sell your house, you found a member of the community who was wealthy enough or influential enough to be able to buy your house. It was pretty simple at that time. If the right person was willing to purchase your house, he would give you the money, and he would own an extra house! When you wanted to buy a house, you would go to the same person and ask if he had any houses he'd like to sell. He would say "sure" and it was done!

Marion continued his business until his son Harold Pratt, took over the business as president of the Pratt Agency in the early 50's. At that time, Harold started what was to become the largest and most successful residential real estate agency in Northern Colorado. Ken Pratt, Harold's son, joined the company in 1969 developing 11 communities in the area. The only one outside of Longmont is in Lyons. If you took a map of Longmont and colored everything that Pratt has developed, you would see just how much the Pratt family has affected the growth of the community of Longmont.

In the 50's and 60's after World War II, the Front Range was just starting to grow. A small house located in Boulder County could be purchased for under 16,000 dollars. What you see of the northern

Front Range today, the foundations of the residential and business community, began with Hewlitt Packard and IBM. Both companies brought people into Longmont, and those people needed homes. Therefore, the Pratt's residential development business boomed.

Market Research

These technology companies would take whatever was personally developed or created by its employees and patent the work under the company's name. At the time, most employers worked this way. A lot of the best and brightest, who works fro these companies began to think "I don't need this company; I can do this on my own." So these engineers started to develop products in their basements, garages, bedrooms, wherever they had space. After providing homes for the employees, Ken and Susan Pratt began realizing a need for "homes" for small business. At that point in time, Longmont was primarily agricultural, and there wasn't a good location where new start up companies could live. As part of their research, Ken and Susan traveled from Silicon Valley in California to Boston, Massachusetts to find out what kind of office the high tech industry needed. Some of the items they realized they needed were curb appeal, space for exercise and walking, a well educated labor market, excellent transportation systems, cheap power & water, and being near like industries! Being close to like businesses creates synergy, which has been dubbed in the 21st century as a "cluster."

After visiting both of those locations, they decided to sell Longmont as the "center of the universe." At the time, they weren't able to say "come to Longmont, CO and see what kind of industry we have" because the most complex technology at the time was the sugar beet factory and the Kunner cannery. Susan and Ken found that people did not mind driving 30 miles to work, if they had a nice place to work and the amenities they wanted. As a result, they took a map of Colorado, made Longmont the center, and surveyed what was available within that 30 mile radius. They found that people didn't care what was available specifically in Longmont, but what was available within those 30 miles.

So what about the labor market? Longmont itself had about 45,000 people. Not a very large labor market, but if you go out 30 miles in all directions, you pick up part of Boulder, most of Loveland, part of Fort Collins, and a good portion of northern Denver, not to mention Louisville, Lafayette, Broomfield and a host of smaller towns. That labor market is closer to 1,000,000. But what high tech companies need out of their labor market is brains and computer related skills. On their research trips, they realized that local labor markets were driven by strong universities (Stanford, University of California, Harvard, MIT, etc.) Although Colorado was a great place to live, and the education system is strong, there lacked engineering schools teaching the high tech skills. The only one was the Colorado School of Mines. Therefore, Ken and Susan decided to approach the University of Colorado at Boulder to talk to them about what they could specifically do to improve the overall economic outlook of Colorado. At least in part due to these talks, CU now has a strong engineering schools. Other local schools have followed

suit, and you can see that CSU is now recognized internationally as one of the top biotech schools in the country.

The next item of importance to high tech companies is cheap power and water. Since the beginning of Longmont, water has been regulated — because of these regulations, the town can continue to safely expand with ample water supply. As long as the mountains have water, so will the town of Longmont. Power in Longmont is the 3rd least expensive along the front range. The same founders of the water regulations saw the need for power and helped build two power plants. Today, these power plants produce enough electricity that there is surplus, which allows for revenue generation, and a lower power cost to the Longmont consumers.

The last item of importance was transportation. The Stapleton Airport at the time was state of the art. I-25 and 287 run north and south, and I-70, I-80, I-40, and Highway 66 run east and west.

Office Park Development

After the research was done, Ken and Susan returned to Silicon Valley to talk to the high tech companies. They did not talk about the sleepy little agricultural city in Colorado. They talked about power and labor market and transportation. They talked about quality of life, the fact it hardly ever rains here, there is clean air or traffic jams. Then they flipped the chart over and compared Colorado to California. Denver became San Francisco, Fort Collins became San Jose and Longmont was right in the middle. The advantage was that California was limited by the ocean to the west and mountains to the east. Colorado was only limited to the west. Companies locating here had room to grow, and grow they did! So did Pratt. Building after building was created, but similar to the housing developments, communities were created, this time for industry. The business parks created by the Pratt family were more than just buildings. They featured curb appeal, and places to walk & gather outside. This is the idea behind the Plaza Convention Center.

The Hotel

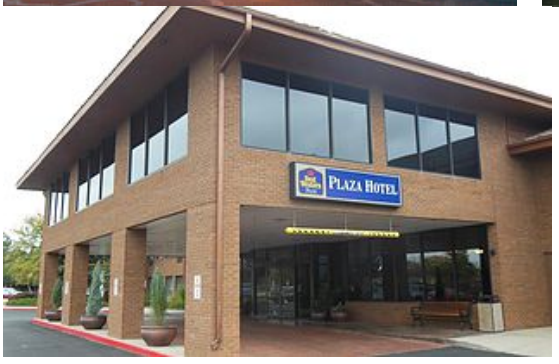
With the new buildings, new jobs were created. There became a need for maintenance, landscape and construction divisions of the company. When new business partners brought in people from out of town, there became a need for a hospitality division. The original hotel was built in 1982, and has been through several remodels and major additions over the years. What started as a Raintree Plaza hotel has flown a few different flags over the years, and is now a Best Western Plus.

Pratt Today

In 1995 Ken Pratt passed away after a long battle with cancer. Susan continued to grow the business as she does actively to this day! She purchased a ranch in Kremling, built the Village at Burlington and the Village Gardener, which is now Oskar Blues, as well as continuing to build new homes for industry.

At the turn of the century, Pratt owned a little over 2 million square feet of commercial space, employed over 430 team members, ran 2 retail businesses, a cattle ranch, and 2 hotels. In 2005, Pratt Land, a portfolio of 2 million square feet of industrial, commercial, and research space was sold to Circle Capital of Denver. This sale represents the largest sale of its kind in the history of Colorado.

With the 100th anniversary of Pratt doing business in Longmont, the hotel was re-branded to stake a bigger claim for a strong future in hospitality. The Pratt's still seek more opportunities in Real Estate as they hold properties for rent and are listing properties for sale and/or development.



Longmont's Premiere Events Venue

From Corporate Meetings/Events to Social Events to a one-of-a-kind wedding, Plaza Convention Center is the right choice.

Contact Us

1850 Industrial Circle
Longmont, CO 80501
Phone: 303.776.2000

Certificate of Excellence
2016
tripadvisor
Best Western Plus
Plaza Hotel

Best Western Plus Plaza Hotel
1900 Ken Pratt Blvd
Longmont, CO 80501
303-776-2000

Smokin' Dave's BBQ & Taphouse
1940 Ken Pratt Blvd

Google Maps 1998 Co Rd 5

Image capture: Sep 2015 © 2018 Google

Erie, Colorado

Google, Inc.

Street View - Sep 2015

Street View Photo Sphere See inside
Click highlighted areas to see images

State investigates Encana after complaints of dug-up trash in Erie

Oil, gas company: 'Moving forward, if we encounter trash, we will stop, investigate'

By Joe Rubino

Camera Staff Writer
Boulder Daily Camera

Posted:Tue Dec 02 19:34:38 MST 2014

State environmental officials are investigating recent actions by Encana Oil & Gas after Erie residents complained of seeing crews unearth and then rebury old trash last week while laying pipe near one of the company's well sites.

Freddy Arck, a spokesman for the Colorado Department of Public Health and Environment, confirmed Tuesday that his office is investigating Encana following complaints from several Erie residents about dug-up trash on a site south of the intersection of Weld County roads 5 and 6.

An employee of the state's solid waste compliance unit visited the site Nov. 25 and found that digging had stopped, Arck said. Officials are now looking into state environmental regulations to see if Encana violated any rules based on what happened there.

Encana's recent drilling operations in Erie have been controversial since before the town's Board of Trustees unanimously approved the 13 hydraulic fracturing wells in August, with many residents of the nearby Vista Ridge and Vista Pointe neighborhoods complaining the sites were too near homes. Work on some of those wells began last month, leading to the complaints about dug-up trash.

"It was very disturbing," said Donna Burton, a Vista Pointe resident who visited the dig Nov. 25 to see it for herself after seeing pictures of trash-speckled dirt piles on an **Erie community Facebook page** on Nov. 24.

"There was garbage flying everywhere. It was very windy," Burton said. "We saw bulldozers pick up the garbage, and there was trench that had been dug and they were laying garbage directly into the trench."

Burton said she took pictures and video on her iPad because she was so upset by what she saw. She said she is concerned about what she perceives to be a lack of transparency on Encana's part.

"I'm not anti-fracking, but I'm anti the way they are doing this," she said.

Encana spokeswoman Wendy Wiedenbeck acknowledged last week that crews had encountered some buried trash when digging a trench for water and oil pipelines, but she disputed that crews buried it again. She said the rubbish was taken to the nearby Front Range Landfill for disposal.

In an email Tuesday, Wiedenbeck said Encana has been in touch with the state health department about the issue and has "temporarily stabilized" the area where the trash was uncovered at the state's request.

Encana is now working on a plan officially outlining how it will deal with trash should it encounter other such deposits in the future. One option is to drill underneath it horizontally, she said.

"Moving forward, if we encounter trash, we will stop, investigate to determine length and depth of the trash area and either excavate and dispose of it per the plan or bore under it," Wiedenbeck wrote. "We will also provide the state with a plan to manage any additional trash we might disturb as part of our investigation. We anticipate submitting our plans within the next day."

Speaking generally, Charles Johnson, head of the state's solid waste and material management program, said it is not uncommon for crews to unearth old trash while digging for various projects. He said in most cases, his office directs people who do find buried material to contact the nearest licensed landfill and see if that facility can accept what has been found.

Erie Mayor Pro Tem Mark Gruber said he visited the dig site on Thanksgiving after being contacted by a resident. He said he has been in close contact with the health department this week and is confident that what was unearthed is not a threat to public health.

"If this had been elevated to a potentially hazardous situation, I assure you that (the town board) would have been standing alongside CDPHE every day monitoring it, but CDPHE assured us that it wasn't a hazardous situation," he said.

Despite the safety assurances, some area residents say the incident is indicative of the larger problem of Encana's indifference to the concerns of neighbors.

Vista Ridge resident Mark Kadlecek, in an email sent Tuesday, said the site where Encana was digging was known to be an old landfill in the 1960s.

He said his wife first saw the piles of trash-laden dirt there around 9:30 a.m. Nov. 23, leading them to believe the rubbish had been unearthed the previous day and left to blow around the neighborhood.

Noting that some of his neighbors whose homes are nearer the well site are already complaining about persistent noise pollution, Kadlecek said he would like to see Encana hire a third-party contractor to monitor for environmental, noise and light pollution, as well as take steps to better muffle noise.

"The main concern about the dig is that proper procedure is followed when uncovering refuse in this area," Kadlecek wrote. "I would ideally like to see that Encana and their sub-contractors be environmentally conscious as well as being a good neighbor by being cognizant of the residences around the well site."

Joe Rubino: 303-473-1328, rubinoj@dailycamera.com or twitter.com/rubinojc

Close Window Send To Printer

A bulldozer is seen pushing a pile of dirt and trash near the intersection of Weld County roads 5 and 6 in Erie on Nov. 25. Encana crews unearthed the refuse while working to install a pipeline. (*Courtesy photo/Kyle Roth*)

Newspapers.com
https://www.newspapers.com/image/24949218
Greeley Daily Tribune (Greeley, Colorado) · Thu, Jan 7, 1965 · Page 33
Downloaded on May 18, 2018

Fire Causes $50,000 Damage To Denver Plant

DENVER (AP)—Fire caused an estimated $50,000 damage and general office building of Protex Industries, Inc., in southwest Denver.

Forty-five firemen and nine pieces of equipment battled the blaze as the fire for a time threatened to spread to a nearby oil-filled railway tank car.

Fire Department Investigator Jim Jordan said the fire started when a jammed electric pump sent a shower of sparks onto oil-covered pipes in the basement of the three-story brick building.

No one was injured.

Copyright © 2018 Newspapers.com. All Rights Reserved.
Powered by Newspapers.com

Newspapers.com
https://www.newspapers.com/image/226841314
Fort Collins Coloradoan (Fort Collins, Colorado) · Thu, Oct 2, 1975 · Page 12
Downloaded on May 18, 2018

Fire destroys chemical complex in Denver

DENVER (AP) — Fire destroyed much of a chemical manufacturing complex here this morning, and was still spewing acrid smoke over the city hours later.

The three-alarm fire broke out at the Protex Industries plant about 5:30 a.m. and nearly 100 firemen battled the blaze.

The petroleum chemicals manufactured by the company caused explosions inside the buildings.

Fire Department officials reported two persons suffered minor injuries.

No damage estimates were available and cause of the fire wasn't known.

Copyright © 2018 Newspapers.com. All Rights Reserved.
POWERED BY Newspapers.com

Newspapers.com
https://www.newspapers.com/image/27300892

Greeley Daily Tribune (Greeley, Colorado) · Fri, Oct 3, 1975 · Page 12

Downloaded on May 18, 2018

Denver fire causes $750,000 damage

DENVER (UPI) -- A three-alarm fire at the firm's chemical plant in southwest Denver caused $750,000 in damage Thursday, a spokesman for Protex Industries, Inc., said today.

Don Wilson, general manager, said cause of the fire has not yet been determined. Three firemen suffered minor injuries in battling the blaze.

Protex manufactures chemicals used to increase the strength of concrete. Officials said the fire was first noticed at 5:30 a.m. by a woman who lives on the top floor of the three-story building.

Mrs. Pearl Dalton said she heard an explosion and saw flames coming up the side of the building. She and her two children, Julie, 20, and Ronald, 19, were able to get out safely.

Wilson said the bottom floor of the building houses laboratories. Company offices were on the second floor and the company watchman and his family lived on the top floor.

The three firemen were injured when chemicals in a storage shed exploded. Officials also were concerned about three railroad tank cars which contained resins and fuel oil, but they were able to prevent the fire from spreading.

It took firemen more than three hours to bring the blaze under control. Wilson said the company's records and laboratory were destroyed, but he said the firm would be able to return to limited production within a week.

Dairy cows are descended from wild cattle that once roamed the forests of northeastern Europe.

Powers Optical Co.
BankAmericard -- Master Charge
Jerry Powers, Ophthalmic Optician
519 16th St. 353-9284

Copyright © 2018 Newspapers.com. All Rights Reserved.

BizWest
BOULDER VALLEY • NORTHERN COLORADO
(https://bizwest.com/?member=guest)

Arapahoe Chemicals a Boulder pioneer

By (https://bizwest.com/author/?member=guest) — January 1, 1998

(https://www.facebook.com/sharer/sharer.php?u=https://bizwest.com/1998/01/01/arapahoe-chemicals-a-boulder-pioneer-2/&t=Arapahoe+Chemicals+a+Boulder+pioneer&redirect_uri=https://bizwest.com?sharing-thankyou=yes&member=guest&__hstc=40977085.4649803dae65c29eae7f49b9b3ea147b.1527635759762.1527635759762.1527635759762.1&__hssc=40977085.1.1527635759762&__hsfp=4229517943)

(https://plus.google.com/share?url=https://bizwest.com/1998/01/01/arapahoe-chemicals-a-boulder-pioneer-2/&member=guest&__hstc=40977085.4649803dae65c29eae7f49b9b3ea147b.1527635759762.1527635759762.1527635759762.1&__hssc=40977085.1.1527635759762&__hsfp=4229517943)

(http://www.linkedin.com/shareArticle?mini=true&ro=true&trk=EasySocialShareButtons&title=Arapahoe+Chemicals+a+Boulder+pioneer&url=https://bizwest.com/1998/01/01/arapahoe-chemicals-a-boulder-pioneer-2/&member=guest&__hstc=40977085.4649803dae65c29eae7f49b9b3ea147b.1527635759762.1527635759762.1527635759762.1&__hssc=40977085.1.1527635759762&__hsfp=4229517943)

Editor's Note: This is the third in an ongoing series of stories tracing the family tree of Boulder County's entrepreneurial marketplace.

BOULDER — With today's employment boom, pharmaceutical manufacturer Syntex Chemicals Inc. can't hire chemists fast enough — often looking outside the state to find them.

But Syntex's humble beginnings speak of a different time and a different Boulder.

It started in 1946 with brothers Tom Waugh and Richard Waugh, advanced degree-holding chemistry graduates from the University of Colorado. Neither wanted to go back home to Arkansas. So with no jobs to speak of in their field, they decided to start their own business.

Gathering their smartest friends who also wanted to stay in Boulder — John Bartram, Bob Inman and Oscar Jacobson — they founded Arapahoe Chemicals Inc.

"We didn't have any money," recalls Tom Waugh. "We went out and sold stock, hawking it up and down the street."

After raising the princely sum of $80,000, the fledgling company bought an acre-and-a-half lot at the corner of Pearl and 28th streets, just outside the Boulder city limit at the time.

"It was across the street from a pig farm, so you didn't notice the smell of the chemicals as much," Waugh says. "28th (Street) was a lane-and-a-half dirt road that went nowhere but the city dump."

The group built a two-story cinderblock building and began manufacturing "fine chemicals" — small lots of re-agents and intermediates workers sold to other chemical companies.

Arapahoe Chemicals had its ups and downs, including irate stockholders and a fire.

But it was an order for an exotic chemical that put it on the map. Waugh got a $17 order from Mead Johnson, the baby food maker, for 100 grams of NBS (N-bromosuccinimide).

Batch after batch of the chemical was a failure. What Waugh sent Mead Johnson wasn't very good, he said, so he charged the company only $7.

But Waugh set to work perfecting his technique, coming up with a revolutionary method that produced NBS of over 99 percent purity. The process proved so good "we put the other manufacturers of it out of business," Waugh says.

Years later, Waugh happened to be at the Mead Johnson plant, where he asked about that fateful order. Not only could no one find the purchase order, the company told him it doesn't use the chemical. For Waugh it's still an unsolved mystery.

But this feat of process design brought the tiny Boulder firm to the attention of world-class chemical manufacturer Syntex Corp., which purchased Arapahoe Chemicals for $4.7 million in 1965. (The name wasn't changed to Syntex Chemicals until 1982, however. Syntex was bought by Roche Holding Ltd. of Basel, Switzerland, in 1994. Current President Eric Lodewijk says a new name is forthcoming in early 1998.)

Waugh and his partners, however, only saw a fraction of that cash because it was shared among 600 stockholders.

After the purchase, Richard Waugh was named president. In 1972, he transferred to Syntex headquarters in Palo Alto, Calif., as corporate vice president.

Subscribe (/Subscribe/) Login (/Wp-login.php)
Sign in with:
(https://bizwest.com/wp-login.php?wpe-login=true&action=wordpress_social_authenticate&mode=login&provider=Facebook&redirect_to=https%3A%2F%2Fbizwest.com%2F1998%2F01%2F01%2Farapahoe-chemicals-a-boulder-pioneer-2%2F&member=guest)
(https://bizwest.com/wp-login.php?wpe-login=true&action=wordpress_social_authenticate&mode=login&provider=Twitter&redirect_to=https%3A%2F%2Fbizwest.com%2F1998%2F01%2F01%2Farapahoe-chemicals-a-boulder-pioneer-2%2F&member=guest)
(https://bizwest.com/wp-login.php?wpe-login=true&action=wordpress_social_authenticate&mode=login&provider=LinkedIn&redirect_to=https%3A%2F%2Fbizwest.com%2F1998%2F01%2F01%2Farapahoe-chemicals-a-boulder-pioneer-2%2F&member=guest)

Event Calendar
< May 2018 >
S M T W T F S
29 30 1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31 1 2
Submit an event (/event-submission/)

BizWest Edition – May 2
(https://bizwest.com/ca

PRINT ED
ttps://bizwest.com/cate

BizWest Publications (https://bizwest.com/category/special_publications/)

Rocky Mountain Tech – (https://bizwest.com/ca/special_publications/p colorado_tech/)

COLORAD

Get Notifications

Tom Waugh stayed on in Boulder as vice president of research and development until 1969, when he "retired," going on to serve on the Boulder City Council for a number of years. He also started selling commercial real estate. One of his proudest accomplishments as a broker was, after Arapahoe Chemicals relocated in 1976 to 55th Street, selling the Pearl Street property to Dayton-Hudson Corp., which built a Target store on the site.

In 1972, after 12 years with Arapahoe Chemical, John Birmingham decided he didn't enjoy his job anymore. Soon a new company was born.

"When I started it was more in line of my interest in organometallic materials. Syntex was slowly starting to change their products to drugs and that wasn't as interesting to me."

To get back to areas of chemistry he preferred, Birmingham set up shop as Boulder Scientific, manufacturing small quantities of chemicals.

By 1979, Boulder Scientific began to grow. Like many of today's entrepreneurs in search of affordable property, Birmingham discovered Mead.

"I was probably one of the first to exit Boulder," he says. "It looked like a really good place with low population density; the interstate and railroad available."

Boulder Scientific's products are about evenly split between intermediates for pharmaceuticals, metallocene catalysts used to make polyethylene and polypropylene, and general industrial products for different applications. With 65 employees and several million in annual sales, the company's growth rate has been between 15 and 20 percent a year, Birmingham says.

Well-known Boulder entrepreneur Bill Coleman started his career at Arapahoe Chemicals in 1959 in the research lab, later moving to sales and marketing activities.

Shortly after the Syntex acquisition, Coleman was asked to put together a team to design, build and operate a chemical plant in the Bahamas. When he returned to Boulder in 1972 he was named president of Arapahoe Chemicals, a position he held until 1979, when he started Colorado Venture Management.

"I wanted to start this because of my operations background, not chemistry," Coleman says. "I had managed a couple of business for 13 years and knew what had to be done."

An early-stage venture capital company, CVM has funded about 55 local companies. Among the most successful Coleman names McData Corp., BI Inc., Hauser, Biostar, Avalon Imaging, Coral Systems, Atlantes, Clinicom and Sievers Instruments.

Coleman also heads up Colorado Energy Management, which runs electric generation plants in Rifle and Brush. The waste heat from those enterprises operates Colorado Greenhouse, another Coleman venture.

Additionally, Coleman and another Arapahoe Chemicals veteran, Jack Kracklauer, founded Econalytic Systems.

Since 1969, Kracklauer had been director of the application development department, a group devoted to finding commercial applications for the 300 or so chemicals the company manufactured.

"I came up with a few candidates and spent the next 12 years developing a number of patents and patented applications," Kracklauer says.

The fun ended, according to Kracklauer, when "Syntex decided they wanted to restrict Arapahoe to production and research support. I decided I didn't want to work for a cost center rather than a profit center."

Besides, Syntex was moving in the direction of pharmaceuticals and that didn't interest him.

"My experience was in rubber and plastics and automotive and construction industries."

As part of Coleman's parting bonus he had acquired some of the technology that Kracklauer was in the process of developing. Thus, the two started Econalytic. Kracklauer spent the first 10 years developing the technology, a fuel additive that catalyzes combustion processes, improving gas mileage and reducing pollution.

Marketing the product has proved more challenging than developing it, Kracklauer says. Although it is sold commercially as a fuel additive, it hasn't taken off because the auto industry isn't interested, he says.

"The biggest problem is that we're not a Tier II company. The auto industry can't work with an entrepreneurial company, only Tier I companies like Allied Signal. We have to get a company like General Motors to tell a Tier I supplier that they should take an interest in our product."

Kracklauer and his wife dutifully add it to the tank with every fill-up and get about a 10 percent gas savings, but most people don't have that discipline, he says.

"We'd like the engine manufacturer to put a part in the engine that it adds this catalyst as the car runs."

In 1980, after 20 years as a process chemist at Arapahoe Chemicals, Per Hultquist really needed a change. He started J'Leen Ltd. which designs and creates lead crystal sun-catchers that are used for "everything from jewelry to gifts to tree ornaments," he says.

The Arapahoe Chemicals connection? None, according to Hultquist.

pecial_publications/pub
ook_of_lists/)

Custom Publications
(https://bizwest.com
/category
/custom_publications/)

2016 – Brighton Econo
(https://bizwest.com/ca
/custom_publications/b
custom_publications/)

BRIGHT
ttps://bizwest.com/cate
ustom_publications/bri
stom_publications/)
h-

Poll

Should businesses and other organizations cut ties with the NRA?

- **Yes**
- **No**

Submit

Get Notifications

"There was some business education — operating and business costs, sourcing and stuff like that. The chemistry angle had nothing whatsoever."

Hultquist just wanted to be an entrepreneur. "I enjoyed Arapahoe Chemicals when it was family-run and small but when it became a large conglomeration I didn't like it as much. I didn't enjoy the large corporate scenario. This is just my wife and myself."

Students at the University of Colorado's Center for Entrepreneurship, under the direction of Dale Meyer, professor of strategy and organizational management, are compiling the Boulder County Genealogy Study. The Boulder County Business Report is working in conjunction with the project and will publish results. To submit information for their study or to ask questions, contact Heidi Neck at 492-4169 or e-mail to Heidi.Neck@colorado.edu.

Sponsored Content

Elevations Credit Union Opens Its Doors in Midtown Fort Collins (https://bizwest.com/2018/03/06/elevations-credit-union-opens-doors-midtown-fort-collins/?member=guest)

(https://bizwest.com/2018/03/06/elevations-credit-union-opens-doors-midtown-fort-collins/?member=guest)

Member-owned not-for-profit Elevations Credit Union has a new branch in Midtown Fort Collins, featuring business bankers, commercial lenders and more.

Read More (https://bizwest.com/2018/03/06/elevations-credit-union-opens-doors-midtown-fort-collins/?member=guest)

(https://www.facebook.com/sharer/sharer.php?u=https://bizwest.com/1998/01/01/arapahoe-chemicals-a-boulder-pioneer-2/&t=Arapahoe+Chemicals+a+Boulder+pioneer&redirect_uri=https://bizwest.com?sharing-thankyou=yes&member=guest&__hstc=40977085.4649803dae65c29eae7f49b9b3ea147b.1527635759762.1527635759762.1527635759762.1&__hssc=40977085.1.1527635759762&__hsfp=4229517943)

(https://plus.google.com/share?url=https://bizwest.com/1998/01/01/arapahoe-chemicals-a-boulder-pioneer-2/&member=guest&__hstc=40977085.4649803dae65c29eae7f49b9b3ea147b.1527635759762.1527635759762.1527635759762.1&__hssc=40977085.1.1527635759762&__hsfp=4229517943)

(http://www.linkedin.com/shareArticle?mini=true&ro=true&trk=EasySocialShareButtons&title=Arapahoe+Chemicals+a+Boulder+pioneer&url=https://bizwest.com/1998/01/01/arapahoe-chemicals-a-boulder-pioneer-2/&member=guest&__hstc=40977085.4649803dae65c29eae7f49b9b3ea147b.1527635759762.1527635759762.1527635759762.1&__hssc=40977085.1.1527635759762&__hsfp=4229517943)

Advertising

Get Notifications

BizWest tv

Produced by V3 MEDIA
THE VIDEO SOLUTION

(https://v3.media/?__hstc=40977085.4649803dae65c29eae7f49b9b3ea147b.1527635759762.1527635759762.1527635759762.1&__hssc=40977085.1.1527635759762&__hsfp=4229517943)

Leave a Reply

Sign in with: (https://bizwest.com/wp-login.php?wpe-login=true&action=wordpress_social_authenticate&mode=login&provider=Facebook&redirect_to=https%3A%2F%2Fbizwest.com%2F1998%2F01%2F01%2Farapahoe-chemicals-a-boulder-pioneer-2%2F&member=guest) (https://bizwest.com/wp-login.php?wpe-login=true&action=wordpress_social_authenticate&mode=login&provider=Twitter&redirect_to=https%3A%2F%2Fbizwest.com%2F1998%2F01%2F01%2Farapahoe-chemicals-a-boulder-pioneer-2%2F&member=guest) (https://bizwest.com/wp-login.php?wpe-login=true&action=wordpress_social_authenticate&mode=login&provider=LinkedIn&redirect_to=https%3A%2F%2Fbizwest.com%2F1998%2F01%2F01%2Farapahoe-chemicals-a-boulder-pioneer-2%2F&member=guest)

Your email address will not be published.

Comment

You may use these HTML (HyperText Markup Language) tags and attributes:

```
<a href="" title=""> <abbr title=""> <acronym title=""> <b> <blockquote cite=""> <cite> <code> <del datetime=""> <em> <i> <q cite=""> <s> <strike> <strong>
```

Name *

Email *

Website

Save my name, email, and website in this browser for the next time I comment.

Post Comment

MEDIA LLC

Jeff Nuttall
jnuttall@bizwest.com (mailto:jnuttall@bizwest.com?member=guest)
970.232.3131 (tel:9702323131)

(http://web.archive.org/web/20170522022750/https://www.facebook.com/bizwestmedia?member=unlimited&member=guest&__hstc=40977085.4649803dae65c29eae7f49b9b3ea147b.1527635759762.1527635759762__hssc=40977085.1.1527635759762&__hsfp=4229517943)
(http://web.archive.org/web/20170522022750/https://www.linkedin.com/company/'report?__hstc=40977085.4649803dae65c29eae7f49b9b3ea147b.1527635759762.1527(__hssc=40977085.1.1527635759762&__hsfp=4229517943)

Get Notifications

(http://web.archive.org/web/20170522022750/https://twitter.com/bizwestmedia?mem
member=guest&
__hstc=40977085.4649803dae65c29eae7f49b9b3ea147b.1527635759762.1527635759762
__hssc=40977085.1.1527635759762&__hsfp=4229517943)
(http://web.archive.org/web/20170522022750/https://www.instagram.com/bizwestme
/?member=guest&
__hstc=40977085.4649803dae65c29eae7f49b9b3ea147b.1527635759762.1527635759762
__hssc=40977085.1.1527635759762&__hsfp=4229517943)

© BizWest Media

The contents of this website are copyright BizWest Media, LLC. All rights reserved.

Use of any of this information or media on this site is strictly prohibited without express written consent.

Services

ABOUT US (/ABOUT-US/)
CONTACT US (/CONTACT-US/)
PRIVACY POLICY (/PRIVACY-POLICY/)
SUBMIT NEWS (/SUBMIT/)
SUBSCRIBE (/SUBSCRIBE/)
TERMS OF USE (/TERMS-OF-USE/)
RSS (/FEED/)

Advertising

BIZWEST EVENTS (HTTPS://BIZWEST.COM/BIZWEST-EVENTS/?MEMBER=GUEST)
CUSTOM & CONTRACT EVENTS (/CUSTOM-CONTRACT-EVENTS/)
CUSTOM PUBLICATIONS (/CATEGORY/CUSTOM_PUBLICATIONS/)
REQUEST MEDIA KIT (/MEDIA-KIT/)
REQUEST EDITORIAL CALENDAR (/EDITORIAL/)
JOIN OUR TEAM (/POSITIONS)
THOUGHT LEADERS (/THOUGHT-LEADERS?MEMBER=FALSE)

Get Notifications

×
View Richard's Background Report
View Results
×
Get Richard Dean's background check
View Results

Richard O Dean

Age 60s

Current addresses

1842 Montane Dr E Golden CO 80401-9123

77 Comstock Pl Castle Rock CO 80108-9001

Previous Locations

Englewood, CO
Colorado Springs, CO
Grand Junction, CO
Aurora, CO
Castle Rock, CO
Centennial, CO
Castle Pines, CO

Family & relatives

Reagan Kay Dean
Elle Dean
Christian O Dean

Looking for a different Richard?

Tracy Brockway Dean
Deborah O'donnell
Robert B Richard
D Z Richard

© 2018 Whitepages Inc.

Look Up a ZIP Code™

Go to

ZIP Code™ by Address

You entered:

1842 MONTANE DRIVE E
GOLDEN CO

If more than one address matches the information provided, try narrowing your search by entering a street address and, if applicable, a unit number. **Edit and search again. (zip-code-lookup.htm?byaddress)**

1842 MONTANE DR E
GOLDEN CO **80401-9123**

Look Up Another ZIP Code™

Edit and Search Again (/zip-code-lookup.htm?byaddress)

×
View Susan's Background Report
View Results
×
Get Susan Pratt's background check
View Results

Susan Marti Pratt

Age 70s

Phone numbers

(303) 776-6822
Landline
(303) 485-3767
Landline

Current addresses

8833 Portico Ln Longmont CO 80503-9436

PO Box 1937 Longmont CO 80502-1937

Previous Locations

Longmont, CO

Family & relatives

James J Unger
Jenna Norene Justen
Nicolle Marti Pratt

Looking for a different Susan?

Kristine Pratt
Katherine M L Pratt
Stephen James Pratt
Karen Marie Pratt

© 2018 Whitepages Inc.

Look Up a ZIP Code™

Go to

ZIP Code™ by Address

You entered:

8833 PORTICO LANE
LONGMONT CO

If more than one address matches the information provided, try narrowing your search by entering a street address and, if applicable, a unit number. **Edit and search again. (zip-code-lookup.htm?byaddress)**

8833 PORTICO LN
LONGMONT CO **80503-9436**

Look Up Another ZIP Code™

Edit and Search Again (/zip-code-lookup.htm?byaddress)

Look Up a ZIP Code™

Go to

ZIP Code™ by Address

You entered:

P.O. BOX 1937
LONGMONT CO

If more than one address matches the information provided, try narrowing your search by entering a street address and, if applicable, a unit number. **Edit and search again. (zip-code-lookup.htm?byaddress)**

PO BOX 1937
LONGMONT CO **80502-1937**

Look Up Another ZIP Code™

Edit and Search Again (/zip-code-lookup.htm?byaddress)

Look Up a ZIP Code™

Go to

ZIP Code™ by Address

You entered:

7677 AL HIGHWAY 28 E
LIVINGSTON AL

If more than one address matches the information provided, try narrowing your search by entering a street address and, if applicable, a unit number. **Edit and search again. (zip-code-lookup.htm?byaddress)**

7677 AL HIGHWAY 28 E
LIVINGSTON AL **35470-3216**

Look Up Another ZIP Code™

Edit and Search Again (/zip-code-lookup.htm?byaddress)

Look Up a ZIP Code™

Go to

ZIP Code™ by Address

You entered:

1 NEW ORCHARD ROAD
ARMONK NY

If more than one address matches the information provided, try narrowing your search by entering a street address and, if applicable, a unit number. **Edit and search again. (zip-code-lookup.htm?byaddress)**

1 NEW ORCHARD RD ARMONK NY **10504-1722**
1 NEW ORCHARD RD ARMONK NY **10504-1722**
1 NEW ORCHARD RD STE 1 ARMONK NY **10504-1722**
IBM WORLD HEADQUARTERS 1 NEW ORCHARD RD STE 1 ARMONK NY **10504-1783**
(Range 1 - 99) NEW ORCHARD RD ARMONK NY **10504-1716**

Look Up Another ZIP Code™

Edit and Search Again (/zip-code-lookup.htm?byaddress)

Newspapers.com
https://www.newspapers.com/image/347963041

Casper Morning Star (Casper, Wyoming) · Wed, Feb 19, 1958 · Page 25

Downloaded on Apr 12, 2018

AL Prexy Hints Minneapolis Move

CHICAGO (UP)—Will Harridge, president of the American League, said Tuesday he had always anticipated "the day that we put a franchise in Minneapolis."

Harridge said the American League at this time was not interested in expanding to the Pacific Coast.

"We might have been in the past," he said. "When Joe Cronin bought the San Francisco franchise, I thought we might have gone out there. But now with the National League having two franchises out there, let's wait a year and see what develops."

Harridge believed it was only a matter of time before the American League will expand to 10 teams compared with the present eight, and he anticipated that the champions of the two leagues still would meet in the World Series.

"It might be a problem in playing schedules," he said "in that one league might begin later or finish earlier than the other. And you don't know how many games you might play with each other team if you had a 10-team league. You might play 150 or 160 instead of 154."

Harridge said the matter of expansion had been discussed by American League owners "and they've always thought about playing two fewer games with the Yankees and have said 'Well, let's lay this aside and talk about it later'."

Both the National and American leagues now play 154-game schedules with 22 games between each team, 11 at home and 11 away. Any larger leagues probably would require fewer games between each pair of teams since the schedule could not be expanded far beyond the current program.

"We can expand," Harridge said. "All that would be required is for a group interested in a franchise to apply to the American League office and show financial responsibility and a place to play.

"We've asked some of these people 'where would you get the players?' and they've all said 'we're not worried about the players.' But I would suppose that any group asking for a franchise, in Minneapolis, say, would have rights to the Minneapolis franchise and the Minneapolis players."

Cronin, of the Boston Red Sox, purchased the San Francisco franchise in the past decade and it was presumed he might move the Red Sox there. But instead he sold the franchise to the New York Giants of the National League a year ago and the Giants moved instead.

Notre Dame, Pittsburgh In NCAA Meet

NEW YORK (UP) The National CoLegiate Athletic Assn. Tuesday named Notre Dame (17-4) and Pittsburgh (14-5) as "at-large" entries in its 1958 basketball tour.ament.

They are the fourth and fifth teams to enter the 24-team tournament. Oklahoma State was the first at-large entry selected. Connecticut of the Yankee Conference and Idaho State of the Rocky Mountain Conference have clinched berths. Sixteen conference champions and eight at-large teams will make up the field.

Notre Dame, which has won 15 of its last 17 games, will take part in the mideast regionals. Notre Dam's first round opponent will be the Mid-American Conference or the Ohio Valley Conference champion, neither of which has yet been decided. The exact date and site of the mideast regionals will be announced later. The dates will be March 10, 11 and 12.

Pitt, which disclosed last week it had used an ineligible player during the current campaign, will compete in either the mideast or the eastern regionals. If Pitt winds up in the eastern regionals, it will take part in a triple-header at Madison Square Garden March 11. If the Panthers appear in the mideast regionals, they will open against the Mid-American or Ohio Valley Conference champion, meeting whichever school does not play Notre Dame.

Windis Has 21.1 Average In 21 Games

LARAMIE, Wyo. (UP) —Though unusual concentration on Tony Windis has cut down his scoring in recent games, the high scoring junior continues to maintain a tight hold on first place in Wyoming's individual scoring race.

In 21 games, Windis has poured in 443 points for a 21.1 per game average. Windis' seasonal average tumbled slightly last week as he scored 12 and 22 points against Denver and New Mexico.

Wyoming's other sparkling guard, Terry Eckhardt, remains Wyoming's second leading scorer with 276 points and a 13.1 average, while forward John Bertolero's 170 points and 8.5 average are the team's third high.

Bertolero continues in his role as Wyoming's top rebounder with 211 rebounds followed by Don Carlson who has speared 133 rebounds.

In conference play Windis has scored 207 points to hold a 23.0 per game average.

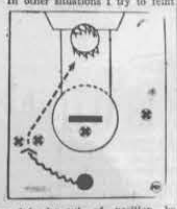
Pointed Pointers

By GUY RODGERS
Temple University

My favorite is the jump shot from the top of the key.

I try to run my defender into a screen so I can get free and take the shot without forcing it.

In other situations I try to feint



my defender out of position by dribbling or changing direction.

If my opponent plays me loose, I take a one-hand which I have tried constantly to improve.

YANKEE BRAINS

Bill Dickey, left, and Ralph Houk, Casey Stengel's coaching assistants, let their expressions show nothing as they watch rookies trying to impress them at St. Petersburg, Fla.—NEA photo.

Richard Seeking Hockey Score Title

MONTREAL (UP) — Henri (Pocket Rocket) Richard, with a little bit of luck, could win the National Hockey League scoring title this season.

That's the one championship that has eluded his illustrious brother, Maurice, in his 15 years in the NHL.

Henri pulled to within 2 points of the lead during the past week when his Montreal linemate, Dickie Moore, garnered only one assist. Including last Sunday's games, Moore had 30 goals and 37 assists for 67 points while the Pocket Rocket had 24 goals and 41 assists for 65 points.

Jacques Plante of the Canadiens headed the goalies with an average of 2.11 goals allowed per game, and leapin' Lou Fontinato of New York was the league "bad man" with 134 minutes of penalty time.

The kit fox is sometimes called the "swift fox" because it can run faster than other foxes. Some naturalists believe that for short distances, perhaps a hundred yards, the kit fox is one of the fastest running mammals.

Horse Racing Nets States Cool $211,285,019 In '58

LEXINGTON, Ky. (UP)— State treasuries in the 24 states with legalized betting on horses were enriched by a record total of $211,285,019 in 1957, the National Association of State Racing Commissioners reported Tuesday.

Thoroughbred racing contributed the lion's share of the record total by furnishing $162,568,872 in revenue. Harness racing chipped in with $44,905,440 while county fairs, at which thoroughbred, standardbreds and quarter horses all race, contributed $3,720,707.

The 1957 total topped the 1956 figure of $207,456,272 by $3,828,747. It was a far cry from the $6,024,193 in total revenue to states in the first report of the N.A.S.R.C. issued in 1934.

The commissioners also reported there were a total of 5,187 racing days last year—3,111 featuring thoroughbred racing, 1,612 starring harness horses and 464 at fairs. A total of 41,365,265 persons attended race meetings throughout the country with thoroughbreds entertaining 28,850,654, harness racing attracting 10,759,637, and the fairs getting 1,754,974 in attendance.

The association said a total of $2,856,796,837 was bet on all racing, $2,153,456,223 on thoroughbreds, $616,206,724 on harness horses and $87,133,890 at fairs.

New York easily led in revenue to the state. It garnered a total of $77,070,007, almost three times as much as runner-up California which collected $25,974,808. New Jersey was third in revenue received with $24,484,666.

Colorado was 20th with $630,799.

A total of 99,144 big game animals were taken in Wyoming by hunters in 1957.

DUTCH BOY NALPLEX starts drying the instant it goes on the walls. Your rooms will be ready to use almost the instant you are through painting.

NOTICE: G. H. B. at 621 E. 14th St. There is a free quart of the paint of your choice at John Jorgensen Paints, 242 W. Yellowstone. Bring this ad with you.

America's Traditional Favorites!

drawings by Norman Rockwell

whiskey by Cream of Kentucky

KENTUCKY'S FINEST WHISKEY A BLEND 86 PROOF. 70% GRAIN NEUTRAL SPIRITS • SCHENLEY DISTILLERS, INC., FRANKFORT, KENTUCKY.

THE "DELRAY" 2-DOOR SEDAN

The Thriftiest Full-Size Car Money Can Buy!!

Styled for the style minded. See this exceptional value on display at our show room now!

EQUIPPED AS FOLLOWS . . .

6 Cylinders — Standard Transmission — Electric Windshield Wipers — Delivery Charges — Air Flow Heater and Defroster — Oil Bath Air Cleaner — Oil Filter — Anti Freeze — Gas and Oil — Directional Signals — Tubeless Tires — Ash Tray — Chrome Equipment — Service and Warranty Included — Two Tone Paint and White Wall Tires Optional at Slightly Extra Cost. Many More Models to Choose From.

DRIVE IT OUT FOR $2,125

NOLAN CHEVROLET CO.

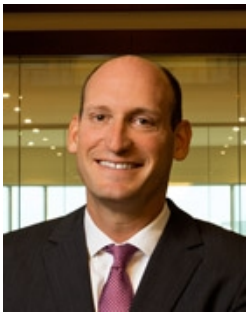
322 SOUTH DAVID "YOUR AUTHORIZED CHEVROLET DEALER" DIAL 3-5771

Copyright © 2018 Newspapers.com. All Rights Reserved.

POWERED BY Newspapers.com

LEADERSHIP TEAM

The UTC Aerospace Systems leadership team is committed to our mission to provide customers with innovative aerospace technologies and integrated systems that advance the performance, safety and efficiency of commercial aviation, global defense and space exploration.



David Gitlin

President, UTC Aerospace Systems

STRATEGIC BUSINESS UNIT LEADERSHIP

LOCATIONS & CONTACTS

Headquartered in Charlotte, N.C., UTC Aerospace Systems has approximately 150 sites operating in 25 countries, with 50 percent of these sites located outside the United States.

Interested in working with us? Visit the UTC Aerospace Systems Careers website to search for jobs in the U.S. For career opportunities at our international locations, click here.

To learn more about our locations in general, use the tool below or download a copy to view all locations information.

Headquarters | Country Filter | State Filter

Search:

Business Unit	Contact	Description

Headquarters	**Address:** Four Coliseum Centre - 2730 West Tyvola Road Charlotte NC 28217-4578 USA **Phone:** +1 704 423 7000 **Fax:** +1 704 423 7002	Corporate Headquarters.

© UTC Aerospace Systems

Look Up a ZIP Code™

Go to

ZIP Code™ by Address

You entered:

2730 WEST TYVOLA ROAD
CHARLOTTE NC

If more than one address matches the information provided, try narrowing your search by entering a street address and, if applicable, a unit number. **Edit and search again. (zip-code-lookup.htm?byaddress)**

2730 W TYVOLA RD
CHARLOTTE NC **28217-4527**

Look Up Another ZIP Code™

Edit and Search Again (/zip-code-lookup.htm?byaddress)

×
View Karen's Background Report
View Results
×
Get Karen Kramer's background check
View Results

Karen Kay Kramer

Age 70s

Phone numbers

(303) 776-7669
Landline

Current addresses

8000 Fox Hill Dr Longmont CO 80504-1354

3125 Marlin Dr Longmont CO 80503-7892

Previous Locations

Longmont, CO

Family & relatives

Harlan Robert Aronson
Molly L Iks K Gunlikson
Julia Jo Aronson
Michael A Kramer
Allison Ann Neal
Michael W Kramer

Looking for a different Karen?

Matthew Paul Kramer
Dawn Kramer-Prather
Dawn Maria Kramer
Trish Ladores Kramer

© 2018 Whitepages Inc.

Look Up a ZIP Code™

Go to

ZIP Code™ by Address

You entered:

8000 FOX HILL DRIVE
LONGMONT CO

If more than one address matches the information provided, try narrowing your search by entering a street address and, if applicable, a unit number. **Edit and search again. (zip-code-lookup.htm?byaddress)**

8000 FOX HILL DR
LONGMONT CO **80504-1354**

Look Up Another ZIP Code™

Edit and Search Again (/zip-code-lookup.htm?byaddress)

Contact IBM. We're here to help.

Get answers to your questions about
products, sales, support or anything else IBM

How can we help you?

Support portal

Get help finding and using IBM products and services →

IBM Knowledge Center

Find answers quickly in official IBM product documentation →

IBM Business Partner support

Get support as a Business Partner to better provide support to your clients →

Directory of worldwide contacts

Find technical support, sales and other support contacts for specific countries →

Need more assistance?

Call – US: 800-426-4968 **-or-** use the contact f

Name:*

Email:*

Phone:

Message category:*

Select one

Message:*

I accept IBM's Privacy statement.

Submit

Where to write us

Corporate headquarters
1 New Orchard Road
Armonk, New York 10504-1722
United States
US: 914-499-1900

Careers at IBM

See what we do, how we work,
and how you can join us

Explore IBM careers →
Applicant FAQ →
Former IBMers →

Accessibility

IBM is committed to equal
access for people of all abilities

TTY Services (US): US: 800-426-3383
IBM Accessibility →

Executive Bios

This index of IBM biographies includes our senior executives, former CEOs and the biographies of some featured IBMers.

Former CEOs Board of Directors

Ginni Rometty

Ginni Rometty began her career with IBM in 1981 in Detroit. Since then she has held a series of leadership positions, most recently as senior vice president and group executive, IBM sales, marketing, and strategy.

Earlier she served as senior vice president, IBM Global Business Services,

This acquisition was the largest in professional services history, creating a global team of more than 100,000 business consultants and services experts.

Michelle H. Browdy

Senior Vice President, Legal and Regulatory Affairs, and General Counsel

Erich Clementi

Senior Vice President, Global Integrated Accounts and Chairman, IBM Europe

Ray Day

Chief Communications Officer

Bruno Di Leo

Senior Vice President, IBM Corporation

Mark Foster

Senior Vice President, Global Business Services IBM

Diane Gherson

Senior Vice President, Human Resources, IBM

IBM News Room

Press Tools

Martin Jetter

Senior Vice President, IBM Global Technology Services

James J. Kavanaugh

Senior Vice President and Chief Financial Officer

Dr. John E. Kelly III

David Kenny

Senior Vice President, Cognitive Solutions and IBM Research

Senior Vice President, IBM Watson and Cloud Platform

IBM News Room

Press Tools

Ken Keverian

Senior Vice President, Corporate Strategy

Arvind Krishna

Senior Vice President, Hybrid Cloud, and Director of IBM Research

Bob Lord

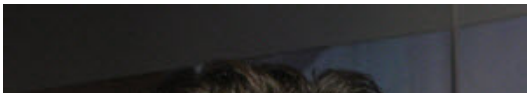
Michelle Peluso

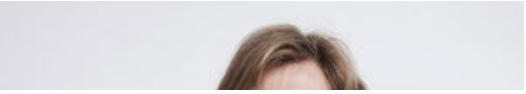
Bob Picciano

Senior Vice President, IBM Cognitive Systems

Tom Rosamilia

Senior Vice President, IBM Systems





Martin Schroeter

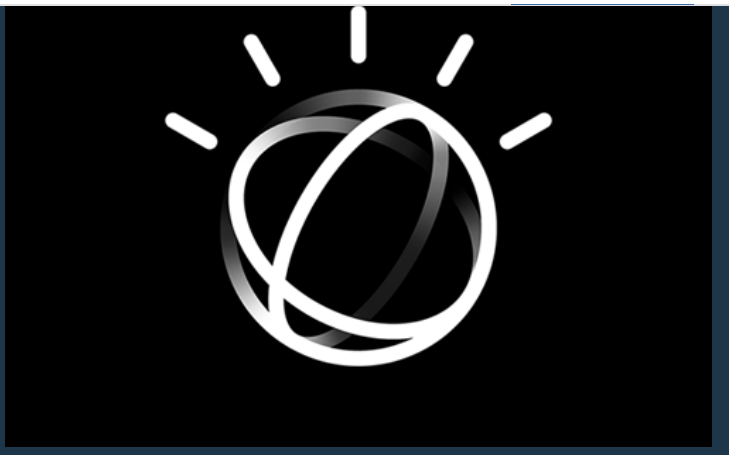
Senior Vice President, IBM Global Markets

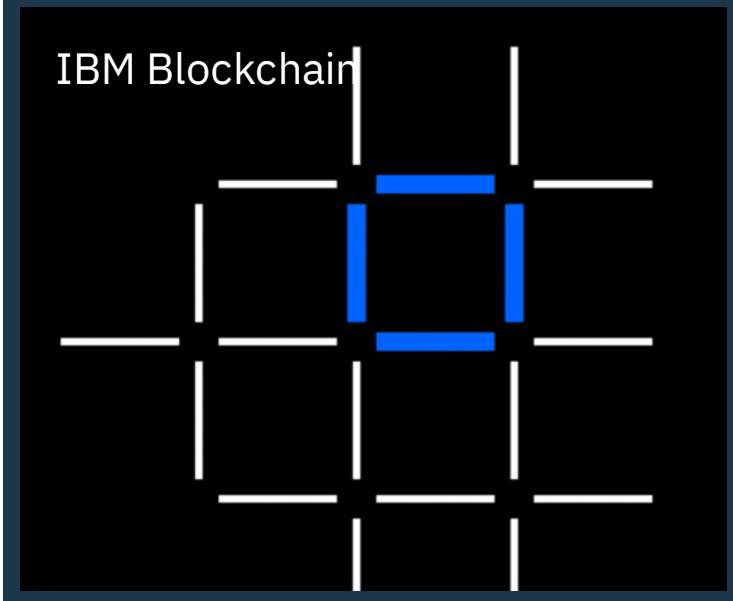
Bridget van Kralingen

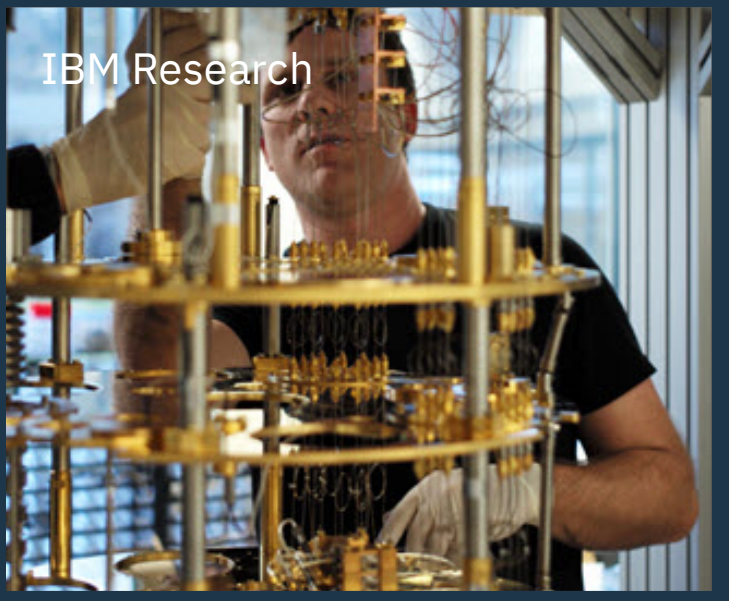
Senior Vice President, IBM Global Industries, Platforms and Blockchain

IBM News Room

Press Tools







Explore IBM

• File an Annual Report/Amend an Annual Report • Upload a PDF Filing • Order a Document Online • Add Entity to My Email Notification List • View Filings • Print an Amended a Annual Report form • Print a Pre-Populated Annual Report form

Business Corporation

Legal Name
Hamilton Sundstrand Corporation

Information

SosId: 1275065
Status: Current-Active
Annual Report Status: Current
Citizenship: Foreign
Date Formed: 8/23/2012
Fiscal Month: December
State of Incorporation:
DE
Registered Agent: CT Corporation System

Addresses

Reg Office
160 Mine Lake Ct Ste 200
Raleigh, NC 27615-6417

Reg Mailing
160 Mine Lake Ct Ste 200
Raleigh, NC 27615-6417

Mailing
2730 West Tyvola Road, Four Coliseum Centre
Charlotte, NC 28217

Principal Office
2730 West Tyvola Road, Four Coliseum Centre
Charlotte, NC 28217

Officers

Secretary
Christoph T. Feddersen
2730 West Tyvola Road, Four Coliseum Centre
Charlotte NC 28217

President
David L. Gitlin
2730 West Tyvola Road, Four Coliseum Centre
Charlotte NC 28217

Treasurer
Jesus (Jay) Malave
2730 West Tyvola Road, Four Coliseum Centre
Charlotte NC 28217

Stock

NYS Department of State

Division of Corporations

Entity Information

The information contained in this database is current through May 29, 2018.

Selected Entity Name: INTERNATIONAL BUSINESS MACHINES CORPORATION

Selected Entity Status Information

Current Entity Name:	INTERNATIONAL BUSINESS MACHINES CORPORATION
DOS ID #:	30059
Initial DOS Filing Date:	JUNE 16, 1911
County:	WESTCHESTER
Jurisdiction:	NEW YORK
Entity Type:	DOMESTIC BUSINESS CORPORATION
Current Entity Status:	ACTIVE

Selected Entity Address Information

DOS Process (Address to which DOS will mail process if accepted on behalf of the entity)

INTERNATIONAL BUSINESS MACHINES CORPORATION
NEW ORCHARD ROAD
ARMONK, NEW YORK, 10504

Chief Executive Officer

VIRGINIA M ROMETTY
NEW ORCHARD ROAD
ARMONK, NEW YORK, 10504

Principal Executive Office

INTERNATIONAL BUSINESS MACHINES CORPORATION
NEW ORCHARD ROAD
ARMONK, NEW YORK, 10504

Registered Agent

NONE

This office does not record information regarding the names and addresses of officers, shareholders or directors of nonprofessional corporations except the chief executive officer, if provided, which would be listed above. Professional corporations must include the name(s) and address(es) of the initial officers, directors, and shareholders in the initial certificate of incorporation, however this

information is not recorded and only available by viewing the certificate.

***Stock Information**

# of Shares	Type of Stock	$ Value per Share
150000000	Par Value	.01
4687500000	Par Value	.2

*Stock information is applicable to domestic business corporations.

Name History

Filing Date	Name Type	Entity Name
FEB 14, 1924	Actual	INTERNATIONAL BUSINESS MACHINES CORPORATION
JUN 16, 1911	Actual	COMPUTING-TABULATING-RECORDING-CO.

A **Fictitious** name must be used when the **Actual** name of a foreign entity is unavailable for use in New York State. The entity must use the fictitious name when conducting its activities or business in New York State.

NOTE: New York State does not issue organizational identification numbers.

Search Results New Search

Services/Programs | Privacy Policy | Accessibility Policy | Disclaimer | Return to DOS Homepage | Contact Us

10-K 1 a2233835z10-k.htm 10-K

QuickLinks -- Click here to rapidly navigate through this document

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM 10-K

ANNUAL REPORT
pursuant to Section 13 or 15 (d) of the
Securities Exchange Act of 1934
FOR THE YEAR ENDED DECEMBER 31, 2017

1-2360
(Commission file number)

INTERNATIONAL BUSINESS MACHINES CORPORATION

(Exact name of registrant as specified in its charter)

NEW YORK
(State of Incorporation)

13-0871985
(IRS Employer Identification Number)

ARMONK, NEW YORK
(Address of principal executive offices)

10504
(Zip Code)

914-499-1900
(Registrant's telephone number)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Voting shares outstanding at February 9, 2018	Name of each exchange on which registered
Capital stock, par value $.20 per share	921,167,894	New York Stock Exchange Chicago Stock Exchange
1.375% Notes due 2019		New York Stock Exchange
2.750% Notes due 2020		New York Stock Exchange
1.875% Notes due 2020		New York Stock Exchange
0.500% Notes due 2021		New York Stock Exchange
2.625% Notes due 2022		New York Stock Exchange
1.25% Notes due 2023		New York Stock Exchange
1.125% Notes due 2024		New York Stock Exchange
2.875% Notes due 2025		New York Stock Exchange
0.950% Notes due 2025		New York Stock Exchange
0.300% Notes due 2026		New York Stock Exchange
1.750% Notes due 2028		New York Stock Exchange
1.500% Notes due 2029		New York Stock Exchange
8.375% Debentures due 2019		New York Stock Exchange
7.00% Debentures due 2025		New York Stock Exchange
6.22% Debentures due 2027		New York Stock Exchange
6.50% Debentures due 2028		New York Stock Exchange
7.00% Debentures due 2045		New York Stock Exchange
7.125% Debentures due 2096		New York Stock Exchange

Indicate by check mark if the registrant is a well-known seasoned issuer as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☒ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☒

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☒
Smaller reporting company ☐

Accelerated filer ☐

Non-Accelerated filer ☐
(Do not check if a smaller reporting company)
Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Exchange Act Rule 12b-2). Yes ☐ No ☒

The aggregate market value of the voting stock held by non-affiliates of the registrant as of the last business day of the registrant's most recently completed second fiscal quarter was $143.3 billion.

Documents incorporated by reference:

Portions of IBM's Annual Report to Stockholders for the year ended December 31, 2017 are incorporated by reference into Parts I, II and IV of this Form 10-K.

Portions of IBM's definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to stockholders in connection with the Annual Meeting of Stockholders to be held April 24, 2018 are incorporated by reference into Part III of this Form 10-K.

PART I

Item 1. Business:

International Business Machines Corporation (IBM or the company) was incorporated in the State of New York on June 16, 1911, as the Computing-Tabulating-Recording Co. (C-T-R), a consolidation of the Computing Scale Co. of America, the Tabulating Machine Co. and The International Time Recording Co. of New York. Since that time, IBM has focused on the intersection of business insight and technological innovation, and its operations and aims have been international in nature. This was signaled over 90 years ago, in 1924, when C-T-R changed its name to International Business Machines Corporation. And it continues today—the company creates value for clients through integrated solutions and products that leverage data, information technology, deep expertise in industries and business processes, and a broad ecosystem of partners and alliances. IBM solutions typically create value by enabling new capabilities for clients that transform their businesses and help them engage with their customers and employees in new ways. These solutions draw from an industry-leading portfolio of consulting and IT implementation services, cloud and cognitive offerings, and enterprise systems and software; all bolstered by one of the world's leading research organizations.

Strategy

The IBM strategy starts with its clients.

As a uniquely integrated technology and services company, IBM helps clients change the way the world works by building smarter businesses.

IBM's clients include many of the world's most successful enterprises. These clients are at an inflection point, facing tremendous new opportunity and incredible competition. Digital technologies are unlocking unparalleled insight from previously inaccessible data. Work processes are being reimagined for speed and vastly smarter decision-making.

To win in these disruptive times requires that businesses learn—learn by extracting insights from their data and by applying those insights to how work is done. Smarter businesses do this faster and more effectively supported by IBM's combination of **Innovative Technology**, **Industry Expertise** and **Trust and Security**.

The company's capabilities include:

Cloud

Cloud is enabling the emergence of platforms through standardization, agility and innovation in both IT and business processes. Enterprise cloud is very different from consumer cloud: enterprises must bridge together mission-critical assets from on-premise systems with private cloud and public cloud. Hybrid cloud technology provides that bridge. All three must coexist and interoperate as a single platform.

The IBM Cloud is uniquely:

- Built for all applications: Applications require data. That data is in on-premise systems, in private clouds and in the public cloud. The IBM Cloud enables one data platform that, regardless of data's location, can run all applications. IBM's hybrid cloud capabilities make this single platform operate seamlessly.

- Artificial intelligence (AI)-ready: The IBM Cloud is built from the ground up to handle the demanding data and computational requirements of AI.

- Secure to the Core: IBM has a long history of helping clients keep data and transactions secure. Security is even more important in an increasingly connected world, and IBM has extended this unparalleled level of security to the cloud. For example, IBM's cybersecurity offerings act as a business immune system, with AI technology at its core, delivered from the IBM Cloud. These

systems help to defend and respond to cyber-attacks across an organization's data, applications, mobile and endpoint devices.

The IBM Cloud is delivered with leading edge technology, including:

- Modern infrastructure: IBM's systems, including servers, storage and operating system software, have been refreshed and redesigned for cloud and enterprise AI workloads. IBM's new z14 is the world's first system to offer pervasive encryption of data without requiring changes to applications, and with no performance degradation. With IBM's systems, clients can build an IT infrastructure that is optimized for the scalability, reliability and growth that businesses need in today's data-driven world.

- Future infrastructure: The Q Network on the IBM Cloud enables clients around the world to explore quantum computing capabilities. IBM is the leader in quantum computing. Clients are signing on to explore how to overcome foreseen constraints in traditional computing models.

AI and Data

Artificial intelligence can help clients extract insight and make intelligent decisions from data. Like cloud, enterprise AI is very different from consumer AI. Enterprise applications deal with more complex use cases that benefit from expert knowledge, such as in healthcare or in the identification of business risk. Enterprise AI applications are trained by expert data, through data sets of all sizes and with more specialization than those in the general-knowledge consumer world. IBM AI—through the Watson platform:

- Learns more from less data: The ability to extract deep insights from both large and small data sets is essential for enterprise applications. Watson excels at this and can produce more insights with less data than other AI systems. That means clients can get started more quickly and begin to gain experience deploying AI in the enterprise.

- Protects clients' insights: While Watson builds on cumulative experience and knowledge, IBM recognizes that data and insights are clients' most important assets and a true competitive advantage. Watson is built to safeguard this type of information.

- Reimagines your workflows: Watson has been built for—and trained in—areas requiring deep expertise. Watson brings AI to professionals so that work can be done more efficiently, and even more importantly, can improve as the systems learn from the data.

Solutions

Creating smarter businesses requires reimagining a company's core processes—for example, in healthcare, managing risk or optimizing a supply chain. In addition to building solutions based on IBM's experience, IBM is also creating a series of AI solutions—cognitive solutions—that embed artificial intelligence and data to change how work is done. Examples include:

- Global Industry Platforms: provides cognitive, analytics, security and cloud technology in comprehensive industry-specific platforms to remove much of the cost and complexity of delivering core business functions. For example: Banking, wealth management, and insurance are some of the areas poised for dramatic change by using cognitive and AI solutions from IBM Watson Financial Services. Watson Health provides technology and expertise to empower leaders, advocates and influencers in health to accelerate discovery, make essential connections and gain confidence on their path to solving the world's biggest health challenges.

- Blockchain Solutions: IBM is working with clients and developers across multiple industries to use blockchain to transform how business is done in areas such as banking and financial services and supply chain. For example, blockchain technology can be used to digitize global trade

processes, providing a more efficient and secure method of moving goods across borders and trading zones.

- Watson IoT: includes both a cloud-based platform and industry solutions infused with AI, helping organizations mine intelligence from billions of connected devices.

Enterprise Services

Through Global Business Services and Global Technology Services, IBM has helped the world's most successful enterprises transition from era to era. Using proven methods, IBM Services bring globally delivered outcomes using proven methods by focusing on:

- Digital Reinvention for growth: a unique framework for business transformation focused on growth opportunities.
- End-to-end Services integration: Global Technology Services brings the ability to connect previously disconnected parts of an organization. By embedding Watson into these mission critical services, new levels of quality, resiliency and automation are achieved.
- Pragmatic journey to Cloud and AI: Global Business Services brings its deep experience when guiding clients through the journey to cloud and AI. Clients gain from the thorough understanding of technology and the best ways to utilize it.

As clients reinvent their businesses to be smarter, they need all of this to work together. This is what they expect from IBM, what they need from IBM and what sets IBM apart.

* * * *

Responsible stewardship is an enduring principle that underscores all IBM endeavors. While IBM is constantly ushering in new technology it does so by:

- Leading in data responsibility, ethics and transparency;
- Preparing workforces of the world;
- Continuing the company's century-long commitment to diversity and inclusion, and
- Remaining grounded in a set of enduring IBM Values:
    - Dedication to every client's success
    - Innovation that matters—for our company and for the world
    - Trust and personal responsibility in all relationships

IBM has built a reputation and track record of trust with its clients for more than a century. IBM safeguards a client's privacy, data and insights. For example, IBM was one of the first companies to appoint a Chief Privacy Officer, to develop and publish a genetics privacy policy, to be certified under the APEC Cross Borders Privacy Rules system and to sign the EU Data Protection Code of Conduct for Cloud Service Providers.

* * * *

This is an era where being faster, more productive and lower cost is important but frankly not enough. To win, a business must be smarter: Being smarter means having deeper expertise, extracting better insights from data and being capable of rapidly changing the way in which one does work.

This is core to the strategy of IBM's clients and is at the heart of the IBM strategy.

Business Model

The company's business model is built to support two principal goals: helping enterprise clients to move from one era to the next by bringing together innovative technology and industry expertise, and providing long-term value to shareholders. The business model has been developed over time through

strategic investments in capabilities and technologies that have long-term growth and profitability prospects based on the value they deliver to clients.

The company's global capabilities include services, software, systems, fundamental research and related financing. The broad mix of businesses and capabilities are combined to provide integrated solutions and platforms to the company's clients.

The business model is dynamic, adapting to the continuously changing industry and economic environment, including the company's transformation into cloud and as-a-Service delivery models. The company continues to strengthen its position through strategic organic investments and acquisitions in higher-value areas, broadening its industry expertise and integrating AI into more of what the company offers. In addition, the company is transforming into a more agile enterprise to drive innovation and speed, as well as helping to drive productivity, which supports investments for participation in markets with significant long-term opportunity.

This business model, supported by the company's financial model, has enabled the company to deliver strong earnings, cash flows and returns to shareholders over the long term.

Business Segments and Capabilities

The company's major operations consist of five business segments: Cognitive Solutions, Global Business Services, Technology Services & Cloud Platforms, Systems and Global Financing.

Cognitive Solutions comprises a broad portfolio of capabilities that help IBM's clients to identify actionable new insights and inform decision-making for competitive advantage. Leveraging IBM's research, technology and industry expertise, this business delivers a full spectrum of capabilities, from descriptive, predictive and prescriptive analytics to cognitive systems. Cognitive Solutions includes Watson, the first commercially available AI platform that has the ability to interact in natural language, process vast amounts of big data, and learn from interactions with people and systems. These solutions are provided through the most contemporary delivery methods including through cloud environments and "as-a-Service" models. Cognitive Solutions consists of Solutions Software and Transaction Processing Software.

Cognitive Solutions Capabilities

Solutions Software: provides the basis for many of the company's strategic areas. IBM has established the world's deepest portfolio of data and analytics solutions, including analytics and data management platforms, cloud data services, talent management solutions, and solutions tailored by industry. Watson Platform, Watson Health and Watson Internet of Things (IoT) are certain capabilities included in Solutions Software. IBM's world-class security platform delivers integrated security intelligence across clients' entire operations, including their cloud, applications, networks and data, helping them to prevent, detect and remediate potential threats.

Transaction Processing Software: includes software that primarily runs mission-critical systems in industries such as banking, airlines and retail. Most of this software is on-premise and annuity in nature.

Global Business Services (GBS) provides clients with consulting, application management services and business process services. These professional services deliver value and innovation to clients through solutions which leverage industry, technology and business strategy and process expertise. GBS is the digital reinvention partner for IBM clients, combining industry knowledge, functional expertise, and applications with the power of business design and cognitive and cloud technologies. The full portfolio of GBS services is backed by its globally integrated delivery network and integration with technologies, solutions and services from IBM units including IBM Watson, IBM Cloud, IBM Research, and Global Technology Services.

In 2017, GBS deployed a new operating model designed to address specific client digital transformation imperatives and take full advantage of IBM and GBS's competitive differentiators in industry, cognitive and cloud. The operating model features Digital Strategy and iX, Cognitive Process Transformation and Cloud Application Innovation. To bring value at scale to clients around the world, GBS has implemented global service lines within each of the three focus areas, which are populated with new practices staffed by practitioners with deep domain skills and industry expertise.

GBS Capabilities

Consulting: provides business consulting services focused on bringing to market solutions that help clients shape their digital blueprints and customer experiences, define their cognitive operating models, unlock the potential in all data to improve decision-making, set their next-generation talent strategies and create new technology architectures in a cloud-centric world.

Application Management: delivers system integration, application management, maintenance and support services for packaged software, as well as custom and legacy applications. Value is delivered through advanced capabilities in areas such as security and privacy, application testing and modernization, cloud application migration and automation.

Global Process Services: delivers finance, procurement, talent and engagement, and industry-specific business process outsourcing services. These services deliver improved business results to clients through our consult-to-operate model which includes the strategic change and/or operation of the client's processes, applications and infrastructure. GBS is redefining process services for both growth and efficiency through the application of the power of cognitive technologies like Watson, as well as the IoT, blockchain and deep analytics.

Technology Services & Cloud Platforms provides comprehensive IT infrastructure services creating business value for clients. By leveraging insights and experience drawn from IBM's global scale, skills and technology, with applied innovation from IBM Research, clients gain access to leading-edge, high-quality services with improved outcomes in productivity, flexibility and cost.

Technology Services & Cloud Platforms Capabilities

Infrastructure Services: delivers a portfolio of cloud, project-based, outsourcing and other managed services focused on clients' enterprise IT infrastructure environments to enable digital transformation and deliver improved quality, flexibility, risk management and financial value. The portfolio includes a comprehensive set of hybrid cloud services and solutions to assist clients in building and running enterprise IT environments that utilize public and private clouds and traditional IT. The IBM Cloud Platform offers leading-edge services to developers and IBM's Cloud Infrastructure-as-a-Service covers a wide variety of workloads with high-quality performance. These offerings integrate long-standing expertise in service management and technology with the ability to utilize the power of new technologies, drawn from across IBM's businesses and ecosystem partners. The portfolio is built around a key set of predictive and proactive solutions addressing systems, mobility, resiliency, networking, cloud and security. The company's capabilities, including IBM Cloud, cognitive computing and hybrid cloud implementation, provide high-performance, end-to-end innovation and an improved ability to achieve business objectives.

Technical Support Services: delivers comprehensive support services to maintain and improve the availability of clients' IT infrastructures. These offerings include maintenance for IBM products and other technology platforms, as well as software and solution support, drawing on innovative technologies and leveraging the Watson platform's predictive capabilities.

Integration Software: delivers industry-leading hybrid cloud solutions that empower clients to achieve rapid innovation, hybrid integration, and process transformation with choice and consistency across public, dedicated and local cloud environments, leveraging the IBM Platform-as-a-Service solution. Integration Software offerings and capabilities help clients address the digital imperatives to

create, connect and optimize their applications, data and infrastructure on their journey to become cognitive businesses.

Systems provides clients with innovative infrastructure platforms to help meet the new requirements of hybrid cloud and cognitive workloads. Approximately half of Systems Hardware's server and storage sales transactions are through the company's business partners, with the balance direct to end-user clients. IBM Systems also designs advanced semiconductor and systems technology in collaboration with IBM Research, primarily for use in the company's systems.

Systems Capabilities

Servers: a range of high-performance systems designed to address computing capacity, security and performance needs of businesses, hyperscale cloud service providers and scientific computing organizations. The portfolio includes IBM Z, a trusted enterprise platform for integrating data, transactions and insight, and Power Systems, a system designed from the ground up for big data and analytics, optimized for scale-out cloud and Linux, and delivering open innovation with OpenPOWER.

Storage: data storage products and solutions that allow clients to retain and manage rapidly growing, complex volumes of digital information and to fuel data-centric cognitive applications. These solutions address critical client requirements for information retention and archiving, security, compliance and storage optimization including data deduplication, availability and virtualization. The portfolio consists of a broad range of software-defined storage solutions, flash storage, disk and tape storage solutions.

Operating Systems Software: The company's z/OS is a security-rich, scalable, high-performance enterprise operating system for IBM Z. Power Systems offers a choice of AIX or Linux operating systems. These operating systems leverage POWER architecture to deliver secure, reliable and high performing enterprise-class workloads across a breadth of server offerings.

Global Financing encompasses two primary businesses: financing, primarily conducted through IBM Credit LLC (IBM Credit), and remanufacturing and remarketing. In 2017, the company reorganized its client and commercial financing business as a wholly owned subsidiary, IBM Credit LLC, and it began accessing the capital markets directly in September 2017. IBM Credit, through its financing solutions, facilitates IBM clients' acquisition of information technology systems, software and services in the areas where the company has the expertise. The financing arrangements are predominantly for products or services that are critical to the end users' business operations. The company conducts a comprehensive credit evaluation of its clients prior to extending financing. As a captive financier, Global Financing has the benefit of both deep knowledge of its client base and a clear insight into the products and services financed. These factors allow the business to effectively manage two of the major risks associated with financing, credit and residual value, while generating strong returns on equity. Global Financing also maintains a long-term partnership with the company's clients through various stages of the IT asset life cycle—from initial purchase and technology upgrades to asset disposition decisions.

Global Financing Capabilities

Client Financing: lease, installment payment plan and loan financing to end users and internal clients for terms up to seven years. Assets financed are primarily new and used IT hardware, software and services where the company has expertise. Internal financing is predominantly in support of Technology Services & Cloud Platforms' long-term client service contracts. All internal financing arrangements are at arm's-length rates and are based upon market conditions.

Commercial Financing: short-term working capital financing to suppliers, distributors and resellers of IBM and OEM products and services. This includes internal activity where Global Financing factors a selected portion of the company's accounts receivable primarily for cash management purposes, at arm's-length rates.

Remanufacturing and Remarketing: assets include used equipment returned from lease transactions, or used and surplus equipment acquired internally or externally. These assets may be refurbished or upgraded and sold or leased to new or existing clients both externally or internally. Externally remarketed equipment revenue represents sales or leases to clients and resellers. Internally remarketed equipment revenue primarily represents used equipment that is sold internally to Systems and Technology Services & Cloud Platforms. Systems may also sell the equipment that it purchases from Global Financing to external clients.

IBM Worldwide Organizations

The following worldwide organizations play key roles in IBM's delivery of value to its clients:

- Global Markets
- Research, Development and Intellectual Property

Global Markets

IBM has a global presence, operating in more than 175 countries with a broad-based geographic distribution of revenue. The company's Global Markets organization manages IBM's global footprint, working closely with dedicated country-based operating units to serve clients locally. These country teams have client relationship managers who lead integrated teams of consultants, solution specialists and delivery professionals to enable clients' growth and innovation.

By complementing local expertise with global experience and digital capabilities, IBM builds deep and broad-based client relationships. This local management focus fosters speed in supporting clients, addressing new markets and making investments in emerging opportunities. The Global Markets organization serves clients with expertise in their industry as well as through the products and services that IBM and partners supply. IBM is also expanding its reach to new and existing clients through digital marketplaces, digital sales and local Business Partner resources.

Research, Development and Intellectual Property

IBM's research and development (R&D) operations differentiate the company from its competitors. IBM annually invests 7 to 8 percent of total revenue for R&D, focusing on high-growth, high-value opportunities. IBM Research works with clients and the company's business units through global labs on near-term and mid-term innovations. It delivers many new technologies to IBM's portfolio every year and helps clients address their most difficult challenges. IBM Research scientists are conducting pioneering work in artificial intelligence, quantum computing, blockchain, security, cloud, nanotechnology, silicon and post-silicon computing architectures and more—applying these technologies across industries including healthcare, IoT, education and financial services.

In 2017, for the 25th consecutive year, IBM was awarded more U.S. patents than any other company. IBM's 9,043 patents awarded in 2017 represent a diverse range of inventions in artificial intelligence, cloud, cybersecurity and other strategic growth areas for the company.

The company continues to actively seek IP protection for its innovations, while increasing emphasis on other initiatives designed to leverage its IP leadership. Some of IBM's technological breakthroughs are used exclusively in IBM products, while others are licensed and may be used in IBM products and/or the products of the licensee. As part of its business model, the company licenses certain of its intellectual property, which is high-value technology, but may be in more mature markets. The licensee drives the future development of the IP and ultimately expands the customer base. This would generate IP income for the company both upon licensing, and with any ongoing royalty arrangements between it and the licensee. While the company's various proprietary IP rights are important to its success, IBM believes its business as a whole is not materially dependent on any particular patent or license, or any particular group of patents or licenses. IBM owns or is licensed under a number of patents, which vary in duration, relating to its products.

COMPETITION

The company is a globally-integrated enterprise, operating in more than 175 countries. The company participates in a highly competitive environment, where its competitors vary by industry segment, and range from large multinational enterprises to smaller, more narrowly focused entities. Overall, across its business segments, the company recognizes hundreds of competitors worldwide.

Across its business, the company's principal methods of competition are: technology innovation; performance; price; quality; brand; its broad range of capabilities, products and services; client relationships; the ability to deliver business value to clients; and service and support. In order to maintain leadership, a corporation must continue to invest, innovate and integrate. The company has been executing a strategy to transform its business, including shifting to higher value market segments and offerings and increasing its capabilities through organic investments, partnerships and strategic acquisitions. As the company executes its strategy, it has entered into new markets, such as cloud and cognitive, including business analytics and "as-a-service" solutions, which exposes the company to new competitors. Overall, the company is the leader or among the leaders in each of its business segments.

A summary of the competitive environment for each business segment is included below:

Cognitive Solutions:

The Cognitive Solutions segment leads the burgeoning market for artificial intelligence infused software solutions. Increasingly, technology companies are looking to implement software solutions that will take advantage of the massive amounts of data businesses hold in order to improve business outcomes for their clients. The Watson platform is integrated throughout the Cognitive Solutions segment. Watson is the first commercially available cognitive computing capability, representing a new era in computing. Delivered through the cloud, the platform analyzes data, understands complex questions posed in natural language, and proposes evidence-based answers. Watson continuously learns in three ways: by being taught by its users, by learning from prior interactions, and by being presented with new information.

The segment's key competitive factors include a wide range of powerful Watson AI services—machine learning to deep learning. IBM is unique in that it allows clients to retain ownership of their data and AI insights, trains with small specialized data sets, and is focused on embedding AI into business workflows. The insights produced by IBM's cognitive systems are trained and designed for specific industries including Health, Financial Services, Education, Retail and others.

Specifically, Cognitive Solutions includes solutions software, delivered both on-premise and "as-a-Service", and transaction processing software. The solutions software portfolio, which spans data management, analytics, security, and social capabilities, provides comprehensive business and industry-specific offerings to IT decision makers. IT buyers include chief information officers as well as line of business buyers, such as chief marketing and procurement officers, chief information security officers and chief financial officers. The transaction processing software portfolio, mostly delivered on-premise, runs mission-critical systems in industries such as banking, airlines and retail.

The depth and breadth of the software offerings, coupled with the company's global markets and technical support infrastructure, differentiate its capabilities from its competitors. The company's research and development capabilities and intellectual property patent portfolio also contribute to its differentiation. The company's principal competitors in this segment include Alphabet Inc. (Google), Amazon.com, Inc. (Amazon), Cisco Systems, Inc. (Cisco), Microsoft Corporation (Microsoft), Oracle Corporation (Oracle), Salesforce.com and SAP. The company also competes with smaller, niche competitors in specific geographic or product markets worldwide.

Global Business Services and Technology Services & Cloud Platforms:

The company's services segments, Global Business Services and Technology Services & Cloud Platforms, operate in a highly competitive and continually evolving global market. Competitive factors in these business segments include: technical skills and capabilities, innovative service and product offerings, industry knowledge and experience, value and speed, price, client relationships, quality of sales and delivery, reliability, security and the availability of resources. The company's competitive advantages in these businesses comes from its ability to deliver integrated solutions that address clients' needs, leveraging cloud, automation and AI, its global reach and scale, a global delivery model, best-of-breed process and industry skills, extensive expertise in technology and innovation, services assets, and a strong set of relationships with clients and strategic business partners worldwide. The IBM Cloud is built for the enterprise-designed for all data, AI-ready and secure to the core.

Global Business Services:

GBS competes in consulting, systems integration, application management and business process outsourcing services. The company competes with broad based competitors including: Accenture, Capgemini, DXC Technology (DXC), Fujitsu, Google and Microsoft; India-based service providers; the consulting practices of public accounting firms; and many companies that primarily focus on local markets or niche service areas.

Technology Services & Cloud Platforms:

Technology Services & Cloud Platforms competes in strategic outsourcing, cloud services, and a wide range of technical and IT support services. The company competes with broad based competitors including: Amazon, DXC, Fujitsu, Google, Microsoft and Oracle; India-based service providers; and many companies that primarily focus on local markets or niche service areas.

This segment also includes the company's Integration Software offerings. Integration Software helps clients address the digital imperatives to create, connect and optimize their applications, data and infrastructure on their journey to become cognitive businesses. The company competes with Amazon, BMC, Microsoft, Oracle, VMWare as well as companies that primarily focus on niche solutions and offerings.

Systems:

The enterprise server and storage market is characterized by competition in technology and service innovation focused on value, function, reliability, price and cost performance. The company's principal competitors include Dell Technologies, Hewlett-Packard Enterprise (HPE), Intel, Pure Storage, Oracle, and lower cost original device manufacturer systems that are often re-branded. Also, alternative as-a-service providers are leveraging innovation in technology and service delivery both to compete with traditional providers and to offer new routes to market for server and storage systems. These alternative providers include Amazon, Google, Microsoft, and IBM's own cloud-based services.

The company gains advantage and differentiation through investments in higher value capabilities—from semiconductor through software stack innovation—that increase efficiency, lower cost and improve performance. The company's research and development capabilities and intellectual property patent portfolio contribute significantly to this segment's leadership across areas as diverse as high performance computing, virtualization technologies, software optimization, power management, security, multi-operating system capabilities and open technologies like interconnect standards to be leveraged by broad ecosystems.

Global Financing:

Global Financing provides client financing, commercial financing and participates in the remarketing of used equipment. Global Financing's access to capital and its ability to manage increased exposures generates a competitive advantage for the company. The key competitive factors include interest rates charged, IT product experience, client service, contract flexibility, ease of doing business, global capabilities and residual values. In client and commercial financing, Global Financing competes with three types of companies in providing financial services to IT customers: other captive financing entities of IT companies such as Cisco and HPE, non-captive financing entities and banks or financial institutions. In remarketing, the company competes with local and regional brokers plus original manufacturers in the fragmented worldwide used IT equipment market.

Forward-looking and Cautionary Statements

Certain statements contained in this Form 10-K may constitute "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995 ("Reform Act"). Forward-looking statements are based on the company's current assumptions regarding future business and financial performance. These statements by their nature address matters that are uncertain to different degrees. The company may also make forward-looking statements in other reports filed with the Securities and Exchange Commission, in materials delivered to stockholders and in press releases. In addition, the company's representatives may from time to time make oral forward-looking statements. Forward-looking statements provide current expectations of future events based on certain assumptions and include any statement that does not directly relate to any historical or current fact. Words such as "anticipates," "believes," "expects," "estimates," "intends," "plans," "projects," and similar expressions, may identify such forward-looking statements. Any forward-looking statement in this Form 10-K speaks only as of the date on which it is made. The company assumes no obligation to update or revise any forward-looking statements. In accordance with the Reform Act, set forth under Item 1A. "Risk Factors" on pages 11 to 17 are cautionary statements that accompany those forward-looking statements. Readers should carefully review such cautionary statements as they identify certain important factors that could cause actual results to differ materially from those in the forward-looking statements and from historical trends. Those cautionary statements are not exclusive and are in addition to other factors discussed elsewhere in this Form 10-K, in the company's filings with the Securities and Exchange Commission or in materials incorporated therein by reference.

The following information is included in IBM's 2017 Annual Report to Stockholders and is incorporated herein by reference:

Segment information and revenue by classes of similar products or services—pages 142 to 146.

Financial information by geographic areas—page 146.

Amount spent during each of the last three years on R&D activities—page 124.

Financial information regarding environmental activities—page 115.

The number of persons employed by the registrant—page 75.

The management discussion overview—pages 27 to 30.

Available information—page 151.

Also refer to Item 1A. entitled "Risk Factors" in Part I of this Form.

Executive Officers of the Registrant (at February 27, 2018):

	Age	Officer since
Virginia M. Rometty, Chairman of the Board, President and Chief Executive Officer*	60	2005
Michelle H. Browdy, Senior Vice President, Legal and Regulatory Affairs, and General Counsel	53	2015
Erich Clementi, Senior Vice President, IBM Global Integrated Accounts	59	2010
Robert F. Del Bene, Vice President and Controller	58	2017
Diane J. Gherson, Senior Vice President and Chief Human Resources Officer	60	2013
James J. Kavanaugh, Senior Vice President and Chief Financial Officer	51	2008
John E. Kelly III, Senior Vice President, IBM Cognitive Solutions and IBM Research	64	2000
Kenneth M. Keverian, Senior Vice President, Corporate Strategy	61	2014
Martin J. Schroeter, Senior Vice President, IBM Global Markets	53	2014

* Member of the Board of Directors.

All executive officers are elected by the Board of Directors annually as provided in the By-laws. Each executive officer named above, with the exception of Kenneth M. Keverian, has been an executive of IBM or its subsidiaries during the past five years.

Mr. Keverian was a Senior Partner at the Boston Consulting Group, a global management consulting firm, until joining IBM in 2014. He was with Boston Consulting Group for 26 years and he focused on serving technology companies in the computing and communications sectors.

Item 1A. Risk Factors:

Downturn in Economic Environment and Client Spending Budgets could impact the Company's Business: If overall demand for IBM's products and solutions decreases, whether due to general economic conditions or a shift in client buying patterns, the company's revenue and profit could be impacted.

The Company may not meet its Growth and Productivity Objectives under its Internal Business Transformation and Global Integration Initiatives: On an ongoing basis, IBM seeks to drive greater agility, productivity, flexibility and cost savings by transforming and globally integrating its own business processes, functions and technologies to remain competitive and to enable scaling of resources and offerings in both emerging and more established markets. These various initiatives may not yield their intended gains in speed, quality, productivity and enablement of rapid scaling, which may impact the company's competitiveness and its ability to meet its growth and productivity objectives.

Failure of Innovation Initiatives could impact the Long-Term Success of the Company: IBM has been moving away from certain segments of the IT industry and into areas in which it can differentiate itself through innovation, by leveraging its investments in R&D and attracting a successful developer ecosystem. If IBM is unable to continue its cutting-edge innovation in a highly competitive and rapidly evolving environment or is unable to commercialize such innovations, expand and scale them with sufficient speed and versatility, the company could fail in its ongoing efforts to maintain and increase its market share and its profit margins.

Damage to IBM's Reputation Could Impact the Company's Business: IBM has one of the strongest brand names in the world, and its brand and overall reputation could be negatively impacted by many factors, including if the company does not continue to be recognized for its industry-leading technology and solutions and as a cognitive leader. IBM's reputation is potentially susceptible to damage by events such as significant disputes with clients, product defects, internal control deficiencies, delivery failures, cybersecurity incidents, government investigations or legal proceedings or actions of current or former clients, directors, employees, competitors, vendors, alliance partners or joint venture partners. If the

company's brand image is tarnished by negative perceptions, its ability to attract and retain customers could be impacted.

Risks from Investing in Growth Opportunities could impact the Company's Business: The company continues to invest significantly in its strategic imperatives to drive revenue growth and market share gains. Client adoption rates and viable economic models are less certain in the high-value, highly competitive, and rapidly-growing segments, and new delivery models may unfavorably impact demand and profitability for our other products or services. In addition, as the company expands to capture emerging growth opportunities, it needs to rapidly secure the appropriate mix of trained, skilled and experienced employees, and develop ecosystems and collaborative partnerships. In emerging growth countries, the developing nature presents potential political, social, legal and economic risks from evolving governmental policy, inadequate infrastructure, creditworthiness of customers and business partners, labor disruption and corruption, which could impact the company's ability to meet its growth objectives and to deliver to its clients around the world.

IBM's Intellectual Property Portfolio may not prevent Competitive Offerings, and IBM may not be able to Obtain Necessary Licenses: The company's patents and other intellectual property may not prevent competitors from independently developing products and services similar to or duplicative to the company's, nor can there be any assurance that the resources invested by the company to protect its intellectual property will be sufficient or that the company's intellectual property portfolio will adequately deter misappropriation or improper use of the company's technology. In addition, the company may be the target of aggressive and opportunistic enforcement of patents by third parties, including non-practicing entities. Also, there can be no assurances that IBM will be able to obtain from third parties the licenses it needs in the future. The company's ability to protect its intellectual property could also be impacted by changes to existing laws, legal principles and regulations governing intellectual property, including the ownership and protection of patents.

Cybersecurity and Privacy Considerations could impact the Company's Business: In the current environment there are numerous and evolving risks to cybersecurity and privacy, including criminal hackers, hacktivists, state-sponsored intrusions, industrial espionage, employee malfeasance, and human or technological error. Computer hackers and others routinely attempt to breach the security of technology products, services and systems, and to fraudulently induce employees, customers, and other third parties to disclose information or unwittingly provide access to systems or data. The risk of such attacks to the company includes attempted breaches not only of our own products, services and systems, but also those of customers, contractors, business partners, vendors and other third parties. The company's products, services and systems may be used in critical company, customer or third-party operations, or involve the storage, processing and transmission of sensitive data, including valuable intellectual property, other proprietary or confidential data, regulated data, and personal information of employees, customers and others. Successful breaches, employee malfeasance, or human or technological error could result in, for example, unauthorized access to, disclosure, modification, misuse, loss, or destruction of company, customer, or other third party data or systems; theft of sensitive, regulated, or confidential data including personal information and intellectual property; the loss of access to critical data or systems through ransomware, destructive attacks or other means; and business delays, service or system disruptions or denials of service. In the event of such actions, the company, its customers and other third parties could be exposed to potential liability, litigation, and regulatory or other government action, as well as the loss of existing or potential customers, damage to brand and reputation, and other financial loss. In addition, the cost and operational consequences of responding to breaches and implementing remediation measures could be significant. The company also experiences and responds to cybersecurity threats. To date, there has not been a cybersecurity attack that has had a material adverse effect on the company, though there is no assurance that there will not be a material adverse effect in the future. As the company's business and the cybersecurity landscape evolve, the company may also find it necessary to make significant further investments to protect data and infrastructure. In the company's industry, security vulnerabilities are increasingly discovered and

publicized across a broad range of hardware and software products, elevating the risk of attacks and the potential cost of response and remediation for the company and its customers. In addition, the fast-paced, evolving, pervasive, and sophisticated nature of certain cyber threats and vulnerabilities, as well as the scale and complexity of the business and infrastructure, make it possible that certain threats or vulnerabilities will be undetected or unmitigated in time to prevent an attack on the company and its customers. Cybersecurity risk to the company and its customers will also depend on factors such as actions, practices and investments of customers, contractors, business partners, vendors and other third parties. Cyber attacks or other catastrophic events resulting in disruptions to or failures in power, information technology, communication systems or other critical infrastructure could result in interruptions or delays to company, customer, or other third party operations or services, financial loss, injury to persons or property, potential liability, and damage to brand and reputation. Although the company takes significant steps to mitigate cybersecurity risk across a range of functions, such measures can never eliminate the risk entirely or provide absolute security.

As a global enterprise, the regulatory environment with regard to cybersecurity, privacy and data protection issues is increasingly complex and may have impacts on the company's business, including increased risk, costs, and expanded compliance obligations. As the company's business focus on data grows, the potential impact of these vulnerabilities and regulations on the company's business, risks, and reputation may grow accordingly. The General Data Protection Regulation that will come into force in the European Union in May 2018 will continue to cause the company to incur additional compliance costs.

The Company's Financial Results for Particular Periods are Difficult to Predict: IBM's revenues are affected by such factors as the introduction of new products and services, our ability to compete effectively in increasingly competitive marketplaces, the length of the sales cycles and the seasonality of technology purchases. Moreover, the company's strategic imperatives involve new products, new customers, new and evolving competitors, and new markets, all of which contribute to the difficulty of predicting the company's financial results. The company's financial results may also be impacted by the structure of products and services contracts and the nature of its customers' businesses; for example, certain of the company's services contracts with commercial customers in regulated industries are subject to periodic review by regulators with respect to controls and processes. As a result of the above-mentioned factors, the company's financial results are difficult to predict. Historically, the company has had lower revenue in the first quarter than in the immediately preceding fourth quarter. In addition, the high volume of products typically ordered at the end of each quarter, especially at the end of the fourth quarter, make financial results for a given period difficult to predict.

Due to the Company's Global Presence, its Business and Operations could be impacted by Local Legal, Economic, Political and Health Conditions: The company is a globally integrated entity, operating in over 175 countries worldwide and deriving more than sixty percent of its revenues from sales outside the United States. Changes in the laws or policies of the countries in which the company operates, or inadequate enforcement of laws or policies, could affect the company's business and the company's overall results of operations. The company's results of operations also could be affected by economic and political changes in those countries and by macroeconomic changes, including recessions, inflation, currency fluctuations between the U.S. dollar and non-U.S. currencies and adverse changes in trade relationships amongst those countries. Further, as the company expands its customer base and the scope of its offerings, both within the U.S. and globally, it may be impacted by additional regulatory or other risks, including compliance with U.S. and foreign data privacy requirements, labor relations laws, laws relating to anti-corruption, anti-competition regulations, import and trade restrictions and export requirements. In addition, any widespread outbreak of an illness, pandemic or other local or global health issue or uncertain political climates, international hostilities, natural disasters, or any terrorist activities, could adversely affect customer demand and the company's operations and its ability to source and deliver products and services to its customers.

The Company could incur Substantial Costs for Environmental Matters: The company is subject to various federal, state, local and foreign laws and regulations concerning the discharge of materials into the environment or otherwise related to environmental protection, including the U.S. Superfund law. The company could incur substantial costs, including cleanup costs, fines and civil or criminal sanctions, as well as third-party claims for property damage or personal injury, if it were to violate or become liable under environmental laws and regulations. Compliance with environmental laws and regulations is not expected to have a material adverse effect on the company's financial position, results of operations and competitive position.

Tax Matters could impact the Company's Results of Operations and Financial Condition: The company is subject to income taxes in both the United States and numerous foreign jurisdictions. IBM's provision for income taxes and cash tax liability in the future could be adversely affected by numerous factors including, but not limited to, income before taxes being lower than anticipated in countries with lower statutory tax rates and higher than anticipated in countries with higher statutory tax rates, changes in the valuation of deferred tax assets and liabilities, and changes in tax laws, regulations, accounting principles or interpretations thereof, which could adversely impact the company's results of operations and financial condition in future periods. The Organization for Economic Cooperation and Development (OECD) is issuing guidelines that are different, in some respects, than long-standing international tax principles. As countries unilaterally amend their tax laws to adopt certain parts of the OECD guidelines, this may increase tax uncertainty and may adversely impact the company's income taxes. Local country, state, provincial or municipal taxation may also be subject to review and potential override by regional, federal, national or similar forms of government. In addition, IBM is subject to the continuous examination of its income tax returns by the United States Internal Revenue Service and other tax authorities around the world. The company regularly assesses the likelihood of adverse outcomes resulting from these examinations to determine the adequacy of its provision for income taxes. There can be no assurance that the outcomes from these examinations will not have an adverse effect on the company's provision for income taxes and cash tax liability.

The Company's Results of Operations and Financial Condition could be negatively impacted by its U.S. and non-U.S. Pension Plans: Adverse financial market conditions and volatility in the credit markets may have an unfavorable impact on the value of the company's pension trust assets and its future estimated pension liabilities. As a result, the company's financial results in any period could be negatively impacted. In addition, in a period of an extended financial market downturn, the company could be required to provide incremental pension plan funding with resulting liquidity risk which could negatively impact the company's financial flexibility. Further, the company's results could be negatively impacted by premiums for mandatory pension insolvency insurance coverage outside the United States. Premium increases could be significant due to the level of insolvencies of unrelated companies in the country at issue. IBM's 2017 Annual Report to Stockholders includes information about potential impacts from pension funding and the use of certain assumptions regarding pension matters.

Ineffective Internal Controls could impact the Company's Business and Operating Results: The company's internal control over financial reporting may not prevent or detect misstatements because of its inherent limitations, including the possibility of human error, the circumvention or overriding of controls, or fraud. Even effective internal controls can provide only reasonable assurance with respect to the preparation and fair presentation of financial statements. If the company fails to maintain the adequacy of its internal controls, including any failure to implement required new or improved controls, or if the company experiences difficulties in their implementation, the company's business and operating results could be harmed and the company could fail to meet its financial reporting obligations.

The Company's Use of Accounting Estimates involves Judgment and could impact the Company's Financial Results: The application of generally accepted accounting principles requires the company to make estimates and assumptions about certain items and future events that directly affect its reported

financial condition. The company's most critical accounting estimates are described in the Management Discussion in IBM's 2017 Annual Report to Stockholders, under "Critical Accounting Estimates." In addition, as discussed in note M, "Contingencies and Commitments," in IBM's 2017 Annual Report to Stockholders, the company makes certain estimates including decisions related to legal proceedings and reserves. These estimates and assumptions involve the use of judgment. As a result, actual financial results may differ.

The Company Depends on Skilled Employees and could be impacted by the loss of Critical Skills: Much of the future success of the company depends on the continued service, availability and integrity of skilled employees, including technical, marketing and staff resources. Skilled and experienced personnel in the areas where the company competes are in high demand, and competition for their talents is intense. Changing demographics and labor work force trends may result in a loss of or insufficient knowledge and skills. In addition, as global opportunities and industry demand shifts, realignment, training and scaling of skilled resources may not be sufficiently rapid or successful. Further, many of IBM's key employees receive a total compensation package that includes equity awards. Any new regulations, volatility in the stock market and other factors could diminish the company's use, and the value, of the company's equity awards, putting the company at a competitive disadvantage or forcing the company to use more cash compensation.

The Company's Business could be impacted by its Relationships with Critical Suppliers: IBM's business employs a wide variety of components, supplies, services and raw materials from a substantial number of suppliers around the world. Certain of the company's businesses rely on a single or a limited number of suppliers, and with the completion of GLOBALFOUNDRIES' acquisition of IBM's global commercial semiconductor business in 2015, it became IBM's exclusive server processor technology provider for certain semiconductors. Changes in the business condition (financial or otherwise) of these suppliers could subject the company to losses and affect its ability to bring products to market. Further, the failure of the company's suppliers to deliver components, supplies, services and raw materials in sufficient quantities, in a timely manner, and in compliance with all applicable laws and regulations could adversely affect the company's business. In addition, any defective components, supplies or materials, or inadequate services received from suppliers could reduce the reliability of the company's products and services and harm the company's reputation.

Product Quality Issues could impact the Company's Business and Operating Results: The company has rigorous quality control standards and processes intended to prevent, detect and correct errors, malfunctions and other defects in its products and services. If errors, malfunctions, defects or disruptions in service are experienced by customers or in the company's operations there could be negative consequences that could impact customers' business operations and harm the company's business's operating results.

The Company could be impacted by its Business with Government Clients: The company's customers include numerous governmental entities within and outside the U.S., including the U.S. Federal Government and state and local entities. Some of the company's agreements with these customers may be subject to periodic funding approval. Funding reductions or delays could adversely impact public sector demand for our products and services. Also, some agreements may contain provisions allowing the customer to terminate without cause and providing for higher liability limits for certain losses. In addition, the company could be suspended or debarred as a governmental contractor and could incur civil and criminal fines and penalties, which could negatively impact the company's results of operations and financial results.

The Company is exposed to Currency and Financing Risks that could impact its Revenue and Business: The company derives a significant percentage of its revenues and costs from its affiliates operating in local currency environments, and those results are affected by changes in the relative values of non-U.S. currencies and the U.S. dollar. Further, inherent in the company's financing business are risks related to the concentration of credit, client creditworthiness, interest rate and currency fluctuations on

the associated debt and liabilities, the determination of residual values and the financing of other than traditional IT assets. The company employs a number of strategies to manage these risks, including the use of derivative financial instruments, which involve the risk of non-performance by the counterparty. In addition, there can be no assurance that the company's efforts to manage its currency and financing risks will be successful.

The Company's Financial Performance could be impacted by Changes in Market Liquidity Conditions and by Customer Credit Risk on Receivables: The company's financial performance is exposed to a wide variety of industry sector dynamics worldwide. The company's earnings and cash flows, as well as its access to funding, could be negatively impacted by changes in market liquidity conditions. IBM's 2017 Annual Report to Stockholders includes information about the company's liquidity position. The company's client base includes many worldwide enterprises, from small and medium businesses to the world's largest organizations and governments, with a significant portion of the company's revenue coming from global clients across many sectors. Most of the company's sales are on an open credit basis, and the company performs ongoing credit evaluations of its clients' financial conditions. If the company becomes aware of information related to the creditworthiness of a major customer, or, if future actual default rates on receivables in general differ from those currently anticipated, the company may have to adjust its allowance for credit losses, which could affect the company's consolidated net income in the period the adjustments are made.

The Company's Reliance on Third Party Distribution Channels and Ecosystems could impact its Business: The company offers its products directly and through a variety of third party distributors, resellers and ecosystem partners. Changes in the business condition (financial or otherwise) of these distributors, resellers and ecosystem partners could subject the company to losses and affect its ability to bring its products to market. As the company moves into new areas, distributors, resellers and ecosystem partners may be unable to keep up with changes in technology and offerings, and the company may be unable to recruit and enable appropriate partners to achieve growth objectives. In addition, the failure of third party distributors, resellers and ecosystem partners to comply with all applicable laws and regulations may prevent the company from working with them and could subject the company to losses and affect its ability to bring products to market.

Risks to the Company from Acquisitions, Alliances and Dispositions include Integration Challenges, Failure to Achieve Objectives, and the Assumption of Liabilities: The company has made and expects to continue to make acquisitions, alliances and dispositions. Acquisitions and alliances present significant challenges and risks relating to the integration of the business into the company, and there can be no assurances that the company will manage acquisitions and alliances successfully or that strategic acquisition opportunities will be available to the company on acceptable terms or at all. The related risks include the company failing to achieve strategic objectives and anticipated revenue improvements and cost savings, as well as the failure to retain key personnel of the acquired business and the assumption of liabilities related to litigation or other legal proceedings involving the acquired business. From time to time, the company disposes or attempts to dispose of assets that are no longer central to its strategic objectives. Any such disposition or attempted disposition is subject to risks, including risks related to the terms and timing of such disposition, risks related to obtaining necessary governmental or regulatory approvals and risks related to retained liabilities not subject to the company's control.

The Company is Subject to Legal Proceedings Risks: As a company with a substantial employee population and with clients in more than 175 countries, IBM is involved, either as plaintiff or defendant, in a variety of ongoing claims, demands, suits, investigations, tax matters and proceedings that arise from time to time in the ordinary course of its business. The risks associated with such legal proceedings are described in more detail in note M, "Contingencies and Commitments," in IBM's 2017 Annual Report to Stockholders. The company believes it has adopted appropriate risk management and compliance programs. Legal and compliance risks, however, will continue to exist and additional legal

proceedings and other contingencies, the outcome of which cannot be predicted with certainty, may arise from time to time.

Risk Factors Related to IBM Securities: The company and its subsidiaries issue debt securities in the worldwide capital markets from time to time, with a variety of different maturities and in different currencies. The value of the company's debt securities fluctuates based on many factors, including the methods employed for calculating principal and interest, the maturity of the securities, the aggregate principal amount of securities outstanding, the redemption features for the securities, the level, direction and volatility of interest rates, changes in exchange rates, exchange controls, governmental and stock exchange regulations and other factors over which the company has little or no control. The company's ability to pay interest and repay the principal for its debt securities is dependent upon its ability to manage its business operations, as well as the other risks described under this Item 1A. entitled "Risk Factors." There can be no assurance that the company will be able to manage any of these risks successfully.

The company also issues its common stock from time to time in connection with various compensation plans, contributions to its pension plan and certain acquisitions. The market price of IBM common stock is subject to significant volatility, due to other factors described under this Item 1A. entitled "Risk Factors," as well as economic and geopolitical conditions generally, trading volumes, speculation by the press or investment community about the company's financial condition, and other factors, many of which are beyond the company's control. Since the market price of IBM's common stock fluctuates significantly, stockholders may not be able to sell the company's stock at attractive prices.

In addition, changes by any rating agency to the company's outlook or credit ratings can negatively impact the value and liquidity of both the company's debt and equity securities. The company does not make a market in either its debt or equity securities and cannot provide any assurances with respect to the liquidity or value of such securities.

Item 1B. Unresolved Staff Comments:

Not applicable.

Item 2. Properties:

The company's corporate headquarters are located at an owned site in Armonk, New York. As of December 31, 2017, in aggregate, the company owns or leases facilities for current use consisting of approximately 78 million square feet worldwide.

At December 31, 2017, IBM's manufacturing and development facilities in the United States had aggregate floor space of 9 million square feet, of which 7 million was owned and 2 million was leased. Similar facilities in 15 other countries totaled 6 million square feet, of which 3 million was owned and 3 million was leased. The company's facilities are utilized for current operations of all its segments.

Although improved production techniques, productivity gains, divestitures and infrastructure reduction actions have resulted in reduced manufacturing floor space, continuous maintenance and upgrading of facilities is essential to maintain technological leadership, improve productivity and meet customer demand.

Item 3. Legal Proceedings:

Refer to note M, "Contingencies and Commitments," on pages 119 to 121 of IBM's 2017 Annual Report to Stockholders, which is incorporated herein by reference.

Item 4. Mine Safety Disclosures:

Not applicable.

PART II

Item 5. Market for the Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities:

Refer to pages 148 and 151 of IBM's 2017 Annual Report to Stockholders, which are incorporated herein by reference solely as they relate to this item.

IBM common stock is listed on the New York Stock Exchange and the Chicago Stock Exchange. There were 408,697 common stockholders of record at February 9, 2018.

The following table provides information relating to the company's repurchase of common stock for the fourth quarter of 2017.

	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Program	Approximate Dollar Value of Shares that May Yet Be Purchased Under the Program(1)
October 1, 2017— October 31, 2017	1,267,625	$ 150.98	1,267,625	$ 4,262,056,220
November 1, 2017— November 30, 2017	1,422,789	$ 151.26	1,422,789	$ 4,046,839,737
December 1, 2017— December 31, 2017	1,695,005	$ 154.11	1,695,005	$ 3,785,623,565
Total	4,385,419	$ 152.28	4,385,419	

(1) On October 25, 2016, the Board of Directors authorized $3.0 billion in funds for use in the company's common stock repurchase program. On October 31, 2017, the Board of Directors authorized an additional $3.0 billion in funds for use in such program. In each case, the company stated that it would repurchase shares on the open market or in private transactions depending on market conditions. The common stock repurchase program does not have an expiration date. This table does not include shares tendered to satisfy the exercise price in connection with cashless exercises of employee stock options or shares tendered to satisfy tax withholding obligations in connection with employee equity awards.

Item 6. Selected Financial Data:

Refer to pages 147 and 148 of IBM's 2017 Annual Report to Stockholders, which are incorporated herein by reference.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations:

Refer to pages 26 through 75 of IBM's 2017 Annual Report to Stockholders, which are incorporated herein by reference.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk:

Refer to the section titled "Market Risk" on page 74 of IBM's 2017 Annual Report to Stockholders, which is incorporated herein by reference.

Item 8. Financial Statements and Supplementary Data:

Refer to pages 78 through 146 of IBM's 2017 Annual Report to Stockholders, which are incorporated herein by reference. Also refer to the Financial Statement Schedule on page S-1 of this Form 10-K.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure:

Not applicable.

Item 9A. Controls and Procedures:

The company's management evaluated, with the participation of the Chief Executive Officer and Chief Financial Officer, the effectiveness of the company's disclosure controls and procedures as of the end of the period covered by this report. Based on that evaluation, the Chief Executive Officer and Chief Financial Officer have concluded that the company's disclosure controls and procedures were effective as of the end of the period covered by this report.

Refer to "Report of Management" and "Report of Independent Registered Public Accounting Firm" on pages 76 and 77 of IBM's 2017 Annual Report to Stockholders, which are incorporated herein by reference. There has been no change in the company's internal control over financial reporting that occurred during the fourth fiscal quarter that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting.

Item 9B. Other Information:

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance:

Refer to the information under the captions "Election of Directors for a Term of One Year," "General Information—Committees of the Board," "General Information—Audit Committee" and "2017 Director Compensation Narrative—Section 16(a) Beneficial Ownership Reporting Compliance" in IBM's definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to stockholders in connection with the Annual Meeting of Stockholders to be held April 24, 2018, all of which information is incorporated herein by reference. Also refer to Item 1 of this Form 10-K under the caption "Executive Officers of the Registrant (at February 27, 2018)" on page 11 for additional information on the company's executive officers.

Item 11. Executive Compensation:

Refer to the information under the captions "2017 Director Compensation Narrative," "2017 Director Compensation Narrative—2017 Director Compensation Table," "2017 Compensation Discussion and Analysis," "2017 Summary Compensation Table Narrative," "2017 Summary Compensation Table," "2017 Grants of Plan-Based Awards Table," "2017 Outstanding Equity Awards at Fiscal Year-End Narrative," "2017 Outstanding Equity Awards at Fiscal Year-End Table," "2017 Option Exercises and Stock Vested Table," "2017 Retention Plan Narrative," "2017 Retention Plan Table," "2017 Pension Benefits Narrative," "2017 Pension Benefits Table," "2017 Nonqualified Deferred Compensation Narrative," "2017 Nonqualified Deferred Compensation Table," "2017 Potential Payments Upon Termination Narrative," "2017 Potential Payments Upon Termination Table," "General Information—Compensation Committee Interlocks and Insider Participation" and "Executive Compensation—2017 Report of the Executive Compensation and Management Resources Committee of the Board of Directors" in IBM's definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to stockholders in connection with the Annual Meeting of Stockholders to be held April 24, 2018, all of which information is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters:

Refer to the information under the caption "Ownership of Securities—Security Ownership of Certain Beneficial Owners" and "Ownership of Securities—Common Stock and Stock-based Holdings of Directors and Executive Officers" in IBM's definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to stockholders in connection with the Annual Meeting of Stockholders to be held April 24, 2018, all of which information is incorporated herein by reference.

EQUITY COMPENSATION PLAN INFORMATION

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights(1) (a)	Weighted-average exercise price of outstanding options, warrants and rights(1) (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column(a)) (c)
Equity compensation plans approved by security holders			
Options	1,500,000	$ 139.83	—
RSUs	8,012,387	N/A	—
PSUs	3,811,335(2)	N/A	—
Subtotal	13,323,722	$ 139.83	88,463,462
Equity compensation plans not approved by security holders			
Options	—	$ —	—
RSUs	542,876	N/A	—
PSUs	162,635(2)	N/A	—
DCEAP shares	190,526	N/A	—
Subtotal	896,036	$ —	15,664,747
Total	14,219,758	$ 139.83	104,128,209

N/A is not applicable

RSUs = Restricted Stock Units, including Retention Restricted Stock Units

PSUs = Performance Share Units

DCEAP Shares = Promised Fee Shares under the DCEAP (see plan description below)

(1) In connection with 35 acquisition transactions, 284,617 additional share based awards, consisting of stock options, were outstanding at December 31, 2017 as a result of the Company's assumption of awards granted by the acquired entities. The weighted-average exercise price of these awards was $41.73. The Company has not made, and will not make, any further grants or awards of equity securities under the plans of these acquired companies.

(2) The numbers included for PSUs in column (a) above reflect the maximum number payout. Assuming target number payout, the number of securities to be issued upon exercise of PSUs for equity compensation plans approved by security holders is 2,540,890 and for equity compensation plans not approved by security holders is 108,423. For additional information about PSUs, including payout calculations, refer to the information under "2017 Summary Compensation Table Narrative," in IBM's definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to stockholders in connection with the Annual Meeting of Stockholders to be held April 24, 2018.

The material features of each equity compensation plan under which equity securities are authorized for issuance that was adopted without stockholder approval are described below:

2001 Long-Term Performance Plan

The 2001 Long-Term Performance Plan (the "2001 Plan") has been used to fund awards for employees other than senior executives of the Company. Awards for senior executives of the Company have been and will continue to be funded from the stockholder-approved 1999 Long-Term Performance Plan (the "1999 Plan"); the 1999 Plan is also used to fund awards for employees other than senior executives, Otherwise, the provisions of the 2001 Plan are identical to the 1999 Plan, including the type of awards that may be granted under the plan (stock options, restricted stock and unit awards and long-term performance incentive awards).

The 2001 Plan is administered by the Executive Compensation and Management Resources Committee of the Board of Directors (the "Committee"), and that Committee may delegate to officers of the company certain of its duties, powers and authority. Payment of awards may be made in the form of cash, stock or combinations thereof and may be deferred with Committee approval. Awards are not transferable or assignable except (i) by law, will or the laws of descent and distribution, (ii) as a result of the disability of the recipient, or (iii) with the approval of the Committee.

If the employment of a participant terminates, other than as a result of the death or disability of a participant, all unexercised, deferred and unpaid awards shall be canceled immediately, unless the award agreement provides otherwise. In the event of the death of a participant or in the event a participant is deemed by the company to be disabled and eligible for benefits under the terms of the IBM Long-Term Disability Plan (or any successor plan or similar plan of another employer), the participant's estate, beneficiaries or representative, as the case may be, shall have the rights and duties of the participant under the applicable award agreement. In addition, unless the award agreement specifies otherwise, the Committee may cancel, rescind, suspend, withhold or otherwise limit or restrict any unexpired, unpaid, or deferred award at any time if the participant is not in compliance with all applicable provisions of the awards agreement and the 2001 Plan. In addition, awards may be cancelled if the participant engages in any conduct or act determined to be injurious, detrimental or prejudicial to any interest of the company.

PWCC Acquisition Long-Term Performance Plan

The IBM PWCC Acquisition Long-Term Performance Plan (the "PWCC Plan") was adopted by the Board of Directors in connection with the company's acquisition of PricewaterhouseCoopers Consulting ("PwCC") from PricewaterhouseCoopers LLP, as announced on October 1, 2002. The PWCC Plan has been and will continue to be used solely to fund awards for employees of PwCC who have become employed by the company as a result of the acquisition. Awards for senior executives of the company will not be funded from the PWCC Plan. The terms and conditions of the PWCC Plan are substantively identical to the terms and conditions of the 2001 Plan, described above.

IBM Deferred Compensation and Equity Award Plan

The IBM Deferred Compensation and Equity Award Plan (the "DCEAP") was adopted in 1993 and amended and restated effective January 1, 2014. Under the Amended and Restated DCEAP, non-management directors receive Promised Fee Shares in connection with deferred annual retainer payments. Each Promised Fee Share is equal in value to one share of the company's common stock. Upon a director's retirement or other completion of service as a director, amounts deferred into Promised Fee Shares are payable in either cash and/or shares of the company's stock either as lump sum or installments pursuant to the director's distribution election. For additional information about the DCEAP, see "2017 Director Compensation Narrative" in IBM's definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to stockholders in connection with the Annual Meeting of Stockholders to be held April 24, 2018.

Item 13. Certain Relationships and Related Transactions, and Director Independence:

Refer to the information under the captions "General Information—IBM Board of Directors" and "General Information—Certain Transactions and Relationships" in IBM's definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to stockholders in connection with the Annual Meeting of Stockholders to be held April 24, 2018, which information is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services:

Refer to the information under the captions "Report of the Audit Committee of the Board of Directors" and "Audit and Non-Audit Fees" in IBM's definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to stockholders in connection with the Annual Meeting of Stockholders to be held April 24, 2018, all of which information is incorporated herein by reference.

PART IV

Item 15. Exhibits, Financial Statement Schedules:

(a) The following documents are filed as part of this report:

1. Financial statements from IBM's 2017 Annual Report to Stockholders, which are incorporated herein by reference:

Report of Independent Registered Public Accounting Firm (page 77).

Consolidated Statement of Earnings for the years ended December 31, 2017, 2016 and 2015 (page 78).

Consolidated Statement of Comprehensive Income for the years ended December 31, 2017, 2016 and 2015 (page 79).

Consolidated Statement of Financial Position at December 31, 2017 and 2016 (page 80).

Consolidated Statement of Cash Flows for the years ended December 31, 2017, 2016 and 2015 (page 81).

Consolidated Statement of Changes in Equity at December 31, 2017, 2016 and 2015 (pages 82 and 83).

Notes to Consolidated Financial Statements (pages 84 through 146).

2. Financial statement schedule required to be filed by Item 8 of this Form:

Page	Schedule Number	
XX		Report of Independent Registered Public Accounting Firm on Financial Statement Schedule.
S-1	II	Valuation and Qualifying Accounts and Reserves for the years ended December 31, 2017, 2016 and 2015.

All other schedules are omitted as the required matter is not present, the amounts are not significant or the information is shown in the Consolidated Financial Statements or the notes thereto.

3. Exhibits:

Reference Number per Item 601 of Regulation S-K	Description of Exhibits	Exhibit Number in this Form 10-K
(2)	Plan of acquisition, reorganization, arrangement, liquidation or succession.	Not applicable
(3)	Certificate of Incorporation and By-laws.	
	The Certificate of Incorporation of IBM is Exhibit 3.2 to Form 8-K filed April 27, 2007, and is hereby incorporated by reference.	
	The By-laws of IBM, as amended through December 12, 2017, is Exhibit 3.2 to Form 8-K filed December 15, 2017, and is hereby incorporated by reference.	
(4)	Instruments defining the rights of security holders.	
	The instruments defining the rights of the holders of the 8.375% Debentures due 2019 are Exhibits 4(a)(b)(c) and (d), respectively, to Registration Statement No. 33-31732 on Form S-3, filed on October 24, 1989, and are hereby incorporated by reference.	P

Reference Number per Item 601 of Regulation S-K	Description of Exhibits	Exhibit Number in this Form 10-K
	The instruments defining the rights of the holders of the 7.00% Debentures due 2025 and the 7.00% Debentures due 2045 are Exhibits 2 and 3, respectively, to Form 8-K, filed on October 30, 1995, and are hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 7.125% Debentures due 2096 is Exhibit 4.2 to Form 8-K/A, filed on December 6, 1996, and is hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 6.22% Debentures due 2027 is Exhibit 3 to Form 8-K, filed on August 1, 1997, and is hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 6.50% Debentures due 2028 is Exhibit 2 to Form 8-K, filed on January 8, 1998, and is hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 2.900% Notes due 2021 is Exhibit 3.1 to Form 8-K, filed October 31, 2011, and is hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 1.875% Notes due 2019 is Exhibit 3.1 to Form 8-K, filed May 10, 2012, and is hereby incorporated by reference.	
	The instruments defining the rights of the holders of the 1.875% Notes due 2022 is Exhibit 2.1 to Form 8-K, filed July 27, 2012, and is hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 1.375% Notes due 2019 is Exhibit 2.1 to Form 8-K, filed November 16, 2012, and is hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 1.250% Notes due 2018 is Exhibits 2.1 to Form 8-K, filed February 7, 2013, and is hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 1.625% Notes due 2020 is 3.1 to Form 8-K, filed May 6, 2013, and is hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 3.375% Notes due 2023 is Exhibit 2 to Form 8-K, filed July 31, 2013, and is hereby incorporated by reference.	
	The instruments defining the rights of the holders of the 1.875% Notes due 2020 and 2.875% Notes due 2025 are Exhibits 2.1 and 3.1 to Form 8-K, filed November 6, 2013, and are hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 2.750% Notes due 2020 is Exhibit 2 to Form 8-K, filed November 20, 2013, and is hereby incorporated by reference.	

Reference Number per Item 601 of Regulation S-K	Description of Exhibits	Exhibit Number in this Form 10-K
	The instruments defining the rights of the holders of the 1.950% Notes due 2019, Floating Rate Notes due 2019 and 3.625% due 2024 are Exhibits 3, 4 and 5 to Form 8-K, filed February 11, 2014, and are hereby incorporated by reference.	
	The instrument defining the rights of the holders of the Floating Rate Notes due 2021 is Exhibit 2 to Form 8-K, filed November 5, 2014, and is hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 1.25% Notes due 2023 is Exhibit 2 to Form 8-K, filed November 25, 2014, and is hereby incorporated by reference.	
	The instruments defining the rights of the holders of the 1.125% Notes due 2018 and Floating Rate Notes due 2018 are Exhibits 2 and 3 to Form 8-K, filed February 5, 2015, and are hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 2.625% Notes due 2022 is Exhibit 2 to Form 8-K, filed on August 4, 2015, and is hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 2.875% Notes due 2022 is Exhibit 2 to Form 8-K, filed on November 6, 2015, and is hereby incorporated by reference.	
	The instruments defining the rights of the holders of the 1.800% Notes due 2019, 2.250% Notes due 2021, 3.450% Notes due 2026 and 4.700% Notes due 2046 are Exhibits 4.2, 4.3, 4.4 and 4.5 to Form 8-K filed February 18, 2016, and are hereby incorporated by reference.	
	The instruments defining the rights of the holders of the 0.500% Notes due 2021, 1.125% Notes due 2024 and 1.750% Notes due 2028 are Exhibits 4.1, 4.2 and 4.3 to Form 8-K filed March 4, 2016 and are hereby incorporated by reference.	
	The instrument defining the rights of the holders of the 0.30% Notes due 2026 is Exhibit 4 to Form 8-K filed November 1, 2016 and is hereby incorporated by reference.	
	Indenture dated as of October 1, 1993 between IBM and The Bank of New York Mellon, (as successor to The Chase Manhattan Bank (National Association)) as Trustee, is Exhibit 4.1 to Form 10-Q for the quarter ended September 30, 2017, and is hereby incorporated by reference.	
	First Supplemental Indenture to Indenture dated as of October 1, 1993 between IBM and The Bank of New York Mellon, (as successor to The Chase Manhattan Bank (National Association)) as Trustee, dated as of December 15, 1995, is Exhibit 4.2 to Form 10-Q for the quarter ended September 30, 2017, and is hereby incorporated by reference.	
(9)	Voting trust agreement	Not applicable
(10)	Material contracts	

Reference Number per Item 601 of Regulation S-K	Description of Exhibits	Exhibit Number in this Form 10-K
	The IBM 2001 Long-Term Performance Plan, a compensatory plan, contained in Registration Statement No. 333-87708 on Form S-8, as such amended plan was filed as Exhibit 10.1 to Form 10-Q for the quarter ended September 30, 2007, is hereby incorporated by reference.*	
	The IBM PWCC Acquisition Long-Term Performance Plan, a compensatory plan, contained in Registration Statement No. 333-102872 on Form S-8, as such amended plan was filed as Exhibit 10.2 to Form 10-Q for the quarter ended September 30, 2007, is hereby incorporated by reference.*	
	The IBM 1999 Long-Term Performance Plan, a compensatory plan, contained in Registration Statement No. 333-30424 on Form S-8, as such amended plan was filed as Exhibit 10.3 to Form 10-Q for the quarter ended September 30, 2007, is hereby incorporated by reference.*	
	The IBM 1997 Long-Term Performance Plan, a compensatory plan, contained in Registration Statement No. 333-31305 on Form S-8, as such amended plan was filed as Exhibit 10.4 to Form 10-Q for the quarter ended September 30, 2007, is hereby incorporated by reference.*	
	Forms of LTPP equity award agreements for (i) stock options, restricted stock, restricted stock units, cash-settled restricted stock units, SARS and (ii) retention restricted stock unit awards. Such equity award agreement forms and the related terms and conditions document, effective June 9, 2014, were filed under Exhibit 10.1 as Exhibit 10.2 to Form 10-Q for the quarter ended March 31, 2014, are hereby incorporated by reference.*	
	Form of LTPP equity award agreement for performance share units was filed as Exhibit 10.1 to Form 10-Q for the quarter ended March 31, 2015, and is hereby incorporated by reference.*	
	Terms and Conditions of LTPP equity award agreements was filed as Exhibit 10.1 to Form 10-Q for the quarter ended June 30, 2016, and is hereby incorporated by reference.*	
	Board of Directors compensatory plans, as described under the caption "General Information—2017 Director Compensation" in IBM's definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to stockholders in connection with the Annual Meeting of Stockholders to be held April 24, 2018, are hereby incorporated by reference.*	
	The IBM Non-Employee Directors Stock Option Plan, contained in Registration Statement 33-60227 on Form S-8, is hereby incorporated by reference.*	
	The IBM Board of Directors Deferred Compensation and Equity Award Plan, a compensatory plan, as amended and restated effective January 1, 2014, which was filed as Exhibit 10.1 to Form 10-K for the year ended December 31, 2013, and is hereby incorporated by reference.*	

Reference Number per Item 601 of Regulation S-K	Description of Exhibits	Exhibit Number in this Form 10-K
	Amendment No. 1 to the Amended and Restated Deferred Compensation and Equity Award Plan, effective January 30, 2018	10.1
	The IBM Supplemental Executive Retention Plan, a compensatory plan, as amended and restated through December 31, 2008, which was filed as Exhibit 10.2 to Form 10-K for the year ended December 31, 2008, is hereby incorporated by reference.*	
	Amendment No. 1 to the IBM Supplemental Executive Retention Plan, a compensatory plan, effective December 9, 2014, which was filed as Exhibit 10.1 to the Form 10-K for the year ended December 31, 2014, and is hereby incorporated by reference.*	
	The IBM Excess 401(k) Plus Plan, a compensatory plan (formerly the IBM Executive Deferred Compensation Plan), as amended and restated through January 1, 2010, which was filed as Exhibit 10.1 to the Form 10-K for the year ended December 31, 2009 contained in Registration Statement No. 333-171968 on Form S-8, is hereby incorporated by reference.*	
	Amendment No. 1 to the IBM Excess 401(k) Plus Plan, a compensatory plan, effective January 1, 2013 which was filed as Exhibit 10.1 to the Form 10-K for the year ended December 31, 2012, and is hereby incorporated by reference.*	
	Amendment No. 2 to the IBM Excess 401(k) Plus Plan, a compensatory plan, effective January 1, 2013 which was filed as Exhibit 10.2 to the Form 10-K for the year ended December 31, 2012, and is hereby incorporated by reference.*	
	Amendment No. 3 to the IBM Excess 401(k) Plus Plan, a compensatory plan, effective January 1, 2013 which was filed as Exhibit 10.2 to the Form 10-K for the year ended December 31, 2013, and is hereby incorporated by reference.*	
	Amendment No. 4 to the IBM Excess 401(k) Plus Plan, a compensatory plan, dated as of February 25, 2014, which was filed as Exhibit 10.1 to the Form 10-Q for the quarter ended March 31, 2014, and is hereby incorporated by reference.*	
	Amendment No. 5 to the IBM Excess 401(k) Plus Plan, a compensatory plan, dated as of December 9, 2014 , which was filed as Exhibit 10.2 to the Form 10-K for the year ended December 31, 2014, and is hereby incorporated by reference.*	
	Amendment No. 6 to the IBM Excess 401(k) Plus Plan, a compensatory plan, dated as of December 18, 2015, which was filed as Exhibit 10.1 to the Form 10-K for the year ended December 31, 2015, and is hereby incorporated by reference.*	
	Amendment No. 7 to the IBM Excess 401 (k) Plus Plan, a compensatory plan, dated as of June 30, 2016, which was filed as Exhibit 10.2 to the Form 10-Q for the quarter ended June 30, 2016, and is hereby incorporated by reference.*	

Reference Number per Item 601 of Regulation S-K	Description of Exhibits	Exhibit Number in this Form 10-K
	Amendment No. 8 to the IBM Excess 401(k) Plus Plan, a compensatory plan, dated as of December 31, 2017*	10.2
	The IBM 2003 Employees Stock Purchase Plan, contained in Registration Statement 333-104806 on Form S-8, as amended through April 1, 2005, which was filed as Exhibit 10.3 to Form 10-Q for the quarter ended March 31, 2005, is hereby incorporated by reference.*	
	Form of Noncompetition Agreement, filed as Exhibit 10.2 to Form 10-Q for the quarter ended March 31, 2009, is hereby incorporated by reference.*	
	Form of Noncompetition Agreement, filed as Exhibit 10.1 to Form 10-Q for the quarter ended March 31, 2012, is hereby incorporated by reference.*	
	Form of Noncompetition Agreement, filed as Exhibit 10.2 to the Form 10-K for the year ended December 31, 2015, is hereby incorporated by reference.*	
	Form of Noncompetition Agreement, filed as Exhibit 10.3 to Form 10-Q for the quarter ended June 30, 2016, is hereby incorporated by reference.*	
	Form of Noncompetition Agreement, filed as Exhibit 10.1 to Form 10-K for the year ended December 31, 2016, is hereby incorporated by reference.*	
	Form of Noncompetition Agreement*	10.3
	Letter dated December 4, 2008, signed by Erich Clementi and IBM, effective January 1, 2009, filed as Exhibit 10.2 to Form 10-K for the year ended December 31, 2016, is hereby incorporated by reference.	
	The $10,000,000 5-Year Credit Agreement dated as of November 10, 2011, among International Business Machines Corporation, the Subsidiary Borrowers parties thereto, the Lenders parties thereto, JPMorgan Chase Bank, N.A., as Administrative Agent, and the Syndication and Documentation Agents named therein, which was filed as Exhibit 10.1 to Form 8-K dated November 14, 2011, the term of which was extended through November 10, 2020, is hereby incorporated by reference.	
	First Amendment, dated as of October 16, 2014, to the 5-Year Credit Agreement, among International Business Machines Corporation, JPMorgan Chase Bank, N.A., as Administrative Agent, the Subsidiary Borrowers parties thereto, the Lenders parties thereto and the Syndication Agents and Documentation Agents therein, which was filed as Exhibit 10.4 to Form 10-K for the year ended December 31, 2014, is hereby incorporated by reference.	

Reference Number per Item 601 of Regulation S-K	Description of Exhibits	Exhibit Number in this Form 10-K
	Second Amendment, dated as of October 21, 2016, to the 5-Year Credit Agreement, among International Business Machines Corporation, JPMorgan Chase Bank, N.A., as Administrative Agent, the Subsidiary Borrowers parties thereto, the Lenders parties thereto and the Syndication Agents and Documentation Agents therein, which was filed as Exhibit 10.4 to Form 10-K for the year ended December 31, 2016, is hereby incorporated by reference.	
	Agent Letter dated October 21, 2016 from JPMorgan Chase Bank, N.A., as Administrative Agent to the Five-Year Credit Agreement (as amended), confirming the extension of the Termination Date of the Five-Year Credit Agreement to November 10, 2021, with Schedule 1 reflecting Revolving Credit Commitments of $10,250,000,000, which was filed as Exhibit 10.5 to Form 10-K for the year ended December 31, 2016, is hereby incorporated by reference.	
	The $2,500,000,000 364-Day Credit Agreement dated as of July 20, 2017, among International Business Machines Corporation and IBM Credit LLC, as Borrowers, The Several Lenders from Time to Time Parties to such Agreement, JPMorgan Chase Bank, N.A., as Administrative Agent, BNP Paribas, Citibank N.A., Royal Bank of Canada and Mizuho Bank, Ltd., as Syndication Agents, and the Documentation Agents named therein, which was filed as Exhibit 10.1 to Form 10-Q for the quarter ended June 30, 2017, and is hereby incorporated by reference.	
	The $2,500,000,000 Three-Year Credit Agreement, dated as of July 20, 2017, among International Business Machines Corporation and IBM Credit LLC, as Borrowers, The Several Lenders from Time to Time Parties to such Agreement, JPMorgan Chase Bank, N.A., as Administrative Agent, BNP Paribas, Citibank N.A., Royal Bank of Canada and Mizuho Bank, Ltd., as Syndication Agents, and the Documentation Agents named therein, which was filed as Exhibit 10.2 to Form 10-Q for the quarter ended June 30, 2017, and is hereby incorporated by reference.	
	Third Amendment, dated as of July 20, 2017, to the 5-Year Credit Agreement dated as of November 10, 2011 (as amended from time to time), among International Business Machines Corporation, JPMorgan Chase Bank, N.A., as Administrative Agent, the Subsidiary Borrowers parties thereto, the Lenders parties thereto, and the Syndication Agents and the Documentation Agents named therein, which was filed as Exhibit 10.3 to Form 10-Q for the quarter ended June 30, 2017, and is hereby incorporated by reference.	
(11)	Statement re computation of per share earnings	
	The statement re computation of per share earnings is note [P], "Earnings Per Share of Common Stock," on page 124 of IBM's 2017 Annual Report to Stockholders, and is hereby incorporated by reference.	
(12)	Statement re computation of ratios	12
(13)	Annual report to security holders**	13

Reference Number per Item 601 of Regulation S-K	Description of Exhibits	Exhibit Number in this Form 10-K
(18)	Letter re: change in accounting principles	Not applicable
(19)	Previously unfiled documents	Not applicable
(21)	Subsidiaries of the registrant	21
(22)	Published report regarding matters submitted to vote of security holders	Not applicable
(23)	Consent of experts	23.1
(24)	Powers of attorney	24.1
	Resolution of the IBM Board of Directors authorizing execution of this report by Powers of Attorney	24.2
(28)	Information from reports furnished to state insurance regulatory authorities	Not applicable
(31)	Certification by CEO pursuant to Rule 13A-14(a) or 15D-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002	31.1
	Certification by CFO pursuant to Rule 13A-14(a) or 15D-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002	31.2
(32)	Certification by CEO pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002	32.1
	Certification by CFO pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002	32.2
101.INS	XBRL Instance Document	
101.SCH	XBRL Taxonomy Extension Schema Document	
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document	
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document	
101.LAB	XBRL Taxonomy Extension Label Linkbase Document	
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document	101

* Management contract or compensatory plan or arrangement.

** The Performance Graphs, set forth on page 149 of IBM's 2017 Annual Report to Stockholders, are deemed to be furnished but not filed.

Item 16. Form 10-K Summary:

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

INTERNATIONAL BUSINESS MACHINES CORPORATION
(Registrant)

By: /s/ VIRGINIA M. ROMETTY

Virginia M. Rometty
Chairman of the Board,
President and Chief Executive Officer

Date: February 27, 2018

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ VIRGINIA M. ROMETTY Virginia M. Rometty	Chairman of the Board, President and Chief Executive Officer	February 27, 2018
/s/ JAMES J. KAVANAUGH James J. Kavanaugh	Senior Vice President and Chief Financial Officer	February 27, 2018
/s/ ROBERT F. DEL BENE Robert F. Del Bene	Vice President and Controller (Chief Accounting Officer)	February 27, 2018

Kenneth I. Chenault	Director
Michael L. Eskew	Director
David N. Farr	Director
Mark Fields	Director
Alex Gorsky	Director
Shirley Ann Jackson	Director
Andrew N. Liveris	Director
W. James McNerney, Jr.	Director
Hutham S. Olayan	Director
James W. Owens	Director
Joseph R. Swedish	Director
Sidney Taurel	Director

By: /s/ CHRISTINA M. MONTGOMERY

Christina M. Montgomery
Attorney-in-fact
February 27, 2018

Peter R. Voser	Director
Frederick H. Waddell	Director

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM
ON FINANCIAL STATEMENT SCHEDULE

To the Board of Directors and Stockholders of
International Business Machines Corporation:

Our audits of the consolidated financial statements referred to in our report dated February 27, 2018 appearing in the 2017 Annual Report to Shareholders of International Business Machines Corporation (which report and consolidated financial statements are incorporated by reference in this Annual Report on Form 10-K) also included an audit of the Financial Statement Schedule listed in Item 15(a)(2) of this Form 10-K. In our opinion, this Financial Statement Schedule presents fairly, in all material respects, the information set forth therein when read in conjunction with the related consolidated financial statements.

/s/ PRICEWATERHOUSECOOPERS LLP
PricewaterhouseCoopers LLP
New York, New York
February 27, 2018

SCHEDULE II

INTERNATIONAL BUSINESS MACHINES CORPORATION AND SUBSIDIARY COMPANIES
VALUATION AND QUALIFYING ACCOUNTS AND RESERVES
For the Years Ended December 31:
(Dollars in Millions)

Description	Balance at Beginning of Period	Additions/ (Deductions)*	Write-offs	Other**	Balance at End of Period
Allowance For Credit Losses					
2017					
—Current	$ 675	$ 65	$ (157)	$ 11	$ 594
—Noncurrent	$ 101	$ (10)	$ (42)	$ 26	$ 74
2016					
—Current	$ 909	$ 87	$ (307)	$ (13)	$ 675
—Noncurrent	$ 118	$ (2)	$ (7)	$ (8)	$ 101
2015					
—Current	$ 829	$ 226	$ (92)	$ (55)	$ 909
—Noncurrent	$ 126	$ 8	$ (1)	$ (14)	$ 118
Allowance For Inventory Losses					
2017	$ 525	$ 164	$ (139)	$ 23	$ 574
2016	$ 483	$ 178	$ (150)	$ 14	$ 525
2015	$ 564	$ 165	$ (230)	$ (15)	$ 483
Revenue Based Provisions					
2017	$ 481	$ 1,292	$ (1,342)	$ 20	$ 451
2016	$ 505	$ 1,377	$ (1,392)	$ (9)	$ 481
2015	$ 616	$ 1,658	$ (1,741)	$ (28)	$ 505

* Additions for Allowance for Credit Losses and Allowance for Inventory Losses are charged to expense and cost accounts, respectively, while Revenue Based Provisions are charged to revenue accounts. Deductions represent the reversal of such charges.

** Primarily comprises currency translation adjustments.

QuickLinks

PART I

Item 1A. Risk Factors
Item 1B. Unresolved Staff Comments
Item 2. Properties
Item 3. Legal Proceedings
Item 4. Mine Safety Disclosures

PART II

Item 5. Market for the Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities
Item 6. Selected Financial Data
Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations
Item 7A. Quantitative and Qualitative Disclosures About Market Risk
Item 8. Financial Statements and Supplementary Data
Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure
Item 9A. Controls and Procedures
Item 9B. Other Information

PART III

Item 10. Directors, Executive Officers and Corporate Governance
Item 11. Executive Compensation
Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters
Item 13. Certain Relationships and Related Transactions, and Director Independence
Item 14. Principal Accounting Fees and Services

PART IV

Item 15. Exhibits, Financial Statement Schedules
Item 16. Form 10-K Summary

SIGNATURES
REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM ON FINANCIAL STATEMENT SCHEDULE

SCHEDULE II

INTERNATIONAL BUSINESS MACHINES CORPORATION AND SUBSIDIARY COMPANIES VALUATION AND QUALIFYING ACCOUNTS AND RESERVES For the Years Ended December 31: (Dollars in Millions)

EX-13 6 a2233835zex-13.htm EX-13

Exhibit 13

Report of Financials
International Business Machines Corporation and Subsidiary Companies

MANAGEMENT DISCUSSION

Overview	26
Forward-Looking and Cautionary Statements	27
Management Discussion Snapshot	27
Description of Business	30
Year in Review	35
Prior Year in Review	56
Other Information	66
Looking Forward	66
Liquidity and Capital Resources	67
Critical Accounting Estimates	70
Currency Rate Fluctuations	73
Market Risk	74
Cybersecurity	75
Employees and Related Workforce	75
Report of Management	76
Report of Independent Registered Public Accounting Firm	77

CONSOLIDATED FINANCIAL STATEMENTS

Earnings	78
Comprehensive Income	79
Financial Position	80
Cash Flows	81
Changes in Equity	82

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

A	Significant Accounting Policies	84
B	Accounting Changes	94
C	Acquisitions/Divestitures	96
D	Financial Instruments	100
E	Inventories	107
F	Financing Receivables	107
G	Property, Plant and Equipment	111
H	Investments and Sundry Assets	111
I	Intangible Assets Including Goodwill	111
J	Borrowings	112
K	Other Liabilities	115
L	Equity Activity	116
M	Contingencies and Commitments	119
N	Taxes	121
O	Research, Development and Engineering	124
P	Earnings Per Share of Common Stock	124
Q	Rental Expense and Lease Commitments	125
R	Stock-Based Compensation	125
S	Retirement-Related Benefits	128
T	Segment Information	142
U	Subsequent Events	146

Five-Year Comparison of Selected Financial Data	147
Selected Quarterly Data	148
Performance Graphs	149
Stockholder Information	150

Management Discussion
International Business Machines Corporation and Subsidiary Companies

OVERVIEW

The financial section of the International Business Machines Corporation (IBM or the company) 2017 Annual Report includes the Management Discussion, the Consolidated Financial Statements and the Notes to Consolidated Financial Statements. This Overview is designed to provide the reader with some perspective regarding the information contained in the financial section.

Organization of Information

- The Management Discussion is designed to provide readers with an overview of the business and a narrative on the company's financial results and certain factors that may affect its future prospects from the perspective of the company's management. The "Management Discussion Snapshot," beginning on page 27, presents an overview of the key performance drivers in 2017.

- Beginning with the "Year in Review" on page 35, the Management Discussion contains the results of operations for each reportable segment of the business and a discussion of the company's financial position and cash flows. Other key sections within the Management Discussion include: "Looking Forward" on page 66, and "Liquidity and Capital Resources" on page 67, which includes a description of management's definition and use of free cash flow.

- The Consolidated Financial Statements are presented on pages 78 through 83. These statements provide an overview of the company's income and cash flow performance and its financial position.

- The Notes follow the Consolidated Financial Statements. Among other items, the Notes contain the company's accounting policies (pages 84 to 93), acquisitions and divestitures (pages 96 to 99), detailed information on specific items within the financial statements, certain contingencies and commitments (pages 119 to 121) and retirement-related plans information (pages 128 to 142).

- The Consolidated Financial Statements and the Notes have been prepared in accordance with accounting principles generally accepted in the United States (GAAP).

- On December 22, 2017, the Tax Cuts and Jobs Act ("U.S. tax reform") was enacted in the U.S. This Act resulted in the company recognizing a fourth quarter provisional one-time charge of $5.5 billion. Refer to note N, "Taxes," on pages 121 to 124 for additional information.

- The references to "adjusted for currency" or "at constant currency" in the Management Discussion do not include operational impacts that could result from fluctuations in foreign currency rates. When the company refers to growth rates at constant currency or adjusts such growth rates for currency, it is done so that certain financial results can be viewed without the impact of fluctuations in foreign currency exchange rates, thereby facilitating period-to-period comparisons of its business performance. Financial results adjusted for currency are calculated by translating current period activity in local currency using the comparable prior year period's currency conversion rate. This approach is used for countries where the functional currency is the local currency. Generally, when the dollar either strengthens or weakens against other currencies, the growth at constant currency rates or adjusting for currency will be higher or lower than growth reported at actual exchange rates. See "Currency Rate Fluctuations" on page 73 for additional information.

- Within the financial statements and tables in this Annual Report, certain columns and rows may not add due to the use of rounded numbers for disclosure purposes. Percentages reported are calculated from the underlying whole-dollar numbers.

Operating (non-GAAP) Earnings

In an effort to provide better transparency into the operational results of the business, the company separates business results into operating and non-operating categories. Operating earnings from continuing operations is a non-GAAP measure that excludes the effects of certain acquisition-related charges, intangible asset amortization expense resulting from basis differences on equity method investments, retirement-related costs, discontinued operations and related tax impacts. For the fourth-quarter and full-year 2017, operating (non-GAAP) earnings also exclude a one-time charge associated with the enactment of U.S. tax reform due to its unique and non-recurring nature. For acquisitions, operating (non-GAAP) earnings exclude the amortization of purchased intangible assets and acquisition-related charges such as in-process research and development, transaction costs, applicable restructuring and related expenses and tax charges related to acquisition integration. These charges are excluded as they may be inconsistent in amount and timing from period to period and are dependent on the size, type and frequency of the company's acquisitions. All other spending for acquired companies is included in both earnings from continuing operations and in operating (non-GAAP) earnings.

Throughout the Management Discussion and Analysis, the impact of acquisitions over the prior 12-month period may be a driver of higher expense year to year. For retirement-related costs, the company characterizes certain items as operating and others as non-operating. The company includes defined benefit plan and nonpension postretirement benefit plan service cost, amortization of prior service cost and the cost of defined contribution plans in operating earnings. Non-operating retirement-related cost includes defined benefit plan and nonpension postretirement benefit plan interest cost, expected return on plan assets, amortized actuarial gains/losses, the impacts of any plan curtailments/settlements and multi-employer plan costs, pension insolvency costs and other costs. Non-operating retirement-related costs are primarily related to changes in pension plan assets and liabilities which are tied to financial market performance, and the company considers these costs to be outside of the operational performance of the business. Effective January 1, 2018, the company adopted the new Financial Accounting Standards Board (FASB) guidance on presentation of net periodic pension and nonpension postretirement benefits costs, and as a result, the company will align its presentation for operating (non-GAAP) earnings to conform to the FASB presentation of these costs included in the Consolidated Statement of Earnings. Operating (non-GAAP) earnings will no longer include amortization of prior service costs and will now include multi-employer plan costs. The full-year 2018 operating (non-GAAP) earnings per share expectation has been calculated under this new definition.

Overall, the company believes that providing investors with a view of operating earnings as described here provides increased transparency and clarity into both the operational results of the business and the performance of the company's pension plans;

Management Discussion
International Business Machines Corporation and Subsidiary Companies

improves visibility to management decisions and their impacts on operational performance; enables better comparison to peer companies; and allows the company to provide a long-term strategic view of the business going forward. The company's reportable segment financial results reflect operating earnings from continuing operations, consistent with the company's management and measurement system.

FORWARD-LOOKING AND CAUTIONARY STATEMENTS

Certain statements contained in this Annual Report may constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Any forward-looking statement in this Annual Report speaks only as of the date on which it is made; the company assumes no obligation to update or revise any such statements. Forward-looking statements are based on the company's current assumptions regarding future business and financial performance; these statements, by their nature, address matters that are uncertain to different degrees. Forward-looking statements involve a number of risks, uncertainties and other factors that could cause actual results to be materially different, as discussed more fully elsewhere in this Annual Report and in the company's filings with the Securities and Exchange Commission (SEC), including the company's 2017 Form 10-K filed on February 27, 2018.

MANAGEMENT DISCUSSION SNAPSHOT

($ and shares in millions except per share amounts)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent/ Margin Change
Revenue	**$ 79,139**	$ 79,919	(1.0)%*
Gross profit margin	**45.8%**	47.9%	(2.1)pts.
Total expense and other (income)	**$ 24,827**	$ 25,964	(4.4)%
Total expense and other (income)-to-revenue ratio	**31.4%**	32.5%	(1.1)pts.
Income from continuing operations before income taxes	**$ 11,400**	$ 12,330	(7.5)%
Provision for income taxes from continuing operations	**$ 5,642****	$ 449	NM
Income from continuing operations	**$ 5,758****	$ 11,881	(51.5)%
Income from continuing operations margin	**7.3%**	14.9%	(7.6.)pts
Loss from discontinued operations, net of tax	**$ (5)**	$ (9)	(44.7)%
Net income	**$ 5,753****	$ 11,872	(51.5)%
Earnings per share from continuing operations:			
Assuming dilution	**$ 6.14****	$ 12.39	(50.4)%
Consolidated earnings per share—assuming dilution	**$ 6.14****	$ 12.38	(50.4)%
Weighted-average shares outstanding			
Assuming dilution	**937.4**	958.7	(2.2)%
Assets+	**$ 125,356**	$ 117,470	6.7%
Liabilities+	**$ 107,631**	$ 99,078	8.6%
Equity+	**$ 17,725**	$ 18,392	(3.6)%

* (1.3) percent adjusted for currency.
**Includes a one-time charge of $5.5 billion associated with the enactment of U.S. tax reform, or $5.84 of diluted earnings per share in 2017.
\+ At December 31
NM—Not meaningful

The following table provides the company's (non-GAAP) operating earnings for 2017 and 2016.

($ in millions except per share amounts)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change
Net income as reported	**$ 5,753****	$ 11,872	(51.5)%
Loss from discontinued operations, net of tax	**(5)**	(9)	(44.7)
Income from continuing operations	**$ 5,758****	$ 11,881	(51.5)%
Non-operating adjustments (net of tax)			
Acquisition-related charges	**718**	735	(2.3)
Non-operating retirement-related costs/(income)	**983**	415	137.0
U.S. tax reform one-time charge	**5,475**	—	NM
Operating (non-GAAP) earnings*	**$ 12,935**	$ 13,031	(0.7)%
Diluted operating (non-GAAP) earnings per share	**$ 13.80**	$ 13.59	1.5%

* See page 49 for a more detailed reconciliation of net income to operating earnings.
**Includes a one-time charge of $5.5 billion associated with the enactment of U.S. tax reform in 2017.

NM—Not meaningful

Management Discussion
International Business Machines Corporation and Subsidiary Companies

In 2017, the company reported $79.1 billion in revenue and $5.8 billion in income from continuing operations, which includes a one-time charge of $5.5 billion associated with the enactment of U.S. tax reform. Operating (non-GAAP) earnings were $12.9 billion, which excludes the one-time charge. Diluted earnings per share from continuing operations were $6.14 as reported and $13.80 on an operating (non-GAAP) basis. The company generated $16.7 billion in cash from operations, $13.0 billion in free cash flow and delivered shareholder returns of $9.8 billion in gross common stock repurchases and dividends.

Total consolidated revenue in 2017 decreased 1.0 percent as reported and 1.3 percent year to year adjusted for currency. The company returned to revenue growth in the fourth quarter with an increase of 3.6 percent as reported and 0.9 percent adjusted for currency. Year-to-year revenue performance improved sequentially in the second half of 2017 compared to first-half performance. Contributors to the second-half improvement included: momentum in cloud and as-a-Service offerings, strong Systems growth across IBM Z, Power and Storage, improved software transactional performance and improved growth in Consulting.

In 2017, the company continued to deliver solid revenue growth in its strategic imperatives which generated $36.5 billion of revenue and grew 11 percent as reported and adjusted for currency, with double-digit growth in cloud, security and mobile, as the company continues to build new products and offerings and continuously reinvent its platforms. These are not separate businesses, they are offerings across the segments that address opportunities in analytics, cloud, security and mobile. The company is embedding cloud and cognitive capabilities across the business and the strategic imperatives reflect the progress being made in helping enterprise clients extract value from data and become digital businesses. Strategic imperatives growth in 2017 largely represented organic growth as the acquisitive content leveled on a year-to-year basis. Total Cloud revenue of $17.0 billion increased 24 percent as reported and adjusted for currency, with as-a-Service revenue up 31 percent as reported and adjusted for currency. The annual exit run rate for as-a-Service revenue increased to $10.3 billion in 2017 compared to $8.6 billion in 2016. Analytics revenue of $20.6 billion increased 6 percent as reported and adjusted for currency. Mobile revenue increased 19 percent as reported and adjusted for currency and Security revenue increased 55 percent (54 percent adjusted for currency), driven by security software solutions and strong demand for the pervasive encryption capabilities in the new z14 mainframe.

From a segment perspective, Cognitive Solutions revenue increased 1.5 percent as reported and 1 percent adjusted for currency with growth in Solutions Software and Transaction Processing Software as reported and adjusted for currency. Solutions Software performance included growth in annuity revenue, led by as-a-Service solutions. Global Business Services (GBS) revenue decreased 2.1 percent as reported and 2 percent adjusted for currency with declines across all lines of business. However, GBS strategic imperatives revenue increased 10 percent as reported and adjusted for currency year to year. The GBS business continued to shift resources and move into the high-value strategic areas of digital, cloud and analytics. Technology Services & Cloud Platforms revenue decreased 3.0 percent as reported and 3 percent adjusted for currency, primarily driven by a decline in Infrastructure Services. Within Technology Services & Cloud Platforms, strategic imperatives revenue was up 19 percent as reported and 18 percent adjusted for currency year to year, driven by hybrid cloud services, security and mobile. Systems revenue increased 6.2 percent as reported and 5 percent adjusted for currency driven by contribution from the z14 mainframe in the second half of 2017 and growth in Storage Systems.

From a geographic perspective, Americas revenue was essentially flat year to year as reported (decreased 1 percent adjusted for currency) with the U.S. decline of 1.4 percent, partially offset by growth in Latin America (5.1 percent as reported, 3 percent adjusted for currency) and Canada (4.9 percent as reported, 3 percent adjusted for currency). Europe/ Middle East/Africa (EMEA) revenue decreased 1.7 percent (3 percent adjusted for currency) driven primarily by declines in the UK (11.2 percent as reported, 7 percent adjusted for currency) and Germany (3.2 percent as reported, 6 percent adjusted for currency). Asia Pacific revenue decreased 2.0 percent (1 percent adjusted for currency) with a decline in China of 10.6 percent (10 percent adjusted for currency). Japan declined 1.1 percent as reported (increased 2 percent adjusted for currency) and India grew 8.6 percent (5 percent adjusted for currency).

The consolidated gross margin of 45.8 percent decreased 2.1 points year to year and reflects investments, mix and higher retirement-related costs, partially offset by benefits from productivity. The operating (non-GAAP) gross margin of 47.4 percent decreased 1.6 points versus the prior year primarily driven by the same factors, excluding the impact of higher non-operational retirement-related costs.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Total expense and other (income) decreased 4.4 percent in 2017 compared to the prior year. The year-to-year decrease was primarily the result of continued focus on efficiency in spending and reduced expenses for workforce transformation. This included a lower level of workforce rebalancing charges (3 points), lower operational spending (2 points) and a prior-year charge for real estate actions (1 point). The year-to-year decrease in expense and other (income) was partially offset by spending related to acquisitions completed in the prior 12 months (1 point) and a decline in intellectual property (IP) income (1 point). Total operating (non-GAAP) expense and other (income) decreased 6.2 percent year to year, driven primarily by the same factors.

Pre-tax income from continuing operations of $11.4 billion decreased 7.5 percent and the pre-tax margin was 14.4 percent, a decrease of 1.0 points versus 2016. The continuing operations effective tax rate for 2017 was 49.5 percent, which includes a one-time charge of $5.5 billion from the enactment of U.S. tax reform in December 2017, compared to 3.6 percent in 2016. The charge encompasses several elements, including taxes on accumulated overseas profits and the revaluation of certain deferred tax assets and liabilities. The tax rate in 2016 was primarily the result of a refund ($1.0 billion) of previously paid Japan

taxes plus interest in the first quarter of 2016. Income from continuing operations of $5.8 billion decreased 51.5 percent, impacted by the one-time charge, and the net income margin was 7.3 percent, a decrease of 7.6 points versus 2016. Losses from discontinued operations, net of tax, were $5 million in 2017 compared to $9 million in 2016. Net income of $5.8 billion decreased 51.5 percent year to year. Operating (non-GAAP) pre-tax income from continuing operations of $13.9 billion decreased 0.5 percent year to year and the operating (non-GAAP) pre-tax margin from continuing operations was essentially flat at 17.5 percent. Operating (non-GAAP) income from continuing operations of $12.9 billion decreased 0.7 percent with an operating (non-GAAP) income margin from continuing operations of 16.3 percent, flat year to year. The operating (non-GAAP) effective tax rate from continuing operations in 2017 was 6.7 percent, which includes the effect of discrete tax benefits in the first and second quarters of 2017.

Diluted earnings per share from continuing operations of $6.14 in 2017, which includes the one-time charge associated with U.S. tax reform, decreased 50.4 percent year to year. In 2017, the company repurchased 27.2 million shares of its common stock at a cost of $4.3 billion and had $3.8 billion remaining in the current share repurchase authorization at December 31, 2017. Operating (non-GAAP) diluted earnings per share of $13.80 increased 1.5 percent versus 2016.

At December 31, 2017, the balance sheet remains strong, and with the newly reorganized financing entity, IBM Credit LLC, the company is better positioned to support the business over the long term. Cash and marketable securities at December 31, 2017 were $12.6 billion, an increase of $4.1 billion from December 31, 2016. Key drivers in the balance sheet and total cash flows were:

Total assets increased $7.9 billion ($3.0 billion adjusted for currency) from December 31, 2016 driven by:

- Increases in cash and marketable securities ($4.1 billion), total receivables ($2.9 billion), retirement plan assets ($1.6 billion) and goodwill ($0.6 billion); partially offset by
- Decreases in intangible assets ($0.9 billion).

Total liabilities increased $8.6 billion ($4.0 billion adjusted for currency) from December 31, 2016 driven by:

- Increases in total debt ($4.7 billion) and taxes ($3.5 billion).

Total equity of $17.7 billion decreased $0.7 billion from December 31, 2016 as a result of:

- Decreases from dividends ($5.5 billion) and share repurchases ($4.3 billion); partially offset by
- Increases from net income ($5.8 billion), retirement-related benefit plans ($2.3 billion) and equity translation adjustments ($0.8 billion).

The company generated $16.7 billion in cash flow provided by operating activities, a decrease of $0.4 billion compared to 2016, driven primarily by performance-related declines within net income and an increase in cash tax payments, partially offset by an increase in cash provided by receivables. Net cash used in investing activities of $7.1 billion was $3.9 billion lower than the prior year, primarily driven by a decrease in cash used for acquisitions ($5.2 billion). Net cash used in financing activities of $6.4 billion increased $0.5 billion compared to 2016, driven primarily by increased gross common share repurchases ($0.8 billion).

In January 2018, the company disclosed that it is expecting GAAP earnings per share from continuing operations of at least $11.70 and operating (non-GAAP) earnings of at least $13.80 per diluted share for 2018. The company expects free cash flow to be approximately $12 billion in 2018. Free cash flow realization is expected to be in excess of 100 percent of GAAP net income. Refer to page 68 in the Liquidity and Capital Resources section for additional information on this non-GAAP measure. Refer to the Looking Forward section on pages 66 and 67 for additional information on the company's expectations.

DESCRIPTION OF BUSINESS

Please refer to IBM's Annual Report on Form 10-K filed with the SEC on February 27, 2018 for Item 1A. entitled "Risk Factors."

The company creates value for clients through integrated solutions and products that leverage: data, information technology, deep expertise in industries and business processes, and a broad ecosystem of partners and alliances. IBM solutions typically create value by enabling new capabilities for clients that transform their businesses and help them engage with their customers and employees in new ways. These solutions draw from an industry-leading portfolio of consulting and IT implementation services, cloud and cognitive offerings, and enterprise systems and software which are all bolstered by one of the world's leading research organizations.

Strategy

The IBM strategy starts with its clients.

As a uniquely integrated technology and services company, IBM helps clients change the way the world works by building smarter businesses.

IBM's clients include many of the world's most successful enterprises. These clients are at an inflection point, facing tremendous new opportunity and incredible competition. Digital technologies are unlocking unparalleled insight from previously inaccessible data. Work processes are being reimagined for speed and vastly smarter decision-making.

To win in these disruptive times requires that businesses learn — learn by extracting insights from their data and by applying those insights to how work is done. Smarter businesses do this faster and more effectively supported by IBM's combination of **Innovative Technology**, **Industry Expertise** and **Trust and Security**.

The company's capabilities include:

Cloud

Cloud is enabling the emergence of platforms through standardization, agility and innovation in both IT and business processes. Enterprise cloud is very different from consumer cloud: enterprises must bridge together mission-critical assets from on-premise systems with private cloud and public cloud. Hybrid cloud technology provides that bridge. All three must coexist and interoperate as a single platform.

The IBM Cloud is uniquely:

- Built for all applications: Applications require data. That data is in on-premise systems, in private clouds and in the public cloud. The IBM Cloud enables one data platform that, regardless of data's location, can run all applications. IBM's hybrid cloud capabilities make this single platform operate seamlessly.
- Artificial intelligence (AI)-ready: The IBM Cloud is built from the ground up to handle the demanding data and computational requirements of AI.
- Secure to the Core: IBM has a long history of helping clients keep data and transactions secure. Security is even more important in an increasingly connected world, and IBM has extended this unparalleled level of security to the cloud. For example, IBM's cybersecurity offerings act as a business immune system, with AI technology at its core, delivered from the IBM Cloud. These systems help to defend and respond to cyber-attacks across an organization's data, applications, mobile and endpoint devices.

The IBM Cloud is delivered with leading edge technology, including:

- Modern infrastructure: IBM's systems, including servers, storage and operating system software, have been refreshed and redesigned for cloud and enterprise AI workloads. IBM's new z14 is the world's first system to offer pervasive encryption of data without requiring changes to applications, and with no performance degradation. With IBM's systems, clients can build an IT infrastructure that is optimized for the scalability, reliability and growth that businesses need in today's data-driven world.
- Future infrastructure: The Q Network on the IBM Cloud enables clients around the world to explore quantum computing capabilities. IBM is the leader in quantum computing. Clients are signing on to explore how to overcome foreseen constraints in traditional computing models.

AI and Data

Artificial intelligence can help clients extract insight and make intelligent decisions from data. Like cloud, enterprise AI is very different from consumer AI. Enterprise applications deal with more complex use cases that benefit from expert knowledge, such as in healthcare or in the identification of business risk. Enterprise AI applications are trained by expert data, through data sets of all sizes and with more specialization than those in the general-knowledge consumer world. IBM AI — through the Watson platform:

- Learns more from less data: The ability to extract deep insights from both large and small data sets is essential for enterprise applications. Watson excels at this and can produce more insights with less data than other AI systems. That means clients can get started more quickly and begin to gain experience deploying AI in the enterprise.

- Protects clients' insights: While Watson builds on cumulative experience and knowledge, IBM recognizes that data and insights are clients' most important assets and a true competitive advantage. Watson is built to safeguard this type of information.
- Reimagines your workflows: Watson has been built for — and trained in — areas requiring deep expertise. Watson brings AI to professionals so that work can be done more efficiently, and even more importantly, can improve as the systems learn from the data.

Solutions

Creating smarter businesses requires reimagining a company's core processes — for example, in healthcare, managing risk or optimizing a supply chain. In addition to building solutions based on IBM's experience, IBM is also creating a series of AI solutions — cognitive solutions — that embed artificial intelligence and data to change how work is done. Examples include:

- Global Industry Platforms: provides cognitive, analytics, security and cloud technology in comprehensive industry-specific platforms to remove much of the cost and complexity of delivering core business functions. For example: Banking, wealth management, and insurance are some of the areas poised for dramatic change by using cognitive and AI solutions from IBM Watson Financial Services. Watson Health provides technology and expertise to empower leaders, advocates and influencers in health to accelerate discovery, make essential connections and gain confidence on their path to solving the world's biggest health challenges.
- Blockchain Solutions: IBM is working with clients and developers across multiple industries to use blockchain to transform how business is done in areas such as banking and financial services and supply chain. For example, blockchain technology can be used to digitize global trade processes, providing a more efficient and secure method of moving goods across borders and trading zones.

- Watson IoT: includes both a cloud-based platform and industry solutions infused with AI, helping organizations mine intelligence from billions of connected devices.

Enterprise Services

Through Global Business Services and Global Technology Services, IBM has helped the world's most successful enterprises transition from era to era. Using proven methods, IBM Services bring globally delivered outcomes using proven methods by focusing on:

- Digital Reinvention for growth: a unique framework for business transformation focused on growth opportunities.
- End-to-end Services integration: Global Technology Services brings the ability to connect previously disconnected parts of an organization. By embedding Watson into these mission critical services, new levels of quality, resiliency and automation are achieved.
- Pragmatic journey to Cloud and AI: Global Business Services brings its deep experience when guiding clients through the journey to cloud and AI. Clients gain from the thorough understanding of technology and the best ways to utilize it.

As clients reinvent their businesses to be smarter, they need all of this to work together. This is what they expect from IBM, what they need from IBM and what sets IBM apart.

****

Responsible stewardship is an enduring principle that underscores all IBM endeavors. While IBM is constantly ushering in new technology it does so by:

- Leading in data responsibility, ethics and transparency;
- Preparing workforces of the world;
- Continuing the company's century-long commitment to diversity and inclusion, and
- Remaining grounded in a set of enduring IBM Values:
    - Dedication to every client's success
    - Innovation that matters — for our company and for the world
    - Trust and personal responsibility in all relationships

IBM has built a reputation and track record of trust with its clients for more than a century. IBM safeguards a client's privacy, data and insights. For example, IBM was one of the first companies to appoint a Chief Privacy Officer, to develop and publish a genetics privacy policy, to be certified under the APEC Cross Borders Privacy Rules system and to sign the EU Data Protection Code of Conduct for Cloud Service Providers.

****

This is an era where being faster, more productive and lower cost is important but frankly not enough. To win, a business must be smarter: Being smarter means having deeper expertise, extracting better insights from data and being capable of rapidly changing the way in which one does work.

This is core to the strategy of IBM's clients and is at the heart of the IBM strategy.

Business Model

The company's business model is built to support two principal goals: helping enterprise clients to move from one era to the next by bringing together innovative technology and industry expertise, and providing long-term value to shareholders. The business model has been developed over time through strategic investments in capabilities and technologies that have long-term growth and profitability prospects based on the value they deliver to clients.

The company's global capabilities include services, software, systems, fundamental research and related financing. The broad mix of businesses and capabilities are combined to provide integrated solutions and platforms to the company's clients.

The business model is dynamic, adapting to the continuously changing industry and economic environment, including the company's transformation into cloud and as-a-Service delivery models. The company continues to strengthen its position through strategic organic investments and acquisitions in higher-value areas, broadening its industry expertise and integrating AI into more of what the company offers. In addition, the company is transforming into a more agile enterprise to drive innovation and speed, as well as helping to drive productivity, which supports investments for participation in markets with significant long-term opportunity.

This business model, supported by the company's financial model, has enabled the company to deliver strong earnings, cash flows and returns to shareholders over the long term.

Business Segments and Capabilities

The company's major operations consist of five business segments: Cognitive Solutions, Global Business Services, Technology Services & Cloud Platforms, Systems and Global Financing.

Cognitive Solutions comprises a broad portfolio of capabilities that help IBM's clients to identify actionable new insights and inform decision-making for competitive advantage. Leveraging IBM's research, technology and industry expertise, this business delivers a full spectrum of capabilities, from descriptive, predictive and prescriptive analytics to cognitive systems. Cognitive Solutions includes Watson, the first commercially available AI platform that has the ability to interact in natural language, process vast amounts of big data, and learn from interactions with people and systems. These solutions are provided through the most contemporary delivery methods including through cloud environments and "as-a-Service" models. Cognitive Solutions consists of Solutions Software and Transaction Processing Software.

Cognitive Solutions Capabilities

Solutions Software: provides the basis for many of the company's strategic areas. IBM has established the world's deepest portfolio of data and analytics solutions, including analytics and data management platforms, cloud data services, talent management solutions, and solutions tailored by industry. Watson Platform, Watson Health and Watson Internet of Things (IoT) are certain capabilities included in Solutions Software. IBM's world-class security platform delivers integrated security intelligence across clients' entire operations, including their cloud, applications, networks and data, helping them to prevent, detect and remediate potential threats.

Transaction Processing Software: includes software that primarily runs mission-critical systems in industries such as banking, airlines and retail. Most of this software is on-premise and annuity in nature.

Global Business Services (GBS) provides clients with consulting, application management services and business process services. These professional services deliver value and innovation to clients through solutions which leverage industry, technology and business strategy and process expertise. GBS is the digital reinvention partner for IBM clients, combining industry knowledge, functional expertise, and applications with the power of business design and cognitive and cloud technologies. The full portfolio of GBS services is backed by its globally integrated delivery network and integration with technologies, solutions and services from IBM units including IBM Watson, IBM Cloud, IBM Research, and Global Technology Services.

In 2017, GBS deployed a new operating model designed to address specific client digital transformation imperatives and take full advantage of IBM and GBS's competitive differentiators in industry, cognitive and cloud. The operating model features Digital Strategy and iX, Cognitive Process Transformation and Cloud Application Innovation. To bring value at scale to clients around the world, GBS has implemented global service lines within each of the three focus areas, which are populated with new practices staffed by practitioners with deep domain skills and industry expertise.

GBS Capabilities

Consulting: provides business consulting services focused on bringing to market solutions that help clients shape their digital blueprints and customer experiences, define their cognitive operating models, unlock the potential in all data to improve decision-making, set their next-generation talent strategies and create new technology architectures in a cloud-centric world.

Application Management: delivers system integration, application management, maintenance and support services for packaged software, as well as custom and legacy applications. Value is delivered through advanced capabilities in areas such as security and privacy, application testing and modernization, cloud application migration and automation.

Global Process Services: delivers finance, procurement, talent and engagement, and industry-specific business process outsourcing services. These services deliver improved business results to clients through our consult-to-operate model which includes the strategic change and/or operation of the client's processes, applications and infrastructure. GBS is redefining process services for both growth and efficiency through the application of the power of cognitive technologies like Watson, as well as the IoT, blockchain and deep analytics.

Technology Services & Cloud Platforms provides comprehensive IT infrastructure services creating business value for clients. By leveraging insights and experience drawn from IBM's global scale, skills and technology, with applied innovation from IBM Research, clients gain access to leading-edge, high-quality services with improved outcomes in productivity, flexibility and cost.

Technology Services & Cloud Platforms Capabilities

Infrastructure Services: delivers a portfolio of cloud, project-based, outsourcing and other managed services focused on clients' enterprise IT infrastructure environments to enable digital transformation and deliver improved quality, flexibility, risk management and financial value. The portfolio includes a comprehensive set of hybrid cloud services and solutions to assist clients in building and running enterprise IT environments that utilize public and private clouds and traditional IT. The IBM Cloud Platform offers leading-edge services to developers and IBM's Cloud Infrastructure-as-a-Service covers a wide variety of workloads with high-quality performance. These offerings integrate long-standing expertise in service management and technology with the ability to utilize the power of new technologies, drawn from across IBM's businesses and ecosystem partners. The portfolio is built around a key set of predictive and proactive solutions addressing systems, mobility, resiliency, networking, cloud and security. The company's capabilities, including IBM Cloud, cognitive computing and hybrid cloud implementation, provide high-performance, end-to-end innovation and an improved ability to achieve business objectives.

Technical Support Services: delivers comprehensive support services to maintain and improve the availability of clients' IT infrastructures. These offerings include maintenance for IBM products and other technology platforms, as well as software and solution support, drawing on innovative technologies and leveraging the Watson platform's predictive capabilities.

Integration Software: delivers industry-leading hybrid cloud solutions that empower clients to achieve rapid innovation, hybrid integration, and process transformation with choice and consistency across public, dedicated and local cloud environments, leveraging the IBM Platform-as-a-Service solution. Integration Software offerings and capabilities help clients address the digital imperatives to create, connect and optimize their applications, data and infrastructure on their journey to become cognitive businesses.

Systems provides clients with innovative infrastructure platforms to help meet the new requirements of hybrid cloud and cognitive workloads. Approximately half of Systems Hardware's server and storage sales transactions are through the company's business partners, with the balance direct to end-user clients. IBM Systems also designs advanced semiconductor and systems technology in collaboration with IBM Research, primarily for use in the company's systems.

Systems Capabilities

Servers: a range of high-performance systems designed to address computing capacity, security and performance needs of businesses, hyperscale cloud service providers and scientific computing organizations. The portfolio includes IBM Z, a trusted enterprise platform for integrating data, transactions and insight, and Power Systems, a system designed from the ground up for big data and analytics, optimized for scale-out cloud and Linux, and delivering open innovation with OpenPOWER.

Storage: data storage products and solutions that allow clients to retain and manage rapidly growing, complex volumes of digital information and to fuel data-centric cognitive applications. These solutions address critical client requirements for information retention and archiving, security, compliance and storage optimization including data deduplication, availability and virtualization. The portfolio consists of a broad range of software-defined storage solutions, flash storage, disk and tape storage solutions.

Operating Systems Software: The company's z/OS is a security-rich, scalable, high-performance enterprise operating system for IBM Z. Power Systems offers a choice of AIX or Linux operating systems. These operating systems leverage POWER architecture to deliver secure, reliable and high performing enterprise-class workloads across a breadth of server offerings.

Global Financing encompasses two primary businesses: financing, primarily conducted through IBM Credit LLC (IBM Credit), and remanufacturing and remarketing. In 2017, the company reorganized its client and commercial financing business as a wholly owned subsidiary, IBM Credit LLC, and it began accessing the capital markets directly in September 2017. IBM Credit, through its financing solutions, facilitates IBM clients' acquisition of information technology systems, software and services in the areas where the company has the expertise. The financing arrangements are predominantly for products or services that are critical to the end users' business operations. The company conducts a comprehensive credit evaluation of its clients prior to extending financing. As a captive financier, Global Financing has the benefit of both deep knowledge of its client base and a clear insight into the products and services financed. These factors allow the business to effectively manage two of the major risks associated with financing, credit and residual value, while generating strong returns on equity. Global Financing also maintains a long-term partnership with the company's clients through various stages of the IT asset life cycle—from initial purchase and technology upgrades to asset disposition decisions.

Global Financing Capabilities

Client Financing: lease, installment payment plan and loan financing to end users and internal clients for terms up to seven years. Assets financed are primarily new and used IT hardware, software and services where the company has expertise. Internal financing is predominantly in support of Technology Services & Cloud Platforms' long-term client service contracts. All internal financing arrangements are at arm's-length rates and are based upon market conditions.

Commercial Financing: short-term working capital financing to suppliers, distributors and resellers of IBM and OEM products and services. This includes internal activity where Global Financing factors a selected portion of the company's accounts receivable primarily for cash management purposes, at arm's-length rates.

Remanufacturing and Remarketing: assets include used equipment returned from lease transactions, or used and surplus equipment acquired internally or externally. These assets may be refurbished or upgraded and sold or leased to new or existing clients both externally or internally. Externally remarketed equipment revenue represents sales or leases to clients and resellers. Internally remarketed equipment revenue primarily represents used equipment that is sold internally to Systems and Technology Services & Cloud Platforms. Systems may also sell the equipment that it purchases from Global Financing to external clients.

IBM Worldwide Organizations

The following worldwide organizations play key roles in IBM's delivery of value to its clients:

- Global Markets

- Research, Development and Intellectual Property

Global Markets

IBM has a global presence, operating in more than 175 countries with a broad-based geographic distribution of revenue. The company's Global Markets organization manages IBM's global footprint, working closely with dedicated country-based operating units to serve clients locally. These country teams have client relationship managers who lead integrated teams of consultants, solution specialists and delivery professionals to enable clients' growth and innovation.

By complementing local expertise with global experience and digital capabilities, IBM builds deep and broad-based client relationships. This local management focus fosters speed in supporting clients, addressing new markets and making investments in emerging opportunities. The Global Markets organization serves clients with expertise in their industry as well as through the products and services that IBM and partners supply. IBM is also expanding its reach to new and existing clients through digital marketplaces, digital sales and local Business Partner resources.

Research, Development and Intellectual Property

IBM's research and development (R&D) operations differentiate the company from its competitors. IBM annually invests 7 to 8 percent of total revenue for R&D, focusing on high-growth, high-value opportunities. IBM Research works with clients and the company's business units through global labs on near-term and mid-term innovations. It delivers many new technologies to IBM's portfolio every year and helps clients address their most difficult challenges. IBM Research scientists are conducting pioneering work in artificial intelligence, quantum computing, blockchain, security, cloud, nanotechnology, silicon and post-silicon computing architectures and more—applying these technologies across industries including healthcare, IoT, education and financial services.

In 2017, for the 25th consecutive year, IBM was awarded more U.S. patents than any other company. IBM's 9,043 patents awarded in 2017 represent a diverse range of inventions in artificial intelligence, cloud, cybersecurity and other strategic growth areas for the company.

The company continues to actively seek IP protection for its innovations, while increasing emphasis on other initiatives designed to leverage its IP leadership. Some of IBM's technological breakthroughs are used exclusively in IBM products, while others are licensed and may be used in IBM products and/or the products of the licensee. As part of its business model, the company licenses certain of its intellectual property, which is high-value technology, but may be in more mature markets. The licensee drives the future development of the IP and ultimately expands the customer base. This would generate IP income for the company both upon licensing, and with any ongoing royalty arrangements between it and the licensee. While the company's various proprietary IP rights are important to its success, IBM believes its business as a whole is not materially dependent on any particular patent or license, or any particular group of patents or licenses. IBM owns or is licensed under a number of patents, which vary in duration, relating to its products.

YEAR IN REVIEW

Results of Continuing Operations

Segment Details

The following is an analysis of the 2017 versus 2016 reportable segment results. The table below presents each reportable segment's external revenue and gross margin results. Segment pre-tax income includes transactions between segments that are intended to reflect an arm's-length transfer price and excludes certain unallocated corporate items.

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr Percent/ Margin Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Revenue				
Cognitive Solutions	**$ 18,453**	$ 18,187	1.5%	1.0%
Gross margin	**78.6%**	81.9%	(3.2)pts.	
Global Business Services	**16,348**	16,700	(2.1)%	(1.8)%
Gross margin	**25.2%**	27.0%	(1.8)pts.	
Technology Services & Cloud Platforms	**34,277**	35,337	(3.0)%	(3.4)%
Gross margin	**40.4%**	41.9%	(1.5)pts.	
Systems	**8,194**	7,714	6.2%	5.4%
Gross margin	**53.2%**	55.7%	(2.5)pts.	
Global Financing	**1,696**	1,692	0.3%	(0.7)%
Gross margin	**29.3%**	38.7%	(9.4)pts.	
Other	**171**	289	(40.7)%	(41.1)%
Gross margin	**(640.3)%**	(293.9)%	(346.4)pts.	

Total consolidated revenue	**$ 79,139**	$ 79,919	(1.0)%	(1.3)%
Total consolidated gross profit	**$ 36,227**	$ 38,294	(5.4)%	
Total consolidated gross margin	**45.8%**	47.9%	(2.1)pts.	
Non-operating adjustments				
Amortization of acquired intangible assets	**449**	494	(9.2)%	
Retirement-related costs/(income)	**799**	316	153.2%	
Operating (non-GAAP) gross profit	**$ 37,475**	$ 39,104	(4.2)%	
Operating (non-GAAP) gross margin	**47.4%**	48.9%	(1.6)pts.	

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Cognitive Solutions

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Cognitive Solutions external revenue	**$ 18,453**	$ 18,187	1.5%	1.0%
Solutions Software	**$ 12,806**	$ 12,589	1.7%	1.3%
Transaction Processing Software	**5,647**	5,598	0.9	0.3

Cognitive Solutions revenue of $18,453 million grew 1.5 percent as reported and 1 percent adjusted for currency in 2017 compared to the prior year. On an as-reported and constant currency basis, there was growth in Solutions Software, which addresses many of the company's strategic areas, while Transaction Processing Software was relatively flat year to year.

Solutions Software revenue of $12,806 million grew 1.7 percent as reported (1 percent adjusted for currency) compared to the prior year led by key areas including security, industry platforms and Watson offerings, as the company continued to embed cognitive into its security offerings and drive vertical solutions. In 2017, the company continued to expand the market for Watson Health which had strong double-digit revenue growth as reported and adjusted for currency compared to the prior year. Most of the strategic areas within Solutions Software have a Software-as-a-Service (SaaS) delivery model and the company continues to build scale in these areas. For the full year, there was year-to-year growth in annuity revenue as reported and at constant currency with strong double-digit growth in SaaS revenue as reported and adjusted for currency.

Transaction Processing Software revenue of $5,647 million grew 0.9 percent as reported (flat adjusted for currency) in 2017 compared to the prior year. In the second half of 2017, there was improved revenue performance with growth both sequentially versus the first half 2017 and year to year as reported and adjusted for currency reflecting clients' ongoing long-term commitment and the value the company's platform provides to them. This portfolio predominately runs on-premise mission critical workloads running on IBM Z in industries such as banking, airlines and retail.

Cognitive Solutions total strategic imperatives revenue of $12.0 billion grew 2 percent year to year as reported and adjusted for currency. Cloud revenue of $2.5 billion grew 19 percent as reported and adjusted for currency, with an as-a-Service exit run rate of $2.1 billion.

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent/ Margin Change
Cognitive Solutions			
External gross profit	**$ 14,510**	$ 14,890	(2.6)%
External gross profit margin	**78.6%**	81.9%	(3.2)pts.
Pre-tax income	**$ 6,817**	$ 6,352	7.3%
Pre-tax margin	**32.3%**	30.5%	1.8pts.

Cognitive Solutions gross profit margin decreased 3.2 points to 78.6 percent in 2017 compared to the prior year. The gross profit margin decline year to year was driven by continued investment and an increasing mix toward SaaS which has a different margin profile than traditional software delivery offerings and is not yet at scale. Margins were impacted by a higher level of royalty cost associated with IP licensing agreements in 2017 compared to the prior year.

Pre-tax income of $6,817 million increased 7.3 percent compared to the prior year with a pre-tax margin improvement of 1.8 points to 32.3 percent as the company continues to invest to embed cognitive into offerings, scale platforms and build high-value vertical solutions.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Global Business Services

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Global Business Services external revenue	**$ 16,348**	$ 16,700	(2.1)%	(1.8)%
Consulting	**$ 7,262**	$ 7,332	(1.0)%	(0.4)%
Global Process Services	**1,265**	1,388	(8.8)	(9.0)
Application Management	**7,821**	7,980	(2.0)	(1.9)

Global Business Services revenue of $16,348 million decreased 2.1 percent as reported and 2 percent adjusted for currency in 2017 compared to the prior year. The company continues to transform this business and shift its practices to digital, cognitive and cloud. GBS signings grew each quarter of the year as reported and adjusted for currency, and strategic imperatives revenue for the full year 2017 had strong growth year to year as reported and adjusted for currency. However, this growth continues to be more than offset by declines in the more traditional areas that the company is shifting away from such as large ERP and on-premise enterprise application implementation.

Consulting revenue of $7,262 million decreased 1.0 percent year to year as reported (flat adjusted for currency). There was improved performance in the second half of 2017 with revenue growth both sequentially versus the first half of 2017 and year to year as reported and adjusted for currency. The improvement was driven by the company's digital strategy and iX platform, and a return to growth as reported and at constant currency in the Consulting backlog. Global Process Services (GPS) revenue of $1,265 million decreased 8.8 percent as reported (9 percent adjusted for currency) compared to the prior year. Application Management revenue of $7,821 million decreased 2.0 percent as reported (2 percent adjusted for currency). The company continues to help clients implement new cloud-centric architectures in their critical applications. However, overall revenue performance in Application Management was impacted by certain areas that are not as differentiated and are experiencing pricing pressure, as well as the successful completion of some large contracts.

Within GBS, total strategic imperatives revenue of $9.8 billion grew 10 percent as reported and adjusted for currency year to year. Cloud revenue of $4.0 billion grew 34 percent as reported (35 percent adjusted for currency), with an as-a-Service exit run rate of $1.3 billion.

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent/ Margin Change
Global Business Services			
External gross profit	**$ 4,112**	$ 4,501	(8.6)%
External gross profit margin	**25.2%**	27.0%	(1.8)pts.
Pre-tax income	**$ 1,401**	$ 1,732	(19.1)%
Pre-tax margin	**8.4%**	10.1%	(1.7)pts.

GBS gross profit margin decreased 1.8 points to 25.2 percent year to year and pre-tax income of $1,401 million decreased 19.1 percent year to year. The pre-tax margin declined 1.7 points to 8.4 percent. Pre-tax income performance for the year included a lower level of charges related to workforce rebalancing and real estate actions as compared to the prior year.

GBS margin has been impacted by investments to drive transformation and reflects pricing and profit pressure in the more traditional IT services. The company will continue to focus on improving productivity with a streamlined practice model and new project management approaches.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Technology Services & Cloud Platforms

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Technology Services & Cloud Platforms external revenue	**$ 34,277**	$ 35,337	(3.0)%	(3.4)%
Infrastructure Services	**$ 22,690**	$ 23,543	(3.6)%	(4.1)%
Technical Support Services	**7,196**	7,272	(1.0)	(1.5)
Integration Software	**4,390**	4,521	(2.9)	(3.4)

Technology Services & Cloud Platforms revenue of $34,277 million decreased 3.0 percent as reported and 3 percent adjusted for currency in 2017 compared to the prior year. For the full year, there were declines across all lines of business, however, within the segment there was strong revenue growth year to year in cloud, analytics, mobile and security, as reported and adjusted for currency.

Infrastructure Services revenue of $22,690 million declined 3.6 percent as reported (4 percent adjusted for currency) compared to the prior year. In Infrastructure Services, the business model is to deliver productivity to clients and then grow by expanding the scope of work and adding new clients to the platform. The revenue decline in 2017 reflects the continued impact associated with contract conclusions at the end of 2016 and the shift away from certain lower value work within this business. During 2017, there were some substantial new transactions signed to implement hybrid cloud environments. Technical Support Services revenue of $7,196 million decreased 1.0 percent as reported (2 percent adjusted for currency) year to year. Within this line of business, the company is focused on growing its multi-vendor support services which provide clients with a single source of expertise and visibility across different vendor solutions. Integration Software full-year revenue of $4,390 million decreased 2.9 percent as reported (3 percent adjusted for currency) compared to the prior year. While the annuity base remains relatively stable and there was strong double-digit growth in SaaS offerings, transactional revenue declined year to year as more of this portfolio shifts to the IBM Cloud.

Within Technology Services & Cloud Platforms, strategic imperatives revenue of $10.4 billion grew 19 percent year to year as reported (18 percent adjusted for currency). Cloud revenue of $7.1 billion grew 21 percent as reported (20 percent adjusted for currency), with an as-a-Service exit run rate of $6.9 billion.

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent/ Margin Change
Technology Services & Cloud Platforms			
External Technology Services gross profit	**$ 10,256**	$ 10,969	(6.5)%
External Technology Services gross profit margin	**34.3%**	35.6%	(1.3) pts.
External Integration Software gross profit	**$ 3,587**	$ 3,830	(6.4)%
External Integration Software gross profit margin	**81.7%**	84.7%	(3.0) pts.
External total gross profit	**$ 13,842**	$ 14,800	(6.5)%
External total gross profit margin	**40.4%**	41.9%	(1.5) pts.
Pre-tax income	**$ 4,344**	$ 4,707	(7.7)%
Pre-tax margin	**12.4%**	13.1%	(0.6) pts.

Technology Services & Cloud Platforms gross profit margin decreased 1.5 points year to year in 2017 to 40.4 percent driven primarily by large contract conclusions, delays in productivity improvements, mix from Integration Software and investments in cloud. The current-year margin reflects savings from the prior-year workforce transformation action. Pre-tax income of $4,344 million decreased 7.7 percent. The pre-tax margin declined 0.6 points year to year to 12.4 percent. The year-to-year performance in 2017 compared to the prior year includes a lower level of charges related to workforce and real estate actions.

The company continues to focus on scaling its platforms, delivering productivity through automation, infusing AI into its offerings and investing to expand its cloud infrastructure. There are approximately 60 cloud centers across 19 countries providing clients with flexibility in how and where they store their data. However, these investments to transform the business continued to impact margins in 2017.

Services Backlog and Signings

($ in billions)

At December 31:	2017	2016	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Total backlog	**$ 121.0**	$ 118.7	1.9%	(3.4)%

The estimated total services backlog at December 31, 2017 was $121 billion, an increase of 1.9 percent as reported (decrease of 3 percent adjusted for currency). There was growth in Global Technology Services backlog as reported, but a decrease year to year adjusted for currency. GBS backlog decreased year to year as reported and adjusted for currency compared to the December 31, 2016 balance.

Total services backlog includes Infrastructure Services, Consulting, Global Process Services, Application Management and Technical Support Services. Total backlog is intended to be a statement of overall work under contract for these businesses and therefore includes Technical Support Services. It does not include as-a-Service offerings that have flexibility in contractual commitment terms. Backlog estimates are subject to change and are affected by several factors, including terminations, changes in the scope of contracts, periodic revalidations, adjustments for revenue not materialized and adjustments for currency.

Services signings are management's initial estimate of the value of a client's commitment under a services contract. There are no third-party standards or requirements governing the calculation of signings. The calculation used by management involves estimates and judgments to gauge the extent of a client's commitment, including the type and duration of the agreement, and the presence of termination charges or wind-down costs.

Signings include Infrastructure Services, Consulting, Global Process Services and Application Management contracts. Contract extensions and increases in scope are treated as signings only to the extent of the incremental new value. Technical Support Services is not included in signings as the maintenance contracts tend to be more steady state, where revenues equal renewals.

Contract portfolios purchased in an acquisition are treated as positive backlog adjustments provided those contracts meet the company's requirements for initial signings. A new signing will be recognized if a new services agreement is signed incidental or coincidental to an acquisition or divestiture.

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Total signings	**$ 42,869**	$ 44,645	(4.0)%	(4.4)%

Systems

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Systems external revenue	**$ 8,194**	$ 7,714	6.2%	5.4%
Systems Hardware	**$ 6,494**	$ 5,926	9.6%	8.6%
IBM Z			24.0	22.3
Power Systems			(3.7)	(4.3)
Storage Systems			7.7	7.0
Operating Systems Software	**1,701**	1,788	(4.9)	(5.3)

Systems revenue of $8,194 million grew 6.2 percent year to year as reported (5 percent adjusted for currency) in 2017 driven by a combination of strong z14 market acceptance and four consecutive quarters of growth as reported and adjusted for currency in Storage Systems. Systems Hardware revenue of $6,494 million grew 9.6 percent as reported (9 percent adjusted for currency) with growth in IBM Z and Storage Systems partially offset by a decrease in Power Systems, as reported and adjusted for currency. Operating Systems Software revenue of $1,701 million decreased 4.9 percent as reported (5 percent adjusted for currency) compared to the prior year.

Within Systems Hardware, IBM Z revenue grew 24.0 percent as reported (22 percent adjusted for currency) year to year, driven by the successful launch of the z14 mainframe in the third quarter of 2017. This success is due to the strong demand for technology that helps address the growing threat of global data breaches and the need for clients to operate within regulated environments. With unprecedented encryption capabilities, there has been strong demand for the z14 across a mix of industries and geographies since its introduction. The company's mainframe is a franchise that continues to deliver a high value, secure and scalable platform that clients rely on for their mission critical applications.

Power Systems revenue decreased 3.7 percent as reported (4 percent adjusted for currency) year to year with revenue growth in the company's high-end portfolio more than offset by declines in mid-range and low-range products, as reported and adjusted for currency. Overall performance reflects the company's continued shift to a growing Linux market while continuing to serve a high-value, but declining UNIX market. Linux revenue grew year to year as reported and adjusted for currency, while UNIX revenue declined as reported and adjusted for currency in 2017. In the fourth quarter of 2017, Power Systems revenue returned to growth as reported and adjusted for currency, and the company released its next generation POWER9 system in the low-end Linux portfolio. With the new POWER9 processor, these systems bring unprecedented speed to AI workloads.

Storage Systems revenue increased by 7.7 percent as reported (7 percent adjusted for currency) year to year. With the company's most competitive storage offerings in some time, there was growth as reported and adjusted for currency in each quarter of the year. All-flash array offerings were a catalyst for Storage Systems growth in 2017 with strong double-digit growth as reported and adjusted for currency throughout the year.

Within Systems, total strategic imperatives revenue of $4.3 billion grew 28 percent year to year as reported (26 percent adjusted for currency). Cloud revenue of $3.4 billion grew 26 percent as reported (25 percent adjusted for currency).

($ in millions)

	Yr.-to-Yr. Percent/

For the year ended December 31:	2017	2016	Margin Change
Systems			
External Systems Hardware gross profit	**$ 2,894**	$ 2,720	6.4%
External Systems Hardware gross profit margin	**44.6%**	45.9%	(1.3) pts.
External Operating Systems Software gross profit	**$ 1,469**	$ 1,577	(6.9)%
External Operating Systems Software gross profit margin	**86.4%**	88.2%	(1.8) pts.
External total gross profit	**$ 4,363**	$ 4,298	1.5%
External total gross profit margin	**53.2%**	55.7%	(2.5) pts.
Pre-tax income	**$ 1,135**	$ 933	21.6%
Pre-tax margin	**12.7%**	11.0%	1.7pts.

The Systems gross profit margin decreased 2.5 points to 53.2 percent in 2017 compared to the prior year. The overall decrease year to year was driven by margin declines across all product lines, partially offset by product mix primarily toward the higher margin IBM Z, reflecting product cycle dynamics.

Pre-tax income of $1,135 million grew 21.6 percent and pre-tax margin increased 1.7 points year to year to 12.7 percent driven by the strong performance in Systems Hardware.

Overall Systems performance in 2017 reflected a successful repositioning of the business through continuous reinvention of core platforms and expansion into new workloads.

Global Financing

Global Financing is a reportable segment that is measured as a stand-alone entity. Global Financing facilitates IBM clients' acquisition of information technology systems, software and services by providing financing solutions in the areas where the company has the expertise, while generating strong returns on equity. Global Financing also optimizes the recovery of residual values by selling assets sourced from end of lease, leasing used equipment to new clients, or extending lease arrangements with current clients. Sales of equipment include equipment returned at the end of a lease, surplus internal equipment and used equipment purchased externally. Residual value is a risk unique to the financing business and management of this risk is dependent upon the ability to accurately project future equipment values at lease inception. Global Financing has insight into product plans and cycles for the IBM products under lease. Based upon this product information, Global Financing continually monitors projections of future equipment values and compares them with the residual values reflected in the portfolio.

Results of Operations

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change
External revenue	**$ 1,696**	$ 1,692	0.3%
Internal revenue	**1,471**	1,802	(18.4)
Total revenue	**$ 3,168**	$ 3,494	(9.3)%
Pre-tax income	**$ 1,279**	$ 1,656	(22.7)%

In 2017, Global Financing delivered external revenue of $1,696 million and total revenue of $3,168 million, with a decline in gross margin of 6.7 points. Total pre-tax income of $1,279 million decreased 22.7 percent compared to 2016 and return on equity increased 2.3 points to 32.9 percent.

Global Financing total revenue of $3,168 million decreased 9.3 percent compared to the prior year. This was due to a decline in internal revenue of 18.4 percent, driven by a decrease in internal used equipment sales (down 25.2 percent to $1,111 million) partially offset by an increase in internal financing (up 13.9 percent to $360 million). External revenue grew 0.3 percent due to an increase in external used equipment sales (up 14.9 percent to $530 million), partially offset by a decline in external financing (down 5.2 percent to $1,167 million).

The decrease in external financing revenue was due to lower asset yields, partially offset by an increase in average asset balances. The increase in internal financing revenue was primarily due to higher average asset balances and higher asset yields.

Global Financing pre-tax income decreased 22.7 percent year to year in 2017 primarily driven by a decrease in gross profit ($430 million), partially offset by a decline in financing receivables provisions ($52 million). This decrease was primarily due to lower reserves in Brazil in the current year. At December 31, 2017 the overall allowance for credit losses coverage rate was 1.1 percent, a decrease of 48 basis points year over year primarily due to the write-off of previously reserved receivables.

The increase in return on equity from 2016 to 2017 was primarily due to a lower average equity balance. See page 48 for the details of the after-tax income and return on equity calculations.

Total unguaranteed residual value of leases at December 31, 2017 and 2016 were $724 million and $725 million, respectively. In addition to the unguaranteed residual value, on a limited basis, Global Financing will obtain guarantees of the future value of the equipment to be returned at end of lease.

Third-party residual value guarantees increase the minimum lease payments as provided for by accounting standards that are utilized in determining the classification of a lease as a sales-type lease, direct financing lease or operating lease. The aggregate asset values associated with the guarantees of sales-type leases were $716 million and $329 million for the financing transactions originated during the years ended December 31, 2017 and December 31, 2016, respectively. In 2017, the residual value guarantee program resulted in the company recognizing approximately $452 million of revenue that would otherwise have been recognized in future periods as operating lease revenue. If the company had chosen to not participate in a residual value guarantee program in 2017 and prior years, the 2017 impact would be substantially mitigated by the effect of prior year asset values being recognized as operating lease revenue in the current year. The aggregate asset values associated with the guarantees of direct financing leases were $154 million and $169 million for the financing transactions originated during the years ended December 31, 2017 and 2016, respectively. The associated aggregate guaranteed future values at the scheduled end of lease were $45 million and $19 million for the financing transactions originated during the years ended December 31, 2017 and 2016, respectively. The cost of guarantees was $4 million and $2 million for the years ended December 31, 2017 and 2016, respectively.

Geographic Revenue

In addition to the revenue presentation by reportable segment, the company also measures revenue performance on a geographic basis. The following geographic, regional and country-specific revenue performance excludes OEM revenue.

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Total revenue	**$ 79,139**	$ 79,919	(1.0)%	(1.3)%
Geographies	**$ 78,793**	$ 79,594	(1.0)%	(1.4)%
Americas	**37,479**	37,513	(0.1)	(0.6)
Europe/Middle East/Africa	**24,345**	24,769	(1.7)	(2.8)
Asia Pacific	**16,970**	17,313	(2.0)	(1.1)

Total geographic revenue of $78,793 million in 2017 decreased 1.0 percent as reported (1 percent adjusted for currency) compared to the prior year.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Americas revenue was essentially flat year to year as reported, but decreased 1 percent adjusted for currency with a decline in North America partially offset by growth in Latin America, both as reported and adjusted for currency. Within North America, the U.S. decreased 1.4 percent and Canada increased 4.9 percent (3 percent adjusted for currency). In Latin America, Brazil increased 7.6 percent (1 percent adjusted for currency) and Mexico increased 9.2 percent (10 percent adjusted for currency).

EMEA revenue decreased 1.7 percent as reported and 3 percent adjusted for currency. Revenue declined in the UK and Germany, while there was growth in France and Spain. The UK decreased 11.2 percent (7 percent adjusted for currency) and Germany decreased 3.2 percent (6 percent adjusted for currency). France increased 6.3 percent (3 percent adjusted for currency), and Spain was up 8.3 percent (6 percent adjusted for currency).

Asia Pacific revenue decreased 2.0 percent as reported and 1 percent adjusted for currency. Japan decreased 1.1 percent as reported, but increased 2 percent adjusted for currency. India grew 8.6 percent as reported and 5 percent adjusted for currency. China decreased 10.6 percent (10 percent adjusted for currency) and Australia decreased 5.8 percent (9 percent adjusted for currency).

Total Expense and Other (Income)

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent/ Margin Change
Total consolidated expense and other (income)	**$ 24,827**	$ 25,964	(4.4)%
Non-operating adjustments			
Amortization of acquired intangible assets	**(496)**	(503)	(1.4)
Acquisition-related charges	**(52)**	(5)	NM
Non-operating retirement- related (costs)/income	**(669)**	(282)	137.2
Operating (non-GAAP) expense and other (income)	**$ 23,609**	$ 25,174	(6.2)%
Total consolidated expense-to-revenue ratio	**31.4%**	32.5%	(1.1)pts.
Operating (non-GAAP) expense-to-revenue ratio	**29.8%**	31.5%	(1.7)pts.

NM—Not meaningful

For additional information regarding total expense and other (income) for both expense presentations, see the following analyses by category.

Selling, General and Administrative

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change
Selling, general and administrative expense administrative expense			
Selling, general and administrative—other	**$ 16,568**	$ 16,971	(2.4)%
Advertising and promotional expense	**1,445**	1,327	8.9
Workforce rebalancing charges	**199**	1,038	(80.9)
Retirement-related costs	**959**	742	29.3
Amortization of acquired intangible assets	**496**	503	(1.4)
Stock-based compensation	**384**	401	(4.1)
Bad debt expense	**55**	87	(36.5)
Total consolidated selling, general and administrative expense	**$ 20,107**	$ 21,069	(4.6)%
Non-operating adjustments			
Amortization of acquired intangible assets	**(496)**	(503)	(1.4)
Acquisition-related charges	**(13)**	2	NM
Non-operating retirement- related (costs)/income	**(472)**	(253)	86.6
Operating (non-GAAP) selling, general and administrative expense	**$ 19,126**	$ 20,315	(5.9)%

NM—Not meaningful

Total selling, general and administrative (SG&A) expense decreased 4.6 percent in 2017 versus 2016, driven primarily by the following factors:

- Lower workforce rebalancing charges (4 points); and
- Lower spending (2 points); partially offset by
- Spending related to acquisitions in the prior 12 months (1 point); and
- Higher retirement-related costs (1 point).

Operating (non-GAAP) expense decreased 5.9 percent year to year driven primarily by the same factors.

Bad debt expense decreased $32 million in 2017 compared to 2016. The receivables provision coverage was 1.6 percent at December 31, 2017, a decrease of 40 basis points from December 31, 2016.

Research, Development and Engineering

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change
Total consolidated research, development and engineering	**$ 5,787**	$ 5,751	0.6%
Non-operating adjustment			
Non-operating retirement-related (costs)/income	**(197)**	(29)	575.5
Operating (non-GAAP) research, development and engineering	**$ 5,590**	$ 5,722	(2.3)%

Research, development and engineering (RD&E) expense was 7.3 percent of revenue in 2017 and 7.2 percent of revenue in 2016.

RD&E expense increased 0.6 percent in 2017 versus 2016 primarily driven by:

- The impact of acquisitions completed in the prior 12-month period (1 point); and
- The effects of currency; partially offset by

- Lower spending, net of higher retirement-related costs (1 point).

Operating (non-GAAP) RD&E expense decreased 2.3 percent in 2017 compared to the prior year, driven primarily by the same factors, excluding higher non-operating retirement-related costs.

Intellectual Property and Custom Development Income

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change
Licensing of intellectual property including royalty-based fees	**$ 1,193**	$ 1,390	(14.1)%
Custom development income	**252**	214	17.5
Sales/other transfers of intellectual property	**21**	27	(24.2)
Total	**$ 1,466**	$ 1,631	(10.2)%

Licensing of intellectual property including royalty-based fees decreased 14.1 percent in 2017 compared to 2016. The company entered into new partnership agreements in 2017, which included three transactions with period income greater than $100 million, compared to four transactions greater than $100 million in 2016. The company licenses IP to partners who allocate their skills to extend the value of assets that are high value, but may be in mature markets. The timing and amount of licensing, sales or other transfers of IP may vary significantly from period to period depending upon the timing of licensing agreements, economic conditions, industry consolidation and the timing of new patents and know-how development.

Other (Income) and Expense

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change
Other (income) and expense			
Foreign currency transaction losses/(gains)	**$ 405**	$ (116)	NM
(Gains)/losses on derivative instruments	**(341)**	260	NM
Interest income	**(144)**	(108)	33.5%
Net (gains)/losses from securities and investment assets	**(20)**	23	NM
Other	**(116)**	85	NM
Total consolidated other (income) and expense	**$ (216)**	$ 145	NM
Non-operating adjustment			
Acquisition-related charges	**(39)**	(7)	444.6
Operating (non-GAAP) other (income) and expense	**$ (255)**	$ 138	NM

NM—Not meaningful

Total consolidated other (income) and expense was income of $216 million in 2017 compared to expense of $145 million in 2016. The decrease in expense of $361 million year over year was primarily driven by:

- Real estate capacity charges (reflected in Other in the table above) in the prior year related to workforce transformation ($328 million);
- Lower net exchange losses ($81 million);
- Reduced losses from securities and investment assets ($43 million), primarily related to the sale of Lenovo shares in 2016; and
- Higher interest income ($36 million); partially offset by
- Lower gains on divestitures ($61 million).

Interest Expense

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change
Interest expense			
Total	**$ 615**	$ 630	(2.3)%

Interest expense decreased $15 million compared to 2016. Interest expense is presented in cost of financing in the Consolidated Statement of Earnings only if the related external borrowings are to support the Global Financing external business. Overall interest expense (excluding capitalized interest) in 2017 was

$1,273 million, an increase of $67 million year to year, primarily driven by higher average interest rates.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Stock-Based Compensation

Pre-tax stock-based compensation cost of $534 million decreased $10 million compared to 2016. This was due primarily to decreases related to the conversion of stock-based awards previously issued by acquired entities ($23 million) and performance share units ($14 million); partially offset by an increase in restricted stock units ($27 million). Stock-based compensation cost, and the year-to-year change, was reflected in the following categories: Cost: $91 million, up $3 million; SG&A expense: $384 million, down $16 million and RD&E expense: $59 million, up $3 million.

Retirement-Related Plans

The following table provides the total pre-tax cost for all retirement-related plans. These amounts are included in the Consolidated Statement of Earnings within the caption (e.g., Cost, SG&A, RD&E) relating to the job function of the plan participants.

($ in millions)

For the year ended December 31:	2017	2016	Yr.-to-Yr. Percent Change
Retirement-related plans—cost			
Service cost	**$ 429**	$ 443	(3.0)%
Amortization of prior service costs/(credits)	**(88)**	(107)	(18.5)
Cost of defined contribution plans	**1,046**	1,070	(2.2)
Total operating costs/(income)	**$ 1,388**	$ 1,405	(1.2)%
Interest cost	**$ 2,961**	$ 3,300	(10.3)%
Expected return on plan assets	**(4,346)**	(5,563)	(21.9)
Recognized actuarial losses	**2,871**	2,751	4.4
Curtailments/settlements	**19**	(16)	NM
Multi-employer plan/other	**(36)**	126	NM
Total non-operating costs/(income)	**$ 1,468**	$ 598	145.6%
Total retirement-related plans—cost	**$ 2,857**	$ 2,003	42.6%

NM—Not meaningful

Total pre-tax retirement-related plan cost increased by $854 million compared to 2016, primarily driven by lower expected return on plan assets ($1,217 million) and an increase in recognized actuarial losses ($120 million); partially offset by lower interest costs ($339 million) and other costs ($162 million) primarily due to impacts from pension litigation in both years.

As discussed in the "Operating (non-GAAP) Earnings" section on pages 26 and 27, the company characterizes certain retirement-related costs as operating and others as non-operating. Utilizing this characterization, operating retirement-related costs in 2017 were $1,388 million, a decrease of $17 million compared to 2016, primarily driven by lower defined contribution plans cost ($23 million). Non-operating costs of $1,468 million increased $871 million in 2017 compared to 2016, driven primarily by lower expected return on plan assets ($1,217 million) and an increase in recognized actuarial losses ($120 million); partially offset by lower interest costs ($339 million) and other costs ($162 million) primarily due to impacts from pension litigation in both years. Effective January 1, 2018, the company adopted the new FASB guidance on presentation of net periodic pension and nonpension postretirement benefit costs, and as a result, beginning in 2018, the company will align its presentation of operating and non-operating costs to the FASB presentation. Prior period non-operating cost/(income) will be recast for comparability.

Income Taxes

The continuing operations effective tax rate for 2017 was 49.5 percent, an increase of 45.8 points versus the prior year. The fourth quarter charge of $5.5 billion related to the impact of the enactment of the U.S. Tax Cuts and Jobs Act resulted in an increase to the effective tax rate of 48.0 points. Without this impact, the continuing operations tax rate would have been 1.5 percent compared to a 2016 rate of 3.6 percent, with the remaining change in the rate year to year driven by the following factors:

- An increased benefit year to year in the utilization of foreign tax credits of 5.4 points;
- A benefit related to an intra-entity asset transfer in the first quarter of 2017 of 5.1 points;
- A benefit due to the tax write down of an investment in the fourth quarter of 2017 of 1.7 points; and
- A benefit due to the geographic mix of pre-tax earnings in 2017 of 1.0 points; partially offset by

- The favorable resolution of the longstanding tax matter in Japan in 2016 of 9.5 points; and
- An increase year to year in tax charges related to intercompany payments of 1.5 points.

The continuing operations operating (non-GAAP) effective tax rate was 6.7 percent, an increase of 0.3 points versus 2016, principally driven by the same factors described above. In 2017, the geographic and product mix of pre-tax earnings were more favorable than the company expected and there was increased utilization of foreign tax credits. These impacts drove the underlying continuing operations operating (non-GAAP) effective tax rate to approximately 12 percent before discrete period benefits.

For more information on the Tax Cuts and Jobs Act impact, see note N, "Taxes," on pages 121 and 124.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Earnings Per Share

Basic earnings per share is computed on the basis of the weighted-average number of shares of common stock outstanding during the period. Diluted earnings per share is computed on the basis of the weighted-average number of shares of common stock outstanding plus the effect of dilutive potential common shares outstanding during the period using the treasury stock method. Dilutive potential common shares include outstanding stock options and stock awards.

For the year ended December 31:	2017	2016	Yr.-to -Yr. Percent Change
Earnings per share of common stock from continuing operations			
Assuming dilution	**$ 6.14***	$ 12.39	(50.4)%
Basic	**$ 6.17**	$ 12.44	(50.4)%
Diluted operating (non-GAAP)	**$ 13.80**	$ 13.59	1.5%
Weighted-average shares outstanding (in millions)			
Assuming dilution	**937.4**	958.7	(2.2)%
Basic	**932.8**	955.4	(2.4)%

* Includes a charge of $5.5 billion associated with the enactment of U.S. tax reform, or $5.84 of diluted earnings per share in 2017.

Actual shares outstanding at December 31, 2017 and 2016 were 922.2 million and 945.9 million, respectively. The average number of common shares outstanding assuming dilution was 21.3 million shares lower in 2017 versus 2016. The decrease was primarily the result of the common stock repurchase program.

Financial Position

Dynamics

At December 31, 2017, the company continued to have the financial flexibility to support the business over the long term. Cash and marketable securities at year end were $12,580 million. During the year, the company continued to manage the investment portfolio to meet its capital preservation and liquidity objectives.

Total debt of $46,824 million increased $4,655 million from prior year-end levels. The commercial paper balance at December 31, 2017, was $1,496 million, an increase of $597 million from the prior year end. Within total debt, $31,434 million is in support of the Global Financing business which is leveraged at a 9.0 to 1 ratio. The company continues to have substantial flexibility in the debt markets. During 2017, the company completed bond issuances totaling $7,986 million, with terms ranging from 2 to 12 years, and interest rates ranging from 0.95 to 3.30 percent depending on maturity. This includes IBM Credit's first public debt issuance of $3,000 million in September 2017. The company has consistently generated strong cash flow from operations and continues to have access to additional sources of liquidity through the capital markets and its Credit Facilities.

Consistent with accounting standards, the company remeasured the funded status of its retirement and postretirement plans at December 31. At December 31, 2017, the overall net underfunded position was $12,890 million, a decrease of $1,949 million from December 31, 2016 driven by asset returns, partially offset by interest cost and a decrease in discount rates. At year end, the company's qualified defined benefit plans were well funded and the cash requirements related to these plans remain stable going forward at approximately $400 million per year through 2020. In 2017, the return on the U.S. Personal Pension Plan assets was 9.6 percent and the plan was 104 percent funded at December 31. Overall, global asset returns were 8.3 percent and the qualified defined benefit plans worldwide were 100 percent funded at December 31, 2017.

During 2017, the company generated $16,724 million in cash from operations, a decrease of $360 million compared to 2016. In addition, the company generated $12,992 million in free cash flow, an increase of $1,293 million versus the prior year. See page 68 for additional information on free cash flow. The company returned $9,847 million to shareholders in 2017, with $5,506 million in dividends and $4,340 million in gross share repurchases. In 2017, the company repurchased 27.2 million shares and had $3.8 billion remaining in share repurchase authorization at year end. The company's cash generation permits the company to invest and deploy capital to areas with the most attractive long-term opportunities.

Global Financing Financial Position Key Metrics:

($ in millions)

At December 31:	2017	2016
Cash and cash equivalents	**$ 2,696**	$ 1,844
Net investment in sales-type and direct financing leases	**7,253**	6,893
Equipment under operating leases—external clients[1]	**477**	548
Client loans	**12,450**	11,478
Total client financing assets	**20,180**	18,920
Commercial financing receivables	**11,590**	9,700
Intercompany financing receivables[2][3]	**5,056**	4,959
Total assets	**$ 41,096**	$ 36,492
Debt	**31,434**	27,859
Total equity	**$ 3,484**	$ 3,812

(1) Includes intercompany mark-up, priced on an arm's-length basis, on products purchased from the company's product divisions which is eliminated in IBM's consolidated results.
(2) Entire amount eliminated for purposes of IBM's consolidated results and therefore does not appear on page 80.
(3) These assets, along with all other financing assets in this table, are leveraged at the value in the table using Global Financing debt.

At December 31, 2017, substantially all financing assets were IT related assets, and approximately 53 percent of the total external portfolio was with investment-grade clients with no direct exposure to consumers. The improvement in investment-grade year to year (1 point) was driven primarily by rating changes within the existing portfolio, not by changing the company's approach to the market. This investment-grade percentage is based on credit ratings of the companies in the portfolio. Additionally, the company takes actions to transfer exposure to third parties. On that basis, the investment-grade content would increase by 17 points to 70 percent, an increase of 5 points year to year.

The company has a long-standing practice of taking mitigation actions, in certain circumstances, to transfer credit risk to third parties, including credit insurance, financial guarantees, nonrecourse borrowings, transfers of receivables recorded as true sales in accordance with accounting guidance or sales of equipment under operating lease.

IBM Working Capital

($ in millions)

At December 31:	2017	2016
Current assets	**$ 49,735**	$ 43,888
Current liabilities	**37,363**	36,275
Working capital	**$ 12,373**	$ 7,613
Current ratio	**1.33:1**	1.21:1

Working capital increased $4,760 million from the year-end 2016 position. The key changes are described below:

Current assets increased $5,847 million ($3,239 million adjusted for currency), as a result of:

- An increase of $4,053 million ($3,105 million adjusted for currency) in cash and marketable securities; and
- An increase of $2,386 million ($993 million adjusted for currency) in receivables driven by financing receivables; partially offset by
- A decrease of $622 million ($841 million adjusted for currency) in prepaid expenses and other current assets.

Current liabilities increased $1,087 million (a decrease of $542 million adjusted for currency), as a result of:

- An increase in taxes of $984 million ($849 million adjusted for currency); and
- An increase in deferred income of $517 million driven by currency-related increases of $583 million; partially offset by
- A decrease in short-term debt of $526 million ($537 million adjusted for currency).

Receivables and Allowances

Roll Forward of Total IBM Receivables Allowance for Credit Losses

($ in millions)

January 1, 2017	Additions*	Write-offs**	Other+	December 31, 2017
$ 776	**$ 55**	**$ (199)**	**$ 37**	**$ 668**

* Additions for Allowance for Credit Losses are charged to expense.

**Refer to note A, "Significant Accounting Policies," on pages 92 and 93 for additional information regarding Allowance for Credit Loss write-offs.

+ Primarily represents translation adjustments.

The total IBM receivables provision coverage was 1.6 percent at December 31, 2017, a decrease of 40 basis points compared to December 31, 2016. The majority of the write-offs during 2017 related to Global Financing receivables, which had been previously reserved.

Global Financing Receivables and Allowances

The following table presents external financing receivables excluding residual values, and the allowance for credit losses:

($ in millions)

At December 31:	2017	2016
Gross financing receivables	**$ 31,044**	$ 28,043
Specific allowance for credit losses	**258**	335
Unallocated allowance for credit losses	**78**	103
Total allowance for credit losses	**336**	438
Net financing receivables	**$ 30,709**	$ 27,605
Allowance for credit losses coverage	**1.1%**	1.6%

The percentage of Global Financing receivables reserved was 1.1 percent at December 31, 2017, compared to 1.6 percent at December 31, 2016. In 2017, write-offs of $144 million of receivables previously reserved, primarily in China, resulted in a 23 percent reduction in the specific reserves, from $335 million at December 31, 2016, to $258 million at December 31, 2017. See note F, "Financing Receivables," on page 107 for additional information. Unallocated reserves decreased 24 percent from $103 million at December 31, 2016, to $78 million at December 31, 2017 due to higher general reserve requirements in Brazil in the prior year.

Roll Forward of Global Financing Receivables Allowance for Credit Losses (included in Total IBM)

($ in millions)

January 1, 2017	Additions*	Write-offs**	Other+	December 31, 2017
$ 438	**$ 17**	**$ (144)**	**$ 24**	**$ 336**

* Additions for Allowance for Credit Losses are charged to expense.

**Refer to note A, "Significant Accounting Policies," on pages 92 and 93 for additional information regarding Allowance for Credit Loss write-offs.

+ Primarily represents translation adjustments.

Global Financing's bad debt expense was $17 million in 2017, compared to $69 million in 2016. The year-to-year decrease in bad debt expense was primarily due to lower general reserve requirements in Brazil.

Noncurrent Assets and Liabilities

($ in millions)

At December 31:	2017	2016
Noncurrent assets	**$ 75,621**	$ 73,582
Long-term debt	**$ 39,837**	$ 34,655

Noncurrent liabilities (excluding debt)	**$**	**30,432**	$	28,147

The increase in noncurrent assets of $2,039 million (a decrease of $233 million adjusted for currency) was driven by:

- An increase in prepaid pension assets of $1,609 million ($1,357 million adjusted for currency) driven by the expected returns on plan assets partially offset by interest costs.

Long-term debt increased $5,182 million ($4,120 million adjusted for currency) driven by:

- Bond issuances of $7,986 million; partially offset by
- Current upcoming maturities of long-term debt of $5,214 million.

Other noncurrent liabilities, excluding debt, increased $2,285 million ($378 million adjusted for currency) primarily driven by:

- An increase of $2,488 million ($1,953 million adjusted for currency) in other liabilities driven by the charge associated with the enactment of U.S. tax reform.

Debt

The company's funding requirements are continually monitored and strategies are executed to manage the overall asset and liability profile. Additionally, the company maintains sufficient flexibility to access global funding sources as needed.

($ in millions)

At December 31:		2017		2016
Total company debt	**$**	**46,824**	$	42,169
Total Global Financing segment debt	**$**	**31,434**	$	27,859
Debt to support external clients		**27,556**		24,034
Debt to support internal clients		**3,878**		3,825
Non-Global Financing debt		**15,390**		14,309

Global Financing provides financing predominantly for the company's external client assets, as well as for assets under contract by other IBM units. These assets, primarily for Technology Services & Cloud Platforms, generate long-term, stable revenue streams similar to the Global Financing asset portfolio. Based on their attributes, these Technology Services & Cloud Platforms assets are leveraged with the balance of the Global Financing asset base. The increase in debt was consistent with the company's expectations in 2017 to increase leverage in the Global Financing business.

Non-Global Financing debt of $15,390 million was up $1,081 million from prior year-end levels.

Consolidated debt-to-capitalization ratio at December 31, 2017 was 72.5 percent, which includes a 5.7 point impact from the onetime charge of $5.5 billion associated with the enactment of U.S. tax reform in 2017, versus 69.6 percent at December 31, 2016.

Given the significant leverage, the company also presents a debt-to-capitalization ratio which excludes Global Financing debt and equity as management believes this is more representative of the company's core business operations. This ratio can vary from period to period as the company manages its global cash and debt positions. "Core" debt-to-capitalization ratio (excluding Global Financing debt and equity) was 51.9 percent at December 31, 2017, which includes an 8.1 point impact from the charge of $5.5 billion associated with the enactment of U.S. tax reform in 2017, compared to 49.5 percent at December 31, 2016.

At December 31:	2017	2016
Global Financing debt-to-equity ratio	**9.0x**	7.3x

The debt used to fund Global Financing assets is composed of intercompany loans and external debt. Total debt changes generally correspond with the level of client and commercial financing receivables, the level of cash and cash equivalents, the change in intercompany and external payables and the change in intercompany investment from IBM. The terms of the intercompany loans are set by the company to substantially match the term, currency and interest rate variability underlying the financing receivable and are based on arm's-length pricing.

Global Financing provides financing predominantly for the company's external client assets, as well as for assets under contract by other IBM units. As previously stated, the company measures Global Financing as a stand-alone entity, and accordingly, interest expense relating to debt supporting Global Financing's external client and internal business is included in the "Global Financing Results of Operations" on page 40 and in note T, "Segment Information," on pages 142 to 146. In the company's Consolidated Statement of Earnings, the external debt-related interest expense supporting Global Financing's internal financing to the company is reclassified from cost of financing to interest expense.

Equity

Total equity decreased by $667 million from December 31, 2016 as a result of an increase in treasury stock of $4,457 million mainly due to gross common stock repurchases, partially offset by lower accumulated other comprehensive losses of $2,806 million primarily due to retirement plan remeasurements, an increase in common stock of $631 million and an increase in retained earnings of $368 million.

Cash Flow

The company's cash flows from operating, investing and financing activities, as reflected in the Consolidated Statement of Cash Flows on page 81 are summarized in the table below. These amounts include the cash flows associated with the Global Financing business.

($ in millions)

For the year ended December 31:	2017	2016
Net cash provided by/(used in) continuing operations		
Operating activities	**$ 16,724**	$ 17,084*
Investing activities	**(7,096)**	(10,976)
Financing activities	**(6,418)**	(5,917)*
Effect of exchange rate changes on cash and cash equivalents	**937**	(51)
Net change in cash and cash equivalents	**$ 4,146**	$ 140

* Reclassified to reflect adoption of the FASB guidance on share-based compensation.

Net cash provided by operating activities decreased by $360 million in 2017 driven by the following key factors:

- Performance-related declines within net income; and
- An increase in cash income tax payments of $519 million; partially offset by
- An increase in cash provided by receivables of $585 million.

Net cash used in investing activities decreased $3,881 million driven by:

- A decrease in cash used related to acquisitions of $5,184 million, partially offset by an increase of net non-operating financing receivables of $1,137 million.

Net cash used in financing activities increased $502 million as compared to the prior year driven by the following factors:

- An increase of $838 million of cash used for gross common share repurchases; partially offset by
- An increase in net cash sourced from debt transactions of $683 million driven by a higher level of issuances in the current year.

Global Financing Return on Equity Calculation

($ in millions)

At December 31:	2017	2016
Numerator		
Global Financing after-tax income(1) *	**$ 1,116**	$ 1,126
Denominator		
Average Global Financing equity(2) **	**$ 3,394**	$ 3,680
Global Financing return on equity(1)/(2)	**32.9%**	30.6%

* Calculated based upon an estimated tax rate principally based on Global Financing's geographic mix of earnings as IBM's provision for income taxes is determined on a consolidated basis.

**Average of the ending equity for Global Financing for the last five quarters.

GAAP Reconciliation

The tables below provide a reconciliation of the company's income statement results as reported under GAAP to its operating earnings presentation which is a non-GAAP measure. The company's calculation of operating (non-GAAP) earnings, as presented, may differ from similarly titled measures reported by other companies. Please refer to the "Operating (non-GAAP) Earnings" section on pages 26 and 27 for the company's rationale for presenting operating earnings information.

($ in millions except per share amounts)

For the year ended December 31, 2017:	GAAP	Acquisition-Related Adjustments	Retirement-Related Adjustments	Tax Reform One-Time Charge[1]	Operating (non-GAAP)
Gross profit	**$ 36,227**	**$ 449**	**$ 799**	**$ —**	**$ 37,475**
Gross profit margin	**45.8%**	**0.6pts.**	**1.0pts.**	**—pts.**	**47.4%**
SG&A	**$ 20,107**	**$ (509)**	**$ (472)**	**$ —**	**$ 19,126**
RD&E	**5,787**	**—**	**(197)**	**—**	**5,590**
Other (income) and expense	**(216)**	**(39)**	**—**	**—**	**(255)**
Total expense and other (income)	**24,827**	**(548)**	**(669)**	**—**	**23,609**
Pre-tax income from continuing operations	**11,400**	**997**	**1,468**	**—**	**13,886**
Pre-tax margin from continuing operations	**14.4%**	**1.3pts.**	**1.9pts.**	**—pts.**	**17.5%**
Provision for income taxes*	**$ 5,642**	**$ 279**	**$ 485**	**$ (5,475)**	**$ 931**
Effective tax rate	**49.5%**	**(1.5)pts.**	**(1.7)pts.**	**(39.5)pts.**	**6.7%**
Income from continuing operations	**$ 5,758**	**$ 718**	**$ 983**	**$ 5,475**	**$ 12,935**
Income margin from continuing operations	**7.3%**	**0.9pts.**	**1.2pts.**	**6.9pts.**	**16.3%**
Diluted earnings per share from continuing operations	**$ 6.14**	**$ 0.77**	**$ 1.05**	**$ 5.84**	**$ 13.80**

* The tax impact on operating (non-GAAP) pre-tax income is calculated under the same accounting principles applied to the GAAP pre-tax income which employs an annual effective tax rate method to the results.

[1] Operating (non-GAAP) earnings excludes a charge of $5.5 billion associated with the enactment of U.S. tax reform due to its unique non-recurring nature.

($ in millions except per share amounts)

For the year ended December 31, 2016:	GAAP	Acquisition-Related Adjustments	Retirement-Related Adjustments	Operating (non-GAAP)
Gross profit	$ 38,294	$ 494	$ 316	$ 39,104
Gross profit margin	47.9%	0.6pts.	0.4pts.	48.9%
SG&A	$ 21,069	$ (501)	$ (253)	$ 20,315
RD&E	5,751	—	(29)	5,722
Other (income) and expense	145	(7)	—	138
Total expense and other (income)	25,964	(508)	(282)	25,174
Pre-tax income from continuing operations	12,330	1,003	598	13,931
Pre-tax margin from continuing operations	15.4%	1.3pts.	0.7pts.	17.4%
Provision for income taxes*	$ 449	$ 268	$ 183	$ 900
Effective tax rate	3.6%	1.7pts.	1.2pts.	6.5%
Income from continuing operations	$ 11,881	$ 735	$ 415	$ 13,031
Income margin from continuing operations	14.9%	0.9pts.	0.5pts.	16.3%
Diluted earnings per share from continuing operations	$ 12.39	$ 0.77	$ 0.43	$ 13.59

* The tax impact on operating (non-GAAP) pre-tax income is calculated under the same accounting principles applied to the GAAP pre-tax income which employs an annual effective tax rate method to the results.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Consolidated Fourth-Quarter Results

($ and shares in millions except per share amounts)

For the fourth quarter:	2017	2016	Yr.-to-Yr. Percent/ Margin Change
Revenue	**$ 22,543**	$ 21,770	3.6%*
Gross profit margin	**48.2%**	50.0%	(1.9)pts.
Total expense and other (income)	**$ 6,393**	$ 5,907	8.2%
Total expense and other (income)-to-revenue ratio	**28.4%**	27.1%	1.2 pts.

Income from continuing operations before income taxes	$	**4,469**	$	4,986	(10.4)%
Provision for income taxes from continuing operations	$	**5,522****	$	480	NM
Income/(loss) from continuing operations	$	**(1,053)****	$	4,505	NM
Income/(loss) from continuing operations margin		**(4.7)%**		20.7%	NM
Loss from discontinued operations, net of tax	$	**(1)**	$	(4)	(71.3)%
Net income/(loss)	$	**(1,054)**	$	4,501	NM
Earnings/(loss) per share from continuing operations: Assuming dilution	$	**(1.14)****	$	4.73	NM
Consolidated earnings/(loss) per share—assuming dilution	$	**(1.14)****	$	4.72	NM
Weighted-average shares outstanding: Assuming dilution		**924.5**		952.7	(3.0)%

* 0.9 percent adjusted for currency.
** Includes a charge of $5.5 billion associated with the enactment of U.S. tax reform, or $5.91 of diluted earnings per share in 2017.
NM—Not meaningful

The following table provides the company's operating (non-GAAP) earnings for the fourth quarter of 2017 and 2016.

($ in millions except per share amounts)

For the fourth quarter:		2017		2016	Yr.-to-Yr. Percent Change
Net income/(loss) as reported	$	**(1,054)****	$	4,501	NM
Loss from discontinued operations, net of tax		**(1)**		(4)	(71.3)%
Income/(loss) from continuing operations		**(1,053)****		4,505	NM
Non-operating adjustments (net of tax)					
Acquisition-related charges		**181**		193	(6.6)
Non-operating retirement-related costs/(income)		**206**		77	168.5
U.S. tax reform one-time charge		**5,475**		—	NM
Operating (non-GAAP) earnings*	$	**4,809**	$	4,776	0.7%
Diluted operating (non-GAAP) earnings per share	$	**5.18**	$	5.01	3.4%

* See page 55 for a more detailed reconciliation of net income to operating (non-GAAP) earnings.
** Includes a charge of $5.5 billion associated with the enactment of U.S. tax reform in December 2017.
NM—Not meaningful

Snapshot

In the fourth quarter of 2017, the company reported $22.5 billion in revenue and a loss from continuing operations of $1.1 billion, which included a charge of $5.5 billion associated with the enactment of U.S. tax reform. Fourth-quarter operating (non-GAAP) earnings was $4.8 billion, which excludes the one-time charge. Fourth-quarter diluted earnings/(loss) per share from continuing operations was $(1.14) as reported and operating (non-GAAP) diluted earnings per share from continuing operations was $5.18. The company generated $5.7 billion in cash from operations and $6.8 billion in free cash flow in the fourth quarter of 2017 and shareholder returns of $2.1 billion in gross common stock repurchases and dividends.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

In the fourth quarter, the company continued to deliver solid growth in its strategic imperatives which generated $11.1 billion of revenue and grew 17 percent as reported and 14 percent adjusted for currency, led by cloud and security, as the company continues to embed AI and cloud into its offerings. The strategic imperatives are not separate businesses, they are offerings across the segments that address opportunities in analytics, cloud, security and mobile. Strategic imperatives growth in the fourth quarter continued to largely represent organic growth as the acquisitive content has leveled on a year-to-year basis. Total Cloud revenue of $5.5 billion increased 30 percent as reported and 27 percent adjusted for currency as the company enables clients to implement comprehensive cloud solutions. Cloud-asa-Service revenue was up 20 percent (18 percent adjusted for currency) and the annual exit run rate for as-a-Service revenue increased to $10.3 billion in the fourth quarter of 2017 compared to $9.4 billion in the third quarter of 2017. Analytics revenue of $6.1 billion increased 9 percent as reported (6 percent adjusted for currency). Mobile revenue increased 23 percent (21 percent adjusted for currency) and Security revenue more than doubled year to year, reflecting the strong demand for the pervasive encryption capabilities in IBM Z and good performance in both managed security services within Technology & Cloud Platforms and in security software.

From a segment perspective, Cognitive Solutions revenue increased 2.5 percent as reported, flat adjusted for currency, led by growth in Transaction Processing Software, driven by middleware as clients continued to invest and grow their high-value, mission critical workloads on the IBM Z platform. Solutions Software revenue increased year to year as reported, but declined adjusted for currency. Cognitive Solutions performance in the fourth quarter included growth in annuity revenue, including double-digit growth in as-a-Service solutions. Global Business Services (GBS) revenue increased 0.7 percent as reported, but decreased 2 percent adjusted for currency. Growth in Consulting, led by the digital offerings was partially offset by declines in Global Process Services and Application Management. This was the second consecutive quarter of revenue growth in Consulting. GBS strategic imperatives revenue increased 9 percent (7 percent adjusted for currency), led by the cloud practice, analytics and mobile. Technology Services & Cloud Platforms

revenue decreased 1.2 percent as reported and 4 percent adjusted for currency, primarily driven by a decline in Infrastructure Services. However, within Technology Services & Cloud Platforms, strategic imperatives revenue was up 15 percent as reported and 12 percent adjusted for currency, driven by hybrid cloud services, security and mobile. Systems revenue increased 31.7 percent as reported and 28 percent adjusted for currency with growth in all three brands —IBM Z, Power Systems and Storage Systems. This was the first full quarter of revenue since the announcement of the z14, and with pervasive encryption and the ability to address new technologies such as blockchain, the company is adding new clients and new workloads to the platform.

From a geographic perspective, Americas revenue increased 4.6 percent (4 percent adjusted for currency) year to year, with growth in the U.S., Latin America and Canada. This represented sequential improvement of 6.6 points as reported (6 points adjusted for currency) compared to the year-to-year third quarter 2017 growth rates. EMEA revenue increased 6.3 percent as reported, but decreased 1 percent adjusted for currency. France and Spain had growth as reported and adjusted for currency, but were more than offset by declines in Germany, Italy and the UK, adjusted for currency. Asia Pacific revenue decreased 2.2 percent as reported (2 percent adjusted for currency). Within Asia Pacific, declines in China and Australia were partially offset by growth in Japan and India, as reported and adjusted for currency.

The consolidated gross profit margin of 48.2 percent decreased 1.9 points year to year. Operating (non-GAAP) gross margin of 49.5 percent decreased 1.4 points compared to the prior year. The consolidated gross margin and the operating (non-GAAP) gross margin both improved sequentially compared to the respective third-quarter 2017 gross margins.

Total expense and other (income) increased 8.2 percent in the fourth quarter of 2017 compared to the prior year. The year-to-year increase was primarily driven by the effects of currency (4 points) and lower intellectual property income (3 points). The expense dynamics reflect continued efficiency in the underlying spending, offset by continued investment to build and reinvent new solutions and platforms. Total operating (non-GAAP) expense and other (income) increased 6.2 percent year to year driven primarily by the same factors.

Pre-tax income from continuing operations of $4.5 billion in the fourth quarter of 2017 decreased 10.4 percent year to year and the pre-tax margin was 19.8 percent, a decrease of 3.1 points. The continuing operations effective tax rate for the fourth quarter of 2017 was 123.6 percent, which included a one-time charge of $5.5 billion from the enactment of U.S. tax reform. Losses from continuing operations in the fourth quarter of 2017 were $1.1 billion compared to income from continuing operations of $4.5 billion in the fourth quarter of 2016. Operating (non-GAAP) pre-tax income from continuing operations of $5.1 billion decreased 5.2 percent year to year. Operating (non-GAAP) pre-tax margin from continuing operations decreased 2.1 points to 22.7 percent. Operating (non-GAAP) income from continuing operations of $4.8 billion increased 0.7 percent and the operating (non-GAAP) income margin from continuing operations of 21.3 percent decreased 0.6 points. The operating (non-GAAP) effective tax rate from continuing operations in the fourth quarter of 2017 was 6.1 percent versus 11.5 percent in the prior year.

Diluted earnings/(loss) per share from continuing operations was $(1.14) in the fourth quarter of 2017, which included the charge associated with the enactment of U.S. tax reform, compared to $4.73 in the prior year. In the fourth quarter of 2017, the company repurchased 4.4 million shares of its common stock at a cost of $0.7 billion and had $3.8 billion remaining in the share repurchase authorization at December 31, 2017. Operating (non-GAAP) diluted earnings per share of $5.18 increased 3.4 percent versus the fourth quarter of 2016.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Results of Continuing Operations

Segment Details

The following is an analysis of the fourth quarter of 2017 versus the fourth quarter of 2016 reportable segment external revenue and gross margin results. Segment pre-tax income includes transactions between the segments that are intended to reflect an arm's-length transfer price and excludes certain unallocated corporate items.

($ in millions)

For the fourth quarter:	2017	2016	Yr.-to-Yr. Percent/ Margin Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Revenue				
Cognitive Solutions	**$ 5,432**	$ 5,297	2.5%	0.0%
Gross margin	**79.2%**	82.7%	(3.5)pts.	
Global Business Services	**4,152**	4,121	0.7%	(1.5)%
Gross margin	**24.8%**	26.9%	(2.1)pts.	
Technology Services & Cloud Platforms	**9,198**	9,308	(1.2)%	(4.0)%
Gross margin	**40.9%**	42.9%	(2.0)pts.	
Systems	**3,332**	2,530	31.7%	28.5%
Gross margin	**55.7%**	56.9%	(1.2)pts.	
Global Financing	**450**	447	0.8%	(1.8)%
Gross margin	**29.5%**	36.2%	(6.8)pts.	
Other	**(20)**	66	NM	NM
Gross margin	**(1,093.4)%**	(289.7)%	NM	

Total consolidated revenue	**$ 22,543**	$ 21,770	3.6%	0.9%
Total consolidated gross profit	**$ 10,862**	$ 10,893	(0.3)%	
Total consolidated gross margin	**48.2%**	50.0%	(1.9)pts.	
Non-operating adjustments				
Amortization of acquired intangible assets	**99**	124	(19.8)%	
Retirement-related costs/(income)	**209**	78	168.2%	
Operating (non-GAAP) gross profit	**$ 11,170**	$ 11,095	0.7%	
Operating (non-GAAP) gross margin	**49.5%**	51.0%	(1.4)pts.	

NM—Not meaningful

Cognitive Solutions

Cognitive Solutions revenue of $5,432 million grew 2.5 percent as reported and was flat adjusted for currency in the fourth quarter of 2017 compared to the prior year. These results reflect growth as reported and adjusted for currency in Transaction Processing Software. Within Solutions Software, there was strong performance in the areas the company is shifting to, including Watson offerings and SaaS.

Solutions Software revenue of $3,791 million grew 1.2 percent as reported (decreased 1 percent adjusted for currency) compared to the prior year. Within Solutions Software, the annuity content, which represents 80 percent of this unit's revenue on an annual basis, grew 5.4 percent as reported (3 percent adjusted for currency) year to year compared to the fourth quarter of 2016. There was continued double-digit growth in SaaS offerings as the company continues to invest to build scale in its as-a-Service businesses. Security contributed to year-to-year growth in the fourth quarter. There was also continued focus on industry verticals and strong performance in areas such as Watson Health and Watson IoT offerings. However, there was weakness in certain more traditional analytics offerings that drove a decline in revenue compared to the prior year. With a larger mix of transactional content in the fourth quarter, this impacted overall revenue performance for Solutions Software. Transaction Processing Software revenue of $1,641 million grew 5.8 percent as reported (3 percent adjusted for currency) compared to the fourth quarter of 2016 as clients continue to invest and grow their high-value, mission-critical workloads on the IBM Z platform. This growth reflects clients' ongoing long-term commitment and the value the company's platform provides to them.

Cognitive Solutions total fourth-quarter strategic imperatives revenue of $3.5 billion was flat year to year as reported and decreased 3 percent adjusted for currency. Cloud revenue of $0.7 billion grew 8 percent as reported and 6 percent adjusted for currency, with an as-a-Service exit run rate of $2.1 billion.

Cognitive Solutions gross profit margin decreased 3.5 points to 79.2 percent in the fourth quarter of 2017 compared to the prior year. In the fourth quarter, pre-tax income of $2,279 million decreased 1.5 percent compared to the prior year with a pre-tax margin decline of 1.1 points to 37.5 percent driven by ongoing investments in strategic areas and a mix of businesses into lower margin offerings. Although SaaS margins continued to expand, the company is not yet at scale for these offerings. There was also lower IP income and an increase in royalty costs associated with IP licensing agreements in the fourth quarter of 2017 compared to the prior year contributing to the pre-tax margin decline.

Global Business Services

Global Business Services revenue of $4,152 million increased 0.7 percent as reported (decreased 2 percent adjusted for currency) in the fourth quarter of 2017 compared to the prior year with growth in Consulting partially offset by declines in Application Management and GPS as reported and at constant currency. In the fourth quarter of 2017, there was growth in GBS signings as reported and adjusted for currency, marking the fourth consecutive quarter of signings growth for the segment.

Consulting revenue of $1,868 million increased 3.0 percent as reported (1 percent adjusted for currency) led by the company's digital strategy and iX platform. This was the second consecutive quarter of growth in Consulting as reported and adjusted for currency. The Consulting backlog has grown year to year in the third and fourth quarters of 2017. GPS revenue of $318 million decreased 6.5 percent as reported (8 percent adjusted for currency) compared to the prior year. Application Management revenue of $1,967 million decreased 0.1 percent as reported (3 percent adjusted for currency) driven by declines in traditional ERP managed services and the successful completion in prior periods of some large contracts. There is continued focus on offerings that help clients modernize their critical application suites by implementing cloud-centric architectures and microservices.

GBS strategic imperatives revenue of $2.6 billion grew 9 percent as reported (7 percent adjusted for currency) year to year. Cloud revenue of $1.1 billion grew 19 percent as reported (17 percent adjusted for currency), with an as-a-Service exit run rate of $1.3 billion.

GBS fourth-quarter gross profit margin decreased 2.1 points to 24.8 percent year to year. Pre-tax income of $337 million decreased 35.5 percent year to year. The pre-tax margin declined 4.4 points to 7.9 percent. This decline in margins reflects fourth-quarter impacts from currency, continuing investment in skills to transform the GBS business, and continued price and profit pressure in some more traditional areas in Application Management.

Technology Services & Cloud Platforms

Technology Services & Cloud Platforms revenue of $9,198 million decreased 1.2 percent as reported and 4 percent adjusted for currency in the fourth quarter of 2017 compared to the prior year. Although there was an overall year-to-year revenue decline, there was continued double-digit growth as reported and adjusted for currency in strategic imperatives revenue within the segment.

Infrastructure Services revenue of $5,995 million declined 1.5 percent as reported (4 percent adjusted for currency) compared to the prior year. This decline reflects the continued impact associated with contract conclusions at the end of 2016 and the shift away from certain lower value work within the business. Clients continue to look to cloud offerings to drive efficiency and agility in their infrastructure and create new business models. Technical Support Services revenue of $1,840 million increased 0.7 percent as reported (decreased 2 percent adjusted for currency) year to year. Integration Software revenue of $1,364 million decreased 2.3 percent as reported (5 percent adjusted for currency) compared to the prior year. There was strong double-digit revenue growth as reported and adjusted for currency in SaaS offerings across the portfolio with continued momentum in hybrid integration tools that are important to enterprise cloud deployments. This was offset by declines in on-premise offerings as more of this portfolio shifts to cloud.

Technology Services & Cloud Platforms strategic imperatives revenue of $2.9 billion grew 15 percent year to year as reported (12 percent adjusted for currency). Cloud revenue of $2.0 billion grew 13 percent as reported (10 percent adjusted for currency), with an as-a-Service exit run rate of $6.9 billion.

Technology Services & Cloud Platforms gross profit margin decreased 2.0 points year to year in the fourth quarter to 40.9 percent driven primarily by some of the large contract conclusions and delays in productivity improvements. Pre-tax income of $1,456 million decreased 22.7 percent. The pretax margin declined 4.2 points year to year to 15.6 percent, but improved sequentially compared to the third quarter of 2017. While there has been improvement in spending related to prior-year workforce reduction transformation actions, the company continues to invest to scale its cloud platforms, deliver productivity through automation and infuse AI into its offerings.

Systems

Systems revenue of $3,332 million grew 31.7 percent year to year as reported (28 percent adjusted for currency) in the fourth quarter of 2017. Systems Hardware revenue of $2,865 million grew 38.2 percent as reported (35 percent adjusted for currency) with strong z14 revenue performance in its first full quarter, growth in Power Systems (as reported and adjusted for currency), and the fourth consecutive quarter of growth in Storage Systems, as reported and adjusted for currency. Operating Systems Software revenue of $467 million grew 2.3 percent as reported (flat adjusted for currency) compared to the prior year.

Within Systems Hardware, fourth-quarter IBM Z revenue grew 74.9 percent as reported (71 percent adjusted for currency) year to year reflecting the strong client demand for this platform. The z14 adoption was broad based across many countries and industries. In the fourth quarter, there were 14 new clients across 10 countries, with strong revenue performance in North America where clients continue to leverage traditional IT infrastructure together with cloud. The company continues to address emerging workloads across the IBM Z platform, such as blockchain, machine learning, dev ops and instant payments. Overall, the mainframe continues to deliver a high-value, secure and scalable platform that is critical in managing clients' complex environments.

Power Systems revenue grew 18.0 percent as reported (15 percent adjusted for currency) year to year driven by double-digit growth in the low-end and high-end portfolios, with cloud-enabled offerings serving new markets. The company continues to shift to the growing Linux market and in the fourth quarter released the next-generation Power System, with the new POWER9 processor. These POWER9 systems bring unprecedented speed to AI workloads and enable clients to compete and win in the data-intensive AI era.

Storage Systems revenue increased by 10.9 percent as reported (8 percent adjusted for currency) year to year with double-digit growth (as reported and adjusted for currency) in high-end hardware products primarily from the demand for flash as well as the capacity increase linked to mainframe demand. There was also continued growth as reported and adjusted for currency in all-flash array offerings in this high-growth market.

Systems strategic imperatives revenue of $2.1 billion grew 91 percent year to year as reported (86 percent adjusted for currency). Cloud revenue of $1.7 billion grew 90 percent as reported (86 percent adjusted for currency).

The Systems gross profit margin decreased 1.2 points to 55.7 percent in the fourth quarter of 2017 compared to the prior year, but improved sequentially compared to the third quarter of 2017 consistent with product cycle dynamics. The overall decrease year-to-year was driven by margin declines across all product lines, partially offset by product mix primarily toward the higher-margin IBM Z. In the fourth quarter of 2017, pre-tax income of $908 million grew 56.8 percent and pre-tax margin increased 4.3 points year to year to 25.9 percent driven by the strong fourth quarter performance in Systems Hardware. The company continues to deliver innovation it its systems and remains focused on continually reinventing this portfolio.

Global Financing

Global Financing revenue of $450 million increased 0.8 percent year to year. Global Financing fourth quarter pre-tax income decreased 1.2 percent to $443 million and the pre-tax margin of 44.4 percent decreased 4.9 points year to year. The decrease in pre-tax income was driven by a decrease in gross profit and an increase in financing receivable provisions, partially offset by a decrease in SG&A expense.

Geographic Revenue

Total geographic revenue of $22,450 million increased 3.6 percent as reported and 1 percent adjusted for currency in the fourth quarter of 2017 compared to the prior year. Americas revenue of $10,752 million increased 4.6 percent as reported and 4 percent adjusted for currency. This represented sequential improvement compared to the year-to-year growth rate in the third quarter of 2017 of 6.6 points as reported (6 points adjusted for currency). EMEA fourth quarter revenue of $7,159 million increased 6.3 percent as reported, but decreased 1 percent adjusted for currency. Asia Pacific revenue of $4,540 million declined 2.2 percent and 2 percent adjusted for currency.

Within Americas, revenue in the U.S. increased 2.9 percent compared to the prior year. Canada increased 15.7 percent as reported and 10 percent adjusted for currency. Latin America increased 6.8 percent as reported and 6 percent adjusted for currency. Within Latin America, Brazil increased 13.1 percent as reported and 12 percent adjusted for currency.

In the fourth quarter, EMEA revenue performance by country varied. The UK increased 2.4 percent as reported, but decreased 4 percent adjusted for currency. Germany increased 0.5 percent as reported, but decreased 8 percent adjusted for currency. France increased 20.8 percent as reported and 10 percent adjusted for currency. Spain was up 18.9 percent as reported and 8 percent adjusted for currency and Italy was essentially flat as reported, but down 9 percent adjusted for currency. Russia was up 12.3 percent (12 percent adjusted for currency).

Within Asia Pacific, China decreased 16.2 percent as reported and 18 percent adjusted for currency primarily due to strong sales in the banking industry in the prior year. Japan increased 1.0 percent as reported and 4 percent adjusted for currency and India increased 7.7 percent as reported and 3 percent adjusted for currency.

Total Expense and Other (Income)

($ in millions)

For the fourth quarter:	2017	2016	Yr.-to-Yr. Percent/ Margin Change
Total consolidated expense and other (income)	**$ 6,393**	$ 5,907	8.2%
Non-operating adjustments			
Amortization of acquired intangible assets	**(115)**	(132)	(13.5)
Acquisition-related charges	**(33)**	(4)	NM
Non-operating retirement-related (costs)/income	**(195)**	(76)	156.9
Operating (non-GAAP) expense and other (income)	**$ 6,050**	$ 5,696	6.2%
Total consolidated expense-to-revenue ratio	**28.4%**	27.1%	1.2pts.
Operating (non-GAAP) expense-to-revenue ratio	**26.8%**	26.2%	0.7pts.

NM—Not meaningful

Total expense and other (income) increased 8.2 percent in the fourth quarter with an expense-to-revenue ratio of 28.4 percent compared to 27.1 percent in the fourth quarter of 2016. Total operating (non-GAAP) expense and other (income) increased 6.2 percent year to year. The year-to-year increase in total expense and other (income) was primarily the result of the effects of currency (4 points) and lower intellectual property income (3 points). The expense dynamics reflected continued efficiency in the underlying spending offset by continued investment to build and reinvent new solutions and platforms.

Cash Flow

The company generated $5.7 billion in cash flow from operating activities in the fourth quarter of 2017, an increase of $1.8 billion compared to the fourth quarter of 2016, primarily due to improved working capital. Net cash used in investing activities of $3.8 billion was $0.1 billion higher than the prior year, primarily driven by an increase in cash from net purchases of marketable securities and other investments ($0.3 billion). Net cash used in financing activities of $0.9 billion decreased $0.4 billion compared to the prior year, primarily driven by higher net debt issuances ($0.3 billion) and lower common stock repurchases ($0.2 billion).

GAAP Reconciliation

The tables below provide a reconciliation of the company's income statement results as reported under GAAP to its operating earnings presentation which is a non-GAAP measure. The company's calculation of operating (non-GAAP) earnings, as presented, may differ from similarly titled measures reported by other companies. Refer to the "Operating (non-GAAP) Earnings" section on pages 26 and 27 for the company's rationale for presenting operating earnings information.

($ in millions except per share amounts)

For the fourth quarter 2017:	GAAP	Acquisition-Related Adjustments	Retirement-Related Adjustments	Tax Reform One-Time Charge [1]	Operating (non-GAAP)
Gross profit	**$ 10,862**	**$ 99**	**$ 209**	**$ —**	**$ 11,170**
Gross profit margin	**48.2%**	**0.4pts.**	**0.9pts.**	**—pts.**	**49.5%**
SG&A	**$ 5,147**	**$ (116)**	**$ (145)**	**$ —**	**$ 4,886**
RD&E	**1,427**	**—**	**(50)**	**—**	**1,378**
Other (income) and expense	**2**	**(32)**	**—**	**—**	**(30)**

Total expense and other (income)	**6,393**	**(148)**	**(195)**	**—**	**6,050**
Pre-tax income from continuing operations	**4,469**	**247**	**404**	**—**	**5,120**
Pre-tax margin from continuing operations	**19.8%**	**1.1pts.**	**1.8pts.**	**—pts.**	**22.7%**
Provision for income taxes*	**$ 5,522**	**$ 67**	**$ 197**	**$ (5,475)**	**$ 310**
Effective tax rate	**123.6%**	**(4.7)pts.**	**(5.9)pts.**	**(106.9)pts.**	**6.1%**
Income/(loss) from continuing operations	**$ (1,053)**	**$ 181**	**$ 206**	**$ 5,475**	**$ 4,809**
Income/(loss) margin from continuing operations	**(4.7)%**	**0.8pts.**	**0.9pts.**	**24.3pts.**	**21.3%**
Diluted earnings/(loss) per share from continuing operations	**$ (1.14)**	**$ 0.19**	**$ 0.22**	**$ 5.91**	**$ 5.18**

* The tax impact on operating (non-GAAP) pre-tax income from continuing operations is calculated under the same accounting principles applied to the GAAP pre-tax income which employs an annual effective tax rate method to the results.

(1) Operating (non-GAAP) earnings excludes a charge of $5.5 billion associated with the enactment of U.S. tax reform due to its unique non-recurring nature.

($ in millions except per share amounts)

For the fourth quarter 2016:	GAAP	Acquisition-Related Adjustments	Retirement-Related Adjustments	Operating (non-GAAP)
Gross profit	$ 10,893	$ 124	$ 78	$ 11,095
Gross profit margin	50.0%	0.6pts.	0.4pts.	51.0%
SG&A	$ 4,976	$ (136)	$ (69)	$ 4,771
RD&E	1,431	—	(6)	1,425
Other (income) and expense	(136)	0	—	(136)
Total expense and other (income)	5,907	(136)	(76)	5,696
Pre-tax income from continuing operations	4,986	260	154	5,399
Pre-tax margin from continuing operations	22.9%	1.2pts.	0.7pts.	24.8%
Provision for income taxes*	$ 480	$ 66	$ 77	$ 623
Effective tax rate	9.6%	0.8pts.	1.2pts.	11.5%
Income from continuing operations	$ 4,505	$ 193	$ 77	$ 4,776
Income margin from continuing operations	20.7%	0.9pts.	0.4pts.	21.9%
Diluted earnings per share from continuing operations	$ 4.73	$ 0.20	$ 0.08	$ 5.01

* The tax impact on operating (non-GAAP) pre-tax income from continuing operations is calculated under the same accounting principles applied to the GAAP pre-tax income which employs an annual effective tax rate method to the results.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

PRIOR YEAR IN REVIEW

This section provides a summary of the company's financial performance in 2016 as compared to 2015. For additional information, see the company's 2016 Annual Report.

($ and shares in millions except per share amounts)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent/ Margin Change
Revenue	$ 79,919	$ 81,741	(2.2)%*
Gross profit margin	47.9%	49.8%	(1.9)pts.
Total expense and other (income)	$ 25,964	$ 24,740	4.9%
Total expense and other (income)-to-revenue ratio	32.5%	30.3%	2.2pts.
Income from continuing operations before income taxes	$ 12,330	$ 15,945	(22.7)%
Provision for income taxes from continuing operations	$ 449	$ 2,581	(82.6)%
Income from continuing operations	$ 11,881	$ 13,364	(11.1)%
Income from continuing operations margin	14.9%	16.3%	(1.5)pts.
Loss from discontinued operations, net of tax	$ (9)	$ (174)	(95.1)%
Net income	$ 11,872	$ 13,190	(10.0)%
Earnings per share from continuing operations:			
Assuming dilution	$ 12.39	$ 13.60	(8.9)%
Consolidated earnings per share—assuming dilution	$ 12.38	$ 13.42	(7.7)%
Weighted-average shares outstanding			

Assuming dilution		958.7		982.7	(2.4)%
Assets**	$	117,470	$	110,495	6.3%
Liabilities**	$	99,078	$	96,071	3.1%
Equity**	$	18,392	$	14,424	27.5%

* (1.6) percent adjusted for currency.
**At December 31

The following table provides the company's operating (non-GAAP) earnings for 2016 and 2015.

($ in millions except per share amounts)

For the year ended December 31:		2016		2015	Yr.-to-Yr. Percent Change
Net income as reported	$	11,872	$	13,190	(10.0)%
Loss from discontinued operations, net of tax		(9)		(174)	(95.1)
Income from continuing operations	$	11,881	$	13,364	(11.1)%
Non-operating adjustments (net of tax)					
Acquisition-related charges		735		562	30.9
Non-operating retirement-related costs/(income)		415		734	(43.5)
Operating (non-GAAP) earnings*	$	13,031	$	14,659	(11.1)%
Diluted operating (non-GAAP) earnings per share	$	13.59	$	14.92	(8.9)%

* See page 65 for a more detailed reconciliation of net income to operating earnings.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Snapshot

In 2016, the company delivered $79.9 billion in revenue, $11.9 billion in income from continuing operations and $13.0 billion in operating (non-GAAP) earnings, resulting in diluted earnings per share from continuing operations of $12.39 as reported and $13.59 on an operating (non-GAAP) basis. On a consolidated basis, net income in 2016 was $11.9 billion, with diluted earnings per share of $12.38. The company generated $17.0 billion in cash from operations and $11.6 billion in free cash flow in 2016 and shareholder returns of $8.8 billion in gross common stock repurchases and dividends.

In 2016, the company:

- Delivered strong results in the strategic imperatives;
- Made progress in building new businesses and creating new markets;
- Delivered innovation in the more traditional businesses and monetized core technologies; and
- Continued to return capital to shareholders.

Total consolidated revenue in 2016 decreased 2.2 percent as reported and 1.6 percent year to year adjusted for currency. Annuity revenue increased as reported and adjusted for currency while transactional revenue declined year to year. In addition, acquisitions completed in the prior 12-month period contributed to revenue growth.

In 2016, the company had continued strong revenue growth in cloud, analytics, mobile and security, which together grew 13 percent year to year as reported and 14 percent adjusted for currency. The strategic imperatives generated $32.8 billion in revenue, which represented 41 percent of the company's revenue, an increase of 6 points from 2015. Total Cloud revenue of $13.7 billion increased 35 percent both as reported and adjusted for currency, with cloud as-a-Service revenue up 55 percent as reported and 57 percent adjusted for currency. The company exited 2016 with an annual run rate for cloud as-a-Service revenue of $8.6 billion, up from $5.3 billion at the end of 2015. Analytics revenue of $19.5 billion increased 9 percent as reported and adjusted for currency. Mobile revenue increased 34 percent year to year as reported (35 percent adjusted for currency) and Security revenue increased 13 percent as reported (14 percent adjusted for currency).

From a segment perspective, Cognitive Solutions revenue increased 1.9 percent as reported and 3 percent adjusted for currency with growth in Solutions Software, led by an increase in Analytics and Security revenue; partially offset by a decline in Transaction Processing Software. GBS revenue decreased 2.7 percent as reported and 3 percent adjusted for currency primarily driven by a decline in Consulting revenue. Revenue performance continued to be impacted by the company's shift away from traditional businesses, such as ERP implementations. GBS strategic imperatives revenue had double-digit growth year to year as reported and adjusted for currency. Technology Services & Cloud Platforms revenue increased 0.6 percent as reported and 1 percent adjusted for

currency led by growth in Infrastructure Services as the company assisted clients in modernizing and transforming their infrastructures. Technology Services & Cloud Platforms strategic imperatives revenue was up 39 percent (40 percent adjusted for currency) year to year. Systems revenue decreased 19.2 percent (19 percent adjusted for currency) with IBM Z down 27.1 percent (27 percent adjusted for currency) and Power Systems down 27.1 percent (27 percent adjusted for currency).

The consolidated gross profit margin of 47.9 percent decreased 1.9 points year to year and reflected the impact of the company's investments, including acquisitions, and mix to as-a-Service. The operating (non-GAAP) gross margin of 48.9 percent decreased 1.9 points compared to 2015 driven primarily by the same factors.

Total expense and other (income) increased 4.9 percent in 2016 compared to the prior year. Total operating (non-GAAP) expense and other (income) increased 5.6 percent compared to 2015. The year-to-year increase in total expense was driven primarily by the impact of acquisitions completed in the prior 12 months (5 points) and the impact from currency (2 points). Total expense and other (income) in 2016 also included charges for actions taken to accelerate the transformation of the company's workforce and shift its skill base, as well as increased investments in the strategic areas of cognitive, security and cloud. This included a higher level of workforce rebalancing charges ($451 million) year to year and real estate capacity charges ($291 million) related to the workforce transformation. Partially offsetting these increases was a higher level of IP income ($950 million) year to year driven primarily by the company's software licensing arrangements.

Pre-tax income from continuing operations of $12.3 billion decreased 22.7 percent year to year and the pre-tax margin was 15.4 percent, a decrease of 4.1 points versus 2015. The continuing operations effective tax rate for 2016 was 3.6 percent, a decrease of 12.5 points versus 2015. The tax rate in 2016 was primarily the result of a refund ($1.0 billion) of previously paid non-U.S. taxes plus interest in the first quarter of 2016. Income from continuing operations of $11.9 billion decreased 11.1 percent and the net income margin was 14.9 percent, a decrease of 1.5 points versus 2015. Losses from discontinued operations, net of tax, were $9 million in 2016 compared to $174 million in 2015. Net income of $11.9 billion decreased 10.0 percent year to year. Operating (non-GAAP) pre-tax income from continuing operations of $13.9 billion decreased 21.3 percent year to year and the operating (non-GAAP) pre-tax margin from continuing operations decreased 4.2 points to 17.4 percent. Operating (non-GAAP) income from continuing operations of $13.0 billion decreased 11.1 percent and the operating (non-GAAP) income margin from continuing operations of 16.3 percent decreased 1.6 points. The operating (non-GAAP) effective tax rate from continuing operations in 2016 was 6.5 percent versus 17.2 percent in 2015.

Diluted earnings per share from continuing operations of $12.39 in 2016 decreased 8.9 percent year to year. In 2016, the company repurchased 23.3 million shares of its common stock at a cost of $3.5 billion. Operating (non-GAAP) diluted earnings per share of $13.59 decreased 8.9 percent versus 2015. Diluted earnings/(loss) per share from discontinued operations was $(0.01) in 2016 compared to $(0.18) in 2015.

At December 31, 2016, the company continued to have the financial flexibility to support the business over the long term. Cash and marketable securities at December 31, 2016 were $8.5 billion, an increase of $0.3 billion from December 31, 2015. Key drivers in the balance sheet and total cash flows were:

Total assets increased $7.0 billion ($7.7 billion adjusted for currency) from December 31, 2015 driven by:

- Increases in goodwill ($4.2 billion), retirement plan assets ($1.3 billion), net intangible assets ($1.2 billion), deferred taxes ($0.4 billion) and cash and marketable securities ($0.3 billion).

Total liabilities increased $3.0 billion ($3.9 billion adjusted for currency) from December 31, 2015 driven by:

- Increases in total debt ($2.3 billion), retirement-related liabilities ($0.6 billion), and taxes ($0.4 billion).

Total equity of $18.4 billion increased $4.0 billion from December 31, 2015 as a result of:

- Increases from net income ($11.9 billion) and stock-based compensation ($0.5 billion); partially offset by

- Decreases from dividends ($5.3 billion) and share repurchases ($3.5 billion).

The company generated $17.0 billion in cash flow provided by operating activities, essentially flat compared to 2015, driven primarily by operational performance; offset by lower income tax payments. Net cash used in investing activities of $11.0 billion was $2.8 billion higher than 2015, primarily driven by an increase in cash used related to acquisitions ($2.3 billion). Net cash used in financing activities of $5.8 billion decreased $3.4 billion compared to the prior year, driven primarily by higher net debt issuances ($2.7 billion) and a decline in cash used for common share repurchases ($1.1 billion).

Results of Continuing Operations

Segment Details

The following is an analysis of the 2016 versus 2015 reportable segment results. The table below presents each reportable segment's external revenue and gross margin results. Segment pre-tax income includes transactions between segments that are intended to reflect an arm's-length transfer price and excludes certain unallocated corporate items.

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent/ Margin Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Revenue				
Cognitive Solutions	$ 18,187	$ 17,841	1.9%	2.7%
Gross margin	81.9%	85.1%	(3.3)pts.	
Global Business Services	16,700	17,166	(2.7)%	(2.5)%
Gross margin	27.0%	28.2%	(1.2)pts.	
Technology Services & Cloud Platforms	35,337	35,142	0.6%	1.4%
Gross margin	41.9%	42.7%	(0.8)pts.	
Systems	7,714	9,547	(19.2)%	(18.9)%
Gross margin	55.7%	55.8%	(0.1)pts.	
Global Financing	1,692	1,840	(8.0)%	(6.9)%
Gross margin	38.7%	45.6%	(6.9)pts.	
Other	289	206	40.4%	41.3%
Gross margin	(293.9)%	(253.0)%	(41.0)pts.	
Total consolidated revenue	$ 79,919	$ 81,741	(2.2)%	(1.6)%
Total consolidated gross profit	$ 38,294	$ 40,684	(5.9)%	
Total consolidated gross margin	47.9%	49.8%	(1.9)pts.	
Non-operating adjustments				
Amortization of acquired intangible assets	494	373	32.6%	
Retirement-related costs/(income)	316	469	(32.7)%	
Operating (non-GAAP) gross profit	$ 39,104	$ 41,526	(5.8)%	
Operating (non-GAAP) gross margin	48.9%	50.8%	(1.9)pts.	

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Cognitive Solutions

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Cognitive Solutions external revenue	$ 18,187	$ 17,841	1.9%	2.7%
Solutions Software	$ 12,589	$ 12,021	4.7%	5.5%
Transaction Processing Software	5,598	5,819	(3.8)	(3.1)

The growth in Solutions Software revenue, which addresses many of the company's strategic areas, was led by analytics and security offerings. Analytics continued to grow in key areas including Watson offerings such as Watson Health. Security also contributed to year-to-year growth, as the company continued to invest to build its security platform. There was strong SaaS performance during the year with double-digit growth in revenue as reported and adjusted for currency. In 2016, five acquisitions, including The Weather Company and Truven, added substantial new capabilities to the Solutions Software portfolio. Transaction Processing Software revenue declined as reported and adjusted for currency compared to the prior year. The majority of the Transaction Processing Software is on-premise and annuity in nature which is not a growing part of the software opportunity.

Within Cognitive Solutions, total 2016 strategic imperatives revenue of $11.7 billion grew 7 percent as reported (8 percent adjusted for currency) year to year. Cloud revenue of $2.1 billion grew 53 percent as reported (54 percent adjusted for currency), with an as-a-Service exit run rate of $1.8 billion.

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent/ Margin Change
Cognitive Solutions			
External gross profit	$ 14,890	$ 15,189	(2.0)%
External gross profit margin	81.9%	85.1%	(3.3)pts.
Pre-tax income	$ 6,352	$ 7,245	(12.3)%
Pre-tax margin	30.5%	36.1%	(5.6)pts.

Profit performance in Cognitive Solutions in 2016 reflected impacts of the company's continued investment into strategic areas, including acquisition content, and the mix toward the SaaS business which was not yet at scale, partially offset by the impact of IP partnership agreements entered into during the year.

Global Business Services

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Global Business Services external revenue	$ 16,700	$ 17,166	(2.7)%	(2.5)%
Consulting	$ 7,332	$ 7,678	(4.5)%	(4.8)%
Global Process Services	1,388	1,435	(3.3)	(2.0)
Application Management	7,980	8,053	(0.9)	(0.5)

Global Business Services revenue decreased in 2016 compared to the prior year with declines across all services lines. The company continued to aggressively shift the GBS business in 2016 to the strategic imperatives which made up more than half of GBS revenue in 2016. Within GBS, total 2016 strategic imperatives revenue of $8.9 billion grew 16 percent as reported and adjusted for currency year to year. Cloud revenue of $3.0 billion grew 68 percent as reported (66 percent adjusted for currency), with an as-a-Service exit run rate of $1.1 billion. This growth was more than offset by declines in the more traditional areas that the company is shifting away from, such as large ERP implementations.

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent/ Margin Change
Global Business Services			
External gross profit	$ 4,501	$ 4,837	(6.9)%
External gross profit margin	27.0%	28.2%	(1.2)pts.
Pre-tax income	$ 1,732	$ 2,602	(33.4)%
Pre-tax margin	10.1%	14.7%	(4.6)pts.

Profit performance for 2016 reflected the company's investments, additional spending in certain accounts to deliver on client commitments, and price and profit pressure in more traditional engagements. The company continued to invest and shift resources to higher-value services around digital and cognitive. The company invested in enablement, hiring top talent and bringing in new skills through acquisitions, and focused on integrating and scaling these new skills.

Technology Services & Cloud Platforms

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Technology Services & Cloud Platforms external revenue	$ 35,337	$ 35,142	0.6%	1.4%
Infrastructure Services	$ 23,543	$ 23,075	2.0%	2.7%
Technical Support Services	7,272	7,426	(2.1)	(1.0)
Integration Software	4,521	4,641	(2.6)	(1.5)

In Technology Services & Cloud Platforms the business has been shifting from systems integration to services integration, which provided momentum in its new offerings. Infrastructure Services revenue grew as reported and adjusted for currency, partially offset by declines in Technical Support Services and Integration Software. Within Technology Services & Cloud Platforms, total 2016 strategic imperatives revenue of $8.7 billion grew 39 percent as reported (40 percent adjusted for currency) year to year. Cloud revenue of $5.9 billion grew 49 percent as reported (50 percent adjusted for currency), with an as-a-Service exit run rate of $5.8 billion.

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent/ Margin Change
Technology Services & Cloud Platforms			
External Technology Services gross profit	$ 10,969	$ 11,008	(0.4)%
External Technology Services gross profit margin	35.6%	36.1%	(0.5)pts.

External Integration Software gross profit	$	3,830	$	4,005	(4.4)%
External Integration Software gross profit margin		84.7%		86.3%	(1.6)pts.
External total gross profit	$	14,800	$	15,014	(1.4)%
External total gross profit margin		41.9%		42.7%	(0.8)pts.
Pre-tax income	$	4,707	$	5,669	(17.0)%
Pre-tax margin		13.1%		15.8%	(2.8)pts.

The Technology Services & Cloud Platforms gross profit margin year-to-year decline was partially due to mix within the segment and margin declines in Technical Support Services and Integration Software, partially offset by an improved margin in Infrastructure Services. The margin improvement in Infrastructure Services reflected the benefits from delivery transformation and ongoing productivity actions related to automation, process optimization and leveraging the company's scale, technology and talent. The company invested in cognitive capabilities to further improve its delivery model and drive efficiencies. The Technical Support Services margin decline reflected the mix to multi-vendor support offerings. The Integration Software margin declined as the portfolio continued to shift to an as-a-Service model. The pre-tax margin reflected the dynamics impacting gross profit and the continued investments to build out the cloud platform, partially offset by the impact of IP partnership agreements entered into during the year.

Systems

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Systems external revenue	$ 7,714	$ 9,547	(19.2)%	(18.9)%
Systems Hardware	$ 5,926	$ 7,574	(21.8)%	(21.6)%
IBM Z			(27.1)	(26.8)
Power Systems			(27.1)	(26.8)
Storage Systems			(10.0)	(10.0)
Operating Systems Software	1,788	1,973	(9.4)	(8.7)

The year-to-year decline in Systems revenue in 2016 reflected market shifts and product cycle dynamics. Within Systems Hardware, the IBM Z revenue decline reflected product cycle dynamics. Throughout 2016, the company continued to optimize IBM Z to drive new workloads such as blockchain and instant payments. The year-to-year decline in Power Systems revenue reflected the underlying dynamics of a declining market for UNIX, where IBM continued to be the market leader, partially offset by growth in the expanding Linux market. The decline in Storage Systems revenue year to year reflected the weakness in the traditional disk storage market. Within Systems, total 2016 strategic imperatives revenue of $3.4 billion decreased 15 percent as reported and adjusted for currency year to year. Cloud revenue of $2.7 billion decreased 11 percent as reported and adjusted for currency as a result of a strong 2015 with the mainframe cycle.

($ in millions)

For the year ended December 31:		2016		2015	Yr.-to-Yr. Percent/ Margin Change
Systems					
External Systems Hardware gross profit	$	2,720	$	3,536	(23.1)%
External Systems Hardware gross profit margin		45.9%		46.7%	(0.8)pts.
External Operating Systems Software gross profit	$	1,577	$	1,790	(11.9)%
External Operating Systems Software gross profit margin		88.2%		90.7%	(2.5)pts.
External total gross profit	$	4,298	$	5,326	(19.3)%
External total gross profit margin		55.7%		55.8%	(0.1)pts.
Pre-tax income	$	933	$	1,722	(45.8)%
Pre-tax margin		11.0%		16.7%	(5.7)pts.

The Systems gross profit margin decline year to year was driven by declines in Power and Storage partially offset by expansion in IBM Z margins. The pre-tax income performance was consistent with the product cycle and portfolio transition dynamics impacting revenue and profit.

Global Financing

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent Change
Results of Operations			
External revenue	$ 1,692	$ 1,840	(8.0)%
Internal revenue	1,802	2,637	(31.7)
Total revenue	$ 3,494	$ 4,477	(22.0)%
Pre-tax income	$ 1,656	$ 2,364	(29.9)%

The decline in Global Financing total revenue was due to declines in both external revenue and internal revenue. External revenue decreased year to year due to a decrease in financing revenue (down 11.2 percent), partially offset by an increase in used equipment sales (up 1.6 percent). The decrease in external financing revenue was due to lower asset yields, a decrease in average asset balance and a decline in remarketing lease revenue. Internal revenue decreased due to lower used equipment sales (down 35.5 percent) and financing revenue (down 5.2 percent). The decrease in internal financing revenue was primarily due to lower asset yields, partially offset by an increase in average asset balance. The decrease in Global Financing pre-tax income was driven by a decrease in gross profit and an increase in SG&A expense, partially offset by a decrease in financing receivables provisions.

Geographic Revenue

In addition to the revenue presentation by reportable segment, the company also measures revenue performance on a geographic basis. The following geographic, regional and country-specific revenue performance excludes OEM revenue.

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency*
Total revenue	$ 79,919	$ 81,741	(2.2)%	(1.6)%
Geographies	$ 79,594	$ 81,430	(2.3)%	(1.6)%
Americas	37,513	38,486	(2.5)	(1.4)
Europe/Middle East/Africa	24,769	26,073	(5.0)	(2.1)
Asia Pacific	17,313	16,871	2.6	(1.2)

Americas revenue decreased year to year as reported and adjusted for currency with declines in North America and Latin America as reported and adjusted for currency. Within North America, the U.S. decreased 0.9 percent and Canada decreased 6.2 percent (3 percent adjusted for currency). In Latin America, Brazil decreased 10.5 percent (7 percent adjusted for currency) and Mexico decreased 14.5 percent (7 percent adjusted for currency).

EMEA revenue decreased as reported and adjusted for currency. The UK decreased 12.8 percent (1 percent adjusted for currency). Germany decreased 5.1 percent (5 percent adjusted for currency). Revenue declined in France 3.4 percent (3 percent adjusted for currency). Italy increased 4.0 percent (4 percent adjusted for currency) year to year. The Middle East and Africa region grew 0.6 percent (3 percent adjusted for currency), while there was a decline in the Central and Eastern European region as reported and adjusted for currency including a year-to-year decline in Russia of 27.1 percent.

Asia Pacific revenue increased as reported, but declined adjusted for currency. Japan grew 10.5 percent as reported, but declined 1 percent adjusted for currency. India grew 5.2 percent as reported and 10 percent adjusted for currency. China decreased 2.4 percent as reported, but was flat on an adjusted for currency basis. Australia decreased 9.7 percent (8 percent adjusted for currency).

Total Expense and Other (Income)

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent/ Margin Change
Total consolidated expense and other (income)	$ 25,964	$ 24,740	4.9%
Non-operating adjustments			
Amortization of acquired intangible assets	(503)	(304)	65.7
Acquisition-related charges	(5)	(26)	(81.0)
Non-operating retirement- related (costs)/income	(282)	(581)	(51.4)
Operating (non-GAAP) expense and other (income)	$ 25,174	$ 23,830	5.6%
Total consolidated expense-to-revenue ratio	32.5%	30.3%	2.2pts.
Operating (non-GAAP) expense-to-revenue ratio	31.5%	29.2%	2.3pts.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Selling, General and Administrative

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent Change
Selling, general and administrative expense			
Selling, general and administrative—other	$ 16,971	$ 16,643	2.0%
Advertising and promotional expense	1,327	1,290	2.8
Workforce rebalancing charges	1,038	587	76.7
Retirement-related costs	742	1,052	(29.5)
Amortization of acquired intangible assets	503	304	65.7
Stock-based compensation	401	322	24.3
Bad debt expense	87	231	(62.3)
Total consolidated selling, general and administrative expense	$ 21,069	$ 20,430	3.1%
Non-operating adjustments			
Amortization of acquired intangible assets	(503)	(304)	65.7
Acquisition-related charges	2	(21)	NM
Non-operating retirement-related (costs)/income	(253)	(533)	(52.6)
Operating (non-GAAP) selling, general and administrative expense	$ 20,315	$ 19,573	3.8%

NM—Not meaningful

Total SG&A expense increased 3.1 percent in 2016 versus 2015, driven primarily by the following factors:

- The impact of acquisitions completed in the prior 12-month period (4 points); and
- Higher workforce rebalancing charges (2 points); partially offset by
- The effects of currency (1 point); and
- A year-to-year decrease in charges for pension obligations related to litigation in Spain (1 point).

Operating (non-GAAP) expense increased 3.8 percent year to year driven primarily by the same factors excluding the year-to-year decrease in charges for pension obligations related to litigation which is not reflected in operating (non-GAAP) expense.

Bad debt expense decreased $144 million in 2016 compared to 2015. The receivables provision coverage was 2.0 percent at December 31, 2016, a decrease of 60 basis points from December 31, 2015 due to write-offs of previously reserved receivables in 2016.

Research, Development and Engineering

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent Change
Total consolidated research, development and engineering	$ 5,751	$ 5,247	9.6%
Non-operating adjustment			
Non-operating retirement-related (costs)/income	(29)	(48)	(38.6)
Operating (non-GAAP) research, development and engineering	$ 5,722	$ 5,200	10.1%

RD&E expense was 7.2 percent of revenue in 2016 and 6.4 percent of revenue in 2015.

RD&E expense increased 9.6 percent in 2016 versus 2015 primarily driven by:

- The impact of acquisitions completed in the prior 12-month period (7 points); and
- Increased investment (4 points); partially offset by
- The effects of currency (1 point).

Operating (non-GAAP) RD&E expense increased 10.1 percent in 2016 compared to the prior year, driven primarily by the same factors.

Intellectual Property and Custom Development Income

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent Change
Licensing of intellectual property including royalty-based fees	$ 1,390	$ 407	241.8%
Custom development income	214	262	(18.4)
Sales/other transfers of intellectual property	27	13	113.4
Total	$ 1,631	$ 682	139.3%

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Licensing of intellectual property including royalty-based fees increased year to year, primarily due to licensing of certain intellectual property in 2016 within the company's Integration Software and Cognitive Solutions software portfolio, which included four transactions each with period income greater than $100 million. The company licenses IP to partners who allocate their skills to extend the value of assets that are high value, but may be in mature markets. There were no significant individual IP transactions in 2015. The timing and amount of licensing, sales or other transfers of IP may vary significantly from period to period depending upon the timing of licensing agreements, economic conditions, industry consolidation and the timing of new patents and know-how development.

Other (Income) and Expense

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent Change
Other (income) and expense			
Foreign currency transaction losses/(gains)	$ (116)	$ 414	NM
(Gains)/losses on derivative instruments	260	(853)	NM
Interest income	(108)	(72)	49.1%
Net (gains)/losses from securities and investment assets	23	47	(50.5)
Other	85	(260)	NM
Total consolidated other (income) and expense	$ 145	$ (724)	NM
Non-operating adjustment			
Acquisition-related charges	(7)	(5)	35.2
Operating (non-GAAP) other (income) and expense	$ 138	$ (729)	NM

NM—Not meaningful

Total consolidated other (income) and expense was expense of $145 million in 2016 compared to income of $724 million in 2015. The decrease in income of $869 million year over year was primarily driven by:

- Lower net exchange gains ($593 million); and
- Real estate capacity charges related to the first-quarter 2016 workforce transformation ($291 million).

Interest Expense

($ in millions)

For the year ended December 31:	2016	2015	Yr.-to-Yr. Percent Change
Interest expense			
Total	$ 630	$ 468	34.4%

The increase in interest expense compared to 2015 was primarily driven by higher average debt levels and higher average interest rates. Overall interest expense (excluding capitalized interest) in 2016 was $1,206 million, an increase of $197 million year to year.

Income Taxes

The continuing operations effective tax rate for 2016 was 3.6 percent, a decrease of 12.5 points versus the prior year. The benefit resulting from the favorable resolution of the Japan tax matter drove a 9.5 point reduction in the rate in 2016. Without that discrete item, the continuing operations effective tax rate for 2016 would have been 13.1 percent, with the remaining change in the rate year to year driven primarily by the following factors:

- A benefit due to the year-to-year decrease in tax charges related to intercompany payments made by foreign subsidiaries and the intercompany licensing of certain IP of 5.7 points; and

- A reduced benefit year to year related to audit settlements of 2.3 points.

The continuing operations operating (non-GAAP) effective tax rate was 6.5 percent, a decrease of 10.7 points versus 2015 principally driven by the same factors described above. Without the Japan benefits, the continuing operations (non-GAAP) effective tax rate would have been 14.9 percent.

Financial Position

Cash and marketable securities at year end were $8,527 million. During the year, the company continued to manage the investment portfolio to meet its capital preservation and liquidity objectives.

Total debt of $42,169 million increased $2,279 million from December 31, 2015. The commercial paper balance at December 31, 2016, was $899 million, an increase of $299 million from the prior-year level. Within total debt, $27,859 million was in support of the Global Financing business which was leveraged at a 7.3 to 1 ratio. The company continued to have substantial flexibility in the debt markets. During 2016, the company completed bond issuances totaling $7,873 million, with terms ranging from 1.5 to 30 years, and interest rates ranging from 0.50 to 4.70 percent depending on maturity. The company generated strong cash flow from operations and continued to have access to additional sources of liquidity through the capital markets and its $10.25 billion global credit facility.

Consistent with accounting standards, the company remeasured the funded status of its retirement and postretirement plans at December 31. At December 31, 2016, the overall net underfunded position was $14,840 million, a decrease of $674 million from December 31, 2015 driven by asset returns partially offset by a decrease in discount rates. At December 31, 2016, the company's qualified defined benefit plans were well funded. In 2016, the return on the U.S. Personal Pension Plan assets was 6.2 percent and the plan was 102 percent funded at December 31. Overall, global asset returns were 8.5 percent and the qualified defined benefit plans worldwide were 98 percent funded at December 31, 2016.

During 2016, the company generated $17,084 million in cash from operations, a decrease of $171 million compared to 2015. In addition, the company generated $11,700 million in free cash flow, a decrease of $1,623 million versus the prior year. The company returned $8,758 million to shareholders in 2016, with $5,256 million in dividends and $3,502 million in gross share repurchases. In 2016, the company repurchased 23.3 million shares.

GAAP Reconciliation

The tables below provide a reconciliation of the company's income statement results as reported under GAAP to its operating earnings presentation which is a non-GAAP measure. The company's calculation of operating (non-GAAP) earnings, as presented, may differ from similarly titled measures reported by other companies. Please refer to the "Operating (non-GAAP) Earnings" section on pages 26 and 27 for the company's rationale for presenting operating earnings information.

($ in millions except per share amounts)

For the year ended December 31, 2016:	GAAP	Acquisition-Related Adjustments	Retirement-Related Adjustments	Operating (non-GAAP)
Gross profit	$ 38,294	$ 494	$ 316	$ 39,104
Gross profit margin	47.9%	0.6pts.	0.4pts.	48.9%
SG&A	$ 21,069	$ (501)	$ (253)	$ 20,315
RD&E	5,751	—	(29)	5,722
Other (income) and expense	145	(7)	—	138
Total expense and other (income)	25,964	(508)	(282)	25,174
Pre-tax income from continuing operations	12,330	1,003	598	13,931
Pre-tax margin from continuing operations	15.4%	1.3pts.	0.7pts.	17.4%
Provision for income taxes*	$ 449	$ 268	$ 183	$ 900
Effective tax rate	3.6%	1.7pts.	1.2pts.	6.5%
Income from continuing operations	$ 11,881	$ 735	$ 415	$ 13,031
Income margin from continuing operations	14.9%	0.9pts.	0.5pts.	16.3%
Diluted earnings per share from continuing operations	$ 12.39	$ 0.77	$ 0.43	$ 13.59

* The tax impact on operating (non-GAAP) pre-tax income is calculated under the same accounting principles applied to the GAAP pre-tax income which employs an annual effective tax rate method to the results.

($ in millions except per share amounts)

	Acquisition-	Retirement-

For the year ended December 31, 2015:	GAAP	Related Adjustments	Related Adjustments	Operating (non-GAAP)
Gross profit	$ 40,684	$ 373	$ 469	$ 41,526
Gross profit margin	49.8%	0.5pts.	0.6pts.	50.8%
SG&A	$ 20,430	$ (324)	$ (533)	$ 19,573
RD&E	5,247	—	(48)	5,200
Other (income) and expense	(724)	(5)	—	(729)
Total expense and other (income)	24,740	(330)	(581)	23,830
Pre-tax income from continuing operations	15,945	703	1,050	17,697
Pre-tax margin from continuing operations	19.5%	0.9pts.	1.3pts.	21.6%
Provision for income taxes*	$ 2,581	$ 141	$ 316	$ 3,037
Effective tax rate	16.2%	0.2pts.	0.9pts.	17.2%
Income from continuing operations	$ 13,364	$ 562	$ 734	$ 14,659
Income margin from continuing operations	16.3%	0.7pts.	0.9pts.	17.9%
Diluted earnings per share from continuing operations	$ 13.60	$ 0.57	$ 0.75	$ 14.92

* The tax impact on operating (non-GAAP) pre-tax income is calculated under the same accounting principles applied to the GAAP pre-tax income which employs an annual effective tax rate method to the results.

OTHER INFORMATION

Looking Forward

The company's strategies, investments and actions are all made with an objective of optimizing long-term performance. A long-term perspective ensures that the company is well-positioned to take advantage of the major shifts in technology, business and the global economy.

As part of its strategic model, the company expects to continue to allocate capital efficiently and effectively to investments, and to return value to shareholders through a combination of dividends and share repurchases. Over the long term, in consideration of the opportunities it will continue to develop, the company expects to have the ability to generate low single-digit revenue growth, and with a higher-value business mix, high single-digit operating (non-GAAP) earnings per share growth, with free cash flow realization of GAAP net income in the 90 to 100 percent range.

The company's 2017 results reflect the work that has been done to reposition the business through investment, shifting skills and reallocating capital—all to enable clients to move to the future. In Cognitive Solutions, performance will be driven by the shift to AI, Watson, security and industry vertical solutions. The company continued to move its offerings to as-a-Service delivery models, and in 2018 will continue to build scale. In the services segments, there is momentum in Consulting driven by digital, and strong revenue growth in cloud, as the company continues to assist clients to build out hybrid environments. The company's expectations from the current services backlog point to an improved revenue trajectory in 2018 versus 2017. The Systems segment had a strong second half of 2017, with the introduction of the z14 with pervasive encryption. The company is ahead of the historical product cycle in the first two quarters since its introduction and in the fourth quarter shipped the most MIPS in history, providing evidence that the market has capacity demand and understands the value in the platform. In addition, the introduction of the new POWER9 processor will bring unprecedented speed to AI workloads and the company has the most competitive storage offerings in some time. As a result, the company enters 2018 with a stronger revenue profile than in 2017.

For full-year 2018, the company expects revenue growth, at mid-January spot rates, and margin stabilization, driven by continued scale in the cloud business and yield from services' productivity improvements. The company expects year-to-year revenue growth in the first quarter of 2018 versus 2017, at both mid-January spot rates and constant currency, with growth rates relatively consistent with the fourth quarter of 2017.

Consistent with the long-term model, the company also expects, over the course of 2018, to continue to acquire key capabilities, remix skills, invest in areas of growth and return value to shareholders. The company will continue to invest to drive growth in the strategic areas and expects a year-to-year headwind in expense in 2018 due to currency hedges. A high level of investment is important as the company continues to build its capabilities in AI, cloud, security and blockchain, among others. Additionally, the company will continue to look for more productivity in spending, especially in the services businesses, along with a remix of skills to the new opportunities. This is all taken into account in the full-year view.

Overall, the company expects GAAP earnings per share from continuing operations for 2018 to be at least $11.70. Excluding acquisition-related charges of $0.78 per share and non-operating retirement-related items of $1.32 per share, operating (non-GAAP) earnings per share is expected to be at least $13.80. For the first quarter of 2018, the company expects operating (non-GAAP) earnings per share to be approximately 17 percent to 18 percent of the full-year expectation. In each of the first quarters of 2017 and 2016, the company had a discrete tax benefit. The company expects a potential benefit again in the first quarter of 2018, and as in the past, will likely take actions that will offset some portion of the benefit. Two accounting changes, revenue recognition and pension cost, that were adopted beginning January 1, 2018, are expected to essentially offset each other within the full-year 2018 operating (non-GAAP) earnings per share expectation. These items are reflected in the first-quarter skew expectations.

Free cash flow realization, which is defined as free cash flow to income from continuing operations (GAAP), is expected to be over 100%. The company expects free cash flow to be approximately $12 billion in 2018. Free cash flow expectations include a year-to-year headwind from strong receivables collections in 2017, an approximate $600 million year-to-year headwind from cash tax payments and an expected growth in capital expenditures.

For 2018, the company expects the GAAP tax rate to be approximately 2 points lower than the operating (non-GAAP) tax rate expectation. The company expects its operating (non-GAAP) tax rate for 2018 to be 16 percent, plus or minus 2 points (excluding discrete items), which is a 4-point headwind year to year. The tax rates reflect the implementation of U.S. tax reform, which includes a lower U.S. corporate tax rate, offset by the broader tax base and reduced foreign tax credit utilization. The rate will change year to year based on nonrecurring events, such as the settlement of income tax audits and changes in tax laws, as well as recurring factors including the geographic mix of income before taxes, state and local taxes and the effects of various global income tax strategies.

The company expects 2018 pre-tax retirement-related plan cost to be approximately $3.2 billion, an increase of approximately $300 million compared to 2017. This estimate reflects current pension plan assumptions at December 31, 2017. Consistent with the newly adopted FASB guidance for the presentation of net periodic pension and postretirement benefit costs, within total retirement-related plan cost, operating retirement-related plan cost is expected to be approximately $1.5 billion, approximately flat versus 2017. Non-operating retirement-related plan cost is expected to be approximately $1.7 billion, an increase of approximately $300 million compared to 2017, driven by lower income from expected return on assets and a year-to-year impact due to the pension obligation adjustment resulting from UK litigation in 2017. Contributions for all retirement-related plans are expected to be approximately $2.4 billion in 2018, approximately flat compared to 2017.

For a discussion of new accounting standards that the company will adopt in future periods, please see note B, “Accounting Changes,” beginning on page 94. For discussion of the company’s presentation of non-operating retirement-related cost, refer to the “Operating (non-GAAP) Earnings” section on pages 26 and 27.

Liquidity and Capital Resources

The company has consistently generated strong cash flow from operations, providing a source of funds ranging between $16.7 billion and $17.8 billion per year over the past five years. The company provides for additional liquidity through several sources: maintaining an adequate cash balance, access to global funding sources, committed global credit facilities and other committed and uncommitted lines of credit worldwide. In 2017, the company and IBM Credit entered into a $2.5 billion 364-day Credit Agreement and a $2.5 billion three-year Credit Agreement. These new agreements permit borrowings up to an aggregate of $5 billion on a revolving basis. The following table provides a summary of the major sources of liquidity for the years ended December 31, 2013 through 2017.

Cash Flow and Liquidity Trends

($ in billions)

	2017	2016	2015	2014	2013
Net cash from operating activities	**$ 16.7**	$ 17.1*	$ 17.3*	$ 17.1*	$ 17.8*
Cash and short-term marketable Securities	**$ 12.6**	$ 8.5	$ 8.2	$ 8.5	$ 11.1
Committed global credit facility	**$ 15.3**	$ 10.3	$ 10.0	$ 10.0	$ 10.0

* Reclassified to reflect adoption of the FASB guidance on share-based compensation.

The major rating agencies’ ratings on the company’s debt securities at December 31, 2017 appear in the following table. On May 3, 2017, Moody’s Investors Service lowered its ratings on the company’s senior long-term debt from Aa3 to A1, while reaffirming its rating on commercial paper. On May 5, 2017, Standard and Poor’s lowered its ratings on the company’s senior long-term debt to A+ from AA- and commercial paper to A-1 from A-1+. The Fitch ratings remain unchanged from December 31, 2016. IBM remains a strong investment grade company with significant flexibility to execute its strategy and capital allocation plans. The company’s indenture governing its debt securities and its various credit facilities each contain significant covenants which obligate the company to promptly pay principal and interest, limit the aggregate amount of secured indebtedness and sale and leaseback transactions to 10 percent of the company’s consolidated net tangible assets, and restrict the company’s ability to merge or consolidate unless certain conditions are met. The credit facilities also include a covenant on the company’s consolidated net interest expense ratio, which cannot be less than 2.20 to 1.0, as well as a cross default provision with respect to other defaulted indebtedness of at least $500 million.

The company is in compliance with all of its significant debt covenants and provides periodic certification to its lenders. The failure to comply with its debt covenants could constitute an event of default with respect to the debt to which such provisions apply. If certain events of default were to occur, the principal and interest on the debt to which such event of default applied would become immediately due and payable.

The company does not have “ratings trigger” provisions in its debt covenants or documentation, which would allow the holders to declare an event of default and seek to accelerate payments thereunder in the event of a change in credit rating. The company’s contractual agreements governing derivative instruments contain standard market clauses which can trigger the termination of the agreement if the company’s credit rating were to fall below investment grade. At December 31, 2017, the fair value of those instruments that were in a liability position was $415 million, before any applicable netting, and this position is subject to fluctuations in fair value period to period based on the level of the company’s outstanding instruments and market conditions. The company has no other contractual arrangements that, in the event of a change in credit rating, would result in a material adverse effect on its financial position or liquidity.

Moody’s

IBM and IBM Credit Ratings	Standard and Poor's	Investors Service	Fitch Ratings
Senior long-term debt	A+	A1	A+
Commercial paper	A-1	Prime-1	F1

The company prepares its Consolidated Statement of Cash Flows in accordance with applicable accounting standards for cash flow presentation on page 81 and highlights causes and events underlying sources and uses of cash in that format on page 48. For the purpose of running its business, the company manages, monitors and analyzes cash flows in a different format.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Management uses free cash flow as a measure to evaluate its operating results, plan share repurchase levels, strategic investments and assess its ability and need to incur and service debt. The entire free cash flow amount is not necessarily available for discretionary expenditures. The company defines free cash flow as net cash from operating activities less the change in Global Financing receivables and net capital expenditures, including the investment in software. A key objective of the Global Financing business is to generate strong returns on equity, and increasing receivables is the basis for growth. Accordingly, management considers Global Financing receivables as a profit-generating investment, not as working capital that should be minimized for efficiency. Therefore, management includes presentations of both free cash flow and net cash from operating activities that exclude the effect of Global Financing receivables. Free cash flow guidance is derived using an estimate of profit, working capital and operational cash outflows. As previously noted, the company views Global Financing receivables as a profit generating investment which it seeks to maximize and therefore it is not considered when formulating guidance for free cash flow. As a result, the company does not estimate a GAAP Net Cash from Operations expectation metric.

From the perspective of how management views cash flow, in 2017, after investing $3.3 billion in capital investments primarily in cloud and in support of the services business, the company generated free cash flow of $13.0 billion, an increase of $1.3 billion compared to 2016. The increase was primarily driven by lower capital expenditures and strong working capital performance due to mix of business and collections.

In 2017, the company continued to focus its cash utilization on returning value to shareholders including $5.5 billion in dividends and $4.3 billion in gross common stock repurchases (27.2 million shares).

Over the past five years, the company generated over $65 billion in free cash flow. During that period, the company invested over $13 billion in strategic acquisitions and returned $64 billion to shareholders through dividends and gross share repurchases. The company's performance during this period demonstrates that there is fungibility across the elements of share repurchases, dividends and acquisitions. The amount of prospective returns to shareholders in the form of dividends and share repurchases will vary based upon several factors including each year's operating results, capital expenditure requirements, research and development investments and acquisitions, as well as the factors discussed on page 69.

The company's Board of Directors considers the dividend payment on a quarterly basis. In the second quarter of 2017, the Board of Directors increased the company's quarterly common stock dividend from $1.40 to $1.50 per share.

The table below represents the way in which management reviews cash flow as described above.

($ in billions)

For the year ended December 31:	2017	2016	2015	2014	2013
Net cash from operating activities per GAAP	**$ 16.7**	$ 17.1*	$ 17.3*	$ 17.1*	$ 17.8*
Less: the change in Global Financing receivables	**0.4**	1.7	0.2	0.7	(1.3)
Net cash from operating activities, excluding Global Financing receivables	**16.3**	15.4*	17.1*	16.4*	19.1*
Capital expenditures, net	**(3.3)**	(3.7)	(3.8)	(3.8)	(3.8)
Free cash flow (FCF)	**13.0**	11.7*	13.3*	12.6*	15.4*
Acquisitions	**(0.5)**	(5.7)	(3.3)	(0.7)	(3.1)
Divestitures	**(0.2)**	(0.5)	(0.4)	2.4	0.3
Share repurchase	**(4.3)**	(3.5)	(4.6)	(13.7)	(13.9)
Common stock repurchases for tax withholdings	**(0.2)**	(0.1)*	(0.2)*	(0.2)*	(0.3)*
Dividends	**(5.5)**	(5.3)	(4.9)	(4.3)	(4.1)
Non-Global Financing debt	**1.1**	1.3	(0.1)	(1.3)	3.2
Other (includes Global Financing receivables and Global Financing debt)	**0.7**	2.3	0.0	2.6	2.4
Change in cash, cash equivalents and short-term marketable securities	**$ 4.1**	$ 0.3	$ (0.3)	$ (2.6)	$ (0.1)
FCF as percent of Income from Continuing Operations	**226%****	98%*	100%*	80%*	91%*

* Reclassified to reflect adoption of the FASB guidance on share-based compensation.

**116% excluding the one-time charge of $5.5 billion associated with the enactment of U.S. tax reform in 2017.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Events that could temporarily change the historical cash flow dynamics discussed previously include significant changes in operating results, material changes in geographic sources of cash, unexpected adverse impacts from litigation, future pension funding requirements during periods of severe downturn in the capital markets or the timing of tax payments. Whether any litigation has such an adverse impact will depend on a number of variables, which are more completely described in note M, "Contingencies and Commitments," on pages 119 to 121. With respect to pension funding, in 2017, the company contributed $409 million to its non-U.S. defined benefit plans compared to $507 million in 2016. As highlighted in the Contractual Obligations table, the company expects to make legally mandated pension plan contributions to certain non-U.S. plans of approximately $1.8 billion in the next five years. The 2018 contributions are currently expected to be approximately $400 million. Contributions related to all retirement-related plans is expected to be approximately $2.4 billion in 2018, approximately flat compared to 2017. Financial market performance could increase the legally mandated minimum contributions in certain non-U.S. countries that require more frequent remeasurement of the funded status. The company is not quantifying any further impact from pension funding because it is not possible to predict future movements in the capital markets or pension plan funding regulations.

In 2018, the company is not legally required to make any contributions to the U.S. defined benefit pension plans.

The company's U.S. cash flows continue to be sufficient to fund its current domestic operations and obligations, including investing and financing activities such as dividends and debt service. The company's U.S. operations generate substantial cash flows, and, in those circumstances where the company has additional cash requirements in the U.S., the company has several liquidity options available. These options may include the ability to borrow additional funds at reasonable interest rates, utilizing its committed global credit facility, repatriating certain foreign earnings and utilizing intercompany loans with certain foreign subsidiaries.

Contractual Obligations

($ in millions)

	Total Contractual Payment Stream	Payments Due In			
		2018	2019–20	2021–22	After 2022
Long-term debt obligations	$ 45,435	$ 5,215	$ 13,365	$ 9,481	$ 17,374
Interest on long-term debt obligations	10,021	1,202	1,854	1,363	5,602
Capital (finance) lease obligations	10	3	4	3	—
Operating lease obligations	6,568	1,614	2,596	1,462	896
Purchase obligations	3,404	1,048	1,285	895	177
Other long-term liabilities:					
Minimum defined benefit plan pension funding (mandated)*	1,800	400	800	600	—
Excess 401(k) Plus Plan	1,771	188	412	460	711
Long-term termination benefits	1,069	173	172	127	598
Tax reserves**	4,630	1,062			
Other	1,264	131	291	101	740
Total	$ 75,973	$ 11,034	$ 20,779	$ 14,492	$ 26,098

* As funded status on plans will vary, obligations for mandated minimum pension payments after 2022 could not be reasonably estimated.

**These amounts represent the liability for unrecognized tax benefits. The company estimates that approximately $1,062 million of the liability is expected to be settled within the next 12 months. The settlement period for the noncurrent portion of the income tax liability cannot be reasonably estimated as the timing of the payments will depend on the progress of tax examinations with the various tax authorities; however, it is not expected to be due within the next 12 months.

Management Discussion
International Business Machines Corporation and Subsidiary Companies

Total contractual obligations are reported in the previous table excluding the effects of time value and therefore, may not equal the amounts reported in the Consolidated Statement of Financial Position. Certain noncurrent liabilities are excluded from the previous table as their future cash outflows are uncertain. This includes deferred taxes, derivatives, deferred income, disability benefits and other sundry items. Certain obligations related to the company's divestitures are included.

Purchase obligations include all commitments to purchase goods or services of either a fixed or minimum quantity that meet any of the following criteria: (1) they are noncancelable, (2) the company would incur a penalty if the agreement was canceled, or (3) the company must make specified minimum payments even if it does not take delivery of the contracted products or services (take-or-pay). If the obligation to purchase goods or services is noncancelable, the entire value of the contract is included in the previous table. If the obligation is cancelable, but the company would incur a penalty if canceled, the dollar

amount of the penalty is included as a purchase obligation. Contracted minimum amounts specified in take-or-pay contracts are also included in the table as they represent the portion of each contract that is a firm commitment.

In the ordinary course of business, the company enters into contracts that specify that the company will purchase all or a portion of its requirements of a specific product, commodity or service from a supplier or vendor. These contracts are generally entered into in order to secure pricing or other negotiated terms. They do not specify fixed or minimum quantities to be purchased and, therefore, the company does not consider them to be purchase obligations.

Interest on floating-rate debt obligations is calculated using the effective interest rate at December 31, 2017, plus the interest rate spread associated with that debt, if any.

Off-Balance Sheet Arrangements

From time to time, the company may enter into off-balance sheet arrangements as defined by SEC Financial Reporting Release 67 (FRR-67), "Disclosure in Management's Discussion and Analysis about Off-Balance Sheet Arrangements and Aggregate Contractual Obligations."

At December 31, 2017, the company had no off-balance sheet arrangements that have, or are reasonably likely to have, a material current or future effect on financial condition, changes in financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources. See the table on page 69 for the company's contractual obligations, and note M, "Contingencies and Commitments," on page 119, for detailed information about the company's guarantees, financial commitments and indemnification arrangements. The company does not have retained interests in assets transferred to unconsolidated entities or other material off-balance sheet interests or instruments.

Critical Accounting Estimates

The application of GAAP requires the company to make estimates and assumptions about certain items and future events that directly affect its reported financial condition. The accounting estimates and assumptions discussed in this section are those that the company considers to be the most critical to its financial statements. An accounting estimate is considered critical if both (a) the nature of the estimate or assumption is material due to the levels of subjectivity and judgment involved, and (b) the impact within a reasonable range of outcomes of the estimate and assumption is material to the company's financial condition. Senior management has discussed the development, selection and disclosure of these estimates with the Audit Committee of the company's Board of Directors. The company's significant accounting policies are described in note A, "Significant Accounting Policies," on pages 84 to 93.

A quantitative sensitivity analysis is provided where that information is reasonably available, can be reliably estimated and provides material information to investors. The amounts used to assess sensitivity (e.g., 1 percent, 10 percent, etc.) are included to allow users of the Annual Report to understand a general direction cause and effect of changes in the estimates and do not represent management's predictions of variability. For all of these estimates, it should be noted that future events rarely develop exactly as forecasted, and estimates require regular review and adjustment.

Pension Assumptions

For the company's defined benefit pension plans, the measurement of the benefit obligation to employees and net periodic pension (income)/cost requires the use of certain assumptions, including, among others, estimates of discount rates and expected return on plan assets.

Changes in the discount rate assumptions would impact the (gain)/loss amortization and interest cost components of the net periodic pension (income)/cost calculation and the projected benefit obligation (PBO). The company decreased the discount rate assumption for the IBM Personal Pension Plan (PPP), a U.S.-based defined benefit plan, by 40 basis points to 3.40 percent on December 31, 2017. This change will increase pre-tax cost and expense recognized in 2018 by an estimated $120 million. If the discount rate assumption for the PPP had increased by 40 basis points on December 31, 2017, pre-tax cost and expense recognized in 2018 would have decreased by an estimated $125 million. Further changes in the discount rate assumptions would impact the PBO which, in turn, may impact the company's funding decisions if the PBO exceeds plan assets. A 25 basis point increase or decrease in the discount rate would cause a corresponding decrease or increase, respectively, in the PPP's PBO of an estimated $1.2 billion based upon December 31, 2017 data.

The expected long-term return on plan assets assumption is used in calculating the net periodic pension (income)/cost. Expected returns on plan assets are calculated based on the market-related value of plan assets, which recognizes changes in the fair value of plan assets systematically over a five-year period in the expected return on plan assets line in net periodic pension (income)/cost. The differences between the actual return on plan assets and the expected long-term return on plan assets are recognized over five years in the expected return on plan assets line in net periodic pension (income)/ cost and also as a component of actuarial (gains)/losses, which are recognized over the service lives or life expectancy of the participants, depending on the plan, provided such amounts exceed thresholds which are based upon the benefit obligation or the value of plan assets, as provided by accounting standards.

To the extent the outlook for long-term returns changes such that management changes its expected long-term return on plan assets assumption, each 50 basis point increase or decrease in the expected long-term return on PPP plan assets assumption would have an estimated decrease or increase, respectively, of $258 million on the following year's pre-tax net periodic pension (income)/cost (based upon the PPP's plan assets at December 31, 2017 and assuming no contributions are made in 2018).

The company may voluntarily make contributions or be required, by law, to make contributions to its pension plans. Actual results that differ from the estimates may result in more or less future company funding into the pension plans than is planned by management. Impacts of these types of changes on

the company's pension plans in other countries worldwide would vary depending upon the status of each respective plan.

In addition to the above, the company evaluates other pension assumptions involving demographic factors, such as retirement age and mortality, and updates these assumptions to reflect experience and expectations for the future. Actual results in any given year can differ from actuarial assumptions because of economic and other factors.

For additional information on the company's pension plans and the development of these assumptions, see note S, "Retirement-Related Benefits," on pages 135 and 136.

Revenue Recognition

Application of the various accounting principles in GAAP related to the measurement and recognition of revenue requires the company to make judgments and estimates. Specifically, complex arrangements with nonstandard terms and conditions may require significant contract interpretation to determine the appropriate accounting, including whether the deliverables specified in a multiple-deliverable arrangement should be treated as separate units of accounting. Other significant judgments include determining whether IBM or a reseller is acting as the principal in a transaction and whether separate contracts are considered part of one arrangement.

Revenue recognition is also impacted by the company's ability to estimate sales incentives, expected returns and collectibility. The company considers various factors, including a review of specific transactions, the creditworthiness of the customers, historical experience and market and economic conditions when calculating these provisions and allowances. Evaluations are conducted each quarter to assess the adequacy of the estimates. If these estimates were changed by 10 percent in 2017, net income would have been impacted by $40 million (excluding Global Financing receivables).

Costs to Complete Service Contracts

The company enters into numerous service contracts through its services businesses. During the contractual period, revenue, cost and profits may be impacted by estimates of the ultimate profitability of each contract, especially contracts for which the company uses the percentage-of-completion (POC) method of accounting. If at any time these estimates indicate the POC contract will be unprofitable, the entire estimated loss for the remainder of the contract is recorded immediately in cost. The company performs ongoing profitability analyses of its POC-based services contracts in order to determine whether the latest estimates require updating. Key factors reviewed by the company to estimate the future costs to complete each contract are future labor costs and product costs and expected productivity efficiencies. Contract loss provisions recorded as a component of other accrued expenses and liabilities were $25 million and $13 million at December 31, 2017 and 2016, respectively.

Income Taxes

The company is subject to income taxes in the U.S. and numerous foreign jurisdictions. Significant judgments are required in determining the consolidated provision for income taxes.

During the ordinary course of business, there are many transactions and calculations for which the ultimate tax determination is uncertain. As a result, the company recognizes tax liabilities based on estimates of whether additional taxes and interest will be due. These tax liabilities are recognized when, despite the company's belief that its tax return positions are supportable, the company believes that certain positions may not be fully sustained upon review by tax authorities. The company believes that its accruals for tax liabilities are adequate for all open audit years based on its assessment of many factors, including past experience and interpretations of tax law. This assessment relies on estimates and assumptions, and may involve a series of complex judgments about future events. To the extent that new information becomes available which causes the company to change its judgment regarding the adequacy of existing tax liabilities, such changes to tax liabilities will impact income tax expense in the period in which such determination is made.

Significant judgment is also required in determining any valuation allowance recorded against deferred tax assets. In assessing the need for a valuation allowance, management considers all available evidence for each jurisdiction including past operating results, estimates of future taxable income and the feasibility of ongoing tax planning strategies. In the event that the company changes its determination as to the amount of deferred tax assets that can be realized, the company will adjust its valuation allowance with a corresponding impact to income tax expense in the period in which such determination is made.

The consolidated provision for income taxes will change period to period based on nonrecurring events, such as the settlement of income tax audits and changes in tax laws, as well as recurring factors including the geographic mix of income before taxes, the timing and amount of foreign dividend repatriation, state and local taxes and the effects of various global income tax strategies.

To the extent that the provision for income taxes increases/ decreases by 1 percent of income from continuing operations before income taxes, consolidated net income would have decreased/improved by $114 million in 2017.

Valuation of Assets

The application of business combination and impairment accounting requires the use of significant estimates and assumptions. The acquisition method of accounting for business combinations requires the company to estimate the fair value of assets acquired including separately identifiable intangible assets, liabilities assumed, and any noncontrolling interest in the acquiree to properly allocate purchase price consideration. Impairment testing for assets, other than goodwill and indefinite-lived intangible assets, requires the allocation of cash flows to those assets or group of assets and if required, an estimate of fair

value for the assets or group of assets. The company's estimates are based upon assumptions believed to be reasonable, but which are inherently uncertain and unpredictable. These valuations require the use of management's assumptions, which would not reflect unanticipated events and circumstances that may occur.

Valuation of Goodwill

The company reviews goodwill for impairment annually and whenever events or changes in circumstances indicate the carrying value of goodwill may not be recoverable. In 2017, the company assessed the qualitative risk factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount.

The company assesses qualitative factors in each of its reporting units that carry goodwill including relevant events and circumstances that affect the fair value of reporting units. Examples include, but are not limited to, macroeconomic, industry and market conditions; as well as other individual factors such as:

- A loss of key personnel;
- A significant adverse shift in the operating environment of the reporting unit such as unanticipated competition;
- A significant pending litigation;
- A more likely than not expectation that a reporting unit or a significant portion of a reporting unit will be sold or otherwise disposed of; and
- An adverse action or assessment by a regulator.

The company assesses these qualitative factors to determine whether it is necessary to perform the two-step quantitative goodwill impairment test. This quantitative test is required only if the company concludes that it is more likely than not that a reporting unit's fair value is less than its carrying amount.

In the fourth quarter, the company performed its annual goodwill impairment analysis. The qualitative assessment illustrated evidence of a potential impairment triggering event as a result of the financial performance of the Systems reporting unit. The quantitative analysis resulted in no impairment as the reporting unit's estimated fair value exceeded the carrying amount by over 100 percent.

Loss Contingencies

The company is currently involved in various claims and legal proceedings. At least quarterly, the company reviews the status of each significant matter and assesses its potential financial exposure. If the potential loss from any claim or legal proceeding is considered probable and the amount can be reasonably estimated, the company accrues a liability for the estimated loss. Significant judgment is required in both the determination of probability and the determination as to whether an exposure is reasonably estimable. Because of uncertainties related to these matters, accruals are based only on the best information available at the time. As additional information becomes available, the company reassesses the potential liability related to its pending claims and litigation, and may revise its estimates. These revisions in the estimates of the potential liabilities could have a material impact on the company's results of operations and financial position.

Global Financing Receivables Allowance for Credit Losses

The Global Financing business reviews its financing receivables portfolio on a regular basis in order to assess collectibility and records adjustments to the allowance for credit losses at least quarterly. A description of the methods used by management to estimate the amount of uncollectible receivables is included in note A, "Significant Accounting Policies," on page 93. Factors that could result in actual receivable losses that are materially different from the estimated reserve include significant changes in the economy, or a sudden change in the economic health of a significant client that represents a concentration in Global Financing's receivables portfolio.

To the extent that actual collectibility differs from management's estimates currently provided for by 10 percent, Global Financing's segment pre-tax income and the company's income from continuing operations before income taxes would be higher or lower by an estimated $34 million depending upon whether the actual collectibility was better or worse, respectively, than the estimates.

Residual Value

Residual value represents the estimated fair value of equipment under lease as of the end of the lease. Residual value estimates impact the determination of whether a lease is classified as operating or capital. Global Financing estimates the future fair value of leased equipment by using historical models, analyzing the current market for new and used equipment, and obtaining forward-looking product information such as marketing plans and technological innovations. Residual value estimates are periodically reviewed and "other than temporary" declines in estimated future residual values are recognized upon identification. Anticipated increases in future residual values are not recognized until the equipment is remarketed.

Factors that could cause actual results to materially differ from the estimates include significant changes in the used-equipment market brought on by unforeseen changes in technology innovations and any resulting changes in the useful lives of used equipment.

To the extent that actual residual value recovery is lower than management's estimates by 10 percent, Global Financing's segment pre-tax income and the company's income from continuing operations before income taxes for 2017 would have been lower by an estimated $72 million. If the actual residual value recovery is higher than management's estimates, the increase in income will be realized at the end of lease when the equipment is remarketed.

Currency Rate Fluctuations

Changes in the relative values of non-U.S. currencies to the U.S. dollar affect the company's financial results and financial position. At December 31, 2017, currency changes resulted in assets and liabilities denominated in local currencies being translated into more dollars than at year-end 2016. The company uses financial hedging instruments to limit specific currency risks related to financing transactions and other foreign currency-based transactions.

During periods of sustained movements in currency, the marketplace and competition adjust to the changing rates. For example, when pricing offerings in the marketplace, the company may use some of the advantage from a weakening U.S. dollar to improve its position competitively, and price more aggressively to win the business, essentially passing on a portion of the currency advantage to its customers. Competition will frequently take the same action. Consequently, the company believes that some of the currency-based changes in cost impact the prices charged to clients. The company also maintains currency hedging programs for cash management purposes which temporarily mitigate, but do not eliminate, the volatility of currency impacts on the company's financial results.

The company translates revenue, cost and expense in its non-U.S. operations at current exchange rates in the reported period. References to "adjusted for currency" or "constant currency" reflect adjustments based upon a simple mathematical formula. However, this constant currency methodology that the company utilizes to disclose this information does not incorporate any operational actions that management could take to mitigate fluctuating currency rates. Currency movements impacted the company's year-to-year revenue and earnings per share growth in 2017. Based on the currency rate movements in 2017, total revenue decreased 1.0 percent as reported and 1.3 percent at constant currency versus 2016. On an income from continuing operations before income taxes basis, these translation impacts offset by the net impact of hedging activities resulted in a theoretical maximum (assuming no pricing or sourcing actions) increase of approximately $100 million in 2017, on both an as-reported basis and operating (non-GAAP) basis. The same mathematical exercise resulted in an increase of approximately $125 million in 2016 on an as-reported basis and an increase of approximately $150 million on an operating (non-GAAP) basis. The company views these amounts as a theoretical maximum impact to its as-reported financial results. Considering the operational responses mentioned above, movements of exchange rates, and the nature and timing of hedging instruments, it is difficult to predict future currency impacts on any particular period, but the company believes it could be substantially less than the theoretical maximum given the competitive pressure in the marketplace.

For non-U.S. subsidiaries and branches that operate in U.S. dollars or whose economic environment is highly inflationary, translation adjustments are reflected in results of operations. Generally, the company manages currency risk in these entities by linking prices and contracts to U.S. dollars.

The company continues to monitor the economic conditions and currency exchange mechanisms in Venezuela. The company recorded a pre-tax loss of $43 million in the first quarter of 2016 in other (income) and expense in the Consolidated Statement of Earnings as a result of the elimination of the SICAD exchange and devaluation of the new exchange. Total pre-tax loss for 2017 was $10 million compared to $48 million in 2016. The company's operations in Venezuela comprised less than 1 percent of total 2017, 2016 and 2015 revenue, respectively.

Market Risk

In the normal course of business, the financial position of the company is routinely subject to a variety of risks. In addition to the market risk associated with interest rate and currency movements on outstanding debt and non-U.S. dollar denominated assets and liabilities, other examples of risk include collectibility of accounts receivable and recoverability of residual values on leased assets.

The company regularly assesses these risks and has established policies and business practices to protect against the adverse effects of these and other potential exposures. As a result, the company does not anticipate any material losses from these risks.

The company's debt, in support of the Global Financing business and the geographic breadth of the company's operations, contains an element of market risk from changes in interest and currency rates. The company manages this risk, in part, through the use of a variety of financial instruments including derivatives, as described in note D, "Financial Instruments—Derivative Financial Instruments," on pages 102 to 107.

To meet disclosure requirements, the company performs a sensitivity analysis to determine the effects that market risk exposures may have on the fair values of the company's debt and other financial instruments.

The financial instruments that are included in the sensitivity analysis are comprised of the company's cash and cash equivalents, marketable securities, short-term and long-term loans, commercial financing and installment payment receivables, investments, long-term and short-term debt and derivative financial instruments. The company's derivative financial instruments generally include interest rate swaps, foreign currency swaps and forward contracts.

To perform the sensitivity analysis, the company assesses the risk of loss in fair values from the effect of hypothetical changes in interest rates and foreign currency exchange rates on market-sensitive instruments. The market values for interest and foreign currency exchange risk are computed based on the present value of future cash flows as affected by the changes in rates that are attributable to the market risk being measured. The discount rates used for the

present value computations were selected based on market interest and foreign currency exchange rates in effect at December 31, 2017 and 2016. The differences in this comparison are the hypothetical gains or losses associated with each type of risk.

Information provided by the sensitivity analysis does not necessarily represent the actual changes in fair value that the company would incur under normal market conditions because, due to practical limitations, all variables other than the specific market risk factor are held constant. In addition, the results of the model are constrained by the fact that certain items are specifically excluded from the analysis, while the financial instruments relating to the financing or hedging of those items are included by definition. Excluded items include short-term and long-term receivables from sales-type and direct financing leases, forecasted foreign currency cash flows and the company's net investment in foreign operations. As a consequence, reported changes in the values of some of the financial instruments impacting the results of the sensitivity analysis are not matched with the offsetting changes in the values of the items that those instruments are designed to finance or hedge.

The results of the sensitivity analysis at December 31, 2017 and 2016, are as follows:

Interest Rate Risk

At December 31, 2017, a 10 percent decrease in the levels of interest rates with all other variables held constant would result in a decrease in the fair value of the company's financial instruments of $201 million as compared with a decrease of $147 million at December 31, 2016. A 10 percent increase in the levels of interest rates with all other variables held constant would result in an increase in the fair value of the company's financial instruments of $232 million as compared to an increase of $142 million at December 31, 2016. Changes in the relative sensitivity of the fair value of the company's financial instrument portfolio for these theoretical changes in the level of interest rates are primarily driven by changes in the company's debt maturities, interest rate profile and amount.

Foreign Currency Exchange Rate Risk

At December 31, 2017, a 10 percent weaker U.S. dollar against foreign currencies, with all other variables held constant, would result in an increase in the fair value of the company's financial instruments of $120 million as compared with a decrease of $132 million at December 31, 2016. Conversely, a 10 percent stronger U.S. dollar against foreign currencies, with all other variables held constant, would result in a decrease in the fair value of the company's financial instruments of $120 million compared with an increase of $132 million at December 31, 2016.

Financing Risks

See the "Description of Business" on page 33 for a discussion of the financing risks associated with the Global Financing business and management's actions to mitigate such risks.

Cybersecurity

While cybersecurity risk can never be completely eliminated, the company's approach draws on the depth and breadth of its global capabilities, both in terms of its offerings to clients and its internal approaches to risk management. The company offers commercial solutions that deliver capabilities in areas such as identity and access management, data security, application security, network security and endpoint security. IBM's solutions include pervasive encryption, security intelligence, analytics, cognitive and artificial intelligence, and forensic tools that can process information on customer IT security events and vulnerabilities and provide detailed information to customers about potential threats and security posture. The company also offers professional solutions for security from assessment and incident response to deployment and resource augmentation. In addition, the company offers managed and outsourced security solutions from multiple security operations centers around the world. Finally, security is embedded in a multitude of IBM offerings through secure engineering processes and by critical functions (encryption, access control, etc.) in servers, storage, software, service, and other solutions.

From an enterprise perspective, IBM implements a multi-faceted risk-management approach to identify and address cybersecurity risks. The company has established policies and procedures that provide the foundation upon which IBM's infrastructure and data are managed. IBM performs ongoing assessments regarding its technical controls and its methods for identifying emerging risks related to cybersecurity. The company uses a layered approach with overlapping controls to defend against cybersecurity attacks and threats on networks, end-user devices, servers, applications and cloud solutions. The company also has a security monitoring program and a global incident response process to respond to cybersecurity threats and attacks. In addition, the company utilizes a combination of online training, educational tools, videos and other awareness initiatives to foster a culture of security awareness and responsibility among its workforce.

Employees and Related Workforce

(In thousands)

For the year ended December 31:	2017
IBM/wholly owned subsidiaries	**366.6**
Less-than-wholly owned subsidiaries	**9.3**
Complementary	**21.9**

As a globally integrated enterprise, the company operates in more than 175 countries and is continuing to shift its business to the higher value segments of enterprise IT. The company continues to remix its skills and people needs to match the best opportunities in the marketplace.

The complementary workforce is an approximation of equivalent full-time employees hired under temporary, part-time and limited-term employment arrangements to meet specific business needs in a flexible and cost-effective manner.

Report of Management
International Business Machines Corporation and Subsidiary Companies

Management Responsibility for Financial Information

Responsibility for the integrity and objectivity of the financial information presented in this Annual Report rests with IBM management. The accompanying financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America, applying certain estimates and judgments as required.

IBM maintains an effective internal control structure. It consists, in part, of organizational arrangements with clearly defined lines of responsibility and delegation of authority, and comprehensive systems and control procedures. An important element of the control environment is an ongoing internal audit program. Our system also contains self-monitoring mechanisms, and actions are taken to correct deficiencies as they are identified.

To assure the effective administration of internal controls, we carefully select and train our employees, develop and disseminate written policies and procedures, provide appropriate communication channels and foster an environment conducive to the effective functioning of controls. We believe that it is essential for the company to conduct its business affairs in accordance with the highest ethical standards, as set forth in the IBM Business Conduct Guidelines. These guidelines, translated into numerous languages, are distributed to employees throughout the world, and reemphasized through internal programs to assure that they are understood and followed.

The Audit Committee of the Board of Directors is composed solely of independent, non-management directors, and is responsible for recommending to the Board the independent registered public accounting firm to be retained for the coming year, subject to stockholder ratification. The Audit Committee meets regularly and privately with the independent registered public accounting firm, with the company's internal auditors, as well as with IBM management, to review accounting, auditing, internal control structure and financial reporting matters.

Management's Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting of the company. Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America.

The company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with accounting principles generally accepted in the United States of America, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Management conducted an evaluation of the effectiveness of internal control over financial reporting based on the criteria established in *Internal Control—Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this evaluation, management concluded that the company's internal control over financial reporting was effective as of December 31, 2017.

PricewaterhouseCoopers LLP, an independent registered public accounting firm, is retained to audit IBM's Consolidated Financial Statements and the effectiveness of the internal control over financial reporting. Its accompanying report is based on audits conducted in accordance with the standards of the Public Company Accounting Oversight Board (United States).

/s/ Virginia M. Rometty
Virginia M. Rometty
Chairman, President and Chief Executive Officer
February 27, 2018

/s/ James J. Kavanaugh
James J. Kavanaugh
Senior Vice President and Chief Financial Officer
February 27, 2018

Report of Independent Registered Public Accounting Firm
International Business Machines Corporation and Subsidiary Companies

To the Board of Directors and Stockholders of International Business Machines Corporation:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying Consolidated Statement of Financial Position of International Business Machines Corporation and its subsidiaries as of December 31, 2017 and 2016, and the related Consolidated Statements of Earnings, Comprehensive Income, Changes in Equity, and Cash Flows for each of the three years in the period ended December 31, 2017, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control—Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2017 and 2016, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2017 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control—Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting appearing on page 76. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ PricewaterhouseCoopers LLP
PricewaterhouseCoopers LLP
New York, New York
February 27, 2018

We, or firms we have ultimately acquired, have served as the Company's auditor since 1923. For the period from 1923 to 1958, the Company was audited by firms that a predecessor firm to PricewaterhouseCoopers LLP ultimately acquired.

Consolidated Statement of Earnings

International Business Machines Corporation and Subsidiary Companies

($ in millions except per share amounts)

For the year ended December 31:	Notes	2017	2016	2015
Revenue				
Services		**$ 50,709**	$ 51,268	$ 49,911
Sales		**26,715**	26,942	29,967
Financing		**1,715**	1,710	1,864
Total revenue	T	**79,139**	79,919	81,741
Cost				
Services		**34,447**	34,021	33,126
Sales		**7,256**	6,559	6,920
Financing		**1,210**	1,044	1,011
Total cost		**42,913**	41,625	41,057
Gross profit		**36,227**	38,294	40,684
Expense and other (income)				
Selling, general and administrative		**20,107**	21,069	20,430
Research, development and engineering	O	**5,787**	5,751	5,247
Intellectual property and custom development income		**(1,466)**	(1,631)	(682)
Other (income) and expense		**(216)**	145	(724)
Interest expense	D&J	**615**	630	468
Total expense and other (income)		**24,827**	25,964	24,740
Income from continuing operations before income taxes		**11,400**	12,330	15,945
Provision for income taxes	N	**5,642**	449	2,581
Income from continuing operations		**5,758**	11,881	13,364
Loss from discontinued operations, net of tax	C	**(5)**	(9)	(174)
Net income		**$ 5,753**	$ 11,872	$ 13,190
Earnings/(loss) per share of common stock				
Assuming dilution				
Continuing operations	P	**$ 6.14**	$ 12.39	$ 13.60
Discontinued operations	P	**0.00**	(0.01)	(0.18)
Total	P	**$ 6.14**	$ 12.38	$ 13.42
Basic				
Continuing operations	P	**$ 6.17**	$ 12.44	$ 13.66
Discontinued operations	P	**0.00**	(0.01)	(0.18)
Total	P	**$ 6.17**	$ 12.43	$ 13.48
Weighted-average number of common shares outstanding				
Assuming dilution		**937,385,625**	958,714,097	982,700,267
Basic		**932,828,295**	955,422,530	978,744,523

Amounts may not add due to rounding.
The accompanying notes on pages 84 through 146 are an integral part of the financial statements.

Consolidated Statement of Comprehensive Income
International Business Machines Corporation and Subsidiary Companies

($ in millions)

For the year ended December 31:	Notes	2017	2016	2015
Net income		**$ 5,753**	$ 11,872	$ 13,190
Other comprehensive income/(loss), before tax				
Foreign currency translation adjustments	L	**152**	(20)	(1,379)
Net changes related to available-for-sale securities	L			
Unrealized gains/(losses) arising during the period		**1**	(38)	(54)
Reclassification of (gains)/losses to net income		**1**	34	86
Total net changes related to available-for-sale securities		**2**	(3)	32
Unrealized gains/(losses) on cash flow hedges	L			
Unrealized gains/(losses) arising during the period		**(58)**	243	618
Reclassification of (gains)/losses to net income		**(363)**	102	(1,072)
Total unrealized gains/(losses) on cash flow hedges		**(421)**	345	(454)
Retirement-related benefit plans	L			
Prior service costs/(credits)		**0**	—	6
Net (losses)/gains arising during the period		**682**	(2,490)	(2,963)
Curtailments and settlements		**19**	(16)	33

Amortization of prior service (credits)/costs		**(88)**	(107)	(100)
Amortization of net (gains)/losses		**2,889**	2,764	3,304
Total retirement-related benefit plans		**3,502**	150	279
Other comprehensive income/(loss), before tax	L	**3,235**	472	(1,523)
Income tax (expense)/benefit related to items of other comprehensive income	L	**(429)**	(263)	(208)
Other comprehensive income/(loss)	L	**2,806**	209	(1,731)
Total comprehensive income		**$ 8,559**	$ 12,081	$ 11,459

Amounts may not add due to rounding.
The accompanying notes on pages 84 through 146 are an integral part of the financial statements.

Consolidated Statement of Financial Position
International Business Machines Corporation and Subsidiary Companies

($ in millions except per share amounts)

At December 31:	Notes	2017	2016
Assets			
Current assets			
Cash and cash equivalents		**$ 11,972**	$ 7,826
Marketable securities	D	**608**	701
Notes and accounts receivable—trade (net of allowances of $297 in 2017 and $290 in 2016)		**8,928**	9,182
Short-term financing receivables (net of allowances of $261 in 2017 and $337 in 2016)	F	**21,721**	19,006
Other accounts receivable (net of allowances of $36 in 2017 and $48 in 2016)		**981**	1,057
Inventories	E	**1,583**	1,553
Prepaid expenses and other current assets		**3,942**	4,564
Total current assets		**49,735**	43,888
Property, plant and equipment	G	**32,331**	30,133
Less: Accumulated depreciation	G	**21,215**	19,303
Property, plant and equipment—net	G	**11,116**	10,830
Long-term financing receivables (net of allowances of $74 in 2017 and $101 in 2016)	F	**9,550**	9,021
Prepaid pension assets	S	**4,643**	3,034
Deferred taxes	N	**4,862**	5,224
Goodwill	I	**36,788**	36,199
Intangible assets—net	I	**3,742**	4,688
Investments and sundry assets	H	**4,919**	4,585
Total assets		**$ 125,356**	$ 117,470
Liabilities and equity			
Current liabilities			
Taxes	N	**$ 4,219**	$ 3,235
Short-term debt	D&J	**6,987**	7,513
Accounts payable		**6,451**	6,209
Compensation and benefits		**3,644**	3,577
Deferred income		**11,552**	11,035
Other accrued expenses and liabilities		**4,510**	4,705
Total current liabilities		**37,363**	36,275
Long-term debt	D&J	**39,837**	34,655
Retirement and nonpension postretirement benefit obligations	S	**16,720**	17,070
Deferred income		**3,746**	3,600
Other liabilities	K	**9,965**	7,477
Total liabilities		**107,631**	99,078
Contingencies and commitments	M		
Equity	L		
IBM stockholders' equity			
Common stock, par value $.20 per share, and additional paid-in capital		**54,566**	53,935
Shares authorized: 4,687,500,000			
Shares issued (2017—2,229,428,813; 2016—2,225,116,815)			
Retained earnings		**153,126**	152,759
Treasury stock, at cost (shares: 2017—1,307,249,588; 2016—1,279,249,412)		**(163,507)**	(159,050)
Accumulated other comprehensive income/(loss)		**(26,592)**	(29,398)
Total IBM stockholders' equity		**17,594**	18,246
Noncontrolling interests	A	**131**	146
Total equity		**17,725**	18,392

Total liabilities and equity	**$ 125,356**	$ 117,470

Amounts may not add due to rounding.
The accompanying notes on pages 84 through 146 are an integral part of the financial statements.

Consolidated Statement of Cash Flows
International Business Machines Corporation and Subsidiary Companies

($ in millions)

For the year ended December 31:	2017	2016	2015
Cash flows from operating activities			
Net income	**$ 5,753**	$ 11,872	$ 13,190
Adjustments to reconcile net income to cash provided by operating activities			
Depreciation	**3,021**	2,837	2,662
Amortization of intangibles	**1,520**	1,544	1,193
Stock-based compensation	**534**	544	468
Deferred taxes	**(931)**	(1,132)	1,387
Net (gain)/loss on asset sales and other	**14**	62	481
Loss on microelectronics business disposal	**—**	—	71
Change in operating assets and liabilities, net of acquisitions/divestitures			
Receivables (including financing receivables)	**1,297**	712	812
Retirement related	**1,014**	54	(22)
Inventories	**18**	(14)	133
Other assets/other liabilities	**4,437**	408*	(3,200)*
Accounts payable	**47**	197	81
Net cash provided by operating activities	**16,724**	17,084*	17,255*
Cash flows from investing activities			
Payments for property, plant and equipment	**(3,229)**	(3,567)	(3,579)
Proceeds from disposition of property, plant and equipment	**460**	424	370
Investment in software	**(544)**	(583)	(572)
Purchases of marketable securities and other investments	**(4,964)**	(5,917)	(3,073)
Proceeds from disposition of marketable securities and other investments	**3,910**	5,692	2,842
Non-operating finance receivables—net	**(2,028)**	(891)	(398)
Acquisition of businesses, net of cash acquired	**(496)**	(5,679)	(3,349)
Divestiture of businesses, net of cash transferred	**(205)**	(454)	(401)
Net cash used in investing activities	**(7,096)**	(10,976)	(8,159)
Cash flows from financing activities			
Proceeds from new debt	**9,643**	9,132	5,540
Payments to settle debt	**(6,816)**	(6,395)	(5,622)
Short-term borrowings/(repayments) less than 90 days—net	**620**	26	101
Common stock repurchases	**(4,340)**	(3,502)	(4,609)
Common stock repurchases for tax withholdings	**(193)**	(126)*	(248)*
Common stock transactions—other	**175**	204	322
Cash dividends paid	**(5,506)**	(5,256)	(4,897)
Net cash used in financing activities	**(6,418)**	(5,917)*	(9,413)*
Effect of exchange rate changes on cash and cash equivalents	**937**	(51)	(473)
Net change in cash and cash equivalents	**4,146**	140	(790)
Cash and cash equivalents at January 1	**7,826**	7,686	8,476
Cash and cash equivalents at December 31	**$ 11,972**	$ 7,826	$ 7,686
Supplemental data			
Income taxes paid—net of refunds received	**$ 1,597**	$ 1,078	$ 2,657
Interest paid on debt	**$ 1,208**	$ 1,158	$ 995

* Reclassified to reflect adoption of the FASB guidance on share-based compensation.

Amounts may not add due to rounding.
The accompanying notes on pages 84 through 146 are an integral part of the financial statements.

Consolidated Statement of Changes in Equity
International Business Machines Corporation and Subsidiary Companies

($ in millions)

	Common Stock and Additional Paid-In Capital	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Income/(Loss)	Total IBM Stockholders' Equity	Non-Controlling Interests	Total Equity
2015							
Equity, January 1, 2015	$ 52,666	$ 137,793	$ (150,715)	$ (27,875)	$ 11,868	$ 146	$ 12,014
Net income plus other comprehensive income/(loss)							
Net income		13,190			13,190		13,190
Other comprehensive income/(loss)				(1,731)	(1,731)		(1,731)
Total comprehensive income/(loss)					$ 11,459		$ 11,459
Cash dividends paid—common stock		(4,897)			(4,897)		(4,897)
Common stock issued under employee plans (6,013,875 shares)	606				606		606
Purchases (1,625,820 shares) and sales (1,155,558 shares) of treasury stock under employee plans—net		39	(102)		(63)		(63)
Other treasury shares purchased, not retired (30,338,647 shares)			(4,701)		(4,701)		(4,701)
Changes in other equity	(10)				(10)		(10)
Changes in noncontrolling interests						16	16
Equity, December 31, 2015	$ 53,262	$ 146,124	$ (155,518)	$ (29,607)	$ 14,262	$ 162	$ 14,424

Amounts may not add due to rounding.
The accompanying notes on pages 84 through 146 are an integral part of the financial statements.

($ in millions)

	Common Stock and Additional Paid-In Capital	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Income/(Loss)	Total IBM Stockholders' Equity	Non-Controlling Interests	Total Equity
2016							
Equity, January 1, 2016	$ 53,262	$ 146,124	$ (155,518)	$ (29,607)	$ 14,262	$ 162	$ 14,424
Net income plus other comprehensive income/(loss)							
Net income		11,872			11,872		11,872
Other comprehensive income/(loss)				209	209		209
Total comprehensive income/(loss)					$ 12,081		$ 12,081
Cash dividends paid—common stock		(5,256)			(5,256)		(5,256)
Common stock issued under employee plans (3,893,366 shares)	695				695		695
Purchases (854,365 shares) and sales (383,077 shares) of treasury stock under employee plans—net		18	(77)		(59)		(59)
Other treasury shares purchased, not retired (23,283,400 shares)			(3,455)		(3,455)		(3,455)
Changes in other equity	(22)	0			(22)		(22)
Changes in noncontrolling interests						(16)	(16)
Equity, December 31, 2016	$ 53,935	$ 152,759	$ (159,050)	$ (29,398)	$ 18,246	$ 146	$ 18,392

Amounts may not add due to rounding.
The accompanying notes on pages 84 through 146 are an integral part of the financial statements.

Consolidated Statement of Changes in Equity
International Business Machines Corporation and Subsidiary Companies

($ in millions)

	Common Stock and Additional Paid-In Capital	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Income/(Loss)	Total IBM Stockholders' Equity	Non-Controlling Interests	Total Equity
2017							
Equity, January 1, 2017	$ 53,935	$ 152,759	$ (159,050)	$ (29,398)	$ 18,246	$ 146	$ 18,392
Cumulative effect of change in accounting principle*		102			102		102
Net income plus other comprehensive income/(loss)							
Net income		5,753			5,753		5,753
Other comprehensive income/(loss)				2,806	2,806		2,806
Total comprehensive income/(loss)					$ 8,559		$ 8,559
Cash dividends paid—common stock		(5,506)			(5,506)		(5,506)
Common stock issued under employee plans (4,311,998 shares)	631				631		631
Purchases (1,226,080 shares) and sales (463,083 shares) of treasury stock under employee plans—net		18	(134)		(116)		(116)
Other treasury shares purchased, not retired (27,237,179 shares)			(4,323)		(4,323)		(4,323)
Changes in other equity		0			0		0
Changes in noncontrolling interests						(15)	(15)
Equity, December 31, 2017	$ 54,566	$ 153,126	$ (163,507)	$ (26,592)	$ 17,594	$ 131	$ 17,725

* Reflects the adoption of the FASB guidance on intra-entity transfers of assets in the first quarter of 2017.

Amounts may not add due to rounding.
The accompanying notes on pages 84 through 146 are an integral part of the financial statements.

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

NOTE A. SIGNIFICANT ACCOUNTING POLICIES

Basis of Presentation

The accompanying Consolidated Financial Statements and footnotes of the International Business Machines Corporation (IBM or the company) have been prepared in accordance with accounting principles generally accepted in the United States of America (GAAP).

Within the financial statements and tables presented, certain columns and rows may not add due to the use of rounded numbers for disclosure purposes. Percentages presented are calculated from the underlying whole-dollar amounts. Certain prior year amounts have been reclassified to conform to the current year presentation. This is annotated where applicable.

On December 22, 2017, the Tax Cuts and Jobs Act ("U.S. tax reform") was enacted in the U.S. This Act introduced many changes, including lowering the U.S. corporate tax rate to 21 percent, changes in incentives, provisions to prevent U.S. base erosion and significant changes in the taxation of international

income, including provisions which allow for the repatriation of foreign earnings without U.S. tax.

The enactment of U.S. tax reform resulted in a provisional charge of $5,475 million to tax expense in the fourth-quarter and year-ended December 31, 2017. The charge was primarily the result of the one-time U.S. transition tax, and any foreign tax costs on undistributed foreign earnings, as well as the remeasurement of deferred tax balances to the new U.S. Federal tax rate. Refer to note N, "Taxes," on pages 121 to 124 for additional information.

Noncontrolling interest amounts of $17 million, $16 million and $8 million, net of tax, for the years ended December 31, 2017, 2016 and 2015, respectively, are included as a reduction within other (income) and expense in the Consolidated Statement of Earnings.

Principles of Consolidation

The Consolidated Financial Statements include the accounts of IBM and its controlled subsidiaries, which are primarily majority owned. Any noncontrolling interest in the equity of a subsidiary is reported in Equity in the Consolidated Statement of Financial Position. Net income and losses attributable to the noncontrolling interest is reported as described above in the Consolidated Statement of Earnings. The accounts of variable interest entities (VIEs) are included in the Consolidated Financial Statements, if required. Investments in business entities in which the company does not have control, but has the ability to exercise significant influence over operating and financial policies, are accounted for using the equity method and the company's proportionate share of income or loss is recorded in other (income) and expense. The accounting policy for other investments in equity securities is on page 92 within "Marketable Securities." Equity investments in non-publicly traded entities are primarily accounted for using the cost method. All intercompany transactions and accounts have been eliminated in consolidation.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the amounts of assets, liabilities, revenue, costs, expenses and other comprehensive income/(loss) (OCI) that are reported in the Consolidated Financial Statements and accompanying disclosures. These estimates are based on management's best knowledge of current events, historical experience, actions that the company may undertake in the future and on various other assumptions that are believed to be reasonable under the circumstances. As a result, actual results may be different from these estimates. See "Critical Accounting Estimates" on pages 70 to 73 for a discussion of the company's critical accounting estimates.

Revenue

The company recognizes revenue when it is realized or realizable and earned. The company considers revenue realized or realizable and earned when it has persuasive evidence of an arrangement, delivery has occurred, the sales price is fixed or determinable and collectibility is reasonably assured. Delivery does not occur until products have been shipped or services have been provided to the client, risk of loss has transferred to the client, and either client acceptance has been obtained, client acceptance provisions have lapsed, or the company has objective evidence that the criteria specified in the client acceptance provisions have been satisfied. The sales price is not considered to be fixed or determinable until all contingencies related to the sale have been resolved.

The company recognizes revenue on sales to solution providers, resellers and distributors (herein referred to as "resellers") when the reseller has: economic substance apart from the company, credit risk, risk of loss to the inventory; and, the fee to the company is not contingent upon resale or payment by the end user, the company has no further obligations related to bringing about resale or delivery and all other revenue recognition criteria have been met.

The company reduces revenue for estimated client returns, price protection, rebates and other similar allowances. (See Schedule II, "Valuation and Qualifying Accounts and Reserves" included in the company's Annual Report on Form 10-K). Revenue is recognized only if these estimates can be reasonably and reliably determined. The company bases its estimates on historical results taking into consideration the type of client, the type of transaction and the specifics of each arrangement. Payments made under cooperative marketing programs are recognized as an expense only if the company receives from the client an identifiable benefit sufficiently separable from the product sale whose fair value can be reasonably and reliably estimated. If the company does not receive an identifiable benefit sufficiently separable from the product sale whose fair value can be reasonably estimated, such payments are recorded as a reduction of revenue.

Revenue from sales of third-party vendor products or services is recorded net of costs when the company is acting as an agent between the client and the vendor, and gross when the company is the principal for the transaction. Several factors are considered to determine whether the company is an agent or principal, most notably whether the company is the primary obligor to the client, or has inventory risk. Consideration is also given to whether the company adds meaningful value to the vendor's product or service, was involved in the selection of the vendor's product or service, has latitude in establishing the sales price or has credit risk.

The company reports revenue net of any revenue-based taxes assessed by governmental authorities that are imposed on and concurrent with specific revenue-producing transactions. In addition to the aforementioned general policies, the following are the specific revenue recognition policies for multiple-deliverable arrangements and for each major category of revenue.

Multiple-Deliverable Arrangements

The company's global capabilities as a cognitive solutions and cloud platform company include services, software, hardware, and/or related financing. For example, a client may purchase a server that includes operating system software. In addition, the arrangement may include post-contract support for the software and a contract for post-warranty maintenance service for the hardware. These types of arrangements can also include financing provided by the

company. These arrangements consist of multiple deliverables, with the hardware and software delivered in one reporting period, and the software support and hardware maintenance services delivered across multiple reporting periods. In another example, the company may assist the client in building and running an enterprise information technology (IT) environment utilizing a private cloud on a long-term basis and the client periodically purchases hardware and/or software products from the company to upgrade or expand the facility. The services delivered on the cloud are provided on a continuous basis across multiple reporting periods, and the hardware and software products are delivered in one reporting period. To the extent that a deliverable in a multiple-deliverable arrangement is subject to specific accounting guidance that deliverable is accounted for in accordance with such specific guidance. Examples of such arrangements may include leased hardware which is subject to specific leasing guidance or software which is subject to specific software revenue recognition guidance on whether and/or how to separate multiple-deliverable arrangements into separate units of accounting (separability) and how to allocate the arrangement consideration among those separate units of accounting (allocation). For all other deliverables in multiple-deliverable arrangements, the guidance below is applied for separability and allocation. A multiple-deliverable arrangement is separated into more than one unit of accounting if the following criteria are met:

- The delivered item(s) has value to the client on a standalone basis; and
- If the arrangement includes a general right of return relative to the delivered item(s), delivery or performance of the undelivered item(s) is considered probable and substantially in the control of the company.

If these criteria are not met, the arrangement is accounted for as one unit of accounting which would result in revenue being recognized ratably over the contract term or being deferred until the earlier of when such criteria are met or when the last undelivered element is delivered. If these criteria are met for each element and there is a relative selling price for all units of accounting in an arrangement, the arrangement consideration is allocated to the separate units of accounting based on each unit's relative selling price. The following revenue policies are then applied to each unit of accounting, as applicable.

Revenue from the company's cloud, analytics, mobile, security, and cognitive offerings follow the specific revenue recognition policies for multiple-deliverable arrangements and for each major category of revenue depending on the type of offering which can be comprised of services, hardware and/or software.

Services

The company's primary services offerings include IT datacenter and business process outsourcing, application management services, consulting and systems integration, technology infrastructure and system maintenance, hosting and the design and development of complex IT systems to a client's specifications (design and build). Many of these services can be delivered entirely or partially through as-a-Service or cloud delivery models. These services are provided on a time-and-material basis, as a fixed-price contract or as a fixed-price per measure of output contract and the contract terms range from less than one year to over 10 years.

Revenue from IT datacenter and business process outsourcing contracts is recognized in the period the services are provided using either an objective measure of output or on a straight-line basis over the term of the contract. Under the output method, the amount of revenue recognized is based on the services delivered in the period.

Revenue from application management services, technology infrastructure, and system maintenance and hosting contracts is recognized on a straight-line basis over the terms of the contracts. Revenue from time-and-material contracts is recognized as labor hours are delivered and direct expenses are incurred. Revenue related to extended warranty and product maintenance contracts is recognized on a straight-line basis over the delivery period.

Revenue from fixed-price design and build contracts is recognized under the percentage-of-completion (POC) method. Under the POC method, revenue is recognized based on the labor costs incurred to date as a percentage of the total estimated labor costs to fulfill the contract. If circumstances arise that change the original estimates of revenues, costs, or extent of progress toward completion, revisions to the estimates are made. These revisions may result in increases or decreases in estimated revenues or costs, and such revisions are reflected in income in the period in which the circumstances that gave rise to the revision become known by the company.

The company performs ongoing profitability analyses of its services contracts accounted for under the POC method in order to determine whether the latest estimates of revenues, costs and profits require updating. If at any time these estimates indicate that the contract will be unprofitable, the entire estimated loss for the remainder of the contract is recorded immediately. For non-POC method services contracts, losses are recorded as incurred.

In some services contracts, the company bills the client prior to recognizing revenue from performing the services. Deferred income of $5,870 million and $5,873 million at December 31, 2017 and 2016, respectively, is included in the Consolidated Statement of Financial Position. In other services contracts, the company performs the services prior to billing the client. Unbilled accounts receivable of $1,756 million and $1,611 million at December 31, 2017 and 2016, respectively, is included in notes and accounts receivable-trade in the Consolidated Statement of Financial Position.

Billings usually occur in the month after the company performs the services or in accordance with specific contractual provisions.

Hardware

The company's hardware offerings include the sale or lease of system servers and storage solutions. These products can also be delivered through as-a-Service or cloud delivery models such as Storage-as-a-Service. The company also offers installation services for its more complex hardware products.

Revenue from hardware sales and sales-type leases is recognized when risk of loss has transferred to the client and there are no unfulfilled company obligations that affect the client's final acceptance of the arrangement. Any cost of standard warranties and remaining obligations that are inconsequential or perfunctory are accrued when the corresponding revenue is recognized. Revenue from as-a-Service arrangements is recognized as the service is delivered. Revenue from rentals and operating leases is recognized on a straight-line basis over the term of the rental or lease.

Software

The company's software offerings include solutions software, which provides the basis for many of the company's strategic areas including analytics, security and social; transaction processing software, which primarily runs mission-critical systems for clients; integration software, which help clients to create, connect and optimize their applications data and infrastructure; and operating systems software, which provides operating systems for IBM Z and Power Systems hardware. Many of these offerings can be delivered entirely or partially through as-a-Service or cloud delivery models, while others are delivered as on-premise software licenses.

Revenue from perpetual (one-time charge) license software is recognized at the inception of the license term if all revenue recognition criteria have been met. Revenue from post-contract support, which may include unspecified upgrades on a when-and-if-available basis, is recognized on a straight-line basis over the period such items are delivered. Revenue from software hosting or Software-as-a-Service arrangements is recognized as the service is delivered. In software hosting arrangements, the rights provided to the customer (e.g., ownership of a license, contract termination provisions and the feasibility of the customer to operate the software) are considered in determining whether the arrangement includes a license. In arrangements which include a software license, the associated revenue is recognized according to whether the license is perpetual or term. Revenue from term (recurring license charge) license software is recognized over the period that the client is entitled to use the license as usage occurs.

In multiple-deliverable arrangements that include software that is more than incidental to the products or services as a whole (software multiple-deliverable arrangements), software and software-related elements are accounted for in accordance with software revenue recognition guidance. Software-related elements include software products and services for which a software deliverable is essential to its functionality. Tangible products containing software components and non-software components that function together to deliver the tangible product's essential functionality are not within the scope of software revenue recognition guidance and are accounted for based on other applicable revenue recognition guidance.

A software multiple-deliverable arrangement is separated into more than one unit of accounting if all of the following criteria are met:

- The functionality of the delivered element(s) is not dependent on the undelivered element(s);
- There is vendor-specific objective evidence (VSOE) of fair value of the undelivered element(s). VSOE of fair value is based on the price charged when the deliverable is sold separately by the company on a regular basis and not as part of the multiple-deliverable arrangement; and
- Delivery of the delivered element(s) represents the culmination of the earnings process for that element(s).

If any one of these criteria is not met, the arrangement is accounted for as one unit of accounting which would result in revenue being recognized ratably over the contract term or being deferred until the earlier of when such criteria are met or when the last undelivered element is delivered. If these criteria are met for each element and there is VSOE of fair value for all units of accounting in an arrangement, the arrangement consideration is allocated to the separate units of accounting based on each unit's relative VSOE of fair value. There may be cases, however, in which there is VSOE of fair value of the undelivered item(s) but no such evidence for the delivered item(s). In these cases, the residual method is used to allocate the arrangement consideration. Under the residual method, the amount of consideration allocated to the delivered item(s) equals the total arrangement consideration less the aggregate VSOE of fair value of the undelivered elements.

The company's multiple-deliverable arrangements may have a stand-alone software deliverable that is subject to the existing software revenue recognition guidance. The revenue for these multiple-deliverable arrangements is allocated to the software deliverable and the non-software deliverables based on the relative selling prices of all of the deliverables in the arrangement using the hierarchy: VSOE, third-party evidence (TPE) or best estimate of selling price (BESP). In circumstances where the company cannot determine VSOE or TPE of the selling price for all of the deliverables in the arrangement, including the software deliverable, BESP is used for the purpose of performing this allocation.

Financing

Financing income attributable to sales-type leases, direct financing leases and loans is recognized on the accrual basis using the effective interest method. Operating lease income is recognized on a straight-line basis over the term of the lease.

Best Estimate of Selling Price

In certain instances, the company is not able to establish VSOE for all elements in a multiple-deliverable arrangement. When VSOE cannot be established, the company attempts to establish the selling price of each element based on TPE. TPE is determined based on competitor prices for similar deliverables when sold separately.

When the company is unable to establish selling price using VSOE or TPE, the company uses BESP in its allocation of arrangement consideration. The objective of BESP is to determine the price at which the company would transact a sale if the product or service were sold on a stand-alone basis. BESP may be used,

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

for example, if a product is not sold on a stand-alone basis or when the company sells a new product, for which VSOE and TPE does not yet exist, in a multiple-deliverable arrangement prior to selling the new product on a stand-alone basis.

The company determines BESP by considering multiple factors including, but not limited to, overall market conditions, including geographic or regional specific factors, competitive positioning, competitor actions, internal costs, profit objectives and pricing practices. The determination of BESP is a formal process that includes review and approval by the company's management. In addition, the company regularly reviews VSOE and TPE for its products and services, in addition to BESP.

Services Costs

Recurring operating costs for services contracts are recognized as incurred. For fixed-price design and build contracts, the costs of external hardware and software accounted for under the POC method are deferred and recognized based on the labor costs incurred to date, as a percentage of the total estimated labor costs to fulfill the contract. Certain eligible, nonrecurring costs incurred in the initial phases of outsourcing or other cloud-based services contracts are deferred and subsequently amortized. These costs consist of transition and setup costs related to the installation of systems and processes and are amortized on a straight-line basis over the expected period of benefit, not to exceed the term of the contract. Additionally, fixed assets associated with these contracts are capitalized and depreciated on a straight-line basis over the expected useful life of the asset. If an asset is contract specific, then the depreciation period is the shorter of the useful life of the asset or the contract term. Amounts paid to clients in excess of the fair value of acquired assets used in outsourcing arrangements are deferred and amortized on a straight-line basis as a reduction of revenue over the expected period of benefit not to exceed the term of the contract. The company performs periodic reviews to assess the recoverability of deferred contract transition and setup costs. This review is done by comparing the estimated minimum remaining undiscounted cash flows of a contract to the unamortized contract costs. If such minimum undiscounted cash flows are not sufficient to recover the unamortized costs, an impairment loss is recognized.

Deferred services transition and setup costs were $2,121 million and $2,072 million at December 31, 2017 and 2016, respectively. Amortization of deferred services transition and setup costs was estimated at December 31, 2017 to be $695 million in 2018, $517 million in 2019, $354 million in 2020, $232 million in 2021 and $323 million thereafter.

Deferred amounts paid to clients in excess of the fair value of acquired assets used in outsourcing or other cloud-based services arrangements were $163 million and $160 million at December 31, 2017 and 2016, respectively. Amortization of deferred amounts paid to clients in excess of the fair value of acquired assets is recorded as an offset of revenue and was estimated at December 31, 2017 to be $65 million in 2018, $51 million in 2019, $29 million in 2020, $13 million in 2021 and $5 million thereafter. In situations in which an outsourcing contract is terminated, the terms of the contract may require the client to reimburse the company for the recovery of unbilled accounts receivable, unamortized deferred costs incurred to purchase specific assets utilized in the delivery of services and to pay any additional costs incurred by the company to transition the services.

Software Costs

Costs that are related to the conceptual formulation and design of licensed software programs are expensed as incurred to research, development and engineering expense; costs that are incurred to produce the finished product after technological feasibility has been established are capitalized as an intangible asset. Capitalized amounts are amortized on a straight-line basis over periods ranging up to three years and are recorded in software cost within cost of sales. The company performs periodic reviews to ensure that unamortized program costs remain recoverable from future revenue. Costs to support or service licensed programs are charged to software cost within cost of sales as incurred.

The company capitalizes certain costs that are incurred to purchase or to create and implement internal-use software programs, including software coding, installation, testing and certain data conversions. These capitalized costs are amortized on a straight-line basis over periods ranging up to three years and are recorded in selling, general and administrative expense.

Certain eligible, non-recurring costs incurred in the initial phases of Software-as-a-Service contracts are deferred and amortized over the expected period of benefit, consistent with the policy described for Services Costs. Recurring operating costs in these contracts are recognized as incurred.

Product Warranties

The company offers warranties for its hardware products that generally range up to three years, with the majority being either one or three years. Estimated costs for standard warranty terms are recognized when revenue is recorded for the related deliverable. The company estimates its warranty costs standard to the deliverable based on historical warranty claim experience and estimates of future spending, and applies this estimate to the revenue stream for products under warranty. Estimated future costs for warranties applicable to revenue recognized in the current period are charged to cost of sales. The warranty liability is reviewed quarterly to verify that it properly reflects the remaining obligation based on the anticipated expenditures over the balance of the obligation period. Adjustments are made when actual warranty claim experience differs from estimates. Costs from fixed-price support or maintenance contracts, including extended warranty contracts, are recognized as incurred.

Revenue from extended warranty contracts is initially recorded as deferred income and subsequently recognized on a straight-line basis over the delivery period. Changes in deferred income for extended warranty contracts, and in the warranty liability for standard warranties, which are included in other accrued expenses and liabilities and other liabilities in the Consolidated Statement of Financial Position, are presented in the following tables:

Standard Warranty Liability

($ in millions)

	2017	2016
Balance at January 1	**$ 156**	$ 181
Current period accruals	**172**	145
Accrual adjustments to reflect experience	**(10)**	(6)
Charges incurred	**(165)**	(164)
Balance at December 31	**$ 152**	$ 156

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

Extended Warranty Liability (Deferred Income)

($ in millions)

	2017	2016
Balance at January 1	**$ 531**	$ 538
Revenue deferred for new extended warranty contracts	**267**	263
Amortization of deferred revenue	**(260)**	(267)
Other*	**28**	(4)
Balance at December 31	**$ 566**	$ 531
Current portion	**$ 277**	$ 264
Noncurrent portion	**$ 289**	$ 267

*Other consists primarily of foreign currency translation adjustments.

Shipping and Handling

Costs related to shipping and handling are recognized as incurred and included in cost in the Consolidated Statement of Earnings.

Expense and Other Income

Selling, General and Administrative

Selling, general and administrative (SG&A) expense is charged to income as incurred. Expenses of promoting and selling products and services are classified as selling expense and include such items as compensation, advertising, sales commissions and travel. General and administrative expense includes such items as compensation, legal costs, office supplies, non-income taxes, insurance and office rental. In addition, general and administrative expense includes other operating items such as an allowance for credit losses, workforce rebalancing charges for contractually obligated payments to employees terminated in the ongoing course of business, acquisition costs related to business combinations, amortization of certain intangible assets and environmental remediation costs.

Advertising and Promotional Expense

The company expenses advertising and promotional costs as incurred. Cooperative advertising reimbursements from vendors are recorded net of advertising and promotional expense in the period in which the related advertising and promotional expense is incurred. Advertising and promotional expense, which includes media, agency and promotional expense, was $1,445 million, $1,327 million and $1,290 million in 2017, 2016 and 2015, respectively, and is recorded in SG&A expense in the Consolidated Statement of Earnings.

Research, Development and Engineering

Research, development and engineering (RD&E) costs are expensed as incurred. Software costs that are incurred to produce the finished product after technological feasibility has been established are capitalized as an intangible asset.

Intellectual Property and Custom Development Income

The company licenses and sells the rights to certain of its intellectual property (IP) including internally developed patents, trade secrets and technological know-how. Certain IP transactions to third parties are licensing/royalty-based and others are transaction-based sales/other transfers. Income from licensing arrangements is recognized at the inception of the perpetual license term if all revenue recognition criteria have been met. Licensing arrangements include IP partnerships whereby a business partner licenses source code from the company and becomes responsible for developing, maintaining and enhancing the product. The company retains its customers and go-to-market capability and any royalty cost due to the partner is recognized in cost of sales. The IP partner has the rights to market the product and its derivative works under its own brand and remits royalty to the company on those sales, which are recorded as royalty-based fees. Income from any royalty-based fee arrangements is recognized over time or as the licensee sells future related products (i.e., variable royalty, based upon licensee's revenue). The company also enters into cross-licensing arrangements of patents, and income from these arrangements is recognized when earned. In addition, the company earns income from certain custom development projects for strategic technology partners and specific

clients. The company records the income from these projects if the fee is not refundable, is not dependent upon the success of the project and when all recognition criteria have been met.

Other (Income) and Expense

Other (income) and expense includes interest income (other than from Global Financing external transactions), gains and losses on certain derivative instruments, gains and losses from securities and other investments, gains and losses from certain real estate transactions, foreign currency transaction gains and losses, gains and losses from the sale of businesses, other than reported as discontinued operations, and amounts related to accretion of asset retirement obligations.

Business Combinations and Intangible Assets Including Goodwill

The company accounts for business combinations using the acquisition method and accordingly, the identifiable assets acquired, the liabilities assumed, and any noncontrolling interest in the acquiree are recorded at their acquisition date fair values. Goodwill represents the excess of the purchase price over the fair value of net assets, including the amount assigned to identifiable intangible assets. The primary drivers that generate goodwill are the value of synergies between the acquired entities and the company and the acquired assembled workforce, neither of which qualifies as a separately identifiable intangible asset. Goodwill recorded in an acquisition is assigned to applicable reporting units based on expected revenues. Identifiable intangible assets with finite lives are amortized over their useful lives. Amortization of completed technology is recorded in cost, and amortization of all other intangible assets is recorded in SG&A expense. Acquisition-related costs, including advisory, legal, accounting, valuation and other costs, are expensed in the periods in which the costs are incurred. The results of operations of acquired businesses are included in the Consolidated Financial Statements from the acquisition date.

Impairment

Long-lived assets, other than goodwill and indefinite-lived intangible assets, are tested for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. The impairment test is based on undiscounted cash flows and, if impaired, the asset is written down to fair value based on either discounted cash flows or appraised values. Goodwill and indefinite-lived intangible assets are tested at least annually, in the fourth quarter, for impairment and whenever changes in circumstances indicate an impairment may exist. Goodwill is tested at the reporting unit level which is the operating segment, or a business, which is one level below that operating segment (the “component” level) if discrete financial information is prepared and regularly

reviewed by management at the segment level. Components are aggregated as a single reporting unit if they have similar economic characteristics.

Depreciation and Amortization

Property, plant and equipment are carried at cost and depreciated over their estimated useful lives using the straight-line method. The estimated useful lives of certain depreciable assets are as follows: buildings, 30 to 50 years; building equipment, 10 to 20 years; land improvements, 20 years; production, engineering, office and other equipment, 2 to 20 years; and information technology equipment, 1.5 to 5 years. Leasehold improvements are amortized over the shorter of their estimated useful lives or the related lease term, rarely exceeding 25 years.

Capitalized software costs incurred or acquired after technological feasibility has been established are amortized over periods ranging up to 3 years. Capitalized costs for internal-use software are amortized on a straight-line basis over periods ranging up to 3 years. Other intangible assets are amortized over periods between 1 and 7 years.

Environmental

The cost of internal environmental protection programs that are preventative in nature are expensed as incurred. When a cleanup program becomes likely, and it is probable that the company will incur cleanup costs and those costs can be reasonably estimated, the company accrues remediation costs for known environmental liabilities. The company’s maximum exposure for all environmental liabilities cannot be estimated and no amounts are recorded for environmental liabilities that are not probable or estimable.

Asset Retirement Obligations

Asset retirement obligations (ARO) are legal obligations associated with the retirement of long-lived assets. These liabilities are initially recorded at fair value and the related asset retirement costs are capitalized by increasing the carrying amount of the related assets by the same amount as the liability. Asset retirement costs are subsequently depreciated over the useful lives of the related assets. Subsequent to initial recognition, the company records period-to-period changes in the ARO liability resulting from the passage of time in interest expense and revisions to either the timing or the amount of the original expected cash flows to the related assets.

Defined Benefit Pension and Nonpension Postretirement Benefit Plans

The funded status of the company’s defined benefit pension plans and nonpension postretirement benefit plans (retirement-related benefit plans) is recognized in the Consolidated Statement of Financial Position. The funded status is measured as the difference between the fair value of plan assets and the

benefit obligation at December 31, the measurement date. For defined benefit pension plans, the benefit obligation is the projected benefit obligation (PBO), which represents the actuarial present value of benefits expected to be paid upon retirement based on employee services already rendered and estimated future compensation levels. For the nonpension postretirement benefit plans, the benefit obligation is the accumulated postretirement benefit obligation (APBO), which represents the actuarial present value of postretirement benefits attributed to employee services already rendered. The fair value of plan assets represents the current market value of assets held in an irrevocable trust fund, held for the sole benefit of participants, which are invested by the trust fund. Overfunded plans, with the fair value of plan assets exceeding the benefit obligation, are aggregated and recorded as a prepaid pension asset equal to this excess. Underfunded plans, with the benefit obligation exceeding the fair value of plan assets, are aggregated and recorded as a retirement and nonpension postretirement benefit obligation equal to this excess.

The current portion of the retirement and nonpension post-retirement benefit obligations represents the actuarial present value of benefits payable in the next 12 months exceeding the fair value of plan assets, measured on a plan-by-plan basis. This obligation is recorded in compensation and benefits in the Consolidated Statement of Financial Position.

Net periodic pension and nonpension postretirement benefit cost/(income) is recorded in the Consolidated Statement of Earnings and includes service cost, interest cost, expected return on plan assets, amortization of prior service costs/ (credits) and (gains)/losses previously recognized as a component of OCI and amortization of the net transition asset remaining in accumulated other comprehensive income/(loss) (AOCI). Service cost represents the actuarial present value of participant benefits earned in the current year. Interest cost represents the time value of money cost associated with the passage of time. Certain events, such as changes in the employee base, plan amendments and changes in actuarial assumptions, result in a change in the benefit obligation and the corresponding change in OCI. The result of these events is amortized as a component of net periodic cost/(income) over the service lives or life expectancy of the participants, depending on the plan, provided such amounts exceed thresholds which are based upon the benefit obligation or the value of plan assets. Net periodic cost/(income) is recorded in Cost, SG&A and RD&E in the Consolidated Statement of Earnings based on the employees' respective functions. Refer to note B, "Accounting Changes", on pages 94 to 96, for additional information on the presentation change relating to pension costs beginning on January 1, 2018.

(Gains)/losses and prior service costs/(credits) are not recognized as a component of net periodic cost/(income) in the Consolidated Statement of Earnings as they arise, but are recognized as a component of OCI in the Consolidated Statement of Comprehensive Income. Those (gains)/losses and prior service costs/(credits) are subsequently recognized as a component of net periodic cost/(income) pursuant to the recognition and amortization provisions of applicable accounting guidance. (Gains)/losses arise as a result of differences between actual experience and assumptions or as a result of changes in actuarial assumptions. Prior service costs/(credits) represent the cost of benefit changes attributable to prior service granted in plan amendments.

The measurement of benefit obligations and net periodic cost/(income) is based on estimates and assumptions approved by the company's management. These valuations reflect the terms of the plans and use participant-specific information such as compensation, age and years of service, as well as certain assumptions, including estimates of discount rates, expected return on plan assets, rate of compensation increases, interest crediting rates and mortality rates.

Defined Contribution Plans

The company's contribution for defined contribution plans is recorded when the employee renders service to the company. The charge is recorded in Cost, SG&A and RD&E in the Consolidated Statement of Earnings based on the employees' respective functions.

Stock-Based Compensation

Stock-based compensation represents the cost related to stock-based awards granted to employees. The company measures stock-based compensation cost at the grant date, based on the estimated fair value of the award and recognizes the cost on a straight-line basis (net of estimated forfeitures) over the employee requisite service period. The company grants its employees Restricted Stock Units (RSUs), including Retention Restricted Stock Units (RRSUs) and Performance Share Units (PSUs) and periodically grants stock options. RSUs are stock awards granted to employees that entitle the holder to shares of common stock as the award vests, typically over a one- to five-year period. The fair value of the awards is determined and fixed on the grant date based on the company's stock price, adjusted for the exclusion of dividend equivalents. The company estimates the fair value of stock options using a Black-Scholes valuation model. Stock-based compensation cost is recorded in Cost, SG&A, and RD&E in the Consolidated Statement of Earnings based on the employees' respective functions.

The company records deferred tax assets for awards that result in deductions on the company's income tax returns, based on the amount of compensation cost recognized and the statutory tax rate in the jurisdiction in which it will receive a deduction. The differences between the deferred tax assets recognized for financial reporting purposes and the actual tax deduction reported on the income tax return are recorded as a benefit or expense to the provision for income taxes in the Consolidated Statement of Earnings.

Income Taxes

Income tax expense is based on reported income before income taxes. Deferred income taxes reflect the tax effect of temporary differences between asset and liability amounts that are recognized for financial reporting purposes and the amounts that are recognized for income tax purposes. These deferred taxes are measured by applying currently enacted tax laws. Valuation allowances are recognized to reduce deferred tax assets to the amount that will more likely than not be realized. In assessing the need for a valuation allowance, management considers all available evidence for each jurisdiction including past operating results, estimates of future taxable income and the feasibility of ongoing tax planning strategies. When the company changes its determination as to the

amount of deferred tax assets that can be realized, the valuation allowance is adjusted with a corresponding impact to income tax expense in the period in which such determination is made.

The company recognizes tax liabilities when, despite the company's belief that its tax return positions are supportable, the company believes that certain positions may not be fully sustained upon review by tax authorities. Benefits from tax positions are measured at the largest amount of benefit that is greater than 50 percent likely of being realized upon settlement. The current portion of tax liabilities is included in taxes and the noncurrent portion of tax liabilities is included in other liabilities in the Consolidated Statement of Financial Position. To the extent that new information becomes available which causes the company to change its judgment regarding the adequacy of existing tax liabilities, such changes to tax liabilities will impact income tax expense in the period in which such determination is made. Interest and penalties, if any, related to accrued liabilities for potential tax assessments are included in income tax expense.

Translation of Non-U.S. Currency Amounts

Assets and liabilities of non-U.S. subsidiaries that have a local functional currency are translated to United States (U.S.) dollars at year-end exchange rates. Translation adjustments are recorded in OCI. Income and expense items are translated at weighted-average rates of exchange prevailing during the year.

Inventories, property, plant and equipment—net and other non-monetary assets and liabilities of non-U.S. subsidiaries and branches that operate in U.S. dollars are translated at the approximate exchange rates prevailing when the company acquired the assets or liabilities. All other assets and liabilities denominated in a currency other than U.S. dollars are translated at year-end exchange rates with the transaction gain or loss recognized in other (income) and expense. Income and expense items are translated at the weighted-average rates of exchange prevailing during the year. These translation gains and losses are included in net income for the period in which exchange rates change.

Derivative Financial Instruments

Derivatives are recognized in the Consolidated Statement of Financial Position at fair value and are reported in prepaid expenses and other current assets, investments and sundry assets, other accrued expenses and liabilities or other liabilities. Classification of each derivative as current or noncurrent is based upon whether the maturity of the instrument is less than or greater than 12 months. To qualify for hedge accounting, the company requires that the instruments be effective in reducing the risk exposure that they are designated to hedge. For instruments that hedge cash flows, hedge designation criteria also require that it be probable that the underlying transaction will occur. Instruments that meet established accounting criteria are formally designated as hedges. These criteria demonstrate that the derivative is expected to be highly effective at offsetting changes in fair value or cash flows of the underlying exposure both at inception of the hedging relationship and on an ongoing basis. The method of assessing hedge effectiveness and measuring hedge ineffectiveness is formally documented at hedge inception. The company assesses hedge effectiveness and measures hedge ineffectiveness at least quarterly throughout the designated hedge period.

Where the company applies hedge accounting, the company designates each derivative as a hedge of: (1) the fair value of a recognized financial asset or liability, or of an unrecognized firm commitment (fair value hedge attributable to interest rate or foreign currency risk); (2) the variability of anticipated cash flows of a forecasted transaction, or the cash flows to be received or paid related to a recognized financial asset or liability (cash flow hedge attributable to interest rate or foreign currency risk); or (3) a hedge of a long-term investment (net investment hedge) in a foreign operation. In addition, the company may enter into derivative contracts that economically hedge certain of its risks, even though hedge accounting does not apply or the company elects not to apply hedge accounting. In these cases, there

exists a natural hedging relationship in which changes in the fair value of the derivative, which are recognized currently in net income, act as an economic offset to changes in the fair value of the underlying hedged item(s).

Changes in the fair value of a derivative that is designated as a fair value hedge, along with offsetting changes in the fair value of the underlying hedged exposure, are recorded in earnings each period. For hedges of interest rate risk, the fair value adjustments are recorded as adjustments to interest expense and cost of financing in the Consolidated Statement of Earnings. For hedges of currency risk associated with recorded financial assets or liabilities, derivative fair value adjustments are recognized in other (income) and expense in the Consolidated Statement of Earnings. Changes in the fair value of a derivative that is designated as a cash flow hedge are recorded, net of applicable taxes, in OCI, in the Consolidated Statement of Comprehensive Income. When net income is affected by the variability of the underlying cash flow, the applicable offsetting amount of the gain or loss from the derivative that is deferred in AOCI is released to net income and reported in interest expense, cost, SG&A expense or other (income) and expense in the Consolidated Statement of Earnings based on the nature of the underlying cash flow hedged. Effectiveness for net investment hedging derivatives is measured on a spot-to-spot basis. The effective portion of changes in the fair value of net investment hedging derivatives and other non-derivative financial instruments designated as net investment hedges are recorded as foreign currency translation adjustments in AOCI. Changes in the fair value of the portion of a net investment hedging derivative excluded from the effectiveness assessment are recorded in interest expense. If the underlying hedged item in a fair value hedge ceases to exist, all changes in the fair value of the derivative are included in net income each period until the instrument matures. When the derivative transaction ceases to exist, a hedged asset or liability is no longer adjusted for changes in its fair value except as required under other relevant accounting standards.

Derivatives that are not designated as hedges, as well as changes in the fair value of derivatives that do not effectively offset changes in the fair value of the underlying hedged item throughout the designated hedge period (collectively, "ineffectiveness"), are recorded in earnings for each period and are primarily reported in other (income) and expense. When a cash flow hedging relationship is discontinued, the net gain or loss in AOCI must generally remain in AOCI

until the item that was hedged affects earnings. However, when it is probable that a forecasted transaction will not occur by the end of the originally specified time period or within an additional two-month period thereafter, the net gain or loss in AOCI must be reclassified into earnings immediately.

The company reports cash flows arising from derivative financial instruments designated as fair value or cash flow hedges consistent with the classification of cash flows from the underlying hedged items that these derivatives are hedging. Accordingly, the cash flows associated with derivatives designated as fair value or cash flow hedges are classified in cash flows from operating activities in the Consolidated Statement of Cash Flows. Cash flows from derivatives designated as net investment hedges and derivatives that do not qualify as hedges are reported in cash flows from investing activities in the Consolidated Statement of Cash Flows. For currency swaps designated as hedges of foreign currency denominated debt (included in the company's debt risk management program as addressed in note D, "Financial Instruments," on pages 100 to 107), cash flows directly associated with the settlement of the principal element of these swaps are reported in payments to settle debt in cash flows from financing activities in the Consolidated Statement of Cash Flows.

Financial Instruments

In determining the fair value of its financial instruments, the company uses a variety of methods and assumptions that are based on market conditions and risks existing at each balance sheet date. See note D, "Financial Instruments," on pages 100 to 107 for further information. All methods of assessing fair value result in a general approximation of value, and such value may never actually be realized.

Fair Value Measurement

Accounting guidance defines fair value as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Under this guidance, the company is required to classify certain assets and liabilities based on the following fair value hierarchy:

- Level 1—Quoted prices (unadjusted) in active markets for identical assets or liabilities that can be accessed at the measurement date;
- Level 2—Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly; and
- Level 3—Unobservable inputs for the asset or liability.

The guidance requires the use of observable market data if such data is available without undue cost and effort.

When available, the company uses unadjusted quoted market prices in active markets to measure the fair value and classifies such items within Level 1. If quoted market prices are not available, fair value is based upon internally developed models that use current market-based or independently sourced market parameters such as interest rates and currency rates. Items valued using internally generated models are classified according to the lowest level input or value driver that is significant to the valuation.

The determination of fair value considers various factors including interest rate yield curves and time value underlying the financial instruments. For derivatives and debt securities, the company uses a discounted cash flow analysis using discount rates commensurate with the duration of the instrument.

In determining the fair value of financial instruments, the company considers certain market valuation adjustments to the "base valuations" calculated using the methodologies described below for several parameters that market participants would consider in determining fair value:

- Counterparty credit risk adjustments are applied to financial instruments, taking into account the actual credit risk of a counterparty as observed in the credit default swap market to determine the true fair value of such an instrument.

- Credit risk adjustments are applied to reflect the company's own credit risk when valuing all liabilities measured at fair value. The methodology is consistent with that applied in developing counterparty credit risk adjustments, but incorporates the company's own credit risk as observed in the credit default swap market.

As an example, the fair value of derivatives is derived utilizing a discounted cash flow model that uses observable market inputs such as known notional value amounts, yield curves, spot and forward exchange rates as well as discount rates. These inputs relate to liquid, heavily traded currencies with active markets which are available for the full term of the derivative.

Certain financial assets are measured at fair value on a nonrecurring basis. These assets include equity method investments that are recognized at fair value at the measurement date to the extent that they are deemed to be other-than-temporarily impaired. Certain assets that are measured at fair value on a recurring basis can be subject to nonrecurring fair value measurements. These assets include available-for-sale equity investments that are deemed to be other-than-temporarily impaired. In the event of an other-than-temporary impairment of a financial instrument, fair value is measured using a model described above.

Accounting guidance permits the measurement of eligible financial assets, financial liabilities and firm commitments at fair value, on an instrument-by-instrument basis, that are otherwise not permitted to be accounted for at fair value under other accounting standards. This election is irrevocable. The company has not applied the fair value option to any eligible assets or liabilities.

Cash Equivalents

All highly liquid investments with maturities of three months or less at the date of purchase are considered to be cash equivalents.

Marketable Securities

Debt securities included in current assets represent securities that are expected to be realized in cash within one year of the balance sheet date. Long-term debt securities that are not expected to be realized in cash within one year and alliance equity securities are included in investments and sundry assets. Debt and marketable equity securities are considered available for sale and are reported at fair value with unrealized gains and losses, net of applicable taxes, in OCI. The realized gains and losses for available-for-sale securities are included in other (income) and expense in the Consolidated Statement of Earnings. Realized gains and losses are calculated based on the specific identification method.

In determining whether an other-than-temporary decline in market value has occurred, the company considers the duration that, and extent to which, the fair value of the investment is below its cost, the financial condition and near-term prospects of the issuer or underlying collateral of a security; and the company's intent and ability to retain the security in order to allow for an anticipated recovery in fair value. Other-than-temporary declines in fair value from amortized cost for available-for-sale equity and debt securities that the company intends to sell or would more likely than not be required to sell before the expected recovery of the amortized cost basis are charged to other (income) and expense in the period in which the loss occurs. For debt securities that the company has no intent to sell and believes that it more likely than not will not be required to sell prior to recovery, only the credit loss component of the impairment is recognized in other (income) and expense, while the remaining loss is recognized in OCI. The credit loss component recognized in other (income) and expense is identified as the amount of the principal cash flows not expected to be received over the remaining term of the debt security as projected using the company's cash flow projections.

Inventories

Raw materials, work in process and finished goods are stated at the lower of average cost or net realizable value. Cash flows related to the sale of inventories are reflected in net cash provided by operating activities in the Consolidated Statement of Cash Flows.

Allowance for Credit Losses

Receivables are recorded concurrent with billing and shipment of a product and/or delivery of a service to customers. A reasonable estimate of probable net losses on the value of customer receivables is recognized by establishing an allowance for credit losses.

Notes and Accounts Receivable—Trade

An allowance for uncollectible trade receivables is estimated based on a combination of write-off history, aging analysis and any specific, known troubled accounts.

Factored Receivables

The company enters into various factoring agreements with third-party financial institutions to sell its receivables (includes notes and accounts receivable-trade, financing receivables and other accounts receivables) under nonrecourse agreements. These transactions are accounted for as a reduction in receivables and are considered sold when: (1) they are transferred beyond the reach of the company and its creditors; (2) the purchaser has the right to pledge or exchange the receivables; and (3) the company has surrendered control over the transferred receivables. The proceeds from these arrangements are reflected as cash provided by operating activities in the Consolidated Statement of Cash Flows.

The gross amounts factored (the gross proceeds) under these programs (primarily relating to notes and accounts receivable-trade) for the three and twelve months ended December 31, 2017 were $0.7 billion and $1.9 billion, respectively, compared to $0.4 billion and $1.2 billion for the three and twelve months ended December 31, 2016, respectively. The fees and the net gains and losses associated with the transfer of receivables were not material for any of the periods presented.

Financing Receivables

Financing receivables include sales-type leases, direct financing leases and loans. Leases are accounted for in accordance with lease accounting standards. Loan receivables, including installment payment plans, which are generally unsecured, are primarily for software and services. Loans are financial assets which are recorded at amortized cost which approximates fair value. Commercial financing receivables are carried at amortized

cost, which approximates fair value. These receivables are for working capital financing to suppliers, distributors and resellers of IBM and OEM IT products and services. The company determines its allowances for credit losses on financing receivables based on two portfolio segments: lease receivables and loan receivables. The company further segments the portfolio into three classes: Americas, Europe/Middle East/Africa (EMEA) and Asia Pacific.

When calculating the allowances, the company considers its ability to mitigate a potential loss by repossessing leased equipment and by considering the current fair market value of any other collateral. The value of the equipment is the net realizable value. The allowance for credit losses for capital leases,

installment payment plan receivables and customer loans includes an assessment of the entire balance of the capital lease or loan, including amounts not yet due. The methodologies that the company uses to calculate its receivables reserves, which are applied consistently to its different portfolios, are as follows:

Individually Evaluated—The company reviews all financing receivables considered at risk on a quarterly basis. The review primarily consists of an analysis based upon current information available about the client, such as financial statements, news reports, published credit ratings, current market-implied credit analysis, as well as the current economic environment, collateral net of repossession cost and prior collection history. For loans that are collateral dependent, impairment is measured using the fair value of the collateral when foreclosure is probable. Using this information, the company determines the expected cash flow for the receivable and calculates an estimate of the potential loss and the probability of loss. For those accounts in which the loss is probable, the company records a specific reserve.

Collectively Evaluated—The company records an unallocated reserve that is calculated by applying a reserve rate to its different portfolios, excluding accounts that have been individually evaluated and specifically reserved. This reserve rate is based upon credit rating, probability of default, term, characteristics (lease/loan) and loss history. Factors that could result in actual receivable losses that are materially different from the estimated reserve include significant changes in the economy, or a sudden change in the economic health of a significant client in the company's receivables portfolio.

Other Credit-Related Policies

Past Due—The company views receivables as past due when payment has not been received after 90 days, measured from the original billing date.

Non-Accrual—Non-accrual assets include those receivables (impaired loans or nonperforming leases) with specific reserves and other accounts for which it is likely that the company will be unable to collect all amounts due according to original terms of the lease or loan agreement. Income recognition is discontinued on these receivables. Cash collections are first applied as a reduction to principal outstanding. Any cash received in excess of principal payments outstanding is recognized as interest income. Receivables may be removed from non-accrual status, if appropriate, based upon changes in client circumstances, such as a sustained history of payments.

Impaired Loans—The company evaluates all financing receivables considered at-risk, including loans, for impairment on a quarterly basis. The company considers any receivable with an individually evaluated reserve as an impaired loan. Depending on the level of impairment, loans will also be placed on non-accrual status as appropriate. Client loans are primarily for software and services and are unsecured. These receivables are subjected to credit analysis to evaluate the associated risk and, when appropriate, actions are taken to mitigate risks in these agreements which include covenants to protect against credit deterioration during the life of the obligation.

Write Off—Receivable losses are charged against the allowance in the period in which the receivable is deemed uncollectible. Subsequent recoveries, if any, are credited to the allowance. Write-offs of receivables and associated reserves occur to the extent that the customer is no longer in operation and/or, there is no reasonable expectation of additional collections or repossession. The company's assessments factor in the history of collections and write-offs in specific countries and across the portfolio.

Estimated Residual Values of Lease Assets

The recorded residual values of lease assets are estimated at the inception of the lease to be the expected fair value of the assets at the end of the lease term. The company periodically reassesses the realizable value of its lease residual values. Any anticipated increases in specific future residual values are not recognized before realization through remarketing efforts. Anticipated decreases in specific future residual values that are considered to be other-than-temporary are recognized immediately upon identification and are recorded as an adjustment to the residual value estimate. For sales-type and direct-financing leases, this reduction lowers the recorded net investment and is recognized as a loss charged to financing income in the period in which the estimate is changed, as well as an adjustment to unearned income to reduce future-period financing income.

Common Stock

Common stock refers to the $.20 par value per share capital stock as designated in the company's Certificate of Incorporation. Treasury stock is accounted for using the cost method. When treasury stock is reissued, the value is computed and recorded using a weighted-average basis.

Earnings Per Share of Common Stock

Earnings per share (EPS) is computed using the two-class method. The two-class method determines EPS for each class of common stock and participating securities according to dividends and dividend equivalents and their respective participation rights in undistributed earnings. Basic EPS of common stock is computed by dividing net income by the weighted-average number of common shares outstanding for the period. Diluted EPS of common stock is computed on the basis of the weighted-average number of shares of common stock plus the effect of dilutive potential common shares outstanding during the period using the treasury stock method. Dilutive potential common shares include outstanding stock awards, convertible notes and stock options.

NOTE B. ACCOUNTING CHANGES

New Standards to be Implemented

In February 2018, the Financial Accounting Standards Board (FASB) issued guidance that allows entities to elect an option to reclassify the stranded tax effects related to the application of U.S. tax reform from accumulated other comprehensive income/ (loss) to retained earnings. The guidance is effective January 1, 2019 with early adoption permitted. The company is currently evaluating whether to elect the option and the impact of the new guidance on its consolidated financial results.

In August 2017, the FASB issued guidance to simplify the application of current hedge accounting in certain areas, better portray the economic results of an entity's risk management activities in its financial statements and make targeted improvements to presentation and disclosure requirements. The guidance is effective January 1, 2019 with early adoption permitted. The company adopted the guidance as of January 1, 2018 and does not expect a material impact in the consolidated financial results.

In March 2017, the FASB issued guidance that impacts the presentation of net periodic pension and postretirement benefit costs. Under the guidance, the service cost component of net benefit cost will continue to be presented within cost, selling general and administrative expense and research, development and engineering expense in the Consolidated Statement of Earnings, unless eligible for capitalization. The other components of net benefit cost will be presented separately from service cost within other (income) and expense in the Consolidated Statement of Earnings. This presentation change will be applied retrospectively upon adoption. The guidance is effective January 1, 2018 with early adoption permitted. The company adopted the guidance as of the effective date. The guidance is primarily a change in financial statement presentation and is not expected to have a material impact in the consolidated financial results. The change will have an impact on gross profit margins.

In June 2016, the FASB issued guidance for credit impairment based on an expected loss model rather than an incurred loss model. The guidance requires the consideration of all available relevant information when estimating expected credit losses, including past events, current conditions and forecasts and their implications for expected credit losses. The guidance is effective January 1, 2020 with a one year early adoption permitted. The company has established an implementation team and is evaluating the impact of the new guidance.

The FASB issued guidance in February 2016, with amendments in 2018, which changes the accounting for leases. The guidance requires lessees to recognize right-of-use assets and lease liabilities for most leases in the Consolidated Statement of Financial Position. The guidance makes some changes to lessor accounting, including the elimination of the use of third-party residual value guarantee insurance in the capital lease test, and overall aligns with the new revenue recognition guidance. The guidance also requires qualitative and quantitative disclosures to assess the amount, timing and uncertainty of cash flows arising from leases. There are certain practical expedients that can be elected which the company is currently evaluating for application. The guidance is effective January 1, 2019 and early adoption is permitted. The company will adopt the guidance as of the effective date.

A cross-functional implementation team has been established which is evaluating the lease portfolio, system, process and policy change requirements. The company has made progress in gathering the necessary data elements for the lease population and a system provider has been selected, with system configuration and implementation underway. The company is currently evaluating the impact of the new guidance on its consolidated financial results and expects it will have a material impact on the Consolidated Statement of Financial Position. The company is currently planning on electing the package of practical expedients to not reassess prior conclusions related to contracts containing leases, leases classification, and initial direct costs and is evaluating the other practical expedients available under the guidance.

The company's operating lease commitments were $6.6 billion at December 31, 2017. In 2017, the use of third-party residual value guarantee insurance resulted in the company recognizing $452 million of sales-type lease revenue that would otherwise have been recognized over the lease period as operating lease revenue. The company continues to assess the potential impacts of the guidance, including normal ongoing business dynamics or potential changes in contracting terms.

In January 2016, the FASB issued guidance which addresses aspects of recognition, measurement, presentation and disclosure of financial instruments. Certain equity investments will be measured at fair value with changes recognized in net income. The amendment also simplifies the impairment test of equity investments that lack readily determinable fair value. The guidance is effective January 1, 2018 and early adoption was not permitted except for limited provisions. The company adopted the guidance on the effective date. The guidance is not expected to have a material impact in the consolidated financial results.

The FASB issued guidance on the recognition of revenue from contracts with customers in May 2014 with amendments in 2015 and 2016. Revenue recognition will depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The guidance also requires disclosures regarding the nature, amount, timing and uncertainty of revenue and cash flows arising from contracts with customers. The guidance permits two methods of adoption: retrospectively to each prior reporting period presented, or retrospectively with the cumulative effect of initially applying the guidance recognized at the date of initial application (the cumulative catch-up transition method). The company adopted the guidance effective January 1, 2018 using the cumulative catch-up transition method.

Given the scope of work required to implement the recognition and disclosure requirements under the new standard, the company began its assessment process in 2014 and has completed its changes to policy, processes, systems and controls. This also included the assessment of data availability and presentation necessary to meet the additional disclosure requirements of the guidance in the Notes to the Consolidated Financial Statements beginning in the first quarter of 2018.

The company expects revenue recognition for its broad portfolio of hardware, software and services offerings to remain largely unchanged. However, the guidance is expected to change the timing of revenue recognition in certain areas, including recognizing revenue for certain software licenses over time

versus at a point in time, in limited circumstances. These impacts are not expected to be material. The company expects to continue to recognize revenue for term license (recurring license charge) software arrangements on a monthly basis over the period that the client is entitled to use the license due to the contractual terms in these arrangements. Since the company currently expenses sales commissions as incurred, the requirement in the new standard to capitalize certain in-scope sales commissions will result in an accounting change for the company. This change is not expected to be material to the consolidated financial results, with no impact to cash flows.

At January 1, 2018, $557 million was reclassified from notes and accounts receivable-trade and deferred income-current to prepaid expenses and other current assets to establish the opening balance for net contract assets. In-scope sales commission costs previously recorded in the Consolidated Statement of Earnings were capitalized in accordance with the transition guidance, in the amount of $737 million. Deferred income of $29 million was recorded for certain software licenses that will be recognized over time versus at a point in time. Additionally, net deferred taxes was reduced $184 million in the Consolidated Statement of Financial Position, resulting in a cumulative-effect net increase to retained earnings of $524 million. The amortization of capitalized sales commissions compared to the previous method of recognition on an as-incurred basis is not expected to have a material impact to the company's consolidated financial results.

Standards Implemented

In January 2017, the FASB issued guidance which clarifies the definition of a business. The guidance provides a more robust framework to use in determining when a set of assets and activities acquired or sold is a business. The guidance was effective January 1, 2018 and early adoption was permitted. The company adopted the guidance effective January 1, 2017, and it did not have a material impact in the consolidated financial results.

In October 2016, the FASB issued guidance which requires an entity to recognize the income tax consequences of intra-entity transfers of assets, other than inventory, at the time of transfer. Assets within the scope of the guidance include intellectual property and property, plant and equipment. The guidance was effective January 1, 2018 and early adoption was permitted. The company adopted the guidance on January 1, 2017 using the required modified retrospective method. At adoption, $95 million and $47 million were reclassified from investments and sundry assets and prepaid expenses and other current assets, respectively into retained earnings. Additionally, net deferred taxes of $244 million were established in deferred taxes in the Consolidated Statement of Financial Position, resulting in a cumulative-effect net increase to retained earnings of $102 million. In January 2017, the company had one transaction that generated a $582 million benefit to income tax expense, income from continuing operations and net income and a benefit to both basic and diluted earnings per share of $0.62 per share for the year ended December 31, 2017. There was no other impact in the consolidated financial results for the year ended December 31, 2017. The ongoing impact of this guidance will be dependent on any transaction that is within its scope.

In March 2016, the FASB issued guidance which changes the accounting for share-based payment transactions, including the income tax consequences, classification of awards as either equity or liabilities and classification in the Consolidated Statement of Cash Flows. The guidance was effective and adopted by the company on January 1, 2017, and it did not have a material impact in the Consolidated Statement of Financial Position. The ongoing impact of the guidance could result in increased volatility in the provision for income taxes and earnings per share in the Consolidated Statement of Earnings, depending on the company's share price at exercise or vesting of share-based awards compared to grant date, however these impacts are not expected to be material. These impacts are recorded on a prospective basis. The company continues to estimate forfeitures in conjunction with measuring stock-based compensation cost. The guidance also requires cash payments on behalf of employees for shares directly withheld for taxes to be presented as financing outflows in the Consolidated Statement of Cash Flows. Prior to adoption, the company reported this activity as an operating cash outflow and as a result, prior periods have been reclassified as required. The FASB also issued guidance in May 2017, which relates to the accounting for modifications of share-based payment awards. The company adopted the guidance in the second quarter of 2017. The guidance had no impact in the consolidated financial results.

In September 2015, the FASB issued guidance eliminating the requirement that an acquirer in a business combination account for a measurement-period adjustment retrospectively. Instead, an acquirer will recognize a measurement-period adjustment during the period in which the amount of the adjustment is determined. In addition, the portion of the amount recorded in current-period earnings by line item that would have been recorded in previous reporting periods if the adjustment to the provisional amounts had been recognized as of the acquisition date should be presented separately on the face of the income statement or disclosed in the notes. The guidance was effective January 1, 2016 on a prospective basis. The guidance did not have a material impact in the consolidated financial results.

In May 2015, the FASB issued guidance which removed the requirement to categorize within the fair value hierarchy all investments for which fair value is measured using the net asset value per share practical expedient. The amendments also removed the requirement to make certain disclosures for all investments that are eligible to be measured at fair value using the net asset value per share practical expedient. Rather, those disclosures are limited to investments for which the entity has elected to measure the fair value using that practical expedient. The guidance was effective January 1, 2016. The guidance was a change in disclosure only and did not have an impact in the consolidated financial results.

In April 2015, the FASB issued guidance about whether a cloud computing arrangement includes a software license. If a cloud computing arrangement includes a software license, then the customer should account for the software license element of the arrangement consistent with the acquisition of other software licenses. If a cloud computing arrangement does not include a software license, the customer should account for the arrangement as a services contract. All software licenses recognized under this guidance will be accounted for consistent with other licenses of intangible assets. The guidance was effective January 1, 2016 and the company adopted it on a prospective basis. The guidance did not have a material impact in the consolidated financial results.

NOTE C. ACQUISITIONS/DIVESTITURES

Acquisitions

Purchase price consideration for all acquisitions, as reflected in the tables in this note, was paid primarily in cash. All acquisitions are reported in the Consolidated Statement of Cash Flows net of acquired cash and cash equivalents.

2017

In 2017, the company completed five acquisitions at an aggregate cost of $134 million. All of these acquisitions were for 100 percent of the acquired businesses.

The Technology Services & Cloud Platforms segment completed acquisitions of three businesses: in the first quarter, Agile 3 Solutions, LLC (Agile 3 Solutions), a privately held business; in the third quarter, the cloud and managed hosting services business from a large U.S. telecommunications company, and Cloudigo Ltd. (Cloudigo), a privately held business. The Cognitive Solutions segment completed the acquisition of one privately held business: in the second quarter, XCC Web Content & Custom Apps Extension (XCC) from TIMETOACT Software & Consulting GmbH. Global Business Services (GBS) completed the acquisition of one privately held business: in the fourth quarter, Vivant Digital (Vivant).

Each acquisition is expected to enhance the company's portfolio of product and services capabilities. Agile 3 Solutions is a developer of software used by C-Suite and senior executives to better visualize, understand and manage risks associated with the protection of sensitive data and adds capabilities to the company's security portfolio. The acquisition of the cloud and managed hosting services business of a large U.S. telecommunications company strengthens the company's services portfolio and aligns with its cloud strategy. Cloudigo brings talent and technology that aligns closely with the company's cloud platform investments in advanced network processing. XCC's technology enhances IBM's Connections Cloud platform by providing a single, accessible engagement center for sharing content. Vivant extends the strategy and design expertise of IBM Interactive Experience (IBM iX) and helps accelerate clients' digital transformations.

The following table reflects the purchase price related to these acquisitions and the resulting purchase price allocations as of December 31, 2017.

2017 Acquisitions

($ in millions)

	Amortization Life (in Years)	Total Acquisitions
Current assets		$ 18
Fixed assets/noncurrent assets		69
Intangible assets		
Goodwill	N/A	16
Completed technology	5	9
Client relationships	5–7	64
Patents/trademarks	1–5	1
Total assets acquired		177
Current liabilities		(9)
Noncurrent liabilities		(34)
Total liabilities assumed		(43)
Total purchase price		$ 134

N/A—Not applicable

The acquisitions were accounted for as business combinations using the acquisition method, and accordingly, the identifiable assets acquired, the liabilities assumed, and any noncontrolling interest in the acquired entity were recorded at their estimated fair values at the date of acquisition. The primary items that generated the goodwill are the value of the synergies between the acquired businesses and IBM and the acquired assembled workforce, neither of which qualify as an amortizable intangible asset.

The overall weighted-average life of the identified amortizable intangible assets acquired is 6.6 years. These identified intangible assets will be amortized on a straight-line basis over their useful lives. Goodwill of $13 million has been assigned to the Technology Services & Cloud Platforms segment and goodwill of $3 million has been assigned to the Cognitive Solutions segment. It is expected that approximately 50 percent of the goodwill will be deductible for tax purposes.

2016

In 2016, the company completed fifteen acquisitions at an aggregate cost of $5,899 million.

The Weather Company (TWC)—On January 29, 2016, the company completed the acquisition of TWC's B2B, mobile and cloud-based Web-properties, weather.com, Weather Underground, The Weather Company brand and WSI, its global business-to-business brand, for cash consideration of $2,278 million. The cable television segment was not acquired by IBM, but is licensing weather forecast data and analytics from IBM under a long-term contract. TWC was a privately held business. Goodwill of $1,717 million was assigned to the Cognitive Solutions segment. It was expected that none of the goodwill would be deductible for tax purposes. The overall weighted-average useful life of the identified intangible assets acquired was 6.9 years.

Truven Health Analytics, Inc. (Truven)—On April 8, 2016, the company completed the acquisition of 100 percent of Truven, a leading provider of healthcare analytics solutions, for cash consideration of $2,612 million, of which $2,412 million was paid in April 2016 and $148 million was paid in July 2017. Truven has developed proprietary analytic methods and assembled

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

analytic content assets, creating extensive national healthcare utilization, performance, quality and cost data. Truven was a privately held business. Goodwill of $1,933 million was assigned to the Cognitive Solutions segment. It was expected that approximately 15 percent of the goodwill would be deductible for tax purposes. The overall weighted-average useful life of the identified intangible assets acquired was 6.9 years.

Other Acquisitions—The Technology Services & Cloud Platforms segment completed acquisitions of four businesses: in the first quarter: Ustream, Inc. (Ustream), a privately held business, and AT&T's application and hosting services business; in the third quarter, G4S's cash solutions business; and in the fourth quarter, Sanovi Technologies Private Limited (Sanovi), a privately held business. GBS completed acquisitions of six privately held businesses: in the first quarter, Resource/Ammirati, ecx International AG (ecx.io) and Optevia Limited (Optevia); in the second quarter, Aperto AG (Aperto) and Bluewolf Group, LLC (Bluewolf); and in the fourth quarter, Fluid, Inc.'s Expert Personal Shopper (XPS) business. The Cognitive Solutions segment completed acquisitions of three privately held businesses: in the second quarter, Resilient Systems, Inc. (Resilient) and EZ Legacy, Ltd. (EZSource); and in the fourth quarter, Promontory Financial Group, LLC (Promontory).

Ustream provides cloud-based video streaming to enterprises and broadcasters. The acquisition of AT&T's application and hosting services business strengthens the company's cloud portfolio. The acquisition of the G4S cash solutions business brings together the engineering skills of G4S with the company's analytics and remote technology capabilities to expand delivery solutions. Sanovi provides hybrid cloud recovery, cloud migration and business continuity software for enterprise data centers and cloud infrastructure. Resource/Ammirati is a leading U.S.-based digital marketing and creative agency, addressing the rising demand from businesses seeking to reinvent themselves for the digital economy. Ecx.io enhances GBS' IBM iX with new digital marketing, commerce and platform skills to accelerate clients' digital transformations. Optevia is a Software-as-a Service systems integrator specializing in CRM solutions for public sector organizations. Aperto also joined IBM iX, supporting the company's growth in Europe, with expertise in digital strategy projects, including website and application development. Bluewolf extends the company's analytics, experience design and industry consulting leadership with one of the world's leading Salesforce consulting practices to deliver differentiated, consumer-grade experiences via the cloud. Fluid, Inc.'s Expert Personal Shopper business extends the company's portfolio of SaaS offerings and services, helping clients conduct commerce and engage with their customers. Resilient, a provider of incident response solutions, automates and orchestrates the many processes needed when dealing with cyber incidents from breaches to lost devices. EZSource helps developers quickly and easily understand and change mainframe code based on data displayed through dashboards and other visualizations. Promontory, a global market-leading risk management and regulatory compliance consulting firm, helps address clients' escalating regulations and risk management requirements.

All of these Other Acquisitions were for 100 percent of the acquired businesses.

The following table reflects the purchase price related to these acquisitions and the resulting purchase price allocations as of December 31, 2016.

2016 Acquisitions

($ in millions)

	Amortization Life (in Years)	The Weather Company	Truven Health Analytics	Other Acquisitions
Current assets		$ 76	$ 171	$ 153
Fixed assets/noncurrent assets		123	127	110
Intangible assets				
Goodwill	N/A	1,717	1,933	593
Completed technology	1–7	160	338	96
Client relationships	3–7	313	516	226
Patents/trademarks	1–7	349	54	42
Total assets acquired		2,738	3,141	1,220
Current liabilities		(88)	(148)	(96)
Noncurrent liabilities		(372)	(381)	(76)
Total liabilities assumed		(460)	(529)	(171)
Bargain purchase gain		—	—	(40)*
Total purchase price		$ 2,278	$ 2,612	$ 1,009

N/A—Not applicable
* Bargain purchase gain relating to AT&T's application and hosting services business was recognized in selling, general and administrative expense in the Consolidated Statement of Earnings in the three months ended March 31, 2016.

For the Other Acquisitions, the overall weighted-average life of the identified amortizable intangible assets acquired was 6.3 years. These identified intangible assets will be amortized on a straight-line basis over their useful lives. Goodwill of $119 million was assigned to the Technology Services & Cloud Platforms segment, goodwill of $303 million was assigned to the GBS segment and goodwill of $171 million was assigned to the Cognitive Solutions segment. It was expected that approximately 55 percent of the goodwill would be deductible for tax purposes.

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

2015

In 2015, the company completed fourteen acquisitions at an aggregate cost of $3,555 million.

Merge Healthcare, Inc. (Merge)—On October 13, 2015, the company completed the acquisition of 100 percent of Merge, a publicly held business and a leading provider of medical image handling and processing, interoperability and clinical systems designed to advance healthcare quality and efficiency, for cash consideration of $1,036 million. Merge joined the company's Watson Health business unit, bolstering clients' ability to analyze and cross-reference medical images against billions of data points already in the Watson Health Cloud. Goodwill of $695 million was assigned to the Cognitive Solutions ($502 million) and Technology Services & Cloud Platforms ($193 million) segments. It was expected that none of the goodwill would be deductible for tax purposes. The overall weighted-average useful life of the identified intangible assets acquired was 7.0 years.

Cleversafe, Inc. (Cleversafe)—On November 6, 2015, the company completed the acquisition of 100 percent of Cleversafe, a privately held business and a leading developer and manufacturer of object-based storage software and appliances, for cash consideration of $1,309 million. Cleversafe's integration into the company's Cloud business gives clients strategic data flexibility, simplified management and consistency with on-premise, cloud and hybrid cloud deployment options. Goodwill of $1,000 million was assigned to the Technology Services & Cloud Platforms ($590 million) and Systems ($410 million) segments. It was expected that none of the goodwill would be deductible for tax purposes. The overall weighted-average useful life of the identified intangible assets acquired was 6.9 years.

Other Acquisitions—The Cognitive Solutions segment completed acquisitions of six privately held businesses: in the first quarter, AlchemyAI, Inc. (AlchemyAI) and Blekko, Inc. (Blekko); in the second quarter, Explorys, Inc. (Explorys) and Phytel, Inc. (Phytel); in the third quarter, Compose, Inc. (Compose); and in the fourth quarter, IRIS Analytics GmbH (IRIS Analytics). The Technology Services & Cloud Platforms segment completed acquisitions of four privately held businesses: in the second quarter, Blue Box Group, Inc. (Blue Box); in the third quarter, StrongLoop, Inc. (StrongLoop); and in the fourth quarter, Gravitant, Inc. (Gravitant) and Clearleap, Inc. (Clearleap). GBS completed acquisitions of two privately held businesses in the fourth quarter, Advanced Application Corporation (AAC) and Meteorix, LLC. (Meteorix).

AlchemyAI provides scalable cognitive computing application program interface services and computing applications. Blekko technology provides advanced Web-crawling, categorization and intelligent filtering. Explorys provides secure cloud-based solutions for clinical integration, at-risk population management, cost of care measurement and pay-for-performance. Phytel's SaaS-based population health management offerings help providers identify patients at risk for care gaps and engage the patient to begin appropriate preventative care. Blue Box provides hosted, managed, OpenStack-based production-grade private clouds for the enterprise and service provider markets. Compose offers auto-scaling, production-ready databases to help software development teams deploy data services efficiently. StrongLoop provides application development software that enables software developers to build applications using application programming interfaces. AAC engages in system integration application development, software support and services. AAC was an affiliate of JBCC Holdings Inc. and IBM Japan Ltd. The company acquired all the shares of AAC which became a wholly owned subsidiary as of October 1, 2015. Gravitant develops cloud-based software to enable organizations to easily plan, buy and manage, or "broker," software and computing services from multiple suppliers across hybrid clouds. Meteorix offers consulting, deployment, integration and ongoing post-production services for Workday Financial Management and Human Capital Management applications. Clearleap provides cloud-based video services. IRIS Analytics provides technology and consultancy services to the payments industry to detect electronic payment fraud.

All of these Other Acquisitions were for 100 percent of the acquired businesses with the exception of the AAC acquisition.

The following table reflects the purchase price related to these acquisitions and the resulting purchase price allocations as of December 31, 2015.

2015 Acquisitions

($ in millions)

	Amortization Life (in Years)	Merge	Cleversafe	Other Acquisitions
Current assets		$ 94	$ 23	$ 60
Fixed assets/noncurrent assets		128	63	82
Intangible assets				
Goodwill	N/A	695	1,000	895
Completed technology	5–7	133	364	163
Client relationships	5–7	145	23	95
Patents/trademarks	2–7	54	11	23
Total assets acquired		1,248	1,484	1,318
Current liabilities		(73)	(15)	(34)
Noncurrent liabilities		(139)	(160)	(73)
Total liabilities assumed		(212)	(175)	(107)
Total purchase price		$ 1,036	$ 1,309	$ 1,210

N/A—Not applicable

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

For the "Other Acquisitions," the overall weighted-average life of the identified intangible assets acquired was 6.4 years. These identified intangible assets will be amortized on a straight-line basis over their useful lives. Goodwill of $518 million was assigned to the Cognitive Solutions segment, $303 million was assigned to the Technology Services & Cloud Platforms segment, and $74 million was assigned to the GBS segment. It was expected that 7 percent of the goodwill would be deductible for tax purposes.

Divestitures

Microelectronics—On October 20, 2014, IBM and GLOBALFOUNDRIES announced a definitive agreement in which GLOBALFOUNDRIES would acquire the company's Microelectronics business, including existing semiconductor manufacturing assets and operations in East Fishkill, NY and Essex Junction, VT. The commercial OEM business acquired by GLOBALFOUNDRIES includes custom logic and specialty foundry, manufacturing and related operations. The transaction closed on July 1, 2015.

At September 30, 2014, the company concluded that the Microelectronics business met the criteria for discontinued operations reporting. The disposal group constituted a component under accounting guidance. The continuing cash inflows and outflows with the discontinued component are related to the manufacturing sourcing arrangement and the transition, packaging and test services. These cash flows are not direct cash flows as they are not significant and the company has no significant continuing involvement.

All assets and liabilities of the business, classified as held for sale at June 30, 2015, were transferred at closing. The company transferred $515 million of net cash to GLOBALFOUNDRIES in the third quarter of 2015. This amount included $750 million of cash consideration, adjusted by the amount of working capital due from GLOBALFOUNDRIES and other miscellaneous items. A second cash payment in the amount of $500 million was transferred in December 2016 while the remaining cash consideration of $250 million was transferred in December 2017.

Summarized financial information for discontinued operations is shown in the table below.

($ in millions)

For the year ended December 31:	2017	2016	2015
Total revenue	$ —	$ —	$ 720
Loss from discontinued operations, before tax	**(9)**	(11)	(175)
Loss on disposal, before tax	**1**	0	(116)
Total loss from discontinued operations, before income taxes	**(8)**	(11)	(291)
Provision/(benefit) for income taxes	**(3)**	(2)	(117)
Loss from discontinued operations, net of tax	**$ (5)**	$ (9)	$ (174)

Industry Standard Server—On January 23, 2014, IBM and Lenovo Group Limited (Lenovo) announced a definitive agreement in which Lenovo would acquire the company's industry standard server portfolio (System x) for an adjusted purchase price of $2.1 billion, consisting of approximately $1.8 billion in cash, with the balance in Lenovo common stock. The stock represented less than 5 percent equity ownership in Lenovo. The company sold to Lenovo its System x, BladeCenter and Flex System blade servers and switches, x86-based Flex integrated systems, NeXtScale and iDataPlex servers and associated software, blade networking and maintenance operations. As of March 31, 2016, all Lenovo common stock was sold.

The initial closing was completed on October 1, 2014. A subsequent closing occurred in most other countries in which there was a large business footprint on December 31, 2014. The remaining countries closed on March 31, 2015. An assessment of the ongoing contractual terms of the transaction resulted in the recognition of pre-tax gains of $63 million, $57 million and $14 million in 2015, 2016 and 2017, respectively.

Overall, the company expects to recognize a total pre-tax gain on the sale of approximately $1.6 billion, which does not include associated costs related to transition and performance-based costs. Net of these charges, the pre-tax gain was approximately $1.3 billion, of which the cumulative gain recorded as of December 31, 2017 is $1.2 billion. The balance of the gain is expected to be recognized in 2019 upon conclusion of the maintenance agreement.

Others—In addition to those above, the company completed the following divestitures:

2017—In the first quarter of 2017, the company completed one research-related divestiture. The Cognitive Solutions segment completed four divestitures; two in the second quarter of 2017 and one each in the third and fourth quarter of 2017. The financial terms related to these transactions were not material. Overall, the company recognized a pre-tax gain of $31 million related to these transactions in 2017.

2016—In the first quarter of 2016, the company completed four software product-related divestitures. In the fourth quarter of 2016, the company completed the divestiture of one service-related offering. The financial terms related to these transactions were not material. Overall, the company recorded a pre-tax gain of $42 million related to these transactions in 2016.

2015—In the first quarter of 2015, the company completed two software product-related divestitures and in the second quarter, the company completed one software product-related divestiture and the divestiture of one GBS offering. In the fourth quarter of 2015, the company completed three software product-related divestitures. The financial terms related to these transactions were not material. Overall, the company recorded a pre-tax gain of $81 million related to these transactions in 2015.

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

NOTE D. FINANCIAL INSTRUMENTS

Fair Value Measurements

Financial Assets and Liabilities Measured at Fair Value on a Recurring Basis

The following tables present the company's financial assets and financial liabilities that are measured at fair value on a recurring basis at December 31, 2017 and 2016.

($ in millions)

At December 31, 2017:	Level 1	Level 2	Level 3	Total
Assets				
Cash equivalents [1]				
Time deposits and certificates of deposit	$ —	$ 8,066	$ —	$ 8,066
Commercial paper	—	96	—	96
Money market funds	26	—	—	26
Canadian government securities	—	398	—	398
Total	26	8,560	—	8,586[6]
Debt securities—current [2]	—	608	—	608[6]
Debt securities—noncurrent [3]	4	7	—	11
Available-for-sale equity investments [3]	4	—	—	4
Derivative assets [4]				
Interest rate contracts	—	461	—	461
Foreign exchange contracts	—	469	—	469
Equity contracts	—	12	—	12
Total	—	942	—	942[7]
Total assets	$ 33	$ 10,117	$ —	$ 10,151[7]
Liabilities				
Derivative liabilities [5]				
Foreign exchange contracts	$ —	$ 378	$ —	$ 378
Equity contracts	—	3	—	3
Interest rate contracts	—	34	—	34
Total liabilities	$ —	$ 415	$ —	$ 415[7]

(1) Included within cash and cash equivalents in the Consolidated Statement of Financial Position.
(2) U.S. government securities reported as marketable securities in the Consolidated Statement of Financial Position.
(3) Included within investments and sundry assets in the Consolidated Statement of Financial Position.
(4) The gross balances of derivative assets contained within prepaid expenses and other current assets, and investments and sundry assets in the Consolidated Statement of Financial Position at December 31, 2017 were $185 million and $757 million, respectively.
(5) The gross balances of derivative liabilities contained within other accrued expenses and liabilities, and other liabilities in the Consolidated Statement of Financial Position at December 31, 2017 were $377 million and $38 million, respectively.
(6) Available-for-sale securities with carrying values that approximate fair value.
(7) If derivative exposures covered by a qualifying master netting agreement had been netted in the Consolidated Statement of Financial Position, the total derivative asset and liability positions each would have been reduced by $255 million.

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

($ in millions)

At December 31, 2016:	Level 1	Level 2	Level 3	Total
Assets				
Cash equivalents [1]				
Time deposits and certificates of deposit	$ —	$ 3,629	$ —	$ 3,629
Money market funds	1,204	—	—	1,204
Total	1,204	3,629	—	4,832[6]
Debt securities—current [2]	—	699	—	699[6]
Debt securities—noncurrent [3]	1	6	—	8

Available-for-sale equity investments [3]	7	—	—	7
Derivative assets [4]				
Interest rate contracts	—	555	—	555
Foreign exchange contracts	—	560	—	560
Equity contracts	—	11	—	11
Total	—	1,126	—	1,126[7]
Total assets	$ 1,212	$ 5,460	$ —	$ 6,672[7]
Liabilities				
Derivative liabilities [5]				
Foreign exchange contracts	$ —	$ 188	$ —	$ 188
Equity contracts	—	10	—	10
Interest rate contracts	—	8	—	8
Total liabilities	$ —	$ 206	$ —	$ 206[7]

(1) Included within cash and cash equivalents in the Consolidated Statement of Financial Position.
(2) U.S. government securities reported as marketable securities in the Consolidated Statement of Financial Position.
(3) Included within investments and sundry assets in the Consolidated Statement of Financial Position.
(4) The gross balances of derivative assets contained within prepaid expenses and other current assets, and investments and sundry assets in the Consolidated Statement of Financial Position at December 31, 2016 were $532 million and $594 million, respectively.
(5) The gross balances of derivative liabilities contained within other accrued expenses and liabilities, and other liabilities in the Consolidated Statement of Financial Position at December 31, 2016 were $145 million and $61 million, respectively.
(6) Available-for-sale securities with carrying values that approximate fair value.
(7) If derivative exposures covered by a qualifying master netting agreement had been netted in the Consolidated Statement of Financial Position, the total derivative asset and liability positions each would have been reduced by $116 million.

There were no transfers between Levels 1 and 2 for the years ended December 31, 2017 and 2016.

Financial Assets and Liabilities Not Measured at Fair Value

Short-Term Receivables and Payables

Notes and other accounts receivable and other investments are financial assets with carrying values that approximate fair value. Accounts payable, other accrued expenses and short-term debt (excluding the current portion of long-term debt) are financial liabilities with carrying values that approximate fair value. If measured at fair value in the financial statements, these financial instruments would be classified as Level 3 in the fair value hierarchy, except for short-term debt, which would be classified as Level 2.

Loans and Long-Term Receivables

Fair values are based on discounted future cash flows using current interest rates offered for similar loans to clients with similar credit ratings for the same remaining maturities. At December 31, 2017 and 2016, the difference between the carrying amount and estimated fair value for loans and long-term receivables was immaterial. If measured at fair value in the financial statements, these financial instruments would be classified as Level 3 in the fair value hierarchy.

Long-Term Debt

Fair value of publicly traded long-term debt is based on quoted market prices for the identical liability when traded as an asset in an active market. For other long-term debt for which a quoted market price is not available, an expected present value technique that uses rates currently available to the company for debt with similar terms and remaining maturities is used to estimate fair value. The carrying amount of long-term debt is $39,837 million and $34,655 million and the estimated fair value is $42,264 million and $36,838 million at December 31, 2017 and 2016, respectively. If measured at fair value in the financial statements, long-term debt (including the current portion) would be classified as Level 2 in the fair value hierarchy.

Debt and Marketable Equity Securities

The company's cash equivalents and current debt securities are considered available-for-sale and recorded at fair value, which is not materially different from carrying value, in the Consolidated Statement of Financial Position.

The following tables summarize the company's noncurrent debt and marketable equity securities which are also considered available-for-sale and recorded at fair value in the Consolidated Statement of Financial Position.

($ in millions)

	Gross	Gross

At December 31, 2017:	Adjusted Cost	Unrealized Gains	Unrealized Losses	Fair Value
Debt securities—noncurrent [1]	**$ 8**	**$ 3**	**$ —**	**$ 11**
Available-for-sale equity investments [1]	**1**	**3**	**0**	**4**

[1] Included within investments and sundry assets in the Consolidated Statement of Financial Position.

($ in millions)

At December 31, 2016:	Adjusted Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Debt securities—noncurrent [1]	$ 5	$ 3	$ —	$ 8
Available-for-sale equity investments [1]	3	5	0	7

[1] Included within investments and sundry assets in the Consolidated Statement of Financial Position.

During the fourth quarter of 2014, the company acquired equity securities in conjunction with the sale of the System x business which were classified as available-for-sale securities. Based on an evaluation of available evidence as of December 31, 2015, the company recorded an other-than-temporary impairment loss of $86 million resulting in an adjusted cost basis of $185 million as of December 31, 2015. In the first quarter of 2016, the company recorded a gross realized loss of $37 million (before taxes) related to the sale of all the outstanding shares. The loss on this sale was recorded in other (income) and expense in the Consolidated Statement of Earnings.

Sales of debt and available-for-sale equity investments during the period were as follows:

($ in millions)

For the year ended December 31:	2017	2016	2015
Proceeds	**$ 7**	$ 151	$ 8
Gross realized gains (before taxes)	**3**	3	1
Gross realized losses (before taxes)	**2**	37	1

The after-tax net unrealized gains/(losses) on available-for-sale debt and equity securities that have been included in other comprehensive income/(loss) and the after-tax net (gains)/losses reclassified from accumulated other comprehensive income/(loss) to net income were as follows:

($ in millions)

For the year ended December 31:	2017	2016
Net unrealized gains/(losses) arising during the period	**$ 0**	$ (23)
Net unrealized (gains)/losses reclassified to net income*	**1**	21

* There were no writedowns in 2017 and 2016, respectively.

The contractual maturities of substantially all available-for-sale debt securities are less than one year at December 31, 2017.

Derivative Financial Instruments

The company operates in multiple functional currencies and is a significant lender and borrower in the global markets. In the normal course of business, the company is exposed to the impact of interest rate changes and foreign currency fluctuations, and to a lesser extent equity and commodity price changes and client credit risk. The company limits these risks by following established risk management policies and procedures, including the use of derivatives, and, where cost effective, financing with

debt in the currencies in which assets are denominated. For interest rate exposures, derivatives are used to better align rate movements between the interest rates associated with the company's lease and other financial assets and the interest rates associated with its financing debt. Derivatives are also used to manage the related cost of debt. For foreign currency exposures, derivatives are used to better manage the cash flow volatility arising from foreign exchange rate fluctuations.

As a result of the use of derivative instruments, the company is exposed to the risk that counterparties to derivative contracts will fail to meet their contractual obligations. To mitigate the counterparty credit risk, the company has a policy of only entering into contracts with carefully selected major financial institutions based upon their overall credit profile. The company's established policies and procedures for mitigating credit risk on principal

transactions include reviewing and establishing limits for credit exposure and continually assessing the creditworthiness of counterparties. The right of set-off that exists under certain of these arrangements enables the legal entities of the company subject to the arrangement to net amounts due to and from the counterparty reducing the maximum loss from credit risk in the event of counterparty default.

The company is also a party to collateral security arrangements with most of its major derivative counterparties. These arrangements require the company to hold or post collateral (cash or U.S. Treasury securities) when the derivative fair values exceed contractually established thresholds. Posting thresholds can be fixed or can vary based on credit default swap pricing or credit ratings received from the major credit agencies. The aggregate fair value of all derivative instruments under these collateralized arrangements that were in a liability position at December 31, 2017 and 2016 was $126 million and $11 million, respectively, for which no collateral was posted at either date. Full collateralization of these agreements would be required in the event that the company's credit rating falls below investment grade or if its credit default swap spread exceeds 250 basis points, as applicable, pursuant to the terms of the collateral security arrangements. The aggregate fair value of derivative instruments in asset positions as of December 31, 2017 and 2016 was $942 million and $1,126 million, respectively. This amount represents the maximum exposure to loss at the reporting date if the counterparties failed to perform as contracted. This exposure was reduced by $255 million and $116 million at December 31, 2017 and 2016, respectively, of liabilities included in master netting arrangements with those counterparties. Additionally, at December 31, 2017 and 2016, this exposure was reduced by $114 million and $141 million of cash collateral, respectively, and $35 million of non-cash collateral in U.S. Treasury securities at December 31, 2016. There were no non-cash collateral balances in U.S. Treasury securities at December 31, 2017. At December 31, 2017 and 2016, the net exposure related to derivative assets recorded in the Consolidated Statement of Financial Position was $572 million and $834 million, respectively. At December 31, 2017 and 2016, the net position related to derivative liabilities recorded in the Consolidated Statement of Financial Position was $160 million and $90 million, respectively.

In the Consolidated Statement of Financial Position, the company does not offset derivative assets against liabilities in master netting arrangements nor does it offset receivables or payables recognized upon payment or receipt of cash collateral against the fair values of the related derivative instruments. No amount was recognized in other receivables at December 31, 2017 and 2016 for the right to reclaim cash collateral. The amount recognized in accounts payable for the obligation to return cash collateral was $114 million and $141 million at December 31, 2017 and 2016, respectively. The company restricts the use of cash collateral received to rehypothecation, and therefore reports it in prepaid expenses and other current assets in the Consolidated Statement of Financial Position. No amount was rehypothecated at December 31, 2017 and 2016.

The company may employ derivative instruments to hedge the volatility in stockholders' equity resulting from changes in currency exchange rates of significant foreign subsidiaries of the company with respect to the U.S. dollar. These instruments, designated as net investment hedges, expose the company to liquidity risk as the derivatives have an immediate cash flow impact upon maturity which is not offset by a cash flow from the translation of the underlying hedged equity. The company monitors this cash loss potential on an ongoing basis and may discontinue some of these hedging relationships by de-designating or terminating the derivative instrument in order to manage the liquidity risk. Although not designated as accounting hedges, the company may utilize derivatives to offset the changes in the fair value of the de-designated instruments from the date of de-designation until maturity.

In its hedging programs, the company uses forward contracts, futures contracts, interest-rate swaps, cross-currency swaps, and options depending upon the underlying exposure. The company is not a party to leveraged derivative instruments.

A brief description of the major hedging programs, categorized by underlying risk, follows.

Interest Rate Risk

Fixed and Variable Rate Borrowings

The company issues debt in the global capital markets to fund its operations and financing business. Access to cost-effective financing can result in interest rate mismatches with the underlying assets. To manage these mismatches and to reduce overall interest cost, the company uses interest-rate swaps to convert specific fixed-rate debt issuances into variable-rate debt (i.e., fair value hedges) and to convert specific variable-rate debt issuances into fixed-rate debt (i.e., cash flow hedges). At December 31, 2017 and 2016, the total notional amount of the company's interest rate swaps was $9.1 billion and $7.3 billion, respectively. The weighted-average remaining maturity of these instruments at December 31, 2017 and 2016 was approximately 4.8 years and 6.2 years, respectively.

Forecasted Debt Issuance

The company is exposed to interest rate volatility on future debt issuances. To manage this risk, the company may use forward starting interest-rate swaps to lock in the rate on the interest payments related to the forecasted debt issuance. These swaps are accounted for as cash flow hedges. The company did not have any derivative instruments relating to this program outstanding at December 31, 2017 and 2016.

At December 31, 2016, net gains of less than $1 million (before taxes) were recorded in accumulated other comprehensive income/(loss) in connection with cash flow hedges of the company's borrowings. During 2017, all gains and losses associated with this program that were recorded in other comprehensive income/(loss) were reclassified to net income and there are no gains and losses remaining in accumulated other comprehensive income/(loss) at December 31, 2017.

Foreign Exchange Risk

Long-Term Investments in Foreign Subsidiaries

(Net Investment)

A large portion of the company's foreign currency denominated debt portfolio is designated as a hedge of net investment in foreign subsidiaries to reduce the volatility in stockholders' equity caused by changes in foreign currency exchange rates in the functional currency of major foreign subsidiaries with respect to the U.S. dollar. The company also uses cross-currency swaps and foreign exchange forward contracts for this risk management purpose. At December 31, 2017 and 2016, the total notional amount of derivative instruments designated as net investment hedges was $7.0 billion and $6.7 billion, respectively. At December 31, 2017 and 2016, the weighted-average remaining maturity of these instruments was approximately 0.2 years at both periods.

Anticipated Royalties and Cost Transactions

The company's operations generate significant nonfunctional currency, third-party vendor payments and intercompany payments for royalties and goods and services among the company's non-U.S. subsidiaries and with the company. In anticipation of these foreign currency cash flows and in view of the volatility of the currency markets, the company selectively employs foreign exchange forward contracts to manage its currency risk. These forward contracts are accounted for as cash flow hedges. The maximum length of time over which the company has hedged its exposure to the variability in future cash flows is four years. At December 31, 2017 and 2016, the total notional amount of forward contracts designated as cash flow hedges of forecasted royalty and cost transactions was $7.8 billion and $8.3 billion, respectively. The weighted-average remaining maturity of these instruments at December 31, 2017 and 2016 was 0.7 years at both periods.

At December 31, 2017 and 2016 in connection with cash flow hedges of anticipated royalties and cost transactions, the company recorded net gains of $27 million and net gains of $462 million (before taxes), respectively, in accumulated other comprehensive income/(loss). Within these amounts, $81 million of losses and $397 million of gains, respectively, are expected to be reclassified to net income within the next 12 months, providing an offsetting economic impact against the underlying anticipated transactions.

Foreign Currency Denominated Borrowings

The company is exposed to exchange rate volatility on foreign currency denominated debt. To manage this risk, the company employs cross-currency swaps to convert fixed-rate foreign currency denominated debt to fixed-rate debt denominated in the functional currency of the borrowing entity. These swaps are accounted for as cash flow hedges. The maximum length of time over which the company has hedged its exposure to the variability in future cash flows is approximately ten years. At December 31, 2017 and 2016, the total notional amount of cross-currency swaps designated as cash flow hedges of foreign currency denominated debt was $6.5 billion and $1.4 billion, respectively.

At December 31, 2017 and 2016, in connection with cash flow hedges of foreign currency denominated borrowings, the company recorded net gains of $42 million and net gains of $29 million (before taxes), respectively, in accumulated other comprehensive income/(loss). Within these amounts, $157 million of gains and $27 million of gains, respectively, are expected to be reclassified to net income within the next 12 months, providing an offsetting economic impact against the underlying exposure.

Subsidiary Cash and Foreign Currency

Asset/Liability Management

The company uses its Global Treasury Centers to manage the cash of its subsidiaries. These centers principally use currency swaps to convert cash flows in a cost-effective manner. In addition, the company uses foreign exchange forward contracts to economically hedge, on a net basis, the foreign currency exposure of a portion of the company's nonfunctional currency assets and liabilities. The terms of these forward and swap contracts are generally less than one year. The changes in the fair values of these contracts and of the underlying hedged exposures are generally offsetting and are recorded in other (income) and expense in the Consolidated Statement of Earnings. At December 31, 2017 and 2016, the total notional amount of derivative instruments in economic hedges of foreign currency exposure was $11.5 billion and $12.7 billion, respectively.

Equity Risk Management

The company is exposed to market price changes in certain broad market indices and in the company's own stock primarily related to certain obligations to employees. Changes in the overall value of these employee compensation obligations are recorded in selling, general and administrative (SG&A) expense in the Consolidated Statement of Earnings. Although not designated as accounting hedges, the company utilizes derivatives, including equity swaps and futures, to economically hedge the exposures related to its employee compensation obligations. The derivatives are linked to the total return on certain broad market indices or the total return on the company's common stock, and are recorded at fair value with gains or losses also reported in SG&A expense in the Consolidated Statement of Earnings. At December 31, 2017 and 2016, the total notional amount of derivative instruments in economic hedges of these compensation obligations was $1.3 billion and $1.2 billion, respectively.

Other Risks

The company may hold warrants to purchase shares of common stock in connection with various investments that are deemed derivatives because they contain net share or net cash settlement provisions. The company records the changes in the fair value of these warrants in other (income) and expense in the Consolidated Statement of Earnings. The company did not have any warrants qualifying as derivatives outstanding at December 31, 2017 and 2016.

The company is exposed to a potential loss if a client fails to pay amounts due under contractual terms. The company may utilize credit default swaps to economically hedge its credit exposures. The swaps are recorded at fair value with gains and losses reported in other (income) and expense in the Consolidated Statement of Earnings. The company did not have any derivative instruments relating to this program outstanding at December 31, 2017 and 2016.

The company is exposed to market volatility on certain investment securities. The company may utilize options or forwards to economically hedge its market exposure. The derivatives are recorded at fair value with gains and losses reported in other (income) and expense in the Consolidated Statement of Earnings. At December 31, 2017 and 2016, the company did not have any derivative instruments relating to this program outstanding.

The following tables provide a quantitative summary of the derivative and non-derivative instrument-related risk management activity as of December 31, 2017 and 2016, as well as for the years ended December 31, 2017, 2016 and 2015, respectively.

Fair Values of Derivative Instruments in the Consolidated Statement of Financial Position

($ in millions)

	Fair Value of Derivative Assets			Fair Value of Derivative Liabilities		
At December 31:	**Balance Sheet Classification**	**2017**	**2016**	**Balance Sheet Classification**	**2017**	**2016**
Designated as hedging instruments						
Interest rate contracts	Prepaid expenses and other current assets	**$ 2**	$ —	Other accrued expenses and liabilities	**$ —**	$ —
	Investments and sundry assets	**459**	555	Other liabilities	**34**	8
Foreign exchange contracts	Prepaid expenses and other current assets	**111**	421	Other accrued expenses and liabilities	**318**	46
	Investments and sundry assets	**298**	17	Other liabilities	**3**	35
	Fair value of derivative assets	**$ 870**	$ 993	**Fair value of derivative liabilities**	**$ 355**	$ 89
Not designated as hedging instruments						
Foreign exchange contracts	Prepaid expenses and other current assets	**$ 61**	$ 100	Other accrued expenses and liabilities	**$ 57**	$ 89
	Investments and sundry assets	**—**	22	Other liabilities	**—**	18
Equity contracts	Prepaid expenses and other current assets	**12**	11	Other accrued expenses and liabilities	**3**	10
	Fair value of derivative assets	**$ 72**	$ 133	**Fair value of derivative liabilities**	**$ 60**	$ 117
Total derivatives		**$ 942**	$ 1,126		**$ 415**	$ 206
Total debt designated as hedging instruments[1]						
Short-term debt		**N/A**	N/A		**$ —**	$ 1,125
Long-term debt		**N/A**	N/A		**$ 6,471**	$ 7,844
		N/A	N/A		**$ 6,471**	$ 8,969
Total		**$ 942**	$ 1,126		**$ 6,886**	$ 9,175

N/A—Not applicable

[1] Debt designated as hedging instruments are reported at carrying value.

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

The Effect of Derivative Instruments in the Consolidated Statement of Earnings

($ in millions)

		Gain/(Loss) Recognized in Earnings					
	Consolidated Statement of	**Recognized on Derivatives**			**Attributable to Risk Being Hedged[2]**		
For the year ended December 31:	**Earnings Line Item**	**2017**	**2016**	**2015**	**2017**	**2016**	**2015**
Derivative instruments in fair value							

hedges[1][5]							
Interest rate contracts	Cost of financing	**$ 1**	$ 28	$ 108	**$ 74**	$ 58	$ (1)
	Interest expense	**1**	31	94	**69**	63	(1)
Derivative instruments not designated as hedging instruments							
Foreign exchange contracts	Other (income) and expense	**16**	(189)	127	**N/A**	N/A	N/A
Interest rate contracts	Other (income) and expense	**—**	0	(1)	**N/A**	N/A	N/A
Equity contracts	SG&A expense	**135**	112	(27)	**N/A**	N/A	N/A
	Other (income) and expense	**—**	(1)	(9)	**N/A**	N/A	N/A
Total		**$ 153**	$ (18)	$ 291	**$ 144**	$ 121	$ (1)

($ in millions)

	Gain/(Loss) Recognized in Earnings and Other Comprehensive Income									
	Effective Portion Recognized in OCI			Consolidated Statement of	Effective Portion Reclassified from AOCI			Ineffectiveness and Amounts Excluded from Effectiveness Testing[3]		
For the year ended December 31:	**2017**	**2016**	**2015**	**Earnings Line Item**	**2017**	**2016**	**2015**	**2017**	**2016**	**2015**
Derivative instruments in cash flow hedges										
Interest rate contracts	**$ —**	$ —	$ —	Interest expense	**$ (45)**	$ (24)	$ 0	**$ —**	$ —	$ —
Foreign exchange contracts	**(58)**	243	618	Other (income) and expense	**324**	(68)	731	**1**	(3)	5
				Cost of sales*	**3**	(5)	192	**—**	—	—
				Cost of services*	**70**	(8)	0	**—**	—	—
				SG&A expense	**11**	4	149	**—**	—	—
Instruments in net investment hedges [4]										
Foreign exchange contracts	**(1,607)**	311	889	Cost of financing	**—**	—	—	**11**	—	—
				Interest expense	**—**	—	—	**33**	77	13
Total	**$ (1,665)**	$ 555	$ 1,507		**$ 363**	$ (102)	$ 1,072	**$ 45**	$ 74	$ 18

* Reclassified to conform to 2017 presentation.

(1) The amount includes changes in clean fair values of the derivative instruments in fair value hedging relationships and the periodic accrual for coupon payments required under these derivative contracts.

(2) The amount includes basis adjustments to the carrying value of the hedged item recorded during the period and amortization of basis adjustments recorded on de-designated hedging relationships during the period.

(3) The amount of gain/(loss) recognized in income represents ineffectiveness on hedge relationships.

(4) Instruments in net investment hedges include derivative and non-derivative instruments.

(5) For the years ended December 31, 2017, 2016 and 2015, fair value hedges resulted in losses of $2 million, $4 million and $2 million in ineffectiveness, respectively.

N/A—Not applicable

For the 12 months ending December 31, 2017, 2016 and 2015, there were no significant gains or losses excluded from the assessment of hedge effectiveness (for fair value hedges), or associated with an underlying exposure that did not or was not expected to occur (for cash flow hedges); nor are there any anticipated in the normal course of business.

NOTE E. INVENTORIES

($ in millions)

At December 31:	**2017**	**2016**
Finished goods	**$ 333**	$ 358
Work in process and raw materials	**1,250**	1,195
Total	**$ 1,583**	$ 1,553

NOTE F. FINANCING RECEIVABLES

The following table presents financing receivables, net of allowances for credit losses, including residual values.

($ in millions)

At December 31:	2017	2016
Current		
Net investment in sales-type and direct financing leases	**$ 2,900**	$ 2,909
Commercial financing receivables	**11,596**	9,706
Client loan and installment payment receivables (loans)	**7,226**	6,390
Total	**$ 21,721**	$ 19,006
Noncurrent		
Net investment in sales-type and direct financing leases	**$ 4,320**	$ 3,950
Client loan and installment payment receivables (loans)	**5,230**	5,071
Total	**$ 9,550**	$ 9,021

Net investment in sales-type and direct financing leases relates principally to the company's systems products and are for terms ranging generally from two to six years. Net investment in sales-type and direct financing leases includes unguaranteed residual values of $630 million and $585 million at December 31, 2017 and 2016, respectively, and is reflected net of unearned income of $535 million and $513 million, and net of the allowance for credit losses of $103 million and $133 million at those dates, respectively. Scheduled maturities of minimum lease payments outstanding at December 31, 2017, expressed as a percentage of the total, are approximately: 2018, 43 percent; 2019, 27 percent; 2020, 18 percent; 2021, 9 percent; and 2022 and beyond, 3 percent.

Commercial financing receivables, net of allowance for credit losses of $21 million and $28 million at December 31, 2017 and 2016, respectively, relate primarily to inventory and accounts receivable financing for dealers and remarketers of IBM and OEM products. Payment terms for inventory and accounts receivable financing generally range from 30 to 90 days.

Client loan and installment payment receivables (loans), net of allowance for credit losses of $211 million and $276 million at December 31, 2017 and 2016, respectively, are loans that are provided primarily to clients to finance the purchase of hardware, software and services. Payment terms on these financing arrangements are generally for terms up to seven years.

The allowance for credit losses at December 31, 2016 reflected a write-off in the fourth quarter of $188 million of previously reserved customer accounts as a result of recent experience and history across the portfolio, particularly in China. Of this total, $30 million was in Americas, $33 million was in EMEA and $125 million was in Asia Pacific and $73 million and $115 million was in lease receivables and loan receivables, respectively.

Client loan and installment payment financing contracts are priced independently at competitive market rates. The company has a history of enforcing these financing agreements.

The company utilizes certain of its financing receivables as collateral for nonrecourse borrowings. Financing receivables pledged as collateral for borrowings were $773 million and $689 million at December 31, 2017 and 2016, respectively. These borrowings are included in note J, "Borrowings," on pages 112 to 115.

The company did not have any financing receivables held for sale as of December 31, 2017 and 2016.

Financing Receivables by Portfolio Segment

The following tables present financing receivables on a gross basis, excluding the allowance for credit losses and residual value, by portfolio segment and by class, excluding commercial financing receivables and other miscellaneous financing receivables at December 31, 2017 and 2016. The company determines its allowance for credit losses based on two portfolio segments: lease receivables and loan receivables, and further segments the portfolio into three classes: Americas, EMEA and Asia Pacific. This portfolio segmentation was changed from growth markets and major markets in 2017 as the company no longer manages the business under those market delineations. There was no impact to segment reporting or the company's Consolidated Financial Statements.

($ in millions)

At December 31, 2017:	Americas	EMEA	Asia Pacific	Total
Financing receivables				
Lease receivables	**$ 3,911**	**$ 1,349**	**$ 1,333**	**$ 6,593**
Loan receivables	**6,715**	**3,597**	**2,354**	**12,667**
Ending balance	**$ 10,626**	**$ 4,946**	**$ 3,687**	**$ 19,259**
Collectively evaluated for impairment	**$ 10,497**	**$ 4,889**	**$ 3,604**	**$ 18,990**
Individually evaluated for impairment	**$ 129**	**$ 57**	**$ 83**	**$ 269**
Allowance for credit losses				
Beginning balance at January 1, 2017				
Lease receivables	**$ 54**	**$ 4**	**$ 76**	**$ 133**

Loan receivables	169	18	89	276
Total	**$ 223**	**$ 22**	**$ 165**	**$ 410**
Write-offs	(51)	(1)	(85)	(137)
Recoveries	1	1	0	2
Provision	(8)	29	(4)	16
Other	7	11	6	24
Ending balance at December 31, 2017	**$ 172**	**$ 61**	**$ 82**	**$ 314**
Lease receivables	$ 63	$ 9	$ 31	$ 103
Loan receivables	$ 108	$ 52	$ 51	$ 211
Collectively evaluated for impairment	$ 43	$ 15	$ 6	$ 64
Individually evaluated for impairment	$ 128	$ 46	$ 76	$ 250

($ in millions)

At December 31, 2016:	Americas	EMEA	Asia Pacific	Total
Financing receivables				
Lease receivables	$ 3,830	$ 1,171	$ 1,335	$ 6,336
Loan receivables	6,185	3,309	2,243	11,737
Ending balance	$ 10,015	$ 4,480	$ 3,578	$ 18,073
Collectively evaluated for impairment	$ 9,847	$ 4,460	$ 3,419	$ 17,726
Individually evaluated for impairment	$ 168	$ 20	$ 159	$ 347
Allowance for credit losses				
Beginning balance at January 1, 2016				
Lease receivables	$ 52	$ 17	$ 143	$ 213
Loan receivables	122	55	200	377
Total	$ 175	$ 72	$ 343	$ 590
Write-offs	(36)	(48)	(154)	(237)
Recoveries	2	0	0	2
Provision	65	(1)	(6)	58
Other	17	(1)	(18)	(3)
Ending balance at December 31, 2016	$ 223	$ 22	$ 165	$ 410
Lease receivables	$ 54	$ 4	$ 76	$ 133
Loan receivables	$ 169	$ 18	$ 89	$ 276
Collectively evaluated for impairment	$ 62	$ 13	$ 15	$ 90
Individually evaluated for impairment	$ 161	$ 9	$ 150	$ 320

When determining the allowances, financing receivables are evaluated either on an individual or a collective basis. For individually evaluated receivables, the company determines the expected cash flow for the receivable and calculates an estimate of the potential loss and the probability of loss. For those accounts in which the loss is probable, the company records a specific reserve. In addition, the company records an unallocated reserve that is calculated by applying a reserve rate to its different portfolios, excluding accounts that have been specifically reserved. This reserve rate is based upon credit rating, probability of default, term, characteristics (lease/loan) and loss history.

Financing Receivables on Non-Accrual Status

The following table presents the recorded investment in financing receivables which were on non-accrual status at December 31, 2017 and 2016.

($ in millions)

At December 31:	2017	2016
Americas	**$ 22**	$ 23
EMEA	**14**	2
Asia Pacific	**3**	14
Total lease receivables	**$ 38**	$ 40
Americas	**$ 71**	$ 128
EMEA	**59**	5
Asia Pacific	**9**	12
Total loan receivables	**$ 138**	$ 145
Total receivables	**$ 177**	$ 185

Impaired Receivables

The company considers any receivable with an individually evaluated reserve as an impaired receivable. Depending on the level of impairment, receivables will also be placed on a non-accrual status. The following tables present impaired receivables at December 31, 2017 and 2016. This presentation includes both loan and lease receivables.

($ in millions)

At December 31, 2017:	Recorded Investment	Related Allowance
Americas	$ 129	$ 128
EMEA	57	46
Asia Pacific	83	76
Total	$ 269	$ 250

($ in millions)

At December 31, 2016:	Recorded Investment	Related Allowance
Americas	$ 168	$ 161
EMEA	20	9
Asia Pacific	159	150
Total	$ 347	$ 320

($ in millions)

For the year ended December 31, 2017:	Average Recorded Investment	Interest Income Recognized	Interest Income Recognized on Cash Basis
Americas	$ 158	$ 0	$ —
EMEA	33	0	—
Asia Pacific	122	0	—
Total	$ 312	$ 0	$ —

($ in millions)

For the year ended December 31, 2016:	Average Recorded Investment	Interest Income Recognized	Interest Income Recognized on Cash Basis
Americas	$ 160	$ 0	$ —
EMEA	56	0	—
Asia Pacific	290	0	—
Total	$ 505	$ 0	$ —

Credit Quality Indicators

The company's credit quality indicators, which are based on rating agency data, publicly available information and information provided by customers, are reviewed periodically based on the relative level of risk. The resulting indicators are a numerical rating system that maps to Moody's Investors Service credit ratings as shown below. The company uses information provided by Moody's, where available, as one of many inputs in its determination of customer credit rating.

The tables present the net recorded investment for each class of receivables, by credit quality indicator, at December 31, 2017 and 2016. Receivables with a credit quality indicator ranging from Aaa to Baa3 are considered investment grade. All others are considered non-investment grade. The credit quality indicators do not reflect mitigation actions that the company may take to transfer credit risk to third parties.

Lease Receivables

($ in millions)

At December 31, 2017:	Americas	EMEA	Asia Pacific
Credit rating			
Aaa–Aa3	$ 422	$ 49	$ 68
A1–A3	855	190	544
Baa1–Baa3	980	371	337
Ba1–Ba2	730	448	184
Ba3–B1	443	192	89
B2–B3	367	77	64
Caa–D	51	13	18
Total	$ 3,847	$ 1,340	$ 1,302

Loan Receivables

($ in millions)

At December 31, 2017:	Americas	EMEA	Asia Pacific
Credit rating			
Aaa–Aa3	$ 724	$ 129	$ 120
A1–A3	1,469	502	961
Baa1–Baa3	1,683	982	596
Ba1–Ba2	1,253	1,186	325
Ba3–B1	760	508	157
B2–B3	630	204	113
Caa–D	88	34	31
Total	$ 6,607	$ 3,545	$ 2,303

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

At December 31, 2017, the industries which made up Global Financing's receivables portfolio consisted of: Financial (33 percent), Government (15 percent), Manufacturing (13 percent), Services (13 percent), Retail (8 percent), Communications (7 percent), Healthcare (6 percent) and Other (6 percent).

Lease Receivables

($ in millions)

At December 31, 2016:	Americas	EMEA	Asia Pacific
Credit rating			
Aaa–Aa3	$ 447	$ 51	$ 53
A1–A3	782	113	486
Baa1–Baa3	772	366	330
Ba1–Ba2	822	350	185
Ba3–B1	574	208	106
B2–B3	297	71	84
Caa–D	83	9	15
Total	$ 3,776	$ 1,167	$ 1,259

Loan Receivables

($ in millions)

At December 31, 2016:	Americas	EMEA	Asia Pacific
Credit rating			
Aaa–Aa3	$ 712	$ 143	$ 90
A1–A3	1,246	318	832
Baa1–Baa3	1,230	1,032	565
Ba1–Ba2	1,309	987	316
Ba3–B1	914	585	182
B2–B3	472	201	143
Caa–D	133	25	25
Total	$ 6,016	$ 3,291	$ 2,154

At December 31, 2016, the industries which made up Global Financing's receivables portfolio consisted of: Financial (34 percent), Government (14 percent), Manufacturing (13 percent), Services (12 percent), Retail (8 percent), Communications (7 percent), Healthcare (6 percent) and Other (6 percent).

Past Due Financing Receivables

($ in millions)

At December 31, 2017:	Total Past Due >90 Days [1]	Fully Reserved Financing Receivables	<90 Days or Unbilled Financing Receivables	Total Financing Receivables	Recorded Investment >90 Days and Accruing[2]
Americas	$ 30	$ 29	$ 3,852	$ 3,911	$ 197
EMEA	3	5	1,340	1,349	5
Asia Pacific	5	28	1,301	1,333	23
Total lease receivables	$ 37	$ 62	$ 6,493	$ 6,593	$ 225
Americas	$ 39	$ 96	$ 6,581	$ 6,715	$ 254
EMEA	12	35	3,551	3,597	17
Asia Pacific	3	46	2,305	2,354	12

Total loan receivables	**$ 53**	**$ 176**	**$ 12,437**	**$ 12,667**	**$ 283**
Total	**$ 91**	**$ 239**	**$ 18,930**	**$ 19,259**	**$ 508**

(1) Only the portion of a financing receivable which is greater than 90 days past due, excluding amounts that are fully reserved.
(2) At a contract level, which includes total billed and unbilled amounts for aged financing receivables greater than 90 days.

($ in millions)

At December 31, 2016:	Total Past Due >90 Days(1)	Fully Reserved Financing Receivables	<90 Days or Unbilled Financing Receivables	Total Financing Receivables	Recorded Investment >90 Days and Accruing(2)
Americas	$ 17	$ 20	$ 3,793	$ 3,830	$ 66
EMEA	2	10	1,159	1,171	6
Asia Pacific	12	59	1,264	1,335	40
Total lease receivables	$ 31	$ 89	$ 6,216	$ 6,336	$ 111
Americas	$ 19	$ 90	$ 6,075	$ 6,185	$ 80
EMEA	5	5	3,299	3,309	15
Asia Pacific	6	87	2,150	2,243	46
Total loan receivables	$ 31	$ 182	$ 11,524	$ 11,737	$ 141
Total	$ 62	$ 271	$ 17,740	$ 18,073	$ 253

(1) Only the portion of a financing receivable which is greater than 90 days past due, excluding amounts that are fully reserved.
(2) At a contract level, which includes total billed and unbilled amounts for aged financing receivables greater than 90 days.

Troubled Debt Restructurings

The company did not have any significant troubled debt restructurings for the years ended December 31, 2017 and 2016.

NOTE G. PROPERTY, PLANT AND EQUIPMENT

($ in millions)

At December 31:	2017	2016*
Land and land improvements	**$ 480**	$ 506
Buildings and building and leasehold improvements	**10,073**	9,763
Information technology equipment	**16,874**	15,012
Production, engineering, office and other equipment	**4,060**	3,869
Plant and other property—gross	**31,487**	29,150
Less: Accumulated depreciation	**20,832**	18,842
Plant and other property—net	**10,655**	10,308
Rental machines	**844**	984
Less: Accumulated depreciation	**383**	461
Rental machines—net	**462**	523
Total—net	**$ 11,116**	$ 10,830

* Reclassified to conform to 2017 presentation.

NOTE H. INVESTMENTS AND SUNDRY ASSETS

($ in millions)

At December 31:	2017	2016
Deferred transition and setup costs and other deferred arrangements*	**$ 1,537**	$ 1,497
Derivatives—noncurrent	**757**	594
Alliance investments		
Equity method	**90**	85
Non-equity method	**32**	19
Prepaid software	**300**	230
Long-term deposits	**271**	267
Other receivables	**455**	416

Employee benefit-related	**316**	272
Prepaid income taxes	**590**	477
Other assets	**572**	729
Total	**$ 4,919**	$ 4,585

* Deferred transition and setup costs and other deferred arrangements are related to services client arrangements. Refer to note A, "Significant Accounting Policies," on page 87 for additional information.

NOTE I. INTANGIBLE ASSETS INCLUDING GOODWILL

Intangible Assets

The following table details the company's intangible asset balances by major asset class.

($ in millions)

At December 31, 2017:	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Intangible asset class			
Capitalized software	**$ 1,600**	**$ (790)**	**$ 810**
Client relationships	**2,358**	**(1,080)**	**1,278**
Completed technology	**2,586**	**(1,376)**	**1,210**
Patents/trademarks	**668**	**(256)**	**413**
Other*	**47**	**(16)**	**31**
Total	**$ 7,260**	**$ (3,518)**	**$ 3,742**

* Other intangibles are primarily acquired proprietary and nonproprietary business processes, methodologies and systems.

($ in millions)

At December 31, 2016:	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Intangible asset class			
Capitalized software	$ 1,537	$ (661)	$ 876
Client relationships	2,831	(1,228)	1,602
Completed technology	3,322	(1,668)	1,654
Patents/trademarks	730	(205)	525
Other*	46	(15)	31
Total	$ 8,466	$ (3,778)	$ 4,688

* Other intangibles are primarily acquired proprietary and nonproprietary business processes, methodologies and systems.

The net carrying amount of intangible assets decreased $946 million during the year ended December 31, 2017, primarily due to intangible asset amortization, partially offset by additions resulting from capitalized software. There was no impairment of intangible assets recorded in 2017 and 2016. The aggregate intangible amortization expense was $1,520 million and $1,544 million for the years ended December 31, 2017 and 2016, respectively. In addition, in 2017 and 2016, respectively, the company retired $1,753 million and $817 million of fully amortized intangible assets, impacting both the gross carrying amount and accumulated amortization by this amount.

The amortization expense for each of the five succeeding years relating to intangible assets currently recorded in the Consolidated Statement of Financial Position is estimated to be the following at December 31, 2017:

($ in millions)

	Capitalized Software	Acquired Intangibles	Total
2018	$ 482	$ 812	$ 1,294
2019	248	671	920
2020	79	560	639
2021	—	446	446
2022	—	377	377

Goodwill

The changes in the goodwill balances by reportable segment, for the years ended December 31, 2017 and 2016, are as follows:

($ in millions)

Segment	Balance January 1, 2017	Goodwill Additions	Purchase Price Adjustments	Divestitures	Foreign Currency Translation and Other Adjustments*	Balance December 31, 2017
Cognitive Solutions	**$ 19,484**	**$ 3**	**$ (38)**	**$ (20)**	**$ 235**	**$ 19,665**
Global Business Services	**4,607**	**—**	**2**	**—**	**204**	**4,813**
Technology Services & Cloud Platforms	**10,258**	**13**	**(2)**	**—**	**179**	**10,447**
Systems	**1,850**	**—**	**0**	**—**	**13**	**1,862**
Total	**$ 36,199**	**$ 16**	**$ (38)**	**$ (20)**	**$ 631**	**$ 36,788**

* Primarily driven by foreign currency translation.

($ in millions)

Segment	Balance January 1, 2016	Goodwill Additions	Purchase Price Adjustments	Divestitures	Foreign Currency Translation and Other Adjustments*	Balance December 31, 2016
Cognitive Solutions	$ 15,621	$ 3,821	$ 5	$ (12)	$ 48	$ 19,484
Global Business Services	4,396	303	4	(1)	(95)	4,607
Technology Services & Cloud Platforms	10,156	119	(12)	(5)	(1)	10,258
Systems	1,848	—	(4)	—	5	1,850
Total	$ 32,021	$ 4,244	$ (7)	$ (18)	$ (42)	$ 36,199

* Primarily driven by foreign currency translation.

There were no goodwill impairment losses recorded during 2017 or 2016 and the company has no accumulated impairment losses.

Purchase price adjustments recorded in 2017 and 2016 were related to acquisitions that were completed on or prior to September 30, 2017 or September 30, 2016, respectively, and were still subject to the measurement period that ends at the earlier of 12 months from the acquisition date or when information becomes available. Net purchase price adjustments of $38 million were recorded during 2017, with the primary drivers being deferred tax assets, other taxes payable and other current liabilities associated with the Truven Health Analytics, Inc. and The Weather Company acquisitions. Net purchase price adjustments of $7 million were recorded during 2016, with the primary drivers being deferred tax assets, accounts receivable, deferred income, inventory and other current liabilities.

NOTE J. BORROWINGS

Short-Term Debt

($ in millions)

At December 31:	2017	2016
Commercial paper	**$ 1,496**	$ 899
Short-term loans	**276**	375
Long-term debt—current maturities	**5,214**	6,239
Total	**$ 6,987**	$ 7,513

The weighted-average interest rate for commercial paper at December 31, 2017 and 2016 was 1.5 percent and 0.7 percent, respectively. The weighted-average interest rates for short-term loans were 8.8 percent and 9.5 percent at December 31, 2017 and 2016, respectively.

Long-Term Debt

Pre-Swap Borrowing

($ in millions)

At December 31:	Maturities	2017	2016
U.S. dollar debt (average interest rate at December 31, 2017):*			
4.0%	2017	**$ —**	$ 5,104
3.5%	2018	**4,640**	4,724
2.7%	2019	**5,540**	4,132
1.9%	2020	**3,416**	2,054
2.2%	2021	**4,129**	2,887
2.4%	2022	**3,481**	1,901
3.3%	2023	**1,547**	1,500
3.6%	2024	**2,000**	2,000
7.0%	2025	**600**	600
3.5%	2026	**1,350**	1,350
4.7%	2027	**969**	469
6.5%	2028	**313**	313
5.9%	2032	**600**	600
8.0%	2038	**83**	83
5.6%	2039	**745**	745
4.0%	2042	**1,107**	1,107
7.0%	2045	**27**	27
4.7%	2046	**650**	650
7.1%	2096	**316**	316
		31,515	30,563
Other currencies (average interest rate at December 31, 2017, in parentheses):*			
Euros (1.5%)	2019—2029	**10,502**	7,122
Pound sterling (2.7%)	2020—2022	**1,420**	1,296
Japanese yen (0.3%)	2022—2026	**1,291**	1,576
Canadian (2.2%)	2017	**—**	373
Other (5.4%)	2018—2020	**717**	215
		45,445	41,145
Less: net unamortized discount		**826**	839
Less: net unamortized debt issuance costs		**93**	82
Add: fair value adjustment**		**526**	669
		45,052	40,893
Less: current maturities		**5,214**	6,239
Total		**$ 39,837**	$ 34,655

* Includes notes, debentures, bank loans, secured borrowings and capital lease obligations.

**The portion of the company's fixed-rate debt obligations that is hedged is reflected in the Consolidated Statement of Financial Position as an amount equal to the sum of the debt's carrying value and a fair value adjustment representing changes in the fair value of the hedged debt obligations attributable to movements in benchmark interest rates.

There are no debt securities issued and outstanding by IBM International Group Capital LLC, which is an indirect, 100 percent owned finance subsidiary of International Business Machines Corporation, the parent. Any debt securities issued by IBM International Group Capital LLC, would be fully and unconditionally guaranteed by the parent.

During the third quarter of 2017, IBM Credit LLC (IBM Credit), a wholly owned subsidiary of the company, filed a shelf registration statement with the Securities and Exchange Commission (SEC) allowing it to offer for sale public debt securities. IBM Credit issued fixed- and floating-rate debt securities in September 2017 in the aggregate amount of $3.0 billion with maturity dates ranging from 2019 to 2022. The debt is included in the long-term debt table on page 113.

The company's indenture governing its debt securities and its various credit facilities each contain significant covenants which obligate the company to promptly pay principal and interest, limit the aggregate amount of secured indebtedness and sale and leaseback transactions to 10 percent of the company's consolidated net tangible assets, and restrict the company's ability to merge or consolidate unless certain conditions are met. The credit facilities also include a covenant on the company's consolidated net interest expense ratio, which cannot be less than 2.20 to 1.0, as well as a cross default provision with respect to other defaulted indebtedness of at least $500 million.

The company is in compliance with all of its significant debt covenants and provides periodic certifications to its lenders. The failure to comply with its debt covenants could constitute an event of default with respect to the debt to which such provisions apply. If certain events of default were to occur, the principal and interest on the debt to which such event of default applied would become immediately due and payable.

Post-Swap Borrowing (Long-Term Debt, Including Current Portion)

($ in millions)

	2017		2016	
For the year ended December 31:	**Amount**	**Average Rate**	**Amount**	**Average Rate**
Fixed-rate debt	**$ 29,007**	**2.73%**	$ 27,414	3.18%
Floating-rate debt*	**16,044**	**2.10%**	13,480	1.59%
Total	**$ 45,052**		$ 40,893	

* Includes $9,138 million in 2017 and $7,338 million in 2016 of notional interest rate swaps that effectively convert fixed-rate long-term debt into floating-rate debt. See note D, "Financial Instruments," on pages 102 to 107.

Pre-swap annual contractual maturities of long-term debt outstanding at December 31, 2017, are as follows:

($ in millions)

	Total
2018	$ 5,217
2019	7,128
2020	6,242
2021	5,196
2022	4,288
2023 and beyond	17,374
Total	$ 45,445

Interest on Debt

($ in millions)

For the year ended December 31:	**2017**	**2016**	**2015**
Cost of financing	**$ 658**	$ 576	$ 540
Interest expense	**615**	630	468
Interest capitalized	**5**	2	0
Total interest paid and accrued	**$ 1,278**	$ 1,208	$ 1,008

Refer to the related discussion on page 144 in note T, "Segment Information," for total interest expense of the Global Financing segment. See note D, "Financial Instruments," on pages 102 to 107 for a discussion of the use of foreign currency denominated debt designated as a hedge of net investment, as well as a discussion of the use of currency and interest rate swaps in the company's debt risk management program.

Lines of Credit

In 2016, the company increased the size of its five-year Credit Agreement (the "Credit Agreement") to $10.25 billion and extended the term by one year to November 10, 2021. The total expense recorded by the company related to this Credit Agreement was $6.1 million in 2017, $5.5 million in 2016 and $5.3 million in 2015. The Credit Agreement permits the company and its Subsidiary Borrowers to borrow up to $10.25 billion on a revolving basis. Borrowings of the Subsidiary Borrowers will be unconditionally backed by the company. The company may also, upon the agreement of either existing lenders, or of the additional banks not currently party to the Credit Agreement, increase the commitments under the Credit Agreement up to an additional $1.75 billion. Subject to certain terms of the Credit Agreement, the company and Subsidiary Borrowers may borrow, prepay and reborrow amounts under the Credit Agreement at any time during the Credit Agreement term. Interest rates on borrowings under the Credit Agreement will be based on prevailing market interest rates, as further described in the Credit Agreement. The Credit Agreement contains customary representations and warranties, covenants, events of default, and indemnification provisions. The company believes that circumstances that might give rise to breach of these covenants or an event of default, as specified in the Credit Agreement, are remote.

The company also has other committed lines of credit in some of the geographies which are not significant in the aggregate. Interest rates and other terms of borrowing under these lines of credit vary from country to country, depending on local market conditions.

On July 20, 2017, the company and IBM Credit, (the Borrowers), entered into a $2.5 billion 364-Day Credit Agreement, and a $2.5 billion Three-Year Credit Agreement (the New Credit Agreements, and together with the Credit Agreement, the Credit Facilities). IBM also entered into the Third Amendment to its Credit Agreement. The total expense recorded by the company related to the New Credit Agreements was $2.8 million in 2017. The New Credit Agreements permit the Borrowers to borrow up to an aggregate of $5 billion on a revolving basis. Neither Borrower is a guarantor or co-obligor of the other Borrower under the New Credit Agreements. Subject to certain conditions stated in the New Credit Agreements, the Borrowers may borrow, prepay and re-borrow amounts under the New Credit Agreements at any time during the term of the New Credit Agreements. Funds borrowed may be used for the general corporate purposes of the Borrowers. Interest rates on borrowings under the New Credit Agreements will be based on prevailing market interest rates, as further described in the New Credit Agreements. The New Credit Agreements contain customary representations and warranties, covenants, events of default, and indemnification provisions. The Amendment to the Credit Agreement adds and restates various provisions in order to provide the company with the opportunity in 2018 to request that the lenders extend the termination date of the Credit Agreement to July 20, 2023.

As of December 31, 2017, there were no borrowings by the company, or its subsidiaries, under the Credit Facilities.

NOTE K. OTHER LIABILITIES

($ in millions)

At December 31:	2017	2016
Income tax reserves	**$ 4,193**	$ 2,621
Excess 401(k) Plus Plan	**1,583**	1,494
Disability benefits	**504**	538
Derivative liabilities	**38**	61
Workforce reductions	**804**	782
Deferred taxes	**545**	424
Other taxes payable	**948**	90
Environmental accruals	**262**	262
Warranty accruals	**56**	68
Asset retirement obligations	**115**	142
Acquisition related	**88**	111
Divestiture related*	**253**	270
Other	**577**	613
Total	**$ 9,965**	$ 7,477

* Primarily related to the divestiture of the Microelectronics business.

In response to changing business needs, the company periodically takes workforce reduction actions to improve productivity, cost competitiveness and to rebalance skills. The noncurrent contractually obligated future payments associated with these activities are reflected in the workforce reductions caption in the previous table. This also includes certain special restructuring-related actions prior to 2006. The noncurrent liabilities are workforce accruals related to terminated employees who are no longer working for the company who were granted annual payments to supplement their incomes in certain countries. Depending on the individual country's legal requirements, these required payments will continue until the former employee begins receiving pension benefits or passes away. Current liabilities are included in other accrued expenses and liabilities in the Consolidated Statement of Financial Position and were immaterial at December 31, 2017.

The company employs extensive internal environmental protection programs that primarily are preventive in nature. The company also participates in environmental assessments and cleanups at a number of locations, including operating facilities, previously owned facilities and Superfund sites. The company's maximum exposure for all environmental liabilities cannot be estimated and no amounts have been recorded for non-ARO environmental liabilities that are not probable or estimable. The total amounts accrued for non-ARO environmental liabilities, including amounts classified as current in the Consolidated Statement of Financial Position, that do not reflect actual or anticipated insurance recoveries, were $267 million and $272 million at December 31, 2017 and 2016, respectively. Estimated environmental costs are not expected to materially affect the consolidated financial position or consolidated results of the company's operations in future periods. However, estimates of future costs are subject to change due to protracted cleanup periods and changing environmental remediation regulations.

As of December 31, 2017, the company was unable to estimate the range of settlement dates and the related probabilities for certain asbestos remediation AROs. These conditional AROs are primarily related to the encapsulated structural fireproofing that is not subject to abatement unless the buildings are demolished and non-encapsulated asbestos that the company would remediate only if it performed major renovations of certain existing buildings. Because these conditional obligations have indeterminate settlement dates, the company could not develop a reasonable estimate of their fair values. The company will continue to assess its ability to estimate fair values at each future reporting date. The related liability will be recognized once sufficient additional information becomes available. The total amounts accrued for ARO liabilities, including amounts classified as current in the Consolidated Statement of Financial Position were $152 million and $173 million at December 31, 2017 and 2016, respectively.

NOTE L. EQUITY ACTIVITY

The authorized capital stock of IBM consists of 4,687,500,000 shares of common stock with a $.20 per share par value, of which 922,179,225 shares were outstanding at December 31, 2017 and 150,000,000 shares of preferred stock with a $.01 per share par value, none of which were outstanding at December 31, 2017.

Stock Repurchases

The Board of Directors authorizes the company to repurchase IBM common stock. The company repurchased 27,237,179 common shares at a cost of $4,323 million, 23,283,400 common shares at a cost of $3,455 million and 30,338,647 common shares at a cost of $4,701 million in 2017, 2016 and 2015, respectively. These amounts reflect transactions executed through December 31 of each year. Actual cash disbursements for repurchased shares may differ due to varying settlement dates for these transactions. At December 31, 2017, $3,786 million of Board common stock repurchase authorization was available. The company plans to purchase shares on the open market or in private transactions from time to time, depending on market conditions.

Other Stock Transactions

The company issued the following shares of common stock as part of its stock-based compensation plans and employees stock purchase plan: 4,311,998 shares in 2017, 3,893,366 shares in 2016, and 6,013,875 shares in 2015. The company issued 463,083 treasury shares in 2017, 383,077 treasury shares in 2016 and 1,155,558 treasury shares in 2015, as a result of restricted stock unit releases and exercises of stock options by employees of certain acquired businesses and by non-U.S. employees. Also, as part of the company's stock-based compensation plans, 1,226,080 common shares at a cost of $193 million, 854,365 common shares at a cost of $126 million, and 1,625,820 common shares at a cost of $248 million in 2017, 2016 and 2015, respectively, were remitted by employees to the company in order to satisfy minimum statutory tax withholding requirements. These amounts are included in the treasury stock balance in the Consolidated Statement of Financial Position and the Consolidated Statement of Changes in Equity.

Reclassifications and Taxes Related to Items of Other Comprehensive Income

($ in millions)

For the year ended December 31, 2017:	Before Tax Amount	Tax (Expense)/ Benefit	Net of Tax Amount
Other comprehensive income/(loss)			
Foreign currency translation adjustments	$ 152	$ 617	$ 769
Net changes related to available-for-sale securities			
Unrealized gains/(losses) arising during the period	$ 1	$ (1)	$ 0
Reclassification of (gains)/losses to other (income) and expense	1	0	1
Total net changes related to available-for-sale securities	$ 2	$ (1)	$ 1
Unrealized gains/(losses) on cash flow hedges			
Unrealized gains/(losses) arising during the period	$ (58)	$ 0	$ (58)
Reclassification of (gains)/losses to:			
Cost of sales	(3)	1	(3)
Cost of services	(70)	27	(43)
SG&A expense	(11)	3	(9)
Other (income) and expense	(324)	124	(199)
Interest expense	45	(17)	28
Total unrealized gains/(losses) on cash flow hedges	$ (421)	$ 137	$ (284)
Retirement-related benefit plans [1]			
Prior service costs/(credits)	$ 0	$ 0	$ 0
Net (losses)/gains arising during the period	682	(201)	481
Curtailments and settlements	19	(5)	14
Amortization of prior service (credits)/costs	(88)	29	(58)
Amortization of net (gains)/losses	2,889	(1,006)	1,883
Total retirement-related benefit plans	$ 3,502	$ (1,182)	$ 2,320
Other comprehensive income/(loss)	$ 3,235	$ (429)	$ 2,806

[1] These AOCI components are included in the computation of net periodic pension cost. (See note S, "Retirement-Related Benefits," for additional information.)

($ in millions)

For the year ended December 31, 2016:	Before Tax Amount	Tax (Expense)/ Benefit	Net of Tax Amount
Other comprehensive income/(loss)			
Foreign currency translation adjustments	$ (20)	$ (120)	$ (140)
Net changes related to available-for-sale securities			
Unrealized gains/(losses) arising during the period	$ (38)	$ 14	$ (23)
Reclassification of (gains)/losses to other (income) and expense	34	(13)	21
Total net changes related to available-for-sale securities	$ (3)	$ 1	$ (2)

Unrealized gains/(losses) on cash flow hedges			
Unrealized gains/(losses) arising during the period	$ 243	$ (80)	$ 163
Reclassification of (gains)/losses to:			
Cost of sales*	5	(5)	1
Cost of services*	8	(3)	5
SG&A expense	(4)	(2)	(7)
Other (income) and expense	68	(26)	42
Interest expense	24	(9)	15
Total unrealized gains/(losses) on cash flow hedges	$ 345	$ (126)	$ 219
Retirement-related benefit plans [1]			
Net (losses)/gains arising during the period	$ (2,490)	$ 924	$ (1,566)
Curtailments and settlements	(16)	1	(15)
Amortization of prior service (credits)/costs	(107)	34	(74)
Amortization of net (gains)/losses	2,764	(976)	1,788
Total retirement-related benefit plans	$ 150	$ (19)	$ 132
Other comprehensive income/(loss)	$ 472	$ (263)	$ 209

* Reclassified to conform to 2017 presentation.

[1] These AOCI components are included in the computation of net periodic pension cost. (See note S, "Retirement-Related Benefits," for additional information.)

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

($ in millions)

For the year ended December 31, 2015:	Before Tax Amount	Tax (Expense)/ Benefit	Net of Tax Amount
Other comprehensive income/(loss)			
Foreign currency translation adjustments	$ (1,379)	$ (342)	$ (1,721)
Net changes related to available-for-sale securities			
Unrealized gains/(losses) arising during the period	$ (54)	$ 21	$ (33)
Reclassification of (gains)/losses to other (income) and expense	86	(33)	53
Total net changes related to available-for-sale securities	$ 32	$ (12)	$ 20
Unrealized gains/(losses) on cash flow hedges			
Unrealized gains/(losses) arising during the period	$ 618	$ (218)	$ 399
Reclassification of (gains)/losses to:			
Cost of sales*	(192)	59	(133)
Cost of services*	0	(2)	(2)
SG&A expense	(149)	43	(105)
Other (income) and expense	(731)	281	(451)
Interest expense	0	0	0
Total unrealized gains/(losses) on cash flow hedges	$ (454)	$ 162	$ (292)
Retirement-related benefit plans [1]			
Prior service costs/(credits)	$ 6	$ (2)	$ 4
Net (losses)/gains arising during the period	(2,963)	1,039	(1,925)
Curtailments and settlements	33	(9)	24
Amortization of prior service (credits)/costs	(100)	36	(65)
Amortization of net (gains)/losses	3,304	(1,080)	2,223
Total retirement-related benefit plans	$ 279	$ (17)	$ 262
Other comprehensive income/(loss)	$ (1,523)	$ (208)	$ (1,731)

* Reclassified to conform to 2017 presentation.

[1] These AOCI components are included in the computation of net periodic pension cost. (See note S, "Retirement-Related Benefits," for additional information.)

Accumulated Other Comprehensive Income/(Loss) (net of tax)

($ in millions)

	Net Unrealized Gains/(Losses)	Foreign Currency	Net Change Retirement-	Net Unrealized Gains/(Losses) on Available-	Accumulated Other

	on Cash Flow Hedges	Translation Adjustments*	Related Benefit Plans	For-Sale Securities	Comprehensive Income/(Loss)
December 31, 2014	$ 392	$ (1,742)	$ (26,509)	$ (15)	$ (27,875)
Other comprehensive income before reclassifications	399	(1,721)	(1,897)	(33)	(3,252)
Amount reclassified from accumulated other comprehensive income	(691)	0	2,158	53	1,520
Total change for the period	(292)	(1,721)	262	20	(1,731)
December 31, 2015	100	(3,463)	(26,248)	5	(29,607)
Other comprehensive income before reclassifications	163	(140)	(1,581)	(23)	(1,581)
Amount reclassified from accumulated other comprehensive income	56	0	1,714	21	1,791
Total change for the period	219	(140)	132	(2)	209
December 31, 2016	319	(3,603)	(26,116)	2	(29,398)
Other comprehensive income before reclassifications	**(58)**	**769**	**495**	**0**	**1,206**
Amount reclassified from accumulated other comprehensive income	**(226)**	**0**	**1,825**	**1**	**1,599**
Total change for the period	**(284)**	**769**	**2,320**	**1**	**2,806**
December 31, 2017	**$ 35**	**$ (2,834)**	**$ (23,796)**	**$ 3**	**$ (26,592)**

* Foreign currency translation adjustments are presented gross except for any associated hedges which are presented net of tax.

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

NOTE M. CONTINGENCIES AND COMMITMENTS

Contingencies

As a company with a substantial employee population and with clients in more than 175 countries, IBM is involved, either as plaintiff or defendant, in a variety of ongoing claims, demands, suits, investigations, tax matters and proceedings that arise from time to time in the ordinary course of its business. The company is a leader in the information technology industry and, as such, has been and will continue to be subject to claims challenging its IP rights and associated products and offerings, including claims of copyright and patent infringement and violations of trade secrets and other IP rights. In addition, the company enforces its own IP against infringement, through license negotiations, lawsuits or otherwise. Also, as is typical for companies of IBM's scope and scale, the company is party to actions and proceedings in various jurisdictions involving a wide range of labor and employment issues (including matters related to contested employment decisions, country-specific labor and employment laws, and the company's pension, retirement and other benefit plans), as well as actions with respect to contracts, product liability, securities, foreign operations, competition law and environmental matters. These actions may be commenced by a number of different parties, including competitors, clients, current or former employees, government and regulatory agencies, stockholders and representatives of the locations in which the company does business. Some of the actions to which the company is party may involve particularly complex technical issues, and some actions may raise novel questions under the laws of the various jurisdictions in which these matters arise.

The company records a provision with respect to a claim, suit, investigation or proceeding when it is probable that a liability has been incurred and the amount of the loss can be reasonably estimated. Any recorded liabilities, including any changes to such liabilities for the years ended December 31, 2017, 2016 and 2015 were not material to the Consolidated Financial Statements.

In accordance with the relevant accounting guidance, the company provides disclosures of matters for which the likelihood of material loss is at least reasonably possible. In addition, the company also discloses matters based on its consideration of other matters and qualitative factors, including the experience of other companies in the industry, and investor, customer and employee relations considerations.

With respect to certain of the claims, suits, investigations and proceedings discussed herein, the company believes at this time that the likelihood of any material loss is remote, given, for example, the procedural status, court rulings, and/or the strength of the company's defenses in those matters. With respect to the remaining claims, suits, investigations and proceedings discussed in this note, except as specifically discussed herein, the company is unable to provide estimates of reasonably possible losses or range of losses, including losses in excess of amounts accrued, if any, for the following reasons. Claims, suits, investigations and proceedings are inherently uncertain, and it is not possible to predict the ultimate outcome of these matters. It is the company's experience that damage amounts claimed in litigation against it are unreliable and unrelated to possible outcomes, and as such are not meaningful indicators of the company's potential liability. Further, the company is unable to provide such an estimate due to a number of other factors with respect to these claims, suits, investigations and proceedings, including considerations of the procedural status of the matter in question, the presence of complex or novel legal theories, and/or the ongoing discovery and development of information important to the matters. The company reviews claims, suits, investigations and proceedings at least quarterly, and decisions are made with respect to recording or adjusting provisions and disclosing reasonably possible losses or range of losses (individually or in the aggregate), to reflect the impact and status of settlement discussions, discovery, procedural and substantive rulings, reviews by counsel and other information pertinent to a particular matter.

Whether any losses, damages or remedies finally determined in any claim, suit, investigation or proceeding could reasonably have a material effect on the company's business, financial condition, results of operations or cash flows will depend on a number of variables, including: the timing and amount of such losses or damages; the structure and type of any such remedies; the significance of the impact any such losses, damages or remedies may have in the Consolidated Financial Statements; and the unique facts and circumstances of the particular matter that may give rise to additional factors. While the company will continue to defend itself vigorously, it is possible that the company's business, financial condition, results of operations or cash flows could be affected in any particular period by the resolution of one or more of these matters.

The following is a summary of the more significant legal matters involving the company.

The company is a defendant in an action filed on March 6, 2003 in state court in Salt Lake City, Utah by the SCO Group (SCO v. IBM). The company removed the case to Federal Court in Utah. Plaintiff is an alleged successor in interest to some of AT&T's UNIX IP rights, and alleges copyright infringement, unfair competition, interference with contract and breach of contract with regard to the company's distribution of AIX and Dynix and contribution of code to Linux and the company has asserted counterclaims. On September 14, 2007, plaintiff filed for bankruptcy protection, and all proceedings in this case were stayed. The court in another suit, the SCO Group, Inc. v. Novell, Inc., held a trial in March 2010. The jury found that Novell is the owner of UNIX and UnixWare copyrights; the judge subsequently ruled that SCO is obligated to recognize Novell's waiver of SCO's claims against IBM and Sequent for breach of UNIX license agreements. On August 30, 2011, the Tenth Circuit Court of Appeals affirmed the district court's ruling and denied SCO's appeal of this matter. In June 2013, the Federal Court in Utah granted SCO's motion to reopen the SCO v. IBM case. In February 2016, the Federal Court ruled in favor of IBM on all of SCO's remaining claims, and SCO appealed. On October 30, 2017, the Tenth Circuit Court of Appeals affirmed the dismissal of all but one of SCO's remaining claims, which was remanded to the Federal Court in Utah.

On May 13, 2010, IBM and the State of Indiana (acting on behalf of the Indiana Family and Social Services Administration) sued one another in a dispute over a 2006 contract regarding the modernization of social service program processing in Indiana. After six weeks of trial, on July 18, 2012, the Indiana Superior Court in Marion County rejected the State's claims in their entirety and awarded IBM $52 million plus interest and costs. On February 13, 2014, the Indiana Court of Appeals reversed portions of the trial judge's findings, found IBM in material breach, and ordered the case remanded to the trial judge to determine the State's damages, if any. The Indiana Court of Appeals also affirmed approximately $50 million of the trial court's award of damages to IBM. On March 22, 2016, the Indiana Supreme Court affirmed the outcome of the Indiana Court of Appeals and remanded the case to the Indiana Superior Court. On August 7, 2017, the Indiana Superior Court awarded the State $128 million, which it then offset against IBM's previously affirmed award of $50 million, resulting in a $78 million award to the State, plus interest. IBM appealed to the Indiana Court of Appeals and the matter remains pending.

On March 9, 2017, the Commonwealth of Pennsylvania's Department of Labor and Industry sued IBM in Pennsylvania state court regarding a 2006 contract for the development of a custom software system to manage the Commonwealth's unemployment insurance benefits programs. The matter is pending in a Pennsylvania court.

On October 29, 2013, Bridgestone Americas, Inc. (Bridgestone) sued IBM regarding a 2009 contract for the implementation of an SAP-based, enterprise-wide order management system. IBM counterclaimed against Bridgestone and its parent, Bridgestone Corp. The case is pending in the Middle District of Tennessee.

On April 16, 2014, Iusacell SA de C.V. (Iusacell) sued IBM, claiming that IBM made fraudulent misrepresentations that induced Iusacell to enter into an agreement with IBM Mexico. Iusacell claimed damages for lost profits. Iusacell's complaint related to a contractual dispute in Mexico, which was the subject of a pending arbitration proceeding in Mexico initiated by IBM Mexico against Iusacell for breach of the underlying agreement. On August 31, 2017, the parties entered into an agreement releasing all claims against each other, resolving both the lawsuit and the arbitration proceeding.

IBM UK initiated legal proceedings in May 2010 before the High Court in London against the IBM UK Pensions Trust (the UK Trust) and two representative beneficiaries of the UK Trust membership. IBM UK sought a declaration that it acted lawfully both in notifying the Trustee of the UK Trust that it was closing its UK defined benefit plans to future accruals for most participants and in implementing the company's new retirement policy. In April 2014, the High Court acknowledged that the changes made to its UK defined benefit plans were within IBM's discretion, but ruled that IBM breached its implied duty of good faith both in implementing these changes and in the manner in which it consulted with employees. Proceedings to determine remedies were held in July 2014, and in February 2015 the High Court held that for IBM to make changes to accruals under the plan would require a new consultation of the participants, but other changes (including to early retirement policy) would not require such consultation. IBM UK appealed both the breach and remedies judgments. In August 2017, the Appeal Court reversed the High Court, holding that IBM UK was not in breach of its implied duties of good faith and that the changes made to the plans were lawful. The time to appeal has expired and the Appeal Court judgment is final. In addition, IBM UK is a defendant in approximately 290 individual actions brought since early 2010 by participants of the defined benefits plans who left IBM UK. These actions, which allege constructive dismissal and age discrimination, are pending before the Employment Tribunal in Southampton UK.

In early 2012, IBM notified the SEC of an investigation by the Polish Central Anti-Corruption Bureau involving allegations of illegal activity by a former IBM Poland employee in connection with sales to the Polish government. IBM cooperated with the SEC and Polish authorities in this matter. In April 2013, IBM learned that the U.S. Department of Justice (DOJ) was also investigating allegations related to the Poland matter, as well as allegations relating to transactions in Argentina, Bangladesh and Ukraine. The DOJ was seeking information regarding the company's global Foreign Corrupt Practices Act of 1977 (FCPA) compliance program and its public sector business. The company cooperated with the DOJ in this matter. In June 2017, the DOJ and the SEC each informed IBM that based on the information to date, they closed their respective investigations into these matters without pursuing any enforcement action against the company.

In May 2015, a putative class action was commenced in the United States District Court for the Southern District of New York related to the company's October 2014 announcement that it was divesting its global commercial semiconductor technology business, alleging violations of the Employee Retirement Income Security Act ("ERISA"). Management's Retirement Plans Committee and three current or former IBM executives are named as defendants. On September 29, 2017, the Court granted the defendants' motion to dismiss the first amended complaint. Plaintiffs have filed a notice of appeal to the Second Circuit Court of Appeals and the matter remains pending.

In August 2015, IBM learned that the SEC is conducting an investigation relating to revenue recognition with respect to the accounting treatment of certain transactions in the U.S., UK and Ireland. The company is cooperating with the SEC in this matter.

The company is party to, or otherwise involved in, proceedings brought by U.S. federal or state environmental agencies under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), known as "Superfund," or laws similar to CERCLA. Such statutes require potentially responsible parties to participate in remediation activities regardless of fault or ownership of sites. The company is also conducting environmental investigations, assessments or remediations at or in the vicinity of several current or former operating sites globally pursuant to permits, administrative orders or agreements with country, state or local environmental agencies, and is involved in lawsuits and claims concerning certain current or former operating sites.

The company is also subject to ongoing tax examinations and governmental assessments in various jurisdictions. Along with many other U.S. companies doing business in Brazil, the company is involved in various challenges with Brazilian tax authorities regarding non-income tax assessments and non-income tax litigation matters. The total potential amount related to all these matters for all applicable years is approximately $1.0 billion. The company believes it will prevail on these matters and that this amount is not a meaningful indicator of liability.

Commitments

The company's extended lines of credit to third-party entities include unused amounts of $8,111 million and $6,542 million at December 31, 2017 and 2016, respectively. A portion of these amounts was available to the company's business partners to support their working capital needs. In addition, the company has committed to provide future financing to its clients in connection with client purchase agreements for approximately $3,569 million and $2,463 million at December 31, 2017 and 2016, respectively.

The company has applied the guidance requiring a guarantor to disclose certain types of guarantees, even if the likelihood of requiring the guarantor's performance is remote. The following is a description of arrangements in which the company is the guarantor.

The company is a party to a variety of agreements pursuant to which it may be obligated to indemnify the other party with respect to certain matters. Typically, these obligations arise in the context of contracts entered into by the company, under which the company customarily agrees to hold the other party harmless against losses arising from a breach of representations and covenants related to such matters as title to assets sold, certain IP rights, specified environmental matters, third-party performance of nonfinancial contractual obligations and certain income taxes. In each of these circumstances, payment by the company is conditioned on the other party making a claim pursuant to the procedures specified in the particular contract, the procedures of which typically allow the company to challenge the other party's claims. While typically indemnification provisions do not include a contractual maximum on the company's payment, the company's obligations under these agreements may be limited in terms of time and/ or nature of claim, and in some instances, the company may have recourse against third parties for certain payments made by the company.

It is not possible to predict the maximum potential amount of future payments under these or similar agreements due to the conditional nature of the company's obligations and the unique facts and circumstances involved in each particular agreement. Historically, payments made by the company under these agreements have not had a material effect on the company's business, financial condition or results of operations.

In addition, the company guarantees certain loans and financial commitments. The maximum potential future payment under these financial guarantees was $19 million and $34 million at December 31, 2017 and 2016, respectively. The fair value of the guarantees recognized in the Consolidated Statement of Financial Position was immaterial.

NOTE N. TAXES

($ in millions)

For the year ended December 31:	2017	2016	2015
Income from continuing operations before income taxes			
U.S. operations	**$ 560**	$ 3,650	$ 5,915
Non-U.S. operations	**10,840**	8,680	10,030
Total income from continuing operations before income taxes	**$ 11,400**	$ 12,330	$ 15,945

The income from continuing operations provision for income taxes by geographic operations is as follows:

($ in millions)

For the year ended December 31:	2017	2016	2015
U.S. operations	**$ 2,923**	$ 38	$ 849
Non-U.S. operations	**2,719**	411	1,732
Total continuing operations provision for income taxes	**$ 5,642**	$ 449	$ 2,581

The components of the income from continuing operations provision for income taxes by taxing jurisdiction are as follows:

($ in millions)

For the year ended December 31:	2017	2016	2015
U.S. federal			
Current	**$ 2,388**	$ 186	$ (321)
Deferred	**77**	(746)	553
	$ 2,465	$ (560)	$ 232
U.S. state and local			
Current	**$ 55**	$ 244	$ 128
Deferred	**28**	(44)	116
	$ 83	$ 200	$ 244
Non-U.S.			
Current	**$ 3,891**	$ 988	$ 2,101
Deferred	**(797)**	(179)	4
	$ 3,094	$ 809	$ 2,105
Total continuing operations provision for income taxes	**$ 5,642**	$ 449	$ 2,581
Discontinued operations provision for income taxes	**(3)**	(2)	(117)
Provision for social security, real estate, personal property and other taxes	**3,434**	3,417	3,497
Total taxes included in net income	**$ 9,073**	$ 3,864	$ 5,961

A reconciliation of the statutory U.S. federal tax rate to the company's effective tax rate from continuing operations is as follows:

For the year ended December 31:	2017	2016	2015
Statutory rate	**35%**	35%	35%
U.S. Tax Cuts and Jobs Act	**48**	—	—
Foreign tax differential	**(26)**	(21)	(17)
Intra-entity transfers	**(5)**	—	—
Domestic incentives	**(2)**	(1)	(2)
State and local	**1**	1	1
Japan resolution	**—**	(10)	—
Other	**(2)**	0	(1)
Effective rate	**49%**	4%	16%

Percentages rounded for disclosure purposes.

The significant components reflected within the tax rate reconciliation labeled "Foreign tax differential" include the effects of foreign subsidiaries' earnings taxed at rates other than the U.S. statutory rate, foreign export incentives, the U.S. tax impacts of non-U.S. earnings repatriation and any net impacts of intercompany transactions. These items also reflect audit settlements, excluding the 2016 Japan resolution, or changes in the amount of unrecognized tax benefits associated with each of these items.

On December 22, 2017, the U.S. Tax Cuts and Jobs Act was enacted. U.S. tax reform introduced many changes, including lowering the U.S. corporate tax rate to 21 percent, changes in incentives, provisions to prevent U.S. base erosion and significant changes in the taxation of international income, including provisions which allow for the repatriation of foreign earnings without U.S. tax. The enactment of U.S. tax reform resulted in a provisional charge of $5,475 million to tax expense in the fourth-quarter and year-ended December 31, 2017. This charge was the result of the one-time U.S. transition tax and any foreign tax costs on undistributed foreign earnings, as well as the remeasurement of deferred tax balances to the new U.S. Federal tax rate.

The net charge related to U.S. tax reform is based on the company's estimates as of December 31, 2017. All components of the provisional charge of $5,475 million are based on the company's estimates as of December 31, 2017. Specifically, the transition tax, any foreign tax costs as well as the remeasurement of deferred tax balances are provisional and have been calculated based on existing tax law and the best information available as of the date of estimate. The final impact of U.S. tax reform may differ, possibly materially, due to factors such as changes in interpretations and assumptions that the company has made in its assessment, conclusion of the effects of the "Global Intangible Low-Taxed Income" provisions, further refinement of the company's calculations, additional guidance that may be issued by the U.S. government, among other items. As these various factors are finalized, any change will be recorded as an adjustment to the provision for, or benefit from, income taxes in the period the amounts are determined, not to exceed 12 months from the date of U.S. tax reform enactment.

In late January 2018, the U.S. Treasury and Internal Revenue Service issued guidelines, which are expected to result in an additional charge in the first quarter of 2018, estimated at approximately $110 million.

The 2017 continuing operations effective tax rate increased 45.8 points from 2016 driven by: the tax charge related to the impact of U.S. tax reform described above (48.0 points), the favorable resolution of the longstanding tax matter in Japan in 2016 (9.5 points) and an increase in the year-to-year tax charges related to intercompany payments (1.5 points). These impacts were partially offset by an increased benefit year to year in the utilization of foreign tax credits

(5.4 points), a tax benefit related to an intra-entity asset transfer in the first quarter of 2017 (5.1 points), a benefit due to the tax write down of an intercompany investment in the fourth quarter of 2017 (1.7 points), and a benefit due to the geographic mix of pre-tax earnings (1.0 points).

The effect of tax law changes on deferred tax assets and liabilities was a benefit of $270 million driven by U.S. tax reform and was included in the one-time charge.

Deferred Tax Assets

($ in millions)

At December 31:	2017	2016
Retirement benefits	**$ 3,477**	$ 4,671
Share-based and other compensation	**646**	1,132
Domestic tax loss/credit carryforwards	**718**	1,676
Deferred income	**605**	741
Foreign tax loss/credit carryforwards	**1,024**	816
Bad debt, inventory and warranty reserves	**395**	473
Depreciation	**293**	270
Accruals	**387**	624
Intangible assets	**585**	—
Other	**1,396**	1,503
Gross deferred tax assets	**9,526**	11,906
Less: valuation allowance	**1,004**	916
Net deferred tax assets	**$ 8,522**	$ 10,990

Deferred Tax Liabilities

($ in millions)

At December 31:	2017	2016
Depreciation	**$ 641**	$ 856
Retirement benefits	**483**	406
Goodwill and intangible assets	**1,226**	1,800
Leases	**584**	651
Software development costs	**360**	672
Deferred transition costs	**254**	351
Other	**658**	1,455
Gross deferred tax liabilities	**$ 4,206**	$ 6,191

For financial reporting purposes, the company has foreign and domestic loss carryforwards, the tax effect of which is $507 million, as well as foreign and domestic credit carryforwards of $1,235 million. Substantially all of these carryforwards are available for at least two years and the majority are available for 10 years or more.

The valuation allowances as of December 31, 2017, 2016 and 2015 were $1,004 million, $916 million and $740 million, respectively. The amounts principally apply to certain foreign, state and local loss carryforwards and credits. In the opinion of management, it is more likely than not that these assets will not be realized. However, to the extent that tax benefits related to these carryforwards are realized in the future, the reduction in the valuation allowance will reduce income tax expense.

The amount of unrecognized tax benefits at December 31, 2017 increased by $3,291 million in 2017 to $7,031 million. A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows:

($ in millions)

	2017	2016	2015
Balance at January 1	**$ 3,740**	$ 4,574	$ 5,104
Additions based on tax positions related to the current year	**3,029**	560	464
Additions for tax positions of prior years	**803**	334	569
Reductions for tax positions of prior years (including impacts due to a lapse in statute)	**(367)**	(1,443)	(1,348)
Settlements	**(174)**	(285)	(215)
Balance at December 31	**$ 7,031**	$ 3,740	$ 4,574

The additions to unrecognized tax benefits related to the current and prior years are primarily attributable to U.S. tax issues, as well as non-U.S. issues, certain tax incentives and credits and state issues. The settlements and reductions to unrecognized tax benefits for tax positions of prior years are primarily attributable to non-U.S. audits and impacts due to lapses in statutes of limitation.

The liability at December 31, 2017 of $7,031 million can be reduced by $967 million of offsetting tax benefits associated with timing adjustments, U.S. tax credits, potential transfer pricing adjustments, and state income taxes. The net amount of $6,064 million, if recognized, would favorably affect the company's effective tax rate. The net amounts at December 31, 2016 and 2015 were $2,965 million and $3,724 million, respectively.

Interest and penalties related to income tax liabilities are included in income tax expense. During the year ended December 31, 2017, the company recognized $174 million in interest expense and penalties; in 2016, the company recognized $62 million in interest expense and penalties; and, in 2015, the company recognized $141 million in interest expense and penalties. The company has $799 million for the payment of interest and penalties accrued at December 31, 2017, and had $625 million accrued at December 31, 2016.

Within the next 12 months, the company believes it is reasonably possible that the total amount of unrecognized tax benefits associated with certain positions may be reduced. The potential decrease in the amount of unrecognized tax benefits is associated with the anticipated resolution of the company's U.S. income tax audit for 2013 and 2014, as well as various non-U.S. audits. The company estimates that the unrecognized tax benefits at December 31, 2017 could be reduced by $1,062 million.

The company is subject to taxation in the U.S. and various state and foreign jurisdictions. With respect to major U.S. state and foreign taxing jurisdictions, the company is generally no longer subject to tax examinations for years prior to 2013. With limited exception, the company is no longer subject to income tax examination of its U.S. federal tax return for years prior to 2013. The open years contain matters that could be subject to differing interpretations of applicable tax laws and regulations related to the amount and/or timing of income, deductions and tax credits. Although the outcome of tax audits is always uncertain, the company believes that adequate amounts of tax and interest have been provided for any significant adjustments that are expected to result for these years.

In the fourth quarter of 2013, the company received a draft tax assessment notice for approximately $866 million (approximately $839 million at 2017 year-end currency rates) from the Indian Tax Authorities for 2009. In July 2016, the Karnataka High Court in Bangalore set aside this assessment by way of court order and the company reached a mutual agreement with the Income Tax Department for a new assessment. On January 2, 2018, the Income Tax Department issued the new 2009 draft tax assessment for approximately $330 million. The revised draft tax assessment is in line with prior and future tax assessments and the company is confident that it will ultimately prevail on the matters raised in the assessment. At December 31, 2017, the company has recorded $585 million as prepaid income taxes in India. A significant portion of this balance represents cash tax deposits paid over time to protect the company's right to appeal various income tax assessments made by the Indian Tax Authorities. The company believes it will prevail on these matters.

In the first quarter of 2016, the U.S. Internal Revenue Service commenced its audit of the company's U.S. tax returns for 2013 and 2014. The company anticipates that this audit will be substantially completed in the first quarter of 2018.

Included in consolidated retained earnings at December 31, 2017 are undistributed after-tax earnings from non-U.S. subsidiaries, as well as a provisional amount of U.S. income taxes and foreign distribution taxes associated with the repatriation of these earnings.

NOTE O. RESEARCH, DEVELOPMENT AND ENGINEERING

RD&E expense was $5,787 million in 2017, $5,751 million in 2016 and $5,247 million in 2015. In addition, RD&E expense included in discontinued operations was $1 million in 2016 and $197 million in 2015.

The company incurred total expense of $5,367 million, $5,421 million and $5,178 million in 2017, 2016 and 2015, respectively, for scientific research and the application of scientific advances to the development of new and improved products and their uses, as well as services and their application. Within these amounts, software-related expense was $3,275 million, $3,470 million and $3,064 million in 2017, 2016 and 2015, respectively.

Expense for product-related engineering was $420 million, $332 million and $267 million in 2017, 2016 and 2015, respectively.

NOTE P. EARNINGS PER SHARE OF COMMON STOCK

The following table presents the computation of basic and diluted earnings per share of common stock.

($ in millions except per share amounts)

For the year ended December 31:	2017	2016	2015
Weighted-average number of shares on which earnings per share calculations are based			
Basic	**932,828,295**	955,422,530	978,744,523
Add—incremental shares under stock-based compensation plans	**3,094,373**	2,416,940	3,037,001
Add—incremental shares associated with contingently issuable shares	**1,462,957**	874,626	918,744
Assuming dilution			

	937,385,625	958,714,097	982,700,267
Income from continuing operations	**$ 5,758**	$ 11,881	$ 13,364
Loss from discontinued operations, net of tax	**(5)**	(9)	(174)
Net income on which basic earnings per share is calculated	**$ 5,753**	$ 11,872	$ 13,190
Income from continuing operations	**$ 5,758**	$ 11,881	$ 13,364
Net income applicable to contingently issuable shares	**(2)**	0	(1)
Income from continuing operations on which diluted earnings per share is calculated	**$ 5,756**	$ 11,881	$ 13,363
Loss from discontinued operations, net of tax, on which basic and diluted earnings per share is calculated	**(5)**	(9)	(174)
Net income on which diluted earnings per share is calculated	**$ 5,752**	$ 11,872	$ 13,189
Earnings/(loss) per share of common stock			
Assuming dilution			
Continuing operations	**$ 6.14**	$ 12.39	$ 13.60
Discontinued operations	**0.00**	(0.01)	(0.18)
Total	**$ 6.14**	$ 12.38	$ 13.42
Basic			
Continuing operations	**$ 6.17**	$ 12.44	$ 13.66
Discontinued operations	**0.00**	(0.01)	(0.18)
Total	**$ 6.17**	$ 12.43	$ 13.48

Weighted-average stock options to purchase 209,294 common shares in 2017, 405,552 common shares in 2016 and 41,380 common shares in 2015 were outstanding, but were not included in the computation of diluted earnings per share because the exercise price of the options was greater than the average market price of the common shares for the full year, and therefore, the effect would have been antidilutive.

NOTE Q. RENTAL EXPENSE AND LEASE COMMITMENTS

Rental expense, including amounts charged to inventories and fixed assets, and excluding amounts previously reserved, was $1,821 million in 2017, $1,508 million in 2016 and $1,474 million in 2015. Within these amounts, rental expense reflected in discontinued operations was $29 million in 2015. Rental expense in agreements with rent holidays and scheduled rent increases is recorded on a straight-line basis over the lease term. Contingent rentals are included in the determination of rental expense as accruable. The table below depicts gross minimum rental commitments under noncancelable leases, amounts related to vacant space associated with workforce transformation, sublease income commitments and capital lease commitments. These amounts reflect activities primarily related to office space, data centers, equipment and vehicles.

($ in millions)

	2018	2019	2020	2021	2022	Beyond 2022
Operating lease commitments						
Gross minimum rental commitments (including vacant space below)	$ 1,614	$ 1,453	$ 1,143	$ 829	$ 633	$ 896
Vacant space	$ 32	$ 21	$ 15	$ 11	$ 7	$ 2
Sublease income commitments	$ 13	$ 7	$ 4	$ 2	$ 2	$ —
Capital lease commitments	$ 3	$ 2	$ 2	$ 2	$ 1	$ —

NOTE R. STOCK-BASED COMPENSATION

The following table presents total stock-based compensation cost included in income from continuing operations.

($ in millions)

For the year ended December 31:	2017	2016	2015
Cost	**$ 91**	$ 88	$ 100
Selling, general and administrative	**384**	401	322
Research, development and engineering	**59**	55	51
Other (income) and expense*	**—**	—	(6)
Pre-tax stock-based compensation cost	**534**	544	468
Income tax benefits	**(131)**	(179)	(156)
Net stock-based compensation cost	**$ 403**	$ 364	$ 312

* Reflects the one-time effects related to divestitures.

The implementation of the new FASB guidance for share-based payment transactions resulted in an immaterial impact to income tax benefits for the year ended December 31, 2017.

Total unrecognized compensation cost related to non-vested awards at December 31, 2017 and 2016 was $851 million and $934 million, respectively. The amount at December 31, 2017 is expected to be recognized over a weighted-average period of approximately 2.6 years.

There was no significant capitalized stock-based compensation cost at December 31, 2017, 2016, and 2015.

Incentive Awards

Stock-based incentive awards are provided to employees under the terms of the company's long-term performance plans (the "Plans"). The Plans are administered by the Executive Compensation and Management Resources Committee of the Board of Directors (the "Committee"). Awards available under the Plans principally include restricted stock units, performance share units, stock options or any combination thereof.

The amount of shares originally authorized to be issued under the company's existing Plans was 273 million at December 31, 2017. In addition, certain incentive awards granted under previous plans, if and when those awards were canceled, could be reissued under the company's existing Plans. As such, 66.2 million additional shares were considered authorized to be issued under the company's existing Plans as of December 31, 2017. There were 104.1 million unused shares available to be granted under the Plans as of December 31, 2017.

Under the company's long-standing practices and policies, all awards are approved prior to or on the date of grant. The awards approval process specifies the individual receiving the grant, the number of options or the value of the award, the exercise price or formula for determining the exercise price and the date of grant. All awards for senior management are approved by the Committee. All awards for employees other than senior management are approved by senior management pursuant to a series of delegations that were approved by the Committee, and the grants made pursuant to these delegations are reviewed periodically with the Committee. Awards that are given as part of annual total compensation for senior management and other employees are made on specific cycle dates scheduled in advance. With respect to awards given in connection with promotions or new hires, the company's policy requires approval of such awards prior to the grant date, which is typically the date of the promotion or the date of hire.

Stock Awards

Stock awards are made in the form of Restricted Stock Units (RSUs), including Retention Restricted Stock Units (RRSUs), or Performance Share Units (PSUs).

The tables below summarize RSU and PSU activity under the Plans during the years ended December 31, 2017, 2016 and 2015.

RSUs

	2017		2016		2015	
	Weighted-Average Grant Price	Number of Units	Weighted-Average Grant Price	Number of Units	Weighted-Average Grant Price	Number of Units
Balance at January 1	**$ 147**	**8,899,092**	$ 159	7,527,341	$ 171	7,734,277
RSUs granted	**137**	**3,540,949**	140	3,985,870	143	4,230,186
RSUs released	**153**	**(3,032,531)**	174	(1,860,660)	164	(3,567,495)
RSUs canceled/forfeited	**147**	**(852,247)**	158	(753,459)	167	(869,627)
Balance at December 31	**$ 141**	**8,555,263**	$ 147	8,899,092	$ 159	7,527,341

PSUs

	2017		2016		2015	
	Weighted-Average Grant Price	Number of Units	Weighted-Average Grant Price	Number of Units	Weighted-Average Grant Price	Number of Units
Balance at January 1	**$ 155**	**2,874,758**	$ 173	2,928,932	$ 185	3,140,707
PSUs granted at target	**137**	**824,875**	140	990,336	153	1,137,242
Performance adjustments*	**175**	**(623,245)**	194	(387,457)	185	(168,055)
PSUs released	**175**	**(293,236)**	194	(419,759)	185	(840,552)
PSUs canceled/forfeited	**144**	**(133,839)**	174	(237,294)	184	(340,410)
Balance at December 31**	**$ 144**	**2,649,313**	$ 155	2,874,758	$ 173	2,928,932

* Represents the change in shares issued to employees after vesting of PSUs because final performance metrics were above or below specified targets.
** Represents the number of shares expected to be issued based on achievement of grant date performance targets. The actual number of shares issued will depend on final performance against specified targets over the vesting period.

RSUs are stock awards granted to employees that entitle the holder to shares of common stock as the award vests, typically over a one- to five-year period. For RSUs, dividend equivalents are not paid. The fair value of such RSUs is determined and fixed on the grant date based on the company's stock price adjusted for the exclusion of dividend equivalents.

The remaining weighted-average contractual term of RSUs at December 31, 2017, 2016 and 2015 is the same as the period over which the remaining cost of the awards will be recognized, which is approximately three years. The fair value of RSUs granted during the years ended December 31, 2017, 2016 and 2015 was $484 million, $557 million and $606 million, respectively. The total fair value of RSUs vested and released during the years ended December 31, 2017, 2016 and 2015 was $463 million, $323 million and $583 million, respectively. As of December 31, 2017, 2016 and 2015, there was $763 million, $814 million and $800 million, respectively, of unrecognized compensation cost related to non-vested RSUs. The company received no cash from employees as a result of employee vesting and release of RSUs for the years ended December 31, 2017, 2016 and 2015.

PSUs are stock awards where the number of shares ultimately received by the employee depends on the company's performance against specified targets and typically vest over a three-year period. For PSUs, dividend equivalents are not paid. The fair value of each PSU is determined on the grant date, based on the company's stock price, adjusted for the exclusion of dividend equivalents, and assumes that performance targets will be achieved. Over the performance period, the number of shares of stock that will be issued is adjusted upward or downward based upon the probability of achievement of performance targets. The ultimate number of shares issued and the related compensation cost recognized as expense will be based on a comparison of the final performance metrics to the specified targets. The fair value of PSUs granted at target during the years ended December 31, 2017, 2016 and 2015 was $113 million, $138 million and $174 million, respectively. Total fair value of PSUs vested and released during the years ended December 31, 2017, 2016 and 2015 was $51 million, $81 million and $156 million, respectively.

In connection with vesting and release of RSUs and PSUs, the tax benefits realized by the company for the years ended December 31, 2017, 2016 and 2015 were $180 million, $118 million and $228 million, respectively.

Stock Options

For the years ended December 31, 2017 and 2015, the company did not grant stock options. For the year ended December 31, 2016, the company made one grant of 1.5 million premium-priced stock options. The option award was granted with a three-year cliff vesting period and a 10-year contractual term. The award's cost of $12 million is recognized ratably over the three-year vesting period.

The company estimates the fair value of stock options at the date of grant using the Black-Scholes valuation model. Key inputs and assumptions used to estimate the fair value of stock options include the grant price of the award, the expected option term, volatility of the company's stock, the risk-free rate and the company's dividend yield. Estimates of fair value are not intended to predict actual future events or the value ultimately realized by employees who receive equity awards, and subsequent events are not indicative of the reasonableness of the original estimates of fair value made by the company.

The following table summarizes option activity under the Plans during the years ended December 31, 2017, 2016 and 2015.

	2017		2016		2015	
	Weighted-Average Exercise Price	Number of Shares Under Option	Weighted-Average Exercise Price	Number of Shares Under Option	Weighted-Average Exercise Price	Number of Shares Under Option
Balance at January 1	**$ 137**	**1,613,923**	$ 94	479,774	$ 97	1,750,949
Options granted	**—**	**—**	140	1,500,000	—	—
Options exercised	**103**	**(106,132)**	91	(361,088)	98	(1,214,109)
Options canceled/expired	**103**	**(7,791)**	86	(4,763)	100	(57,066)
Balance at December 31	**$ 140**	**1,500,000**	$ 137	1,613,923	$ 94	479,774
Exercisable at December 31	**$ —**	**—**	$ 103	113,923	$ 94	479,774

The shares under option at December 31, 2017 were in the following exercise price ranges:

	Options Outstanding			
Exercise Price Range	Weighted-Average Exercise Price	Number of Shares Under Option	Aggregate Intrinsic Value	Weighted-Average Remaining Contractual Life (in Years)
$129–$154	**$ 140**	**1,500,000**	**$ 39,236,250**	**8.1**

Exercises of Employee Stock Options

The total intrinsic value of options exercised during the years ended December 31, 2017, 2016 and 2015 was $7 million, $20 million and $74 million, respectively. The total cash received from employees as a result of employee stock option exercises for the years ended December 31, 2017, 2016 and 2015 was approximately $11 million, $33 million and $119 million, respectively. In connection with these exercises, the tax benefits realized by the company for the years ended December 31, 2017, 2016 and 2015 were $2 million, $7 million and $26 million, respectively.

The company settles employee stock option exercises primarily with newly issued common shares and, occasionally, with treasury shares. Total treasury shares held at December 31, 2017 and 2016 were approximately 1,307 million and 1,279 million shares, respectively.

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

Acquisitions

In connection with various acquisition transactions, there was an additional 0.3 million options outstanding at December 31, 2017, as a result of the company's conversion of stock-based awards previously granted by the acquired entities. The weighted-average exercise price of these awards was $42 per share.

IBM Employees Stock Purchase Plan

The company maintains a non-compensatory Employees Stock Purchase Plan (ESPP). The ESPP enables eligible participants to purchase full or fractional shares of IBM common stock at a 5 percent discount off the average market price on the day of purchase through payroll deductions of up to 10 percent of eligible compensation. Eligible compensation includes any compensation received by the employee during the year. The ESPP provides for offering periods during which shares may be purchased and continues as long as shares remain available under the ESPP, unless terminated earlier at the discretion of the Board of Directors. Individual ESPP participants are restricted from purchasing more than $25,000 of common stock in one calendar year or 1,000 shares in an offering period.

Employees purchased 1.0 million, 1.2 million and 1.3 million shares under the ESPP during the years ended December 31, 2017, 2016 and 2015, respectively. Cash dividends declared and paid by the company on its common stock also include cash dividends on the company stock purchased through the ESPP. Dividends are paid on full and fractional shares and can be reinvested. The company stock purchased through the ESPP is considered outstanding and is included in the weighted-average outstanding shares for purposes of computing basic and diluted earnings per share.

In July 2014, the "2014 ESPP Reserve" became effective and 25 million additional shares of authorized common stock were reserved and approved for issuance. The 2014 ESPP provides for semi-annual offerings commencing July 1, 2014, and continuing as long as shares remain available under the ESPP, unless terminated earlier at the discretion of the Board of Directors.

Approximately 20.8 million, 21.8 million and 23.1 million shares were available for purchase under the ESPP at December 31, 2017, 2016 and 2015, respectively.

NOTE S. RETIREMENT-RELATED BENEFITS

Description of Plans

IBM sponsors defined benefit pension plans and defined contribution plans that cover eligible regular employees, a supplemental retention plan that covers certain U.S. executives and nonpension postretirement benefit plans primarily consisting of retiree medical and dental benefits for eligible retirees and dependents.

U.S. Plans

Defined Benefit Pension Plans

IBM Personal Pension Plan

IBM provides U.S. regular, full-time and part-time employees hired prior to January 1, 2005 with noncontributory defined benefit pension benefits via the IBM Personal Pension Plan (PPP). The PPP has two plans, a tax qualified plan (Qualified PPP) and a non-tax qualified plan (Excess PPP). The Qualified PPP is funded by company contributions to an irrevocable trust fund, which is held for the sole benefit of participants and beneficiaries. The Excess PPP, which is unfunded, provides benefits in excess of IRS limitations for qualified plans.

Benefits provided to the PPP participants are calculated using benefit formulas that vary based on the participant. The first method uses a five-year, final pay formula that determines benefits based on salary, years of service, mortality and other participant-specific factors. The second method is a cash balance formula that calculates benefits using a percentage of employees' annual salary, as well as an interest crediting rate.

Benefit accruals under the IBM Personal Pension Plan ceased December 31, 2007 for all participants.

U.S. Supplemental Executive Retention Plan

The company also sponsors a nonqualified U.S. Supplemental Executive Retention Plan (Retention Plan). The Retention Plan, which is unfunded, provides benefits to eligible U.S. executives based on average earnings, years of service and age at termination of employment.

Benefit accruals under the Retention Plan ceased December 31, 2007 for all participants.

Defined Contribution Plans

IBM 401(k) Plus Plan

U.S. regular, full-time and part-time employees are eligible to participate in the IBM 401(k) Plus Plan, which is a qualified defined contribution plan under section 401(k) of the Internal Revenue Code. Under the IBM 401(k) Plus Plan, eligible employees receive a dollar-for-dollar match of their contributions generally up to 6 percent of eligible compensation for those hired prior to January 1, 2005, and, generally up to 5 percent of eligible compensation for those hired on or after January 1, 2005. In addition, eligible employees generally receive automatic contributions from the company equal to 1, 2 or 4 percent of eligible compensation based on their eligibility to participate in the PPP as of December 31, 2007. Employees generally receive automatic contributions and matching contributions after the completion of one year of service.

All contributions, including the company match, are made in cash and invested in accordance with participants' investment elections. There are no minimum amounts that must be invested in company stock, and there are no restrictions on transferring amounts out of company stock to another investment choice, other than excessive trading rules applicable to such investments. Matching and automatic contributions are made once annually at the end of the year. In order to receive such contributions each year, a participant must be employed on December 15 of the plan year. However, matching and auto contributions may be made for certain types of separations that occur prior to December 15, including for example, if the participant has completed certain service and/or age requirements at separation. The company's matching contributions vest immediately and participants are always fully vested in their own contributions.

IBM Excess 401(k) Plus Plan

The IBM Excess 401(k) Plus Plan (Excess 401(k)) is an unfunded, nonqualified defined contribution plan. Employees whose eligible compensation is expected to exceed the IRS compensation limit for qualified plans are eligible to participate in the Excess 401(k). The purpose of the Excess 401(k) is to provide benefits that would be provided under the qualified IBM 401(k) Plus Plan if the compensation limits did not apply.

Amounts deferred into the Excess 401(k) are record-keeping (notional) accounts and are not held in trust for the participants. Participants in the Excess 401(k) may invest their notional accounts in investments which mirror the primary investment options available under the 401(k) Plus Plan. Participants in the Excess 401(k) are also eligible to receive company match and automatic contributions (at the same rate as under the 401(k) Plus Plan) on eligible compensation deferred into the Excess 401(k) and on compensation earned in excess of the Internal Revenue Code pay limit once they have completed one year of service. Amounts deferred into the Excess 401(k), including company contributions are recorded as liabilities in the Consolidated Statement of Financial Position. Matching and automatic contributions are made once annually at the end of the year. In order to receive such contributions each year, a participant must be employed on December 15 of the plan year. However, matching and auto contributions may be made for certain types of separations that occur prior to December 15, including for example, if the participant has completed certain service and/or age requirements at separation.

Nonpension Postretirement Benefit Plan

U.S. Nonpension Postretirement Plan

The company sponsors a defined benefit nonpension postretirement benefit plan that provides medical and dental benefits to eligible U.S. retirees and eligible dependents, as well as life insurance for eligible U.S. retirees. Benefits provided vary based on plan design formulas and eligibility requirements. Under all the plan arrangements, there is a maximum cost to the company for these benefits.

Since January 1, 2004, new hires, as of that date or later, are not eligible for company-subsidized nonpension postretirement benefits.

Non-U.S. Plans

Certain subsidiaries and branches outside the United States sponsor defined benefit and/or defined contribution plans that cover eligible regular employees. The company deposits funds under various fiduciary-type arrangements, purchases annuities under group contracts or provides reserves for these plans. Benefits under the defined benefit plans are typically based either on years of service and the employee's compensation (generally during a fixed number of years immediately before retirement) or on annual credits. The range of assumptions that are used for the non-U.S. defined benefit plans reflect the different economic environments within the various countries.

In addition, certain of the company's non-U.S. subsidiaries sponsor nonpension postretirement benefit plans that provide medical and dental benefits to eligible non-U.S. retirees and eligible dependents, as well as life insurance for certain eligible non-U.S. retirees. However, most non-U.S. retirees are covered by local government sponsored and administered programs.

Plan Financial Information

Summary of Financial Information

The following table presents a summary of the total retirement-related benefits net periodic (income)/cost recorded in the Consolidated Statement of Earnings.

($ in millions)

	U.S. Plans			Non-U.S. Plans			Total		
For the year ended December 31:	**2017**	**2016**	**2015**	**2017**	**2016**	**2015**	**2017**	**2016**	**2015**
Defined benefit pension plans	**$ 237**	$ (334)	$ (284)	**$ 1,315**	$ 1,039	$ 1,421	**$ 1,552**	$ 705	$ 1,137
Retention Plan	**16**	17	23	**—**	—	—	**16**	17	23
Total defined benefit pension plans (income)/cost	**$ 253**	$ (317)	$ (261)	**$ 1,315**	$ 1,039	$ 1,421	**$ 1,568**	$ 722	$ 1,160
IBM 401(k) Plus Plan and non-U.S. plans	**$ 616**	$ 626	$ 676	**$ 404**	$ 420	$ 442	**$ 1,020**	$ 1,046	$ 1,117
Excess 401(k)	**26**	24	21	**—**	—	—	**26**	24	21
Total defined contribution plans cost	**$ 643**	$ 650	$ 697	**$ 404**	$ 420	$ 442	**$ 1,046**	$ 1,070	$ 1,138
Nonpension postretirement benefit plans cost	**$ 180**	$ 195	$ 218	**$ 62**	$ 16	$ 55	**$ 242**	$ 211	$ 273
Total retirement-related benefits net periodic cost	**$ 1,076**	$ 527	$ 654	**$ 1,781**	$ 1,475	$ 1,918	**$ 2,857**	$ 2,003	$ 2,572

The following table presents a summary of the total PBO for defined benefit pension plans, APBO for nonpension postretirement benefit plans, fair value of plan assets and the associated funded status recorded in the Consolidated Statement of Financial Position.

($ in millions)

	Benefit Obligations		Fair Value of Plan Assets		Funded Status*	
At December 31:	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**
U.S. Plans						
Overfunded plans						
Qualified PPP	**$ 50,602**	$ 50,403	**$ 52,694**	$ 51,405	**$ 2,092**	$ 1,002
Underfunded plans						
Excess PPP	**$ 1,532**	$ 1,509	**$ —**	$ —	**$ (1,532)**	$ (1,509)
Retention Plan	**310**	307	**—**	—	**(310)**	(307)
Nonpension postretirement benefit plan	**4,184**	4,470	**18**	26	**(4,165)**	(4,444)
Total underfunded U.S. plans	**$ 6,026**	$ 6,286	**$ 18**	$ 26	**$ (6,007)**	$ (6,260)
Non-U.S. Plans						
Overfunded plans						
Qualified defined benefit pension plans	**$ 19,537**	$ 17,614	**$ 22,088**	$ 19,647	**$ 2,551**	$ 2,032
Nonpension postretirement benefit plans	**0**	0	**0**	0	**0**	0
Total overfunded non-U.S. plans	**$ 19,537**	$ 17,614	**$ 22,088**	$ 19,647	**$ 2,551**	$ 2,032
Underfunded plans						
Qualified defined benefit pension plans	**$ 23,046**	$ 21,447	**$ 18,711**	$ 16,374	**$ (4,336)**	$ (5,074)
Nonqualified defined benefit pension plans	**6,527**	5,919	**—**	—	**(6,527)**	(5,919)
Nonpension postretirement benefit plans	**732**	692	**70**	71	**(663)**	(622)
Total underfunded non-U.S. plans	**$ 30,306**	$ 28,059	**$ 18,780**	$ 16,445	**$ (11,526)**	$ (11,614)
Total overfunded plans	**$ 70,139**	$ 68,017	**$ 74,782**	$ 71,051	**$ 4,643**	$ 3,034
Total underfunded plans	**$ 36,332**	$ 34,344	**$ 18,799**	$ 16,470	**$ (17,533)**	$ (17,874)

* Funded status is recognized in the Consolidated Statement of Financial Position as follows: Asset amounts as prepaid pension assets; (Liability) amounts as compensation and benefits (current liability) and retirement and nonpension postretirement benefit obligations (noncurrent liability).

At December 31, 2017, the company's qualified defined benefit pension plans worldwide were 100 percent funded compared to the benefit obligations, with the U.S. Qualified PPP 104 percent funded. Overall, including nonqualified plans, the company's defined benefit pension plans worldwide were 92 percent

funded.

Defined Benefit Pension and Nonpension Postretirement Benefit Plan Financial Information

The following tables through page 134 represent financial information for the company's retirement-related benefit plans, excluding defined contribution plans. The defined benefit pension plans under U.S. Plans consists of the Qualified PPP, the Excess PPP and the Retention Plan. The defined benefit pension plans and the nonpension postretirement benefit plans under non-U.S. Plans consists of all plans sponsored by the company's subsidiaries. The nonpension postretirement benefit plan under U.S. Plan consists of only the U.S. Nonpension Postretirement Benefit Plan.

The tables below present the components of net periodic (income)/cost of the retirement-related benefit plans recognized in the Consolidated Statement of Earnings, excluding defined contribution plans.

($ in millions)

	Defined Benefit Pension Plans					
	U.S. Plans			Non-U.S. Plans		
For the year ended December 31:	**2017**	**2016**	**2015**	**2017**	**2016**	**2015**
Service cost	**$ —**	$ —	$ —	**$ 410**	$ 420	$ 454
Interest cost	**1,913**	2,048	2,028	**837**	1,035	1,075
Expected return on plan assets	**(3,014)**	(3,689)	(3,953)	**(1,325)**	(1,867)	(1,919)
Amortization of transition assets	**—**	—	—	**0**	0	0
Amortization of prior service costs/(credits)	**16**	10	10	**(97)**	(106)	(98)
Recognized actuarial losses	**1,337**	1,314	1,654	**1,507**	1,408	1,581
Curtailments and settlements	**—**	—	—	**19**	22	35
Multi-employer plans/other costs*	**—**	—	—	**(36)**	126	293
Total net periodic (income)/cost	**$ 253**	$ (317)	$ (261)	**$ 1,315**	$ 1,039	$ 1,421

($ in millions)

	Nonpension Postretirement Benefit Plans					
	U.S. Plan			Non-U.S. Plans		
For the year ended December 31:	**2017**	**2016**	**2015**	**2017**	**2016**	**2015**
Service cost	**$ 14**	$ 17	$ 24	**$ 6**	$ 5	$ 7
Interest cost	**154**	165	163	**57**	51	50
Expected return on plan assets	**0**	0	0	**(7)**	(6)	(7)
Amortization of transition assets	**—**	—	—	**0**	0	0
Amortization of prior service costs/(credits)	**(7)**	(7)	(7)	**0**	(5)	(5)
Recognized actuarial losses	**20**	20	39	**7**	9	10
Curtailments and settlements	**—**	—	—	**0**	(38)	0
Total net periodic cost	**$ 180**	$ 195	$ 218	**$ 62**	$ 16	$ 55

* Multi-employer plans costs were $40 million, $43 million and $40 million for 2017, 2016, and 2015, respectively. The non-U.S. plans amounts include a gain of $91 million in 2017 related to the IBM UK litigation and retirement-related obligations of $56 million and $233 million related to the IBM Spain pension litigation for 2016, and 2015, respectively.

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

The following table presents the changes in benefit obligations and plan assets of the company's retirement-related benefit plans, excluding defined contribution plans.

($ in millions)

	Defined Benefit Pension Plans				Nonpension Postretirement Benefit Plans			
	U.S. Plans		Non-U.S. Plans		U.S. Plan		Non-U.S. Plans	
	2017	**2016**	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**
Change in benefit obligation								
Benefit obligation at January 1	**$ 52,218**	$ 53,120	**$ 44,981**	$ 44,717	**$ 4,470**	$ 4,652	**$ 692**	$ 618
Service cost	**—**	—	**410**	420	**14**	17	**6**	5
Interest cost	**1,913**	2,048	**837**	1,035	**154**	165	**57**	51
Plan participants' contributions	**—**	—	**28**	30	**54**	50	**—**	—
Acquisitions/divestitures, net	**—**	—	**24**	(63)	**0**	0	**0**	0

Actuarial losses/(gains)	**1,895**	602	**520**	3,217	**(98)**	16	**(3)**	16
Benefits paid from trust	**(3,460)**	(3,430)	**(1,865)**	(1,792)	**(385)**	(400)	**(6)**	(5)
Direct benefit payments	**(123)**	(123)	**(384)**	(381)	**(24)**	(30)	**(30)**	(27)
Foreign exchange impact	**—**	—	**4,657**	(2,222)	**—**	—	**18**	35
Amendments/curtailments/ settlements/other	**—**	—	**(96)**	20	**—**	—	**(1)**	0
Benefit obligation at December 31	**$ 52,444**	$ 52,218	**$ 49,111**	$ 44,981	**$ 4,184**	$ 4,470	**$ 732**	$ 692
Change in plan assets								
Fair value of plan assets at January 1	**$ 51,405**	$ 51,716	**$ 36,020**	$ 35,748	**$ 26**	$ 71	**$ 71**	$ 59
Actual return on plan assets	**4,749**	3,118	**2,583**	3,828	**0**	0	**6**	8
Employer contributions	**—**	—	**368**	464	**394**	305	**0**	0
Acquisitions/divestitures, net	**—**	—	**(28)**	(73)	**0**	0	**0**	0
Plan participants' contributions	**—**	—	**28**	30	**54**	50	**—**	—
Benefits paid from trust	**(3,460)**	(3,430)	**(1,865)**	(1,792)	**(385)**	(400)	**(6)**	(5)
Foreign exchange impact	**—**	—	**3,694**	(2,175)	**—**	—	**(1)**	9
Amendments/curtailments/ settlements/other	**—**	—	**(2)***	(10)*	**(70)**	—	**(1)**	0
Fair value of plan assets at December 31	**$ 52,694**	$ 51,405	**$ 40,798**	$ 36,020	**$ 18**	$ 26	**$ 70**	$ 71
Funded status at December 31	**$ 250**	$ (814)	**$ (8,312)**	$ (8,960)	**$ (4,165)**	$ (4,444)	**$ (663)**	$ (622)
Accumulated benefit obligation**	**$ 52,444**	$ 52,218	**$ 47,974**	$ 44,514	**N/A**	N/A	**N/A**	N/A

* Includes the reinstatement of certain plan assets in Brazil due to government rulings in 2011 and 2013 allowing certain previously restricted plan assets to be returned to IBM. Return of assets to IBM over a three-year period began June 2011 and September 2013 respectively, with approximately $23 million returned in 2016. There were no assets returned during 2017. The remaining surplus in Brazil at December 31, 2017 is excluded from total plan assets due to continued restrictions imposed by the government on the use of those plan assets.

** Represents the benefit obligation assuming no future participant compensation increases.

N/A—Not applicable

Notes to Consolidated Financial Statements

International Business Machines Corporation and Subsidiary Companies

The following table presents the net funded status recognized in the Consolidated Statement of Financial Position.

($ in millions)

	Defined Benefit Pension Plans				Nonpension Postretirement Benefit Plans			
	U.S. Plans		Non-U.S. Plans		U.S. Plan		Non-U.S. Plans	
At December 31:	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**
Prepaid pension assets	**$ 2,092**	$ 1,002	**$ 2,551**	$ 2,032	**$ 0**	$ 0	**$ 0**	$ 0
Current liabilities— compensation and benefits	**(120)**	(118)	**(323)**	(303)	**(353)**	(368)	**(17)**	(15)
Noncurrent liabilities— retirement and nonpension postretirement benefit obligations	**(1,722)**	(1,698)	**(10,541)**	(10,689)	**(3,812)**	(4,076)	**(646)**	(607)
Funded status—net	**$ 250**	$ (814)	**$ (8,312)**	$ (8,960)	**$ (4,165)**	$ (4,444)	**$ (663)**	$ (622)

The following table presents the pre-tax net loss and prior service costs/(credits) and transition (assets)/liabilities recognized in OCI and the changes in the pre-tax net loss, prior service costs/(credits) and transition (assets)/liabilities recognized in AOCI for the retirement-related benefit plans.

($ in millions)

	Defined Benefit Pension Plans				Nonpension Postretirement Benefit Plans			
	U.S. Plans		Non-U.S. Plans		U.S. Plan		Non-U.S. Plans	
	2017	**2016**	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**
Net loss at January 1	**$ 19,222**	$ 19,363	**$ 20,544**	$ 20,724	**$ 605**	$ 609	**$ 154**	$ 128
Current period loss/(gain)	**159**	1,173	**(740)**	1,251	**(99)**	16	**(2)**	14
Curtailments and settlements	**—**	—	**(22)**	(22)	**—**	—	**0**	20
Amortization of net loss	**(1,337)**	(1,314)	**(1,507)**	(1,408)	**(20)**	(20)	**(7)**	(9)

included in net periodic (income)/cost								
Net loss at December 31	**$ 18,045**	$ 19,222	**$ 18,275**	$ 20,544	**$ 486**	$ 605	**$ 145**	$ 154
Prior service costs/(credits) at January 1	**$ 90**	$ 101	**$ (188)**	$ (294)	**$ 37**	$ 30	**$ 1**	$ (21)
Curtailments, settlements and other	**—**	—	**1**	0	**—**	—	**2**	18
Amortization of prior service (costs)/credits included in net periodic (income)/cost	**(16)**	(10)	**97**	106	**7**	7	**0**	5
Prior service costs/(credits) at December 31	**$ 74**	$ 90	**$ (90)**	$ (188)	**$ 45**	$ 37	**$ 3**	$ 1
Transition (assets)/liabilities at January 1	**$ —**	$ —	**$ 0**	$ 0	**$ —**	$ —	**$ 0**	$ 0
Amortization of transition assets/(liabilities) included in net periodic (income)/cost	**—**	—	**0**	0	**—**	—	**0**	0
Transition (assets)/liabilities at December 31	**$ —**	$ —	**$ 0**	$ 0	**$ —**	$ —	**$ 0**	$ 0
Total loss recognized in accumulated other comprehensive income/(loss)*	**$ 18,119**	$ 19,313	**$ 18,184**	$ 20,356	**$ 531**	$ 642	**$ 147**	$ 154

* See note L, "Equity Activity," for the total change in AOCI, and the Consolidated Statement of Comprehensive Income for the components of net periodic (income)/cost, including the related tax effects, recognized in OCI for the retirement-related benefit plans.

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

The following table presents the pre-tax estimated net loss, estimated prior service costs/(credits) and estimated transition (assets)/ liabilities of the retirement-related benefit plans that will be amortized from AOCI into net periodic (income)/cost in 2018.

($ in millions)

	Defined Benefit Pension Plans		Nonpension Postretirement Benefit Plans	
	U.S. Plans	Non-U.S. Plans	U.S. Plan	Non-U.S. Plans
Net loss	$ 1,538	$ 1,464	$ 9	$ 6
Prior service costs/(credits)	16	(81)	(7)	0
Transition (assets)/liabilities	—	0	—	0

On March 24, 2014, the Supreme Court of Spain issued a ruling against IBM Spain in litigation involving its defined benefit and defined contribution plans. During the fourth quarter of 2016, an arbitration ruling related to the defined contribution plan resulted in an additional charge of $56 million. For the years ended December 31, 2016 and 2015, the company recorded pre-tax retirement-related obligations of $56 million and $233 million, respectively, in selling, general and administrative expense in the Consolidated Statement of Earnings. There were no pre-tax retirement-related obligations for the year ended December 31, 2017. These obligations are reflected in "Non-U.S. Plans—Multi-employer plans/other costs" in the table on page 131.

On October 12, 2012, the High Court in London issued a ruling against IBM United Kingdom Limited and IBM United Kingdom Holdings Limited, both wholly-owned subsidiaries of the company, in litigation involving one of IBM UK's defined benefit plans. As a result of the ruling, the company recorded a pretax retirement-related obligation of $162 million in the fourth quarter of 2012 in selling, general and administrative expense in the Consolidated Statement of Earnings. As a result of the final Court of Appeal ruling received in August 2017, the company adjusted its obligation under the plan. This adjustment resulted in a gain of $91 million for the year ended December 31, 2017, which was recorded in selling, general and administrative expense in the Consolidated Statement of Earnings. This gain is reflected in "Non-U.S. Plans—Multi-employer plans/other" in the table on page 131. See note M, "Contingencies and Commitments" for additional information.

Assumptions Used to Determine Plan Financial Information

Underlying both the measurement of benefit obligations and net periodic (income)/cost are actuarial valuations. These valuations use participant-specific information such as salary, age and years of service, as well as certain assumptions, the most significant of which include estimates of discount rates, expected return on plan assets, rate of compensation increases, interest crediting rates and mortality rates. The company evaluates these assumptions, at a minimum, annually, and makes changes as necessary.

The table below presents the assumptions used to measure the net periodic (income)/cost and the year-end benefit obligations for retirement-related benefit plans.

	Defined Benefit Pension Plans					
	U.S. Plans			Non-U.S. Plans		
	2017	2016	2015	2017	2016	2015
Weighted-average assumptions used to measure net periodic (income)/cost for the year ended December 31						
Discount rate	**3.80%**	4.00%	3.70%	**1.80%**	2.40%	2.34%
Expected long-term returns on plan assets	**5.75%**	7.00%	7.50%	**3.77%**	5.53%	5.67%
Rate of compensation increase	**N/A**	N/A	N/A	**2.45%**	2.40%	2.49%
Weighted-average assumptions used to measure benefit obligations at December 31						
Discount rate	**3.40%**	3.80%	4.00%	**1.76%**	1.80%	2.40%
Rate of compensation increase	**N/A**	N/A	N/A	**2.41%**	2.45%	2.40%

N/A—Not applicable

	Nonpension Postretirement Benefit Plans					
	U.S. Plan			Non-U.S. Plans		
	2017	2016	2015	2017	2016	2015
Weighted-average assumptions used to measure net periodic cost for the year ended December 31						
Discount rate	**3.60%**	3.70%	3.40%	**8.26%**	7.06%	7.51%
Expected long-term returns on plan assets	**N/A**	N/A	N/A	**10.47%**	9.95%	10.17%
Weighted-average assumptions used to measure benefit obligations at December 31						
Discount rate	**3.30%**	3.60%	3.70%	**7.28%**	8.26%	7.06%

N/A—Not applicable

Discount Rate

The discount rate assumptions used for retirement-related benefit plans accounting reflect the yields available on high-quality, fixed-income debt instruments at the measurement date. For the U.S. and certain non-U.S. countries, a portfolio of high-quality corporate bonds is used to construct a yield curve. The cash flows from the company's expected benefit obligation payments are then matched to the yield curve to derive the discount rates. In other non-U.S. countries, where the markets for high-quality long-term bonds are not generally as well developed, a portfolio of long-term government bonds is used as a base, to which a credit spread is added to simulate corporate bond yields at these maturities in the jurisdiction of each plan, as the benchmark for developing the respective discount rates.

For the U.S. defined benefit pension plans, the changes in the discount rate assumptions impacted the net periodic (income)/ cost and the PBO. The changes in the discount rate assumptions resulted in a decrease in 2017 net periodic income of $64 million, an increase in 2016 net periodic income of $103 million and a decrease in 2015 net periodic income of $286 million. The changes in the discount rate assumptions resulted in an increase in the PBO of $1,962 million and an increase of $998 million for the years ended December 31, 2017 and 2016, respectively.

For the U.S. nonpension postretirement benefit plans, the changes in the discount rate assumptions had no material impact on net periodic cost for the years ended December 31, 2017, 2016 and 2015 and resulted in an increase in the APBO of $88 million and an increase of $33 million at December 31, 2017 and 2016, respectively.

For all of the company's retirement-related benefit plans, the change in the discount rate assumptions resulted in an increase in the benefit obligation of approximately $2.5 billion at December 31, 2017 and an increase of approximately $4.8 billion at December 31, 2016.

Expected Long-Term Returns on Plan Assets

Expected returns on plan assets, a component of net periodic (income)/cost, represent the expected long-term returns on plan assets based on the calculated market-related value of plan assets. Expected long-term returns on plan assets take into account long-term expectations for future returns and the investment policies and strategies as described on page 136. These rates of return are developed by the company and are tested for reasonableness against historical

returns. The use of expected long-term returns on plan assets may result in recognized pension income that is greater or less than the actual returns of those plan assets in any given year. Over time, however, the expected long-term returns are designed to approximate the actual long-term returns, and therefore result in a pattern of income and cost recognition that more closely matches the pattern of the services provided by the employees. Differences between actual and expected returns are recognized as a component of net loss or gain in AOCI, which is amortized as a component of net periodic (income)/cost over the service lives or life expectancy of the plan participants, depending on the plan, provided such amounts exceed certain thresholds provided by accounting standards. The market-related value of plan assets recognizes changes in the fair value of plan assets systematically over a five-year period in the expected return on plan assets line in net periodic (income)/cost.

For the U.S. defined benefit pension plan, the expected long-term rate of return on plan assets for the years ended December 31, 2017, 2016 and 2015 was 5.75 percent, 7.0 percent and 7.5 percent, respectively. The change in the rate in 2017 resulted in a decrease in 2017 net periodic income of $656 million. For the year ended December 31, 2016, the change in the rate resulted in a decrease in net periodic income of $268 million. For the year ended December 31, 2015, the change in the rate in resulted in a decrease in net periodic income of $264 million. For 2018, the projected long-term rate of return on plan assets is 5.25 percent. The 50 basis point year-to-year decline is primarily driven by a change in investment strategy.

For the U.S. nonpension postretirement benefit plans, the company maintains a highly liquid trust fund balance to ensure timely payments are made. As a result, for the years ended December 31, 2017, 2016 and 2015, the expected long-term return on plan assets and the actual return on those assets were not material.

Rate of Compensation Increases and Mortality Rate

The rate of compensation increases is determined by the company, based upon its long-term plans for such increases. The rate of compensation increase is not applicable to the U.S. defined benefit pension plans as benefit accruals ceased December 31, 2007 for all participants. Mortality rate assumptions are based on life expectancy and death rates for different types of participants. Mortality rates are periodically updated based on actual experience. In the U.S., the Society of Actuaries released new mortality tables in 2014 and updated them in 2015, 2016 and 2017. The company utilized these tables in its plan remeasurements at December 31, 2017 and 2016. For the U.S. retirement-related plans, the change in mortality assumptions resulted in a decrease to the plan benefit obligations of $0.3 billion and $0.6 billion at December 31, 2017 and 2016, respectively.

Interest Crediting Rate

Benefits for certain participants in the PPP are calculated using a cash balance formula. An assumption underlying this formula is an interest crediting rate, which impacts both net periodic (income)/cost and the PBO. This assumption provides a basis for projecting the expected interest rate that participants will earn on the benefits that they are expected to receive in the following year and is based on the average from August to October of the one-year U.S. Treasury Constant Maturity yield plus one percent.

For the PPP, the change in the interest crediting rate to 1.6 percent for the year ended December 31, 2017 from 1.3 percent for the year ended December 31, 2016 resulted in a decrease in 2017 net periodic income of $14 million. The change in the interest crediting rate to 1.3 percent for the year ended December 31, 2016 from 1.1 percent for the year ended December 31, 2015 resulted in a decrease in 2016 net periodic income of $7 million. The interest crediting rate of 1.1 percent for the year ended December 31, 2015 was unchanged from December 31, 2014 and, therefore, had no impact on 2015 net periodic income.

Healthcare Cost Trend Rate

For nonpension postretirement benefit plan accounting, the company reviews external data and its own historical trends for healthcare costs to determine the healthcare cost trend rates. However, the healthcare cost trend rate has an insignificant effect on plan costs and obligations as a result of the terms of the plan which limit the company's obligation to the participants. The company assumes that the healthcare cost trend rate for 2018 will be 6.5 percent. In addition, the company assumes that the same trend rate will decrease to 5 percent over the next six years. A one percentage point increase or decrease in the assumed healthcare cost trend rate would not have had a material effect on 2017, 2016 and 2015 net periodic cost or the benefit obligations as of December 31, 2017 and 2016.

Plan Assets

Retirement-related benefit plan assets are recognized and measured at fair value. Because of the inherent uncertainty of valuations, these fair value measurements may not necessarily reflect the amounts the company could realize in current market transactions.

Investment Policies and Strategies

The investment objectives of the Qualified PPP portfolio are designed to generate returns that will enable the plan to meet its future obligations. The precise amount for which these obligations will be settled depends on future events, including the retirement dates and life expectancy of the plans' participants. The obligations are estimated using actuarial assumptions, based on the current economic environment and other pertinent factors described previously on pages 135 and 136. The Qualified PPP portfolio's investment strategy balances the requirement to generate returns, using potentially higher yielding assets such as equity securities, with the need to control risk in the portfolio with less volatile assets, such as fixed-income securities. Risks include, among others, inflation, volatility in equity values and changes in interest rates that could cause the plan to become underfunded, thereby increasing its dependence on contributions from the company. To mitigate any potential concentration risk, careful consideration is given to balancing the portfolio among industry

sectors, companies and geographies, taking into account interest rate sensitivity, dependence on economic growth, currency and other factors that affect investment returns. During 2016 and 2017, the company changed its investment strategy, modifying the target allocation primarily by reducing equity securities and increasing debt securities. These changes were designed to reduce the potential negative impact that equity markets might have on the funded status of the plan. The Qualified PPP portfolio's target allocation is 12 percent equity securities, 79 percent fixed-income securities, 4 percent real estate and 5 percent other investments.

The assets are managed by professional investment firms and investment professionals who are employees of the company. They are bound by investment mandates determined by the company's management and are measured against specific benchmarks. Among these managers, consideration is given, but not limited to, balancing security concentration, issuer concentration, investment style and reliance on particular active and passive investment strategies.

Market liquidity risks are tightly controlled, with $4,683 million of the Qualified PPP portfolio as of December 31, 2017 invested in private market assets consisting of private equities and private real estate investments, which are less liquid than publicly traded securities. In addition, the Qualified PPP portfolio had $1,845 million in commitments for future investments in private markets to be made over a number of years. These commitments are expected to be funded from plan assets.

Derivatives are used as an effective means to achieve investment objectives and/or as a component of the plan's risk management strategy. The primary reasons for the use of derivatives are fixed income management, including duration, interest rate management and credit exposure, cash equitization and to manage currency and commodity strategies.

Outside the U.S., the investment objectives are similar to those described previously, subject to local regulations. The weighted-average target allocation for the non-U.S. plans is 23 percent equity securities, 62 percent fixed-income securities, 3 percent real estate and 12 percent other investments, which is consistent with the allocation decisions made by the company's management. In some countries, a higher percentage allocation to fixed income is required to manage solvency and funding risks. In others, the responsibility for managing the investments typically lies with a board that may include up to 50 percent of members elected by employees and retirees. This can result in slight differences compared with the strategies previously described. Generally, these non-U.S. plans do not invest in illiquid assets and their use of derivatives is consistent with the U.S. plan and mainly for currency hedging, interest rate risk management, credit exposure and alternative investment strategies.

The company's nonpension postretirement benefit plans are underfunded or unfunded. For some plans, the company maintains a nominal, highly liquid trust fund balance to ensure timely benefit payments.

Defined Benefit Pension Plan Assets

The following table presents the company's defined benefit pension plans' asset classes and their associated fair value at December 31, 2017. The U.S. Plan consists of the Qualified PPP and the non-U.S. Plans consist of all plans sponsored by the company's subsidiaries.

($ in millions)

	U.S. Plan				Non-U.S. Plans			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Equity								
Equity securities [1]	$ 2,215	$ 0	$ —	$ 2,215	$ 3,508	$ 0	$ —	$ 3,508
Equity mutual funds [2]	108	—	—	108	24	—	—	24
Fixed income								
Government and related [3]	—	19,762	—	19,762	—	10,103	8	10,111
Corporate bonds [4]	—	17,864	372	18,236	—	2,000	—	2,000
Mortgage and asset-backed securities	—	619	4	623	—	5	—	5
Fixed income mutual funds [5]	338	—	—	338	86	—	—	86
Insurance contracts	—	—	—	—	—	1,366	—	1,366
Cash and short-term investments [6]	100	1,903	—	2,004	221	606	—	827
Real estate	—	—	—	—	—	—	356	356
Derivatives [7]	21	(4)	—	17	20	744	—	764
Other mutual funds [8]	—	—	—	—	60	—	—	60
Subtotal	2,782	40,144	376	43,302	3,918	14,824	365	19,107
Investments measured at net asset value using the NAV practical expedient [9]	—	—	—	9,537	—	—	—	21,744
Other [10]	—	—	—	(145)	—	—	—	(52)
Fair value of plan assets	$ 2,782	$ 40,144	$ 376	$ 52,694	$ 3,918	$ 14,824	$ 365	$ 40,798

(1) Represents U.S. and international securities. The U.S. Plan includes IBM common stock of $14 million, representing 0.03 percent of the U.S. Plan assets. Non-U.S. Plans include IBM common stock of $7 million, representing 0.02 percent of the non-U.S. Plans assets.
(2) Invests in predominantly equity securities.
(3) Includes debt issued by national, state and local governments and agencies.
(4) The U.S. Plan includes IBM corporate bonds of $1 million, representing 0.002 percent of the U.S. Plan assets. Non-U.S. plans include IBM corporate bonds of $1 million representing 0.002 percent of the non-U.S. Plan assets.
(5) Invests predominantly in fixed income securities.
(6) Includes cash, cash equivalents and short-term marketable securities.
(7) Includes interest rate derivatives, forwards, exchange traded and other over-the-counter derivatives.
(8) Invests in both equity and fixed-income securities.
(9) Investments measured at fair value using the net asset value (NAV) per share (or its equivalent) as a practical expedient, including commingled funds, hedge funds, private equity and real estate partnerships.
(10) Represents net unsettled transactions, relating primarily to purchases and sales of plan assets.

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

The U.S. nonpension postretirement benefit plan assets of $18 million were invested primarily in cash equivalents, categorized as Level 1 in the fair value hierarchy. The non-U.S. nonpension postretirement benefit plan assets of $70 million, primarily in Brazil, and, to a lesser extent, in Mexico and South Africa, were invested primarily in government and related fixed-income securities and corporate bonds, categorized as Level 2 in the fair value hierarchy.

The following table presents the company's defined benefit pension plans' asset classes and their associated fair value at December 31, 2016. The U.S. Plan consists of the Qualified PPP and the non-U.S. Plans consist of all plans sponsored by the company's subsidiaries.

($ in millions)

	U.S. Plan				Non-U.S. Plans			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Equity								
Equity securities (1)	$ 5,778	$ 1	$ —	$ 5,779	$ 4,080	$ 0	$ —	$ 4,080
Equity mutual funds (2)	93	—	—	93	35	—	—	35
Fixed income								
Government and related (3)	—	14,897	—	14,897	—	7,577	16	7,593
Corporate bonds (4)	—	18,063	101	18,164	—	2,045	1	2,045
Mortgage and asset-backed securities	—	652	5	656	—	4	—	4
Fixed income mutual funds (5)	359	—	—	359	22	—	—	22
Insurance contracts	—	—	—	—	—	1,137	—	1,137
Cash and short-term investments (6)	55	1,927	—	1,982	294	707	—	1,001
Real estate	—	—	—	—	—	—	294	294
Derivatives (7)	18	20	—	38	43	752	—	796
Other mutual funds (8)	—	—	—	—	114	—	—	114
Subtotal	6,303	35,560	106	41,969	4,589	12,223	310	17,122
Investments measured at net asset value using the NAV practical expedient (9)	—	—	—	9,641	—	—	—	18,946
Other (10)	—	—	—	(205)	—	—	—	(48)
Fair value of plan assets	$ 6,303	$ 35,560	$ 106	$ 51,405	$ 4,589	$ 12,223	$ 310	$ 36,020

(1) Represents U.S. and international securities. The U.S. Plan includes IBM common stock of $28 million, representing 0.1 percent of the U.S. Plan assets. Non-U.S. Plans include IBM common stock of $15 million, representing 0.04 percent of the non-U.S. Plans assets.
(2) Invests in predominantly equity securities.
(3) Includes debt issued by national, state and local governments and agencies.
(4) The U.S. Plan includes IBM corporate bonds of $4 million, representing 0.01 percent of the U.S. Plan assets. Non-U.S. plans include IBM corporate bonds of $1 million representing 0.003 percent of the non-U.S. Plan assets.
(5) Invests in predominantly fixed-income securities.
(6) Includes cash and cash equivalents and short-term marketable securities.
(7) Includes interest rate derivatives, forwards, exchange traded and other over-the-counter derivatives.
(8) Invests in both equity and fixed-income securities.
(9) Investments measured at fair value using the net asset value (NAV) per share (or its equivalent) as a practical expedient, including commingled funds, hedge funds, private equity and real estate partnerships.
(10) Represents net unsettled transactions, relating primarily to purchases and sales of plan assets.

The U.S. nonpension postretirement benefit plan assets of $26 million were invested in cash, categorized as Level 1 in the fair value hierarchy. The non-U.S. nonpension postretirement benefit plan assets of $71 million, primarily in Brazil, and, to a lesser extent, in Mexico and South Africa, were invested primarily in government and related fixed-income securities and corporate bonds, categorized as Level 2 in the fair value hierarchy.

The following tables present the reconciliation of the beginning and ending balances of Level 3 assets for the years ended December 31, 2017 and 2016 for the U.S. Plan.

($ in millions)

	Corporate Bonds	Mortgage and Asset-Backed Securities	Total
Balance at January 1, 2017	**$ 101**	**$ 5**	**$ 106**
Return on assets held at end of year	**12**	**0**	**11**
Return on assets sold during the year	**1**	**0**	**1**
Purchases, sales and settlements, net	**259**	**(1)**	**258**
Balance at December 31, 2017	**$ 372**	**$ 4**	**$ 376**

($ in millions)

	Corporate Bonds	Mortgage and Asset-Backed Securities	Total
Balance at January 1, 2016	$ 2	$ 10	$ 12
Return on assets held at end of year	(3)	0	(2)
Return on assets sold during the year	0	1	1
Purchases, sales and settlements, net	103	(5)	99
Transfers, net	(2)	(2)	(3)
Balance at December 31, 2016	$ 101	$ 5	$ 106

The following tables present the reconciliation of the beginning and ending balances of Level 3 assets for the years ended December 31, 2017 and 2016 for the non-U.S. Plans.

($ in millions)

	Government and Related	Corporate Bonds	Private Real Estate	Total
Balance at January 1, 2017	**$ 16**	**$ 1**	**$ 294**	**$ 310**
Return on assets held at end of year	**2**	**0**	**24**	**26**
Return on assets sold during the year	**(3)**	**0**	**(1)**	**(4)**
Purchases, sales and settlements, net	**(2)**	**0**	**9**	**7**
Transfers, net	**(6)**	**0**	**—**	**(6)**
Foreign exchange impact	**2**	**0**	**30**	**31**
Balance at December 31, 2017	**$ 8**	**$ —**	**$ 356**	**$ 365**

($ in millions)

	Government and Related	Corporate Bonds	Private Real Estate	Total
Balance at January 1, 2016	$ 16	$ 4	$ 411	$ 431
Return on assets held at end of year	1	0	(22)	(21)
Return on assets sold during the year	0	0	35	35
Purchases, sales and settlements, net	0	(3)	(68)	(72)
Transfers, net	0	—	—	0
Foreign exchange impact	0	0	(62)	(63)
Balance at December 31, 2016	$ 16	$ 1	$ 294	$ 310

Valuation Techniques

The following is a description of the valuation techniques used to measure plan assets at fair value. There were no changes in valuation techniques during 2017 and 2016.

Equity securities are valued at the closing price reported on the stock exchange on which the individual securities are traded. IBM common stock is valued at the closing price reported on the New York Stock Exchange. Mutual funds are typically valued based on quoted market prices. These assets are generally classified as Level 1.

The fair value of fixed-income securities is typically estimated using pricing models, quoted prices of securities with similar characteristics or discounted cash flows and are generally classified as Level 2. If available, they are valued using the closing price reported on the major market on which the individual securities are traded.

Cash includes money market accounts that are valued at their cost plus interest on a daily basis, which approximates fair value. Short-term investments represent securities with original maturities of one year or less. These assets are classified as Level 1 or Level 2.

Real estate valuations require significant judgment due to the absence of quoted market prices, the inherent lack of liquidity and the long-term nature of such assets. These assets are initially valued at cost and are reviewed periodically utilizing available and relevant market data, including appraisals, to determine if the carrying value of these assets should be adjusted. These assets are classified as Level 3.

Exchange traded derivatives are valued at the closing price reported on the exchange on which the individual securities are traded, while forward contracts are valued using a mid-close price. Over-the-counter derivatives are typically valued using pricing models. The models require a variety of inputs, including, for example, yield curves, credit curves, measures of volatility and foreign exchange rates. These assets are classified as Level 1 or Level 2 depending on availability of quoted market prices.

Certain investments are measured at fair value using the net asset value (NAV) per share (or its equivalent) as a practical expedient. These investments, which include commingled funds, hedge funds, private equity and real estate partnerships, are typically valued using the NAV provided by the administrator of the fund and reviewed by the company. The NAV is based on the value of the underlying assets owned by the fund, minus liabilities and divided by the number of shares or units outstanding. In accordance with FASB guidance, these investments have not been classified in the fair value hierarchy. Refer to note B, “Accounting Changes.”

Contributions

Defined Benefit Pension Plans

It is the company’s general practice to fund amounts for pensions sufficient to meet the minimum requirements set forth in applicable employee benefits laws and local tax laws. From time to time, the company contributes additional amounts as it deems appropriate.

The company contributed $192 million in cash and $176 million in U.S. Treasury securities to non-U.S. defined benefit pension plans as well as $40 million in cash to multi-employer plans for the year ended December 31, 2017. The contribution of U.S. Treasury securities is considered a non-cash transaction in the Consolidated Statement of Cash Flows. For the year ended December 31, 2016, the company contributed $169 million in cash and $295 million in U.S. Treasury securities to non-U.S. defined benefit pension plans as well as $43 million in cash to multi-employer plans. The cash contributions to multi-employer plans represent the annual cost included in net periodic (income)/cost recognized in the Consolidated Statement of Earnings. The company’s participation in multi-employer plans has no material impact on the company’s financial statements.

In 2018, the company is not legally required to make any contributions to the U.S. defined benefit pension plans. However, depending on market conditions, or other factors, the company may elect to make discretionary contributions to the Qualified PPP during the year.

In 2018, the company estimates contributions to its non-U.S. defined benefit and multi-employer plans to be approximately $400 million, the largest of which will be contributed to defined benefit pension plans in the UK, Japan and Spain. This amount generally represents legally mandated minimum contributions.

Financial market performance in 2018 could increase the legally mandated minimum contribution in certain countries which require monthly or daily remeasurement of the funded status. The company could also elect to contribute more than the legally mandated amount based on market conditions or other factors.

Defined Contribution Plans

The company contributed $1,020 million and $1,046 million in cash to the defined contribution plans during the years ended December 31, 2017 and 2016, respectively. In 2018, the company estimates cash contributions to the defined contribution plans to be approximately $1.0 billion.

Nonpension Postretirement Benefit Plans

The company contributed $394 million and $305 million to the nonpension postretirement benefit plans during the years ended December 31, 2017 and 2016, respectively. The $394 million contribution in 2017 consisted of U.S. Treasury securities. In 2017, excess cash in the plan of $70 million was subsequently transferred to the Active Employee Medical Trust. The $305 million contribution in 2016 consisted of $80 million in cash and $225 million in U.S. Treasury securities. The contribution of U.S. Treasury securities is considered a non-cash transaction in the Consolidated Statement of Cash Flows.

Expected Benefit Payments

Defined Benefit Pension Plan Expected Payments

The following table presents the total expected benefit payments to defined benefit pension plan participants. These payments have been estimated based on the same assumptions used to measure the plans' PBO at December 31, 2017 and include benefits attributable to estimated future compensation increases, where applicable.

($ in millions)

	Qualified U.S. Plan Payments	Nonqualified U.S. Plans Payments	Qualified Non-U.S. Plans Payments	Nonqualified Non-U.S. Plans Payments	Total Expected Benefit Payments
2018	$ 3,528	$ 123	$ 1,879	$ 338	$ 5,868
2019	3,510	122	1,898	340	5,870
2020	3,581	124	1,913	380	5,997
2021	3,579	125	1,939	418	6,061
2022	3,486	123	1,981	439	6,029
2023–2027	16,673	588	9,936	2,388	29,585

The 2018 expected benefit payments to defined benefit pension plan participants not covered by the respective plan assets (underfunded plans) represent a component of compensation and benefits, within current liabilities, in the Consolidated Statement of Financial Position.

Nonpension Postretirement Benefit Plan Expected Payments

The following table reflects the total expected benefit payments to nonpension postretirement benefit plan participants. These payments have been estimated based on the same assumptions used to measure the plans' APBO at December 31, 2017.

($ in millions)

	U.S. Plan Payments	Qualified Non-U.S. Plans Payments	Nonqualified Non-U.S. Plans Payments	Total Expected Benefit Payments
2018	$ 373	$ 6	$ 35	$ 414
2019	382	6	38	426
2020	390	7	40	437
2021	387	7	43	437
2022	372	7	46	425
2023–2027	1,623	37	285	1,945

The 2018 expected benefit payments to nonpension postretirement benefit plan participants not covered by the respective plan assets represent a component of compensation and benefits, within current liabilities, in the Consolidated Statement of Financial Position.

Other Plan Information

The following table presents information for defined benefit pension plans with accumulated benefit obligations (ABO) in excess of plan assets. For a more detailed presentation of the funded status of the company's defined benefit pension plans, see the table on page 132.

($ in millions)

	2017		2016	
At December 31:	Benefit Obligation	Plan Assets	Benefit Obligation	Plan Assets
Plans with PBO in excess of plan assets	**$ 31,416**	**$ 18,711**	$ 29,182	$ 16,374
Plans with ABO in excess of plan assets	**27,751**	**15,607**	28,770	16,272
Plans with assets in excess of PBO	**70,139**	**74,782**	68,017	71,051

NOTE T. SEGMENT INFORMATION

The company's major operations consist of five business segments: Cognitive Solutions, Global Business Services, Technology Services & Cloud Platforms, Systems and Global Financing. The segments represent components of the company for which separate financial information is available that is utilized on a regular basis by the chief operating decision maker (the chief executive officer) in determining how to allocate resources and evaluate performance. The segments are determined based on several factors, including client base, homogeneity of products, technology, delivery channels and similar economic characteristics.

Segment revenue and pre-tax income include transactions between the segments that are intended to reflect an arm's-length, market-based transfer price. Systems that are used by Technology Services & Cloud Platforms in outsourcing engagements are primarily sourced internally from the Systems segment and software is sourced from various segments. Software used by Technology Services & Cloud Platforms on external engagements is sourced internally through Cognitive Solutions and the Systems segments. For providing IT services that are used internally, Technology Services & Cloud Platforms and Global Business Services recover cost, as well as a reasonable fee, that is intended to reflect the arm's-length value of providing the services. They enter into arm's-length loans at prices equivalent to market rates with Global Financing to facilitate the acquisition of equipment and software used in services engagements. All internal transaction prices are reviewed annually, and reset if appropriate.

The company utilizes globally integrated support organizations to realize economies of scale and efficient use of resources. As a result, a considerable amount of expense is shared by all of the segments. This shared expense includes sales coverage, certain marketing functions and support functions such as Accounting, Treasury, Procurement, Legal, Human Resources and Billing and Collections. Where practical, shared expenses are allocated based on measurable drivers of expense, e.g., headcount. When a clear and measurable driver cannot be identified, shared expenses are allocated on a financial basis that is consistent with the company's management system, e.g., advertising expense is allocated based on the gross profits of the segments. A portion of the shared expenses, which are recorded in net income, are not allocated to the segments. These expenses are associated with the elimination of internal transactions and other miscellaneous items.

The following tables reflect the results of continuing operations of the company's segments consistent with the management and measurement system utilized within the company. Performance measurement is based on pre-tax income from continuing operations. These results are used, in part, by the chief operating decision maker, both in evaluating the performance of, and in allocating resources to, each of the segments.

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

Management System Segment View

($ in millions)

For the year ended December 31:	Cognitive Solutions	Global Business Services	Technology Services & Cloud Platforms	Systems	Global Financing	Total Segments
2017						
External revenue	**$ 18,453**	**$ 16,348**	**$ 34,277**	**$ 8,194**	**$ 1,696**	**$ 78,968**
Internal revenue	**2,647**	**363**	**657**	**750**	**1,471**	**5,889**
Total revenue	**$ 21,100**	**$ 16,711**	**$ 34,934**	**$ 8,945**	**$ 3,168**	**$ 84,857**
Pre-tax income from continuing operations	**$ 6,817**	**$ 1,401**	**$ 4,344**	**$ 1,135**	**$ 1,279**	**$ 14,977**
Revenue year-to-year change	**1.4%**	**(2.3)%**	**(3.1)%**	**5.7%**	**(9.3)%**	**(1.3)%**
Pre-tax income year-to-year change	**7.3%**	**(19.1)%**	**(7.7)%**	**21.6%**	**(22.7)%**	**(2.6)%**
Pre-tax income margin	**32.3%**	**8.4%**	**12.4%**	**12.7%**	**40.4%**	**17.6%**
2016						
External revenue	$ 18,187	$ 16,700	$ 35,337	$ 7,714	$ 1,692	$ 79,630
Internal revenue	2,630	409	715	750	1,802	6,307
Total revenue	$ 20,817	$ 17,109	$ 36,052	$ 8,464	$ 3,494	$ 85,936
Pre-tax income from continuing operations	$ 6,352	$ 1,732	$ 4,707	$ 933	$ 1,656	$ 15,380
Revenue year-to-year change	3.8%	(3.1)%	0.6%	(18.0)%	(22.0)%	(2.7)%
Pre-tax income year-to-year change	(12.3)%	(33.4)%	(17.0)%	(45.8)%	(29.9)%	(21.5)%
Pre-tax income margin	30.5%	10.1%	13.1%	11.0%	47.4%	17.9%
2015						
External revenue	$ 17,841	$ 17,166	$ 35,142	$ 9,547	$ 1,840	$ 81,535
Internal revenue	2,215	499	698	778	2,637	6,826
Total revenue	$ 20,055	$ 17,664	$ 35,840	$ 10,325	$ 4,477	$ 88,361
Pre-tax income from continuing operations	$ 7,245	$ 2,602	$ 5,669	$ 1,722	$ 2,364	$ 19,602
Revenue year-to-year change	(8.4)%	(11.9)%	(9.8)%	(22.4)%	(1.0)%	(11.2)%
Pre-tax income year-to-year change	(11.8)%	(22.3)%	(20.0)%	24.4%	8.0%	(11.8)%
Pre-tax income margin	36.1%	14.7%	15.8%	16.7%	52.8%	22.2%

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

Reconciliations of IBM as Reported

($ in millions)

For the year ended December 31:	2017	2016	2015
Revenue			
Total reportable segments	**$ 84,857**	$ 85,936	$ 88,361
Other revenue	**171**	289	206
Elimination of internal transactions	**(5,889)**	(6,307)	(6,826)
Total IBM consolidated revenue	**$ 79,139**	$ 79,919	$ 81,741

($ in millions)

For the year ended December 31:	2017	2016	2015
Pre-tax income from continuing operations			
Total reportable segments	**$ 14,977**	$ 15,380	$ 19,602
Amortization of acquired intangible assets	**(945)**	(998)	(677)
Acquisition-related charges	**(52)**	(5)	(26)
Non-operating retirement- related (costs)/income	**(1,468)**	(598)	(1,050)
Elimination of internal transactions	**(726)**	(1,160)	(1,675)
Unallocated corporate amounts	**(385)**	(290)	(230)
Total pre-tax income from continuing operations	**$ 11,400**	$ 12,330	$ 15,945

Immaterial Items

Investment in Equity Alliances and Equity Alliances Gains/(Losses)

The investments in equity alliances and the resulting gains and (losses) from these investments that are attributable to the segments did not have a material effect on the financial position or the financial results of the segments.

Segment Assets and Other Items

Cognitive Solutions assets are mainly goodwill, acquired intangible assets and accounts receivable. Global Business Services assets are primarily goodwill and accounts receivable. Technology Services & Cloud Platforms assets are primarily goodwill, plant, property and equipment including the assets associated with the outsourcing business, deferred services arrangement transition costs and accounts receivable. Systems assets are primarily goodwill, manufacturing inventory, and plant, property and equipment. Global Financing assets are primarily financing receivables, cash and marketable securities, and fixed assets under operating leases.

To ensure the efficient use of the company's space and equipment, several segments may share plant, property and equipment assets. Where assets are shared, landlord ownership of the assets is assigned to one segment and is not allocated to each user segment. This is consistent with the company's management system and is reflected accordingly in the table on page 145. In those cases, there will not be a precise correlation between segment pre-tax income and segment assets.

Similarly, the depreciation amounts reported by each segment are based on the assigned landlord ownership and may not be consistent with the amounts that are included in the segments' pre-tax income. The amounts that are included in pre-tax income reflect occupancy charges from the landlord segment and are not specifically identified by the management reporting system. Capital expenditures that are reported by each segment also are consistent with the landlord ownership basis of asset assignment.

Global Financing amounts for interest income and interest expense reflect the interest income and interest expense associated with the Global Financing business, including the intercompany financing activities discussed on pages 33 and 34, as well as the income from investment in cash and marketable securities. The explanation of the difference between cost of financing and interest expense for segment presentation versus presentation in the Consolidated Statement of Earnings is included on page 48 of the Management Discussion.

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

Management System Segment View

($ in millions)

For the year ended December 31:	Cognitive Solutions	Global Business Services	Technology Services & Cloud Platforms	Systems	Global Financing	Total Segments
2017						
Assets	**$ 24,829**	**$ 8,713**	**$ 24,619**	**$ 3,898**	**$ 41,096**	**$ 103,155**
Depreciation/amortization of intangibles*	**1,121**	**101**	**2,359**	**341**	**267**	**4,190**
Capital expenditures/investments in intangibles	**373**	**50**	**2,290**	**189**	**364**	**3,265**
Interest income	**—**	**—**	**—**	**—**	**1,527**	**1,527**
Interest expense	**—**	**—**	**—**	**—**	**381**	**381**
2016						
Assets	$ 25,517	$ 8,628	$ 24,085	$ 3,812	$ 36,492	$ 98,534
Depreciation/amortization of intangibles*	1,228	104	2,224	375	317	4,248
Capital expenditures/investments in intangibles	495	55	2,382	453	380	3,764
Interest income	—	—	—	—	1,547	1,547
Interest expense	—	—	—	—	371	371
2015						
Assets	$ 20,017	$ 8,327	$ 23,530	$ 3,967	$ 36,157	$ 91,999
Depreciation/amortization of intangibles*	921	81	1,944	321	343	3,610
Capital expenditures/investments in intangibles	448	86	2,619	321	356	3,830
Interest income	—	—	—	—	1,720	1,720
Interest expense	—	—	—	—	469	469

* Segment pre-tax income from continuing operations does not include the amortization of intangible assets.

Notes to Consolidated Financial Statements
International Business Machines Corporation and Subsidiary Companies

Reconciliations of IBM as Reported

($ in millions)

At December 31:	2017	2016	2015
Assets			
Total reportable segments	**$ 103,155**	$ 98,534	$ 91,999
Elimination of internal transactions	**(6,272)**	(5,670)	(4,709)
Unallocated amounts			
Cash and marketable securities	**9,900**	6,752	6,634
Notes and accounts receivable	**2,554**	2,660	2,333
Deferred tax assets	**4,746**	5,078	4,693
Plant, other property and equipment	**2,659**	2,656	2,650
Pension assets	**4,643**	3,034	1,734
Other	**3,972**	4,425	5,161
Total IBM consolidated assets	**$ 125,356**	$ 117,470	$ 110,495

Major Clients

No single client represented 10 percent or more of the company's total revenue in 2017, 2016 or 2015.

Geographic Information

The following provides information for those countries that are 10 percent or more of the specific category.

Revenue*

($ in millions)

For the year ended December 31:	2017	2016	2015
United States	$ 29,759	$ 30,194	$ 30,514
Japan	8,239	8,339	7,544
Other countries	41,141	41,386	43,683
Total IBM consolidated revenue	$ 79,139	$ 79,919	$ 81,741

* Revenues are attributed to countries based on the location of the client.

Plant and Other Property—Net

($ in millions)

At December 31:	2017	2016	2015
United States	$ 4,670	$ 4,701	$ 4,644
Other countries	5,985	5,607	5,532
Total	$ 10,655	$ 10,308	$ 10,176

Revenue by Classes of Similar Products or Services

The following table presents external revenue for similar classes of products or services within the company's reportable segments. Client solutions often include IBM software and systems and other suppliers' products if the client solution requires it. For each of the segments that include services; Software-as-a-Service, consulting, education, training and other product-related services are included as services. For each of these segments, software includes product license charges and ongoing subscriptions.

($ in millions)

For the year ended December 31:	2017	2016	2015
Cognitive Solutions			
Software	$ 13,598	$ 13,969	$ 14,557
Services	4,752	4,111	3,175
Systems	103	107	108
Global Business Services			
Services	$ 16,004	$ 16,399	$ 16,851
Software	179	179	164
Systems	165	121	151
Technology Services & Cloud Platforms			
Services	$ 23,629	$ 24,311	$ 23,947
Maintenance	5,783	5,862	6,085
Software	3,610	3,818	3,907
Systems	1,254	1,346	1,203
Systems			
Servers	$ 3,993	$ 3,567	$ 5,032
Storage	2,243	2,083	2,325
Software	1,520	1,586	1,749
Services	439	478	442
Global Financing			
Financing	$ 1,167	$ 1,231	$ 1,386
Used equipment sales	530	461	454

NOTE U. SUBSEQUENT EVENTS

On January 30, 2018, the company announced that the Board of Directors approved a quarterly dividend of $1.50 per common share. The dividend is payable March 10, 2018 to shareholders of record on February 9, 2018.

On February 6, 2018, IBM Credit LLC issued $2.0 billion in bonds as follows: $450 million of 3-year floating-rate bonds priced at LIBOR plus 16 basis points, $800 million of 3-year fixed-rate bonds with a 2.65 percent coupon and $750 million of 5-year fixed-rate bonds with a 3.0 percent coupon.

Five-Year Comparison of Selected Financial Data
International Business Machines Corporation and Subsidiary Companies

($ in millions except per share amounts)

For the year ended December 31:	2017	2016	2015	2014	2013
Revenue	$ 79,139	$ 79,919	$ 81,741	$ 92,793	$ 98,367
Income from continuing operations	$ 5,758	$ 11,881	$ 13,364	$ 15,751	$ 16,881

Loss from discontinued operations, net of tax	**$ (5)**	$ (9)	$ (174)	$ (3,729)	$ (398)
Net income	**$ 5,753**	$ 11,872	$ 13,190	$ 12,022	$ 16,483
Operating (non-GAAP) earnings*	**$ 12,935**	$ 13,031	$ 14,659	$ 16,702	$ 18,356
Earnings/(loss) per share of common stock:					
Assuming dilution:					
Continuing operations	**$ 6.14**	$ 12.39	$ 13.60	$ 15.59	$ 15.30
Discontinued operations	**$ 0.00**	$ (0.01)	$ (0.18)	$ (3.69)	$ (0.36)
Total	**$ 6.14**	$ 12.38	$ 13.42	$ 11.90	$ 14.94
Basic:					
Continuing operations	**$ 6.17**	$ 12.44	$ 13.66	$ 15.68	$ 15.42
Discontinued operations	**$ 0.00**	$ (0.01)	$ (0.18)	$ (3.71)	$ (0.36)
Total	**$ 6.17**	$ 12.43	$ 13.48	$ 11.97	$ 15.06
Diluted operating (non-GAAP)*	**$ 13.80**	$ 13.59	$ 14.92	$ 16.53	$ 16.64
Cash dividends paid on common stock	**$ 5,506**	$ 5,256	$ 4,897	$ 4,265	$ 4,058
Per share of common stock	**$ 5.90**	$ 5.50	$ 5.00	$ 4.25	$ 3.70
Investment in property, plant and equipment	**$ 3,229**	$ 3,567	$ 3,579	$ 3,740	$ 3,623
Return on IBM stockholders' equity	**31.1%**	74.0%	101.1%	72.5%	83.8%

At December 31:	2017	2016	2015	2014	2013
Total assets	**$ 125,356**	$ 117,470	$ 110,495	$ 117,271	$ 125,641
Net investment in property, plant and equipment	**$ 11,116**	$ 10,830	$ 10,727	$ 10,771	$ 13,821
Working capital	**$ 12,373**	$ 7,613	$ 8,235	$ 7,797	$ 9,610
Total debt	**$ 46,824**	$ 42,169	$ 39,890	$ 40,722	$ 39,637
Total equity	**$ 17,725**	$ 18,392	$ 14,424	$ 12,014	$ 22,929

* Refer to the "GAAP Reconciliation," on page 59 of the company's 2015 Annual Report for the reconciliation of non-GAAP financial information for 2014 and 2013. Also see "GAAP Reconciliation," on pages 49 and 55 for the reconciliation of non-GAAP financial information for 2017, 2016 and 2015.

Selected Quarterly Data
International Business Machines Corporation and Subsidiary Companies

($ in millions except per share amounts and stock prices)

2017	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Full Year
Revenue	**$ 18,155**	**$ 19,289**	**$ 19,153**	**$ 22,543**	**$ 79,139**
Gross profit	**$ 7,772**	**$ 8,794**	**$ 8,800**	**$ 10,862**	**$ 36,227**
Income/(loss) from continuing operations	**$ 1,753**	**$ 2,332**	**$ 2,726**	**$ (1,053)**	**$ 5,758**
Income/(loss) from discontinued operations, net of tax	**$ (3)**	**$ (1)**	**$ 0**	**$ (1)**	**$ (5)**
Net income/(loss)	**$ 1,750**	**$ 2,331**	**$ 2,726**	**$ (1,054)**	**$ 5,753**
Operating (non-GAAP) earnings*	**$ 2,255**	**$ 2,792**	**$ 3,079**	**$ 4,809**	**$ 12,935**
Earnings/(loss) per share of common stock**					
Assuming dilution	**$ 1.85**	**$ 2.48**	**$ 2.92**	**$ (1.14)**	**$ 6.14**
Basic	**$ 1.86**	**$ 2.49**	**$ 2.93**	**$ (1.14)**	**$ 6.17**
Diluted operating (non-GAAP)*	**$ 2.38**	**$ 2.97**	**$ 3.30**	**$ 5.18**	**$ 13.80**
Dividends per share of common stock	**$ 1.40**	**$ 1.50**	**$ 1.50**	**$ 1.50**	**$ 5.90**
Stock prices++					
High	**$ 181.95**	**$ 174.52**	**$ 155.58**	**$ 162.07**	
Low	**$ 165.52**	**$ 150.37**	**$ 139.70**	**$ 146.48**	

($ in millions except per share amounts and stock prices)

2016	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Full Year
Revenue	$ 18,684	$ 20,238	$ 19,226	$ 21,770	$ 79,919
Gross profit	$ 8,686	$ 9,702	$ 9,013	$ 10,893	$ 38,294
Income from continuing operations	$ 2,016	$ 2,505	$ 2,854	$ 4,505	$ 11,881
Income/(loss) from discontinued operations, net of tax	$ (3)	$ 0	$ (1)	$ (4)	$ (9)
Net income	$ 2,014	$ 2,504	$ 2,853	$ 4,501	$ 11,872
Operating (non-GAAP) earnings*	$ 2,270	$ 2,835	$ 3,149	$ 4,776	$ 13,031
Earnings/(loss) per share of common stock**					
Assuming dilution:					
Continuing operations	$ 2.09	$ 2.61	$ 2.98	$ 4.73	$ 12.39
Discontinued operations	$ 0.00	$ 0.00	$ 0.00	$ (0.01)	$ (0.01)
Total	$ 2.09	$ 2.61	$ 2.98	$ 4.72	$ 12.38

Basic:					
Continuing operations	$ 2.09	$ 2.62	$ 2.99	$ 4.75	$ 12.44
Discontinued operations	$ 0.00	$ 0.00	$ 0.00	$ (0.01)	$ (0.01)
Total	$ 2.09	$ 2.62	$ 2.99	$ 4.74	$ 12.43
Diluted operating (non-GAAP)*	$ 2.35	$ 2.95	$ 3.29	$ 5.01	$ 13.59
Dividends per share of common stock	$ 1.30	$ 1.40	$ 1.40	$ 1.40	$ 5.50
Stock prices++					
High	$ 151.45	$ 155.35	$ 163.53	$ 168.51	
Low	$ 117.85	$ 143.50	$ 151.68	$ 149.63	

* Refer to page 68 of the company's first-quarter 2017 Form 10-Q filed on April 25, 2017, page 82 of the company's second-quarter 2017 Form 10-Q filed on July 25, 2017, page 85 of the company's third-quarter 2017 Form 10-Q filed on October 31, 2017, and page 55 under the heading "GAAP Reconciliation" for the reconciliation of non-GAAP financial information for the fourthquarter of 2017 and 2016. Also see "GAAP Reconciliation," on page 49 for the reconciliation of non-GAAP financial information for full-year 2017 and 2016.

**Earnings Per Share (EPS) in each quarter is computed using the weighted-average number of shares outstanding during that quarter while EPS for the full year is computed using the weighted-average number of shares outstanding during the year. Thus, the sum of the four quarters' EPS does not equal the full-year EPS.

++The stock prices reflect the high and low prices for IBM's common stock on the New York Stock Exchange composite tape for the periods presented.

Performance Graphs

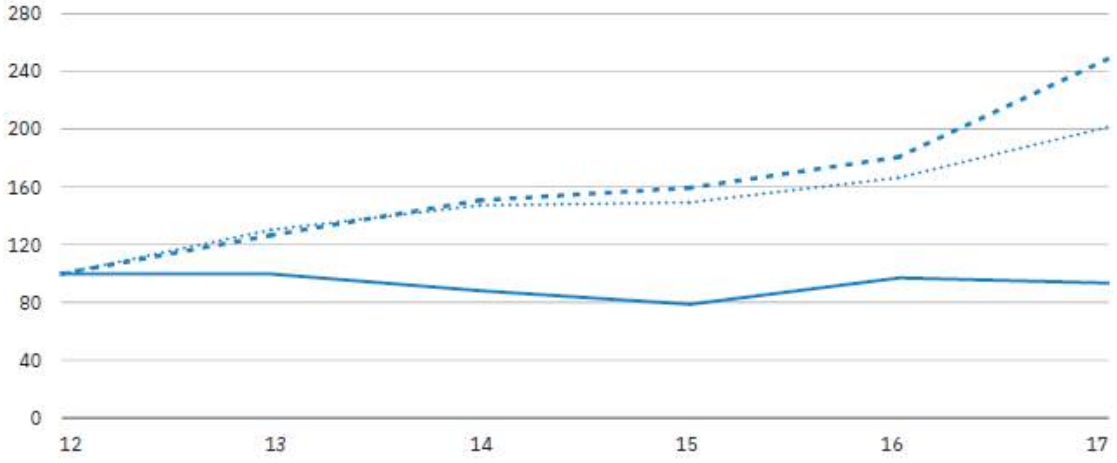
International Business Machines Corporation and Subsidiary Companies

Comparison of Five- and Ten-Year Cumulative Total Return for IBM, S&P 500 Stock Index and S&P Information Technology Index

The following graphs compare the five- and ten-year cumulative total returns for IBM common stock with the comparable cumulative of certain Standard & Poor's (S&P) indices. Due to the fact that IBM is a company included in the S&P 500 Stock Index, the SEC's rules require the use of that index for the required five-year graph. Under those rules, the second index used for comparison may be a published industry or line-of-business index. The S&P Information Technology Index is such an index. IBM is also included in this index.

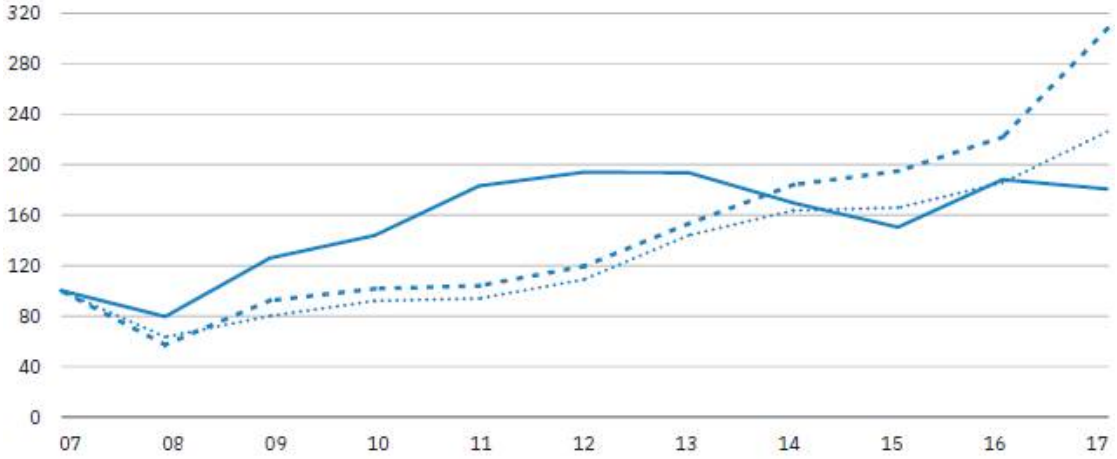
Each graph assumes $100 invested on December 31 (of the initial year shown in the graph) in IBM common stock and $100 invested on the same date in each of the S&P indices. The comparisons assume that all dividends are reinvested.

Five-Year



(U.S. Dollar)	2012	2013	2014	2015	2016	2017
IBM Common Stock	$ 100.00	$ 99.82	$ 87.44	$ 77.47	$ 96.98	**$ 93.12**
S & P 500 Index	100.00	132.39	150.51	152.59	170.84	**208.14**
S & P Information Technology Index	100.00	128.43	154.26	163.40	186.03	**258.28**

Ten-Year



(U.S. Dollar)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
IBM Common Stock	$ 100.00	$ 79.24	$ 125.67	$ 143.62	$ 183.01	$ 193.87	$ 193.51	$ 169.53	$ 150.18	$ 188.01	**$ 180.52**
S & P 500 Index	100.00	63.00	79.67	91.67	93.61	108.59	143.76	163.44	165.70	185.52	**226.03**
S & P Information Technology Index	100.00	56.86	91.96	101.32	103.77	119.15	153.02	183.81	194.70	221.66	**307.74**

Stockholder Information
International Business Machines Corporation and Subsidiary Companies

IBM Stockholder Services

Stockholders with questions about their accounts should contact:

Computershare Trust Company, N.A., P.O. Box 505005, Louisville, Kentucky 40233-5005 (888) IBM-6700

Investors residing outside the United States, Canada and Puerto Rico should call (781) 575-2727.

Stockholders can also reach Computershare Trust Company, N.A. via e-mail at: ibm@computershare.com

Hearing-impaired stockholders with access to a telecommunications device (TDD) can communicate directly with Computershare Trust Company, N.A., by calling (800) 490-1493. Stockholders residing outside the United States, Canada and Puerto Rico should call (781) 575-2694.

IBM on the Internet

Topics featured in this Annual Report can be found online at www.ibm.com. Financial results, news on IBM products, services and other activities can also be found at that website.

IBM files reports with the Securities and Exchange Commission (SEC), including the annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and any other filings required by the SEC.

IBM's website (www.ibm.com/investor) contains a significant amount of information about IBM, including the company's annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and all amendments to those reports as soon as reasonably practicable after such material is electronically filed with or furnished to the SEC. These materials are available free of charge on or through our website.

The public may read and copy any materials the company files with the SEC at the SEC's Public Reference Room at 100 F Street, NE, Washington, DC 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at (800) SEC-0330. The SEC maintains a website (www.sec.gov) that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC.

Computershare Investment Plan (CIP) (formerly IBM Investor Services Program)

The Computershare Investment Plan brochure outlines a number of services provided for IBM stockholders and potential IBM investors, including the reinvestment of dividends, direct purchase and the deposit of IBM stock certificates for safekeeping. Call (888) IBM-6700 for a copy of the brochure. Investors residing outside the United States, Canada and Puerto Rico should call (781) 575-2727.

Investors with other requests may write to: IBM Stockholder Relations, New Orchard Road, M/D 325, Armonk, New York 10504.

IBM Stock

IBM common stock is listed on the New York Stock Exchange, the Chicago Stock Exchange, and outside the United States.

Stockholder Communications

Stockholders can get quarterly financial results, a summary of the Annual Meeting remarks, and voting results from the meeting by calling (914) 499-7777, by sending an e-mail to infoibm@us.ibm.com, or by writing to IBM Stockholder Relations, New Orchard Road, M/D 325, Armonk, New York 10504.

Annual Meeting

The IBM Annual Meeting of Stockholders will be held on Tuesday, April 24, 2018, at 10 a.m. at the Hyatt Regency Milwaukee, Milwaukee, Wisconsin.

Literature for IBM Stockholders

The literature mentioned below on IBM is available without charge from:

Computershare Trust Company, N.A., P.O. Box 505005, Louisville, Kentucky 40233-5005 (888) IBM-6700.

Investors residing outside the United States, Canada and Puerto Rico should call (781) 575-2727.

The company's annual report on Form 10-K and the quarterly reports on Form 10-Q provide additional information on IBM's business. The 10-K report is released by the end of February; 10-Q reports are released by early May, August and November.

The IBM Corporate Responsibility Report highlights IBM's values and its integrated approach to corporate responsibility, including its innovative strategies to transform communities through global citizenship. Highlights from the Corporate Responsibility Report are available online at ibm.com/responsibility/report. The full Corporate Responsibility Report is available in printed form by downloading the report at ibm.com/responsibility/report.

General Information

Stockholders of record can receive account information and answers to frequently asked questions regarding stockholder accounts online at www.ibm.com/investor. Stockholders of record can also consent to receive future IBM Annual Reports and Proxy Statements online through this site.

For answers to general questions about IBM from within the continental United States, call (800) IBM-4YOU. From outside the United States, Canada and Puerto Rico, call (914) 499-1900.

10-K 1 a2017-12x31form10xk.htm 10-K
Table of Contents

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the fiscal year ended December 31, 2017

Commission file number 1-812

UNITED TECHNOLOGIES CORPORATION
(Exact name of registrant as specified in its charter)

DELAWARE	**06-0570975**
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)
10 Farm Springs Road, Farmington, Connecticut	**06032**
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: (860) 728-7000

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Common Stock ($1 par value) (CUSIP 913017 10 9)	**New York Stock Exchange**
1.250% Notes due 2023 (CUSIP U91301 AD0)	**New York Stock Exchange**
1.125% Notes due 2021 (CUSIP 913017 CD9)	**New York Stock Exchange**
1.875% Notes due 2026 (CUSIP 913017 CE7)	**New York Stock Exchange**
Floating Rate Notes due 2018 (CUSIP 913017 CC1)	**New York Stock Exchange**
Floating Rate Notes due 2019 (CUSIP 913017 CS6)	**New York Stock Exchange**

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.
Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.
Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.
Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files).
Yes ☒ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§232.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☒

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐ (Do not check if a smaller reporting company)	Smaller reporting company	☐
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act).

Yes ☐ No ☒

The aggregate market value of the voting Common Stock held by non-affiliates at June 30, 2017 was approximately $97,490,067,627, based on the New York Stock Exchange closing price for such shares on that date. For purposes of this calculation, the Registrant has assumed that its directors and executive officers are affiliates.

At January 31, 2018, there were 799,778,295 shares of Common Stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Parts I, II and IV hereof incorporate by reference portions of the United Technologies Corporation 2017 Annual Report to Shareowners. Part III hereof incorporates by reference portions of the United Technologies Corporation Proxy Statement for the 2018 Annual Meeting of Shareowners.

UNITED TECHNOLOGIES CORPORATION
AND SUBSIDIARIES

Index to Annual Report
on Form 10-K for
Year Ended December 31, 2017

	Page
PART I	
Item 1. Business:	3
Cautionary Note Concerning Factors That May Affect Future Results	10
Item 1A. Risk Factors	11
Item 1B. Unresolved Staff Comments	19
Item 2. Properties	19
Item 3. Legal Proceedings	19
Item 4. Mine Safety Disclosures	20
PART II	
Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities	21
Item 6. Selected Financial Data	21
Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations	21
Item 7A. Quantitative and Qualitative Disclosures About Market Risk	21
Item 8. Financial Statements and Supplementary Data	22
Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure	22
Item 9A. Controls and Procedures	22
PART III	
Item 10. Directors, Executive Officers and Corporate Governance	22
Item 11. Executive Compensation	24
Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters	24
Item 13. Certain Relationships and Related Transactions, and Director Independence	24
Item 14. Principal Accounting Fees and Services	24
PART IV	
Item 15. Exhibits and Financial Statement Schedule	25
SIGNATURES	29

Table of Contents

UNITED TECHNOLOGIES CORPORATION

Annual Report on Form 10-K for
Year Ended December 31, 2017

Whenever reference is made in this Form 10-K to specific sections of United Technologies Corporation's 2017 Annual Report to Shareowners (2017 Annual Report), those sections are incorporated herein by reference and are included in Exhibit 13 to this Form 10-K. United Technologies Corporation and its subsidiaries' names, abbreviations thereof, logos, and product and service designators are all either the registered or unregistered trademarks or tradenames of United Technologies Corporation and its subsidiaries. Names, abbreviations of names, logos, and product and service designators of other companies are either the registered or unregistered trademarks or tradenames of their respective owners. As used herein, the terms "we," "us," "our," "the Company," or "UTC," unless the context otherwise requires, mean United Technologies Corporation and its subsidiaries. References to internet websites in this Form 10-K are provided for convenience only. Information available through these websites is not incorporated by reference into this Form 10-K.

PART I

Item 1. Business

General

United Technologies Corporation was incorporated in Delaware in 1934. UTC provides high technology products and services to the building systems and aerospace industries worldwide. Growth is attributable primarily to the internal development of our existing businesses and to acquisitions. The following description of our business should be read in conjunction with "Management's Discussion and Analysis of Financial Condition and Results of Operations" in our 2017 Annual Report, including the information contained therein under the heading "Business Overview."

Our operations for the periods presented herein are classified into four segments: Otis, UTC Climate, Controls & Security, Pratt & Whitney, and UTC Aerospace Systems, with each segment comprised of groups of similar operating companies. References to each segment include the various operating companies established worldwide through which the operations for each segment are conducted.

Otis and UTC Climate, Controls & Security (collectively referred to as the "commercial businesses") serve customers in the commercial, government, infrastructure and residential property sectors and transport and refrigeration businesses worldwide. Pratt & Whitney and UTC Aerospace Systems (collectively referred to as the "aerospace businesses") primarily serve commercial and government customers in both the original equipment and aftermarket parts and services markets of the aerospace industry. For 2017, our commercial and industrial sales (generated principally by the commercial businesses) were approximately 50 percent of our consolidated sales, and our commercial aerospace sales and military aerospace sales (generated exclusively by our aerospace businesses) were approximately 37 percent and 13 percent, respectively, of our consolidated sales. International sales for 2017, including U.S. export sales, were 61% percent of our total segment sales.

This Form 10-K and our quarterly reports on Form 10-Q, current reports on Form 8-K and all amendments to those reports are available free of charge through the Investor Relations section of our Internet website (http://www.utc.com) under the heading "SEC Filings" as soon as reasonably practicable after these reports are electronically filed with, or furnished to, the Securities and Exchange Commission (SEC). Our SEC filings are also available for reading and copying at the SEC's Public Reference Room at 100 F Street, NE, Washington, D.C. 20549. Information on the operation of the Public Reference Room may be obtained by calling the SEC at 1-800-SEC-0330. In addition, the SEC maintains an Internet site (http://www.sec.gov) containing reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC.

Description of Business by Segment

Each segment's business, including its principal products and services and other material developments and information, is described below. Segment financial data for the years 2015 through 2017, including financial information about foreign and domestic operations and export sales, appears in Note 19 to the Consolidated Financial Statements in our 2017 Annual Report. Segment sales as discussed below include intercompany sales, which are ultimately eliminated within the "Eliminations and other" category as reflected in the segment financial data in Note 19 to the Consolidated Financial Statements in our 2017 Annual Report. Similarly, total segment backlog as discussed below includes intercompany backlog, as well as fully-funded government orders.

Otis

Otis is the world's largest elevator and escalator manufacturing, installation and service company. Otis designs, manufactures, sells and installs a wide range of passenger and freight elevators as well as escalators and moving walkways. In addition to new equipment, Otis provides modernization products to upgrade elevators and escalators as well as maintenance and repair services for both its products and those of other manufacturers. Otis serves customers in the commercial and residential property industries around the world. Otis sells directly to the end customer and through sales representatives and distributors.

Sales generated by Otis' international operations were 73 percent and 75 percent of total Otis segment sales in 2017 and 2016, respectively. At December 31, 2017, Otis' backlog was $16.2 billion as compared to $14.9 billion at December 31, 2016. Of the total Otis backlog at December 31, 2017, approximately $8.4 billion is expected to be realized as sales in 2018.

UTC Climate, Controls & Security

UTC Climate, Controls & Security is a leading provider of heating, ventilating, air conditioning (HVAC), refrigeration, fire, security and building automation products, solutions and services for residential, commercial, industrial and transportation applications. UTC Climate, Controls & Security provides a wide range of building systems, including cooling, heating, ventilation, refrigeration, fire and smoke detection, portable fire extinguishers, fire suppression, gas and flame safety, intruder alarms, access control systems, video surveillance and building control systems. UTC Climate, Controls & Security also provides a broad array of related building services, including audit, design, installation, system integration, repair, maintenance, and monitoring services.

UTC Climate, Controls & Security sells its HVAC and refrigeration solutions directly to end customers, including building contractors and owners, homeowners, transportation companies, retail stores and food service companies, and through joint ventures, manufacturer's representatives, distributors, wholesalers, dealers and retail outlets. These products and services are sold under the Carrier name and other brand names. UTC Climate, Controls & Security's security and fire safety products and services are used by governments, financial institutions, architects, building owners and developers, security and fire consultants, homeowners and other end-users requiring a high level of security and fire protection for their businesses and residences. UTC Climate, Controls & Security provides its security and fire safety products and services under Chubb, Kidde and other brand names and sells directly to customers as well as through manufacturer's representatives, distributors, dealers, value-added resellers and retail distribution.

Certain UTC Climate, Controls & Security HVAC businesses are seasonal, and sales and service activity can be impacted by weather. UTC Climate, Controls & Security customarily offers its customers incentives to purchase products to ensure an adequate supply of its products in the distribution channels. The principal incentive program provides reimbursements to distributors for offering promotional pricing on UTC Climate, Controls & Security products.

Sales generated by UTC Climate, Controls & Security's international operations, including U.S. export sales, were 55 percent of total UTC Climate, Controls & Security segment sales in each of 2017 and 2016. At December 31, 2017, UTC Climate, Controls & Security's backlog was $4.4 billion as compared to $3.2 billion at December 31, 2016. Substantially all of the backlog at December 31, 2017 is expected to be realized as sales in 2018.

Pratt & Whitney

Pratt & Whitney is among the world's leading suppliers of aircraft engines for the commercial, military, business jet and general aviation markets. Pratt & Whitney provides fleet management services and aftermarket maintenance, repair and overhaul services. Pratt & Whitney produces and develops families of large engines for wide- and narrow-body and large regional aircraft in the commercial market and for fighter, bomber, tanker and transport aircraft in the military market. Pratt & Whitney Canada (P&WC) is among the world's leading suppliers of engines powering general and business aviation, as well as regional airline, utility and military airplanes, and helicopters. Pratt & Whitney and P&WC also produce, sell and service auxiliary power units for commercial and military aircraft.

The development of new engines and improvements to current production engines present important growth opportunities. In view of the risks and costs associated with developing new engines, Pratt & Whitney has entered into collaboration arrangements in which revenues, costs and risks are shared with third parties. At December 31, 2017, the interests of third-party participants in Pratt & Whitney-directed commercial jet engine programs ranged from approximately 14 percent to 50 percent. UTC holds a 61 percent interest in the IAE International Aero Engines AG (IAE) collaboration with MTU Aero Engines AG (MTU) and Japanese Aero Engines Corporation (JAEC). Pratt & Whitney also holds a 59 percent program share interest in the International Aero Engines, LLC (IAE LLC) collaboration with MTU and JAEC. IAE LLC sells the PW1100G-JM engine for the Airbus A320neo aircraft and the PW1400G-JM engine for the Irkut MC-21 aircraft. In addition, Pratt &

Whitney has interests in other engine programs, including a 50 percent ownership interest in the Engine Alliance (EA), a joint venture with GE Aviation, which markets and manufactures the GP7000 engine for the Airbus A380 aircraft. Pratt & Whitney has entered into risk and revenue sharing arrangements with third parties for 40 percent of the products and services that Pratt & Whitney is responsible for providing to the EA. Pratt & Whitney accounts for its interests in the EA joint venture under the equity method of accounting. See Note 1 to the Consolidated Financial Statements in our 2017 Annual Report for a description of our accounting for collaborative arrangements.

Pratt & Whitney produces the PurePower PW1000G Geared TurboFan engine family, the first of which, the PW1100G-JM, entered into service in January 2016. The PurePower PW1000G engine has demonstrated a significant reduction in fuel burn and noise levels with lower environmental emissions and operating costs than current production engines. The PW1100G-JM engine is offered on the Airbus A320neo family of aircraft. PurePower PW1000G engine models also power Bombardier's CSeries passenger aircraft. Additionally, the PurePower PW1000G engine models have been selected to power the new Mitsubishi Regional Jet, the new Irkut MC-21 passenger aircraft and Embraer's E-Jet family of aircraft. The Irkut MC-21 and Embraer's E-Jet family aircraft are scheduled to enter service in 2018. The Mitsubishi Regional Jet is scheduled to enter service in 2020. As previously disclosed, Gulfstream announced the selection of the PurePower PW 800 engine to exclusively power Gulfstream's new G500 and G600 business jets scheduled to enter service in 2018. P&WC's PurePower PW 800 engine has also been selected to power the new Falcon business jet by Dassault Aviation. P&WC has developed and certified the PW210 engine family for helicopters manufactured by Sikorsky and Leonardo Helicopters. Pratt & Whitney continues to enhance its programs through performance improvement measures and product base expansion. The success of these aircraft and engines is dependent upon many factors, including technological accomplishments, program execution, aircraft demand, and regulatory approval. As a result of these factors, as well as the level of success of aircraft program launches by aircraft manufacturers and other conditions, additional investment in these engine programs may be required.

In 2017, Pratt & Whitney's commercial products supported engine certification of the PW1200G and PW 1700G for the Mitsubishi Regional Jet and Embraer E190-E2 and E-195-E2, the first flight of the Irkut MC21. Pratt & Whitney Canada has developed and received European Aviation Safety Agency (EASA) and the Federal Aviation Administration (FAA) Type Certifications for the PurePower PW800 turbofan engine for the Gulfstream G500 and G600 aircraft. Also during the year, the Pratt & Whitney F-135 program experienced the first engine delivery from the Japan Final Assembly and Check Out facility and the Israeli Air Force achieved initial operational capability for their F-35I 'Adir' fleet. The military business also supported FAR Part 25 aircraft certification for the Boeing Tanker KC-46A aircraft.

Pratt & Whitney is under contract with the U.S. Government's F-35 Joint Program Office to produce and sustain the F135 engine to power the single-engine F-35 Lightning II aircraft (commonly known as the Joint Strike Fighter) being produced by Lockheed Martin. The two F135 propulsion system configurations for the F-35A, F-35B and F-35C jets are used by the U.S. Air Force, U.S. Marine Corps and U.S. Navy, respectively. F135 engines are also used on F-35 aircraft purchased by Joint Strike Fighter partner countries and foreign military sales countries.

Pratt & Whitney's products are sold principally to aircraft manufacturers, airlines and other aircraft operators, aircraft leasing companies and the U.S. and foreign governments. Pratt & Whitney's products and services must adhere to strict regulatory and market-driven safety and performance standards. The frequently changing nature of these standards, along with the long duration of aircraft engine development, production and support programs, creates uncertainty regarding engine program profitability. Sales to Airbus (Pratt & Whitney's largest customer by sales) were 38 percent and 34 percent of total Pratt & Whitney segment sales in 2017 and 2016, respectively, before taking into account discounts or financial incentives offered to customers. Sales to the U.S. Government were approximately 21 percent of total Pratt & Whitney segment sales in 2017 and 2016.

Sales generated by Pratt & Whitney's international operations, including U.S. export sales, were 61 percent and 63 percent of total Pratt & Whitney segment sales in 2017 and 2016, respectively. At December 31, 2017, Pratt & Whitney's backlog was $64.3 billion, including $6.0 billion of U.S. Government-funded contracts and subcontracts. At December 31, 2016, these amounts were $61.8 billion and $6.4 billion, respectively. Of the total Pratt & Whitney backlog at December 31, 2017, approximately $11.1 billion is expected to be realized as sales in 2018. Pratt & Whitney's backlog includes certain contracts for which actual costs may ultimately exceed total sales. Pratt & Whitney's backlog excludes orders for new commercial engines that have not yet received aviation authority engine certification. See Note 1 to the Consolidated Financial Statements in our 2017 Annual Report for a description of our accounting for long-term contracts, including a discussion of the impact of Accounting Standards Update 2014-09, *Revenue from Contracts with Customers*, on our revenue recognition and backlog accounting policies.

UTC Aerospace Systems

UTC Aerospace Systems is a leading global provider of technologically advanced aerospace products and aftermarket service solutions for aircraft manufacturers, airlines, regional, business and general aviation markets, military, space and

undersea operations. UTC Aerospace Systems' product portfolio includes electric power generation, power management and distribution systems, air data and aircraft sensing systems, engine control systems, intelligence, surveillance and reconnaissance systems, engine components, environmental control systems, fire and ice detection and protection systems, propeller systems, engine nacelle systems, including thrust reversers and mounting pylons, interior and exterior aircraft lighting, aircraft seating and cargo systems, actuation systems, landing systems, including landing gear, wheels and brakes, and space products and subsystems. Aftermarket services include spare parts, overhaul and repair, engineering and technical support and fleet management solutions. UTC Aerospace Systems sells aerospace products to aircraft manufacturers, airlines and other aircraft operators, the U.S. and foreign governments, maintenance, repair and overhaul providers, and independent distributors. UTC Aerospace Systems' largest customers are Boeing and Airbus with a combined 33 percent and 34 percent of total UTC Aerospace Systems segment sales in 2017 and 2016, respectively. Sales to the U.S. Government were 17 percent of total UTC Aerospace Systems segment sales in 2017 and 2016.

In 2017, UTC Aerospace Systems' products supported first flights of the Boeing 737MAX-9 and 787-10, Embraer E195-E2, COMAC C919, Airbus A330neo and Irkut MC21 aircraft. In addition, UTC Aerospace Systems' products supported the certification of the Airbus A350-1000, and the on-going certification efforts for the Gulfstream G500 and the Embraer E190-E2.

Significant product development activity continues, including major systems for the Embraer E175-E2 and KC390, the Mitsubishi Regional Jet and the Bombardier Global 7000/8000. UTC Aerospace Systems is also the operations support prime contractor for NASA's space suit/life support system and produces environmental monitoring and control, life support, power management and distribution, and thermal control systems for the International Space Station and the Orion crew exploration vehicle.

Sales generated by UTC Aerospace Systems' international operations, including U.S. export sales, were 56 percent of total UTC Aerospace Systems segment sales in each of 2017 and 2016. At December 31, 2017, UTC Aerospace Systems' backlog was $13.9 billion, including $3.0 billion of U.S. Government-funded contracts and subcontracts. At December 31, 2016, these amounts were $12.7 billion and $2.4 billion, respectively. The 2016 amounts have been revised to present backlog balances on a basis consistent with the 2017 presentation. Of the total UTC Aerospace Systems backlog at December 31, 2017, approximately $7.8 billion is expected to be realized as sales in 2018. See Note 1 to the Consolidated Financial Statements in our 2017 Annual Report for a description of our accounting for long-term contracts, including a discussion of the impact of Accounting Standards Update 2014-09, *Revenue from Contracts with Customers*, on our revenue recognition and backlog accounting policies.

UTC's Pending Acquisition of Rockwell Collins

On September 4, 2017, we announced that we had entered into a merger agreement with Rockwell Collins, Inc. (Rockwell Collins), under which we agreed to acquire Rockwell Collins. Under the terms of the merger agreement, each Rockwell Collins shareowner will receive $93.33 per share in cash and a fraction of a share of UTC common stock equal to the quotient obtained by dividing $46.67 by the average of the volume-weighted average price per share of UTC common stock on the NYSE on each of the 20 consecutive trading days ending with the trading day immediately prior to the closing date (the "UTC Stock Price"), subject to adjustment based on a two-way collar mechanism as described below (the "Stock Consideration"). The cash and UTC stock payable in exchange for each such share of Rockwell Collins common stock are collectively the "Merger Consideration." The fraction of a share of UTC common stock into which each such share of Rockwell Collins common stock will be converted is the "Exchange Ratio." The Exchange Ratio will be determined based upon the UTC Stock Price. If the UTC Stock Price is greater than $107.01 but less than $124.37, the Exchange Ratio will be equal to the quotient of (i) $46.67 divided by (ii) the UTC Stock Price, which, in each case, will result in the Stock Consideration having a value equal to $46.67. If the UTC Stock Price is less than or equal to $107.01 or greater than or equal to $124.37, then a two-way collar mechanism will apply, pursuant to which, (x) if the UTC Stock Price is greater than or equal to $124.37, the Exchange Ratio will be fixed at 0.37525 and the value of the Stock Consideration will be greater than $46.67, and (y) if the UTC Stock Price is less than or equal to $107.01, the Exchange Ratio will be fixed at 0.43613 and the value of the Stock Consideration will be less than $46.67. On January 11, 2018, the merger was approved by Rockwell Collins' shareowners. We currently expect that the merger will be completed in the third quarter of 2018, subject to customary closing conditions, including the receipt of required regulatory approvals.

We anticipate that approximately $15 billion will be required to pay the aggregate cash portion of the Merger Consideration. We expect to fund the cash portion of the Merger Consideration through debt issuances and cash on hand. Additionally, we have entered into a $6.5 billion 364-day unsecured bridge loan credit agreement that would be funded only to the extent certain anticipated debt issuances are not completed prior to the completion of the merger. We expect to assume approximately $7 billion of Rockwell Collins' outstanding debt upon completion of the merger. To help manage the cash flow and liquidity impact resulting from the pending acquisition, we have, among other things, suspended share repurchases, excluding activity relating to our employee savings plans. As we continue to assess the impacts of the U.S. tax reform enacted on December 22, 2017, commonly referred to as the Tax Cuts and Jobs Act of 2017 (TCJA), future opportunities for

repatriation of our non-U.S. earnings, and accelerated de-leveraging, we may consider, in addition to investments in our operations, limited additional share repurchases to offset the effects of dilution related to our stock-based compensation programs - see Note 12 to the Consolidated Financial Statements in our 2017 Annual Report.

Rockwell Collins is a leader in aviation and high-integrity solutions for commercial and military customers and is globally recognized for its leading-edge avionics, flight controls, aircraft interior and data connectivity solutions. Upon completion of the transaction, Rockwell Collins and UTC Aerospace Systems will be integrated to create a new business unit named Collins Aerospace Systems. Kelly Ortberg, Rockwell Collins' current Chairman and Chief Executive Officer, is expected to assume the role of Chief Executive Officer of this new business unit, with David Gitlin, UTC Aerospace Systems' current President, serving as President and Chief Operating Officer of the unit.

Other Matters Relating to Our Business as a Whole

Competition and Other Factors Affecting Our Businesses

As worldwide businesses, our operations can be affected by a variety of economic, industry and other factors, including those described in this section, in "Management's Discussion and Analysis of Financial Condition and Results of Operations" included in our 2017 Annual Report, in Item 1, "Cautionary Note Concerning Factors That May Affect Future Results," and in Item 1A, "Risk Factors" in this Form 10-K. Each business unit is subject to significant competition from a large number of companies in the U.S. and other countries, and each competes on the basis of price, delivery schedule, product performance and service.

Our aerospace businesses are subject to substantial competition from various domestic and foreign manufacturers, customers and companies that obtain regulatory agency approval to manufacture spare parts, with foreign companies sometimes receiving government research and development assistance, marketing subsidies and other assistance for certain of their commercial products beyond the assistance that may be available in the U.S. Customer selections of aircraft engines, components and systems can also have a significant impact on future sales of parts and services. In addition, the U.S. Government's and other governments' policies of purchasing parts from suppliers other than the original equipment manufacturer affect military spare parts sales. Significant elements of our aerospace businesses, such as spare parts sales for engines and aircraft in service, have short lead times. Therefore, backlog information may not be indicative of future demand. Additionally, our aerospace businesses' competitors may offer substantial discounts and other financial incentives, performance and operating cost guarantees, and participation in financing arrangements, in an effort to compete for the aftermarket associated with these products. For information regarding customer financing commitments, participation in guarantees of customer financing arrangements and performance and operating cost guarantees, primarily related to Pratt & Whitney, see Notes 5 and 17 to the Consolidated Financial Statements in our 2017 Annual Report. Pratt & Whitney's major competitors in the sale of engines are GE Aviation, Honeywell, Safran Helicopter Engines, and CFM International.

Research and Development

Because changes in technology can have a significant impact on our operations and competitive position, we spend substantial amounts of our own funds on research and development. These expenditures, which are charged to expense as incurred, were $2.4 billion or 4.0 percent of total sales in 2017 and $2.3 billion or 4.1 percent of total sales in 2016 and 2015. We also perform research and development work under contracts funded by the U.S. Government and other customers. Costs incurred under this contract research and development, which is performed in our aerospace businesses, amounted to $1.5 billion in 2017, as compared to $1.4 billion in 2016 and $1.5 billion in 2015. These contract research and development costs include amounts that are expensed as incurred, through cost of products sold, and amounts that are capitalized into inventory to be subsequently recovered through production shipments. Total contract research and development costs of $1.5 billion, $1.4 billion and $1.6 billion were expensed through cost of products sold in 2017, 2016 and 2015, respectively.

U.S. Government Contracts

Contracting with the U.S. Government entails certain unique risks. U.S. Government contracts are subject to termination by the government, either for convenience or for default in the event of our failure to perform under the applicable contract. In the case of a termination for convenience, we would normally be entitled to reimbursement for our allowable costs incurred and termination costs. If terminated by the government as a result of our default, we could be liable for additional costs the government incurs in acquiring undelivered goods or services from another source and any other damages it suffers. Most of our U.S. Government sales are made under fixed-price type contracts, while approximately $1.8 billion or 3 percent of our total sales for 2017 were made under cost-reimbursement type contracts.

Our contracts with the U.S. Government are also subject to audits. Like many defense contractors, we have received audit reports, which recommend that certain contract prices should be reduced, or that certain payments should be delayed, refunded

or withheld to comply with various government regulations, including reports alleging that cost or pricing data we submitted in negotiation of the contract prices or cost accounting practices may not have conformed to government regulations. Some of these audit reports involved substantial amounts. We have made voluntary refunds in those cases we believe appropriate, have settled some allegations and, in some cases, continue to negotiate with the government and/or litigate. For further discussion of risks related to government contracting, Item 1A, "Risk Factors" and Item 3, "Legal Proceedings," in this Form 10-K and Note 18 to the Consolidated Financial Statements in our 2017 Annual Report.

Compliance with Environmental and Other Government Regulations

Our operations are subject to and affected by environmental regulation by federal, state and local authorities in the U.S. and regulatory authorities with jurisdiction over our foreign operations. We have incurred and will likely continue to incur liabilities under various government statutes for the cleanup of pollutants previously released into the environment. We do not anticipate that compliance with current provisions relating to the protection of the environment or that any payments we may be required to make for cleanup liabilities will have a material adverse effect upon our cash flows, competitive position, financial condition or results of operations. Environmental matters are further addressed in "Management's Discussion and Analysis of Financial Condition and Results of Operations" and Notes 1 and 18 to the Consolidated Financial Statements in our 2017 Annual Report.

Most of the U.S. laws governing environmental matters include criminal provisions. If we were convicted of a violation of the federal Clean Air Act or Clean Water Act, the facility or facilities involved in the violation could be deemed ineligible to be used in performing any U.S. Government contract we are awarded until the Environmental Protection Agency thereafter certifies that the condition giving rise to the violation has been corrected.

In addition, we could be affected by future laws or regulations imposed in response to concerns over climate change. Changes in climate change concerns, or in the regulation of such concerns, including greenhouse gas emissions, could subject us to additional costs and restrictions, including compliance costs and increased energy and raw materials costs.

We conduct our businesses through subsidiaries and affiliates worldwide. Changes in legislation or government policies can affect our worldwide operations. For example, governmental regulation of refrigerants and energy efficiency standards and fire safety regulations are important to our UTC Climate, Controls & Security businesses, and elevator safety codes are important to the businesses of Otis, while government safety and performance regulations, restrictions on aircraft engine noise and emissions and government procurement practices can impact our aerospace businesses.

U.S. laws, regulations, orders, and other measures concerning the export or re-export of products, software, services and technology to, and other trade-related activities involving, non-U.S. countries and parties affect the operations of UTC and its affiliates.

For further discussion of risks related to environmental matters and other government regulations, see Item 1A, "Risk Factors" and Item 3, "Legal Proceedings," in this Form 10-K and Note 18 to the Consolidated Financial Statements in our 2017 Annual Report.

Intellectual Property and Raw Materials and Supplies

We maintain a portfolio of patents, trademarks, copyrights, trade secrets, licenses and franchises related to our businesses. While we believe we have taken reasonable measures to protect this portfolio, our efforts may not be sufficient. See Item 1A "Risk Factors" in this Form 10-K for further discussion of intellectual property matters.

We believe we have adequate sources for our purchases of materials, components, services and supplies used in our manufacturing. We work continuously with our supply base to ensure an adequate source of supply and to reduce costs. We pursue cost reductions through a number of mechanisms, including consolidating our purchases, reducing the number of suppliers, strategic global sourcing and using bidding competitions among potential suppliers. In some instances, we depend upon a single source of supply or participate in commodity markets that may be subject to allocations of limited supplies by suppliers. Like other users in the U.S., we are largely dependent upon foreign sources for certain raw materials requirements, such as cobalt, tantalum, chromium, rhenium and nickel. We have a number of ongoing programs to manage this dependence and the accompanying risk, including long-term agreements and the conservation of materials through scrap reclamation and new manufacturing processes. We believe that our supply management practices are based on an appropriate balancing of the foreseeable risks and the costs of alternative practices. Although at times high prices for some raw materials important to our businesses (for example, steel, copper, aluminum, titanium and nickel) have caused margin and cost pressures, we do not foresee near term unavailability of materials, components or supplies that would have a material adverse effect on our competitive position, results of operations, cash flows or financial condition. For further discussion of the possible effects of the cost and availability of raw materials on our business, see Item 1A, "Risk Factors" in this Form 10-K.

Employees and Employee Relations

At December 31, 2017, our total number of employees was approximately 205,000, of which approximately 67 percent represents employees based outside the U.S. During 2017, we negotiated or concluded 12 domestic collective bargaining agreements, the largest of which covered certain workers at Otis across the U.S. In 2018, numerous collective bargaining agreements are subject to renegotiation, the largest of which covers certain workers at UTC Aerospace Systems in Rockford, Illinois. Although some previous contract renegotiations have had a significant impact on our financial condition or results of operations, we do not anticipate that the renegotiation of these contracts in 2018 will have a material adverse effect on our competitive position, cash flows, financial condition or results of operations. For discussion of the effects of our restructuring actions on employment, see Item 1A, "Risk Factors" in this Form 10-K and under "Management's Discussion and Analysis of Financial Condition and Results of Operations" and Note 13 to the Consolidated Financial Statements in our 2017 Annual Report.

For a discussion of other matters which may affect our competitive position, cash flows, financial condition or results of operations, including the risks of our international operations, see the further discussion under the headings "General" and "Description of Business by Segment" in this section, Item 1A, "Risk Factors" in this Form 10-K, and under "Management's Discussion and Analysis of Financial Condition and Results of Operations" in our 2017 Annual Report.

Cautionary Note Concerning Factors That May Affect Future Results

This Form 10-K contains statements which, to the extent they are not statements of historical or present fact, constitute "forward-looking statements" under the securities laws. From time to time, oral or written forward-looking statements may also be included in other information released to the public. These forward-looking statements are intended to provide management's current expectations or plans for our future operating and financial performance, based on assumptions currently believed to be valid. Forward-looking statements can be identified by the use of words such as "believe," "expect," "expectations," "plans," "strategy," "prospects," "estimate," "project," "target," "anticipate," "will," "should," "see," "guidance," "outlook", "confident" and other words of similar meaning in connection with a discussion of future operating or financial performance. Forward-looking statements may include, among other things, statements relating to future sales, earnings, cash flow, results of operations, uses of cash, share repurchases, tax rates and other measures of financial performance or potential future plans, strategies or transactions of United Technologies or the combined company following United Technologies' pending acquisition of Rockwell Collins, the anticipated benefits of the pending acquisition, including estimated synergies, the expected timing of completion of the transaction and other statements that are not historical facts. All forward-looking statements involve risks, uncertainties and other factors that may cause actual results to differ materially from those expressed or implied in the forward-looking statements. For those statements, we claim the protection of the safe harbor for forward-looking statements contained in the U.S. Private Securities Litigation Reform Act of 1995. Such risks, uncertainties and other factors include, without limitation:

- the effect of economic conditions in the industries and markets in which we and Rockwell Collins operate in the U.S. and globally and any changes therein, including financial market conditions, fluctuations in commodity prices, interest rates and foreign currency exchange rates, levels of end market demand in construction and in both the commercial and defense segments of the aerospace industry, levels of air travel, financial condition of commercial airlines, the impact of weather conditions and natural disasters and the financial condition of our customers and suppliers;
- challenges in the development, production, delivery, support, performance and realization of the anticipated benefits of advanced technologies and new products and services;
- the scope, nature, impact or timing of acquisition and divestiture activity, including the pending acquisition of Rockwell Collins, including among other things integration of acquired businesses into UTC's existing businesses and realization of synergies and opportunities for growth and innovation;
- future levels of indebtedness, including indebtedness expected to be incurred by UTC in connection with the proposed Rockwell Collins acquisition, and capital spending and research and development spending, including in connection with the proposed Rockwell Collins acquisition;
- future availability of credit and factors that may affect such availability, including credit market conditions and our capital structure;
- the timing and scope of future repurchases of our common stock, which may be suspended at any time due to various factors, including market conditions and the level of other investing activities and uses of cash;
- delays and disruption in delivery of materials and services from suppliers;
- company and customer-directed cost reduction efforts and restructuring costs and savings and other consequences thereof;
- new business and investment opportunities;
- our ability to realize the intended benefits of organizational changes;
- the anticipated benefits of diversification and balance of operations across product lines, regions and industries;
- the outcome of legal proceedings, investigations and other contingencies;
- pension plan assumptions and future contributions;
- the impact of the negotiation of collective bargaining agreements and labor disputes;
- the effect of changes in political conditions in the U.S. and other countries in which we and Rockwell Collins operate, including the effect of changes in U.S. trade policies or the U.K.'s pending withdrawal from the EU, on general market conditions, global trade policies and currency exchange rates in the near term and beyond; and

- the effect of changes in tax (including the U.S. tax reform enacted on December 22, 2017 and is commonly referred to as the Tax Cuts and Jobs Act of 2017 (TCJA), environmental, regulatory (including among other things import/export) and other laws and regulations in the U.S. and other countries in which we and Rockwell Collins operate;
- the ability of UTC and Rockwell Collins to receive the required regulatory approvals (and the risk that such approvals may result in the imposition of conditions that could adversely affect the combined company or the expected benefits of the merger) and to satisfy the other conditions to the closing of the proposed merger on a timely basis or at all;
- the occurrence of events that may give rise to a right of one or both of UTC or Rockwell Collins to terminate the merger agreement, including in circumstances that might require Rockwell Collins to pay a termination fee of $695 million to UTC or $50 million of expense reimbursement;
- negative effects of the announcement or the completion of the merger on the market price of UTC's and/or Rockwell Collins' common stock and/or on their respective financial performance;
- the risks related to Rockwell Collins and UTC being restricted in their operation of their businesses while the merger agreement is in effect;
- risks relating to the value of the UTC's shares to be issued in connection with the proposed Rockwell merger, significant merger costs and/or unknown liabilities;
- risks associated with third-party contracts containing consent and/or other provisions that may be triggered by the Rockwell merger agreement;
- risks associated with merger-related litigation or appraisal proceedings; and
- the ability of UTC and Rockwell Collins, or the combined company, to retain and hire key personnel.

In addition, this Form 10-K includes important information as to risks, uncertainties and other factors that may cause actual results to differ materially from those expressed or implied in the forward-looking statements. See the "Notes to Consolidated Financial Statements" under the heading "Note 18: Contingent Liabilities," the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" under the headings "Business Overview," "Results of Operations," "Liquidity and Financial Condition," and "Critical Accounting Estimates," and the section titled "Risk Factors." This Form 10-K also includes important information as to these factors in the "Business" section under the headings "General," "Description of Business by Segment" and "Other Matters Relating to Our Business as a Whole," and in the "Legal Proceedings" section. Additional important information as to these factors is included in our 2017 Annual Report in the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" under the headings "Restructuring Costs," "Environmental Matters" and "Governmental Matters." The forward-looking statements speak only as of the date of this report or, in the case of any document incorporated by reference, the date of that document. We undertake no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable law. Additional information as to factors that may cause actual results to differ materially from those expressed or implied in the forward-looking statements is disclosed from time to time in our other filings with the SEC.

Item 1A. Risk Factors

Our business, financial condition, operating results and cash flows can be impacted by the factors set forth below, any one of which could cause our actual results to vary materially from recent results or from our anticipated future results.

Our Global Growth May be Affected by Global Economic, Capital Market and Political Conditions.

Our business, financial condition, operating results and cash flows may be adversely affected by changes in global economic conditions and geopolitical risks, including credit market conditions, levels of consumer and business confidence, commodity prices, exchange rates, levels of government spending and deficits, trade policies, political conditions, actual or anticipated default on sovereign debt and other challenges that could affect the global economy. These economic conditions affect businesses such as ours in a number of ways. Tightening of credit in financial markets could adversely affect the ability of our customers and suppliers to obtain financing for significant purchases and operations and could result in a decrease in or cancellation of orders for our products and services as well as impact the ability of our customers to make payments. Similarly, such tightening of credit may adversely affect our supplier base and increase the potential for one or more of our suppliers to experience financial distress or bankruptcy. Our global business is also adversely affected by decreases in the general level of economic activity, such as decreases in business and consumer spending, air travel, construction activity, the financial strength of airlines and business jet operators, and government procurement.

Our Financial Performance Is Dependent on the Conditions of the Construction and Aerospace Industries.

The results of our commercial and industrial businesses, which generated approximately 50 percent of our consolidated sales in 2017, are influenced by a number of external factors including fluctuations in residential and commercial construction activity, regulatory changes, interest rates, labor costs, foreign currency exchange rates, customer attrition, raw material and energy costs, global credit market conditions, and other global and political factors. For example, a slowdown in building and remodeling activity can adversely affect the financial performance of Otis and UTC Climate, Controls & Security. In addition, the financial performance of UTC Climate, Controls & Security can also be influenced by production and utilization of transport equipment and, particularly in its residential business, weather conditions.

The results of our commercial and military aerospace businesses, which generated approximately 50 percent of our consolidated sales in 2017, are directly tied to the economic conditions in the commercial aviation and defense industries, which are cyclical in nature. Capital spending and demand for aircraft engines, aerospace products and component aftermarket parts and service by commercial airlines, aircraft operators and aircraft manufacturers are influenced by a wide variety of factors, including current and predicted traffic levels, load factors, aircraft fuel pricing, labor issues, worldwide airline profits, airline consolidation, bankruptcies, competition, the retirement of older aircraft, regulatory changes, terrorism and related safety concerns, general economic conditions, corporate profitability, cost reduction efforts and backlog levels. Any of these conditions could reduce the sales and margins of our aerospace businesses. Other factors, including future terrorist actions, pandemic health issues or major natural disasters, could also dramatically reduce the demand for air travel, which could negatively impact the sales and margins of our aerospace businesses. Additionally, because a substantial portion of the backlog for commercial aerospace customers is scheduled for delivery beyond 2018, changes in economic conditions may cause customers to request that firm orders be rescheduled or canceled. At times, our aerospace businesses also enter into firm fixed-price development contracts, which may require us to bear cost overruns related to unforeseen technical and design challenges that arise during the development and early production stages of the program. In addition, our aerospace businesses face intense competition from domestic and foreign manufacturers of new equipment and spare parts. Spare parts sales and aftermarket service trends are affected by similar factors, including usage, pricing, technological improvements, regulatory changes and the retirement of older aircraft. Furthermore, because of the lengthy research and development cycle involved in bringing products in these business segments to market, we cannot predict the economic conditions that will exist when any new product is complete. A reduction in capital spending in the commercial aviation or defense industries could have a significant effect on the demand for our products, which could have a material adverse effect on our competitive position, results of operations, cash flows or financial condition. The defense industry is also affected by a changing U.S. and global political environment, continued pressure on U.S. and global defense spending and U.S. foreign policy and the level of activity in military flight operations. Should overall U.S. Government defense spending decline, it could result in significant reductions to revenue, cash flow, profit and backlog for our military businesses. One or more of the programs that we currently support or are currently pursuing could be phased-out, limited or terminated. Reductions in these existing programs, unless offset by other programs and opportunities, could have a material adverse effect on our competitive position, cash flows, results of operations or financial condition.

Our International Operations Subject Us to Economic Risk As Our Results of Operations May Be Adversely Affected by Changes in Foreign Currency Fluctuations, Economic Conditions and Changes in Local Government Regulation.

We conduct our business on a global basis, with approximately 61 percent of our 2017 total segment sales derived from international operations, including U.S. export sales. Changes in local and regional economic conditions, including fluctuations in exchange rates, may affect product demand and reported profits in our non-U.S. operations (especially the commercial businesses and P&WC), where transactions are generally denominated in local currencies. In addition, currency fluctuations may affect the prices we pay suppliers for materials used in our products. As a result, our operating margins also may be negatively impacted by worldwide currency fluctuations that result in higher costs for certain cross border transactions. Our financial statements are denominated in U.S. Dollars. Accordingly, fluctuations in exchange rates may also give rise to translation gains or losses when financial statements of non-U.S. operating units are translated into U.S. Dollars. Given that the majority of our sales are non-U.S. based, a strengthening of the U.S. Dollar against other major foreign currencies could adversely affect our results of operations.

The majority of sales in the aerospace businesses are transacted in U.S. Dollars, consistent with established industry practice, while the majority of costs at locations outside the U.S. are incurred in the applicable local currency (principally the Euro, the Canadian Dollar, and the Polish Zloty). For operating units with U.S. Dollar sales and local currency costs, there is foreign currency exposure that could impact our results of operations depending on market changes in the exchange rate of the U.S. Dollar against the applicable foreign currencies. To manage certain exposures, we employ long-term hedging strategies associated with U.S. Dollar sales. See Notes 1 and 14 to the Consolidated Financial Statements in our 2017 Annual Report for further discussion of our hedging strategies.

Our international sales and operations are subject to risks associated with changes in local government laws, regulations and policies, including those related to tariffs and trade barriers, investments, taxation, exchange controls, capital controls, employment regulations, and repatriation of earnings. Government policies on international trade and investments such as import quotas, capital controls, punitive taxes or tariffs, whether adopted by individual governments or addressed by regional trade blocs, can affect demand for our products and services, impact the competitive position of our products or prevent us from being able to manufacture or sell products in certain countries. The implementation of more restrictive trade policies or the renegotiation of existing trade agreements in the U.S. or countries where we sell large quantities of products and services or procure supplies and other materials incorporated into our products could negatively impact our business, results of operations and financial condition. For example, a government's adoption of "buy national" policies or retaliation by another government against such policies, such as tariffs, could have a negative impact on our results of operations. Our international sales and operations are also sensitive to changes in foreign national priorities, including government budgets, as well as to political and economic instability. International transactions may involve increased financial and legal risks due to differing legal systems and customs in foreign countries. For example, as a condition of sale or award of a contract, some international customers require us to agree to offset arrangements, which may include in-country purchases, manufacturing and financial support arrangements. The contract may provide for penalties in the event we fail to perform in accordance with the offset requirements.

In addition, as part of our globalization strategy, we have invested in certain countries, including Argentina, Brazil, China, India, Indonesia, Mexico, Poland, Russia, South Africa, Ukraine and countries in the Middle East, that carry high levels of currency, political, compliance and economic risk. We expect that sales to emerging markets will continue to account for a significant portion of our sales as our businesses evolve and as these and other developing nations and regions around the world increase their demand for our products. Emerging market operations can present many risks, including cultural differences (such as employment and business practices), volatility in gross domestic product, economic and government instability, and the imposition of exchange controls and capital controls. While these factors and their impact are difficult to predict, any one or more of them could have a material adverse effect on our competitive position, results of operations, cash flows or financial condition.

We Use a Variety of Raw Materials, Supplier-Provided Parts, Components, Sub-Systems and Contract Manufacturing Services in Our Businesses, and Significant Shortages, Supplier Capacity Constraints, Supplier Production Disruptions or Price Increases Could Increase Our Operating Costs and Adversely Impact the Competitive Positions of Our Products.

Our reliance on suppliers (including third-party contract manufacturing and logistics) and commodity markets to secure raw materials, parts, components and sub-systems used in our products exposes us to volatility in the prices and availability of these materials. In many instances, we depend upon a single source of supply, manufacturing, logistics support or assembly or participate in commodity markets that may be subject to allocations of limited supplies by suppliers. A disruption in deliveries from our suppliers, supplier capacity constraints, supplier production disruptions, supplier quality issues, closing or bankruptcy of our suppliers, price increases, or decreased availability of raw materials or commodities, could have a material adverse effect on our ability to meet our commitments to customers or increase our operating costs. We believe that our supply management and production practices are based on an appropriate balancing of the foreseeable risks and the costs of alternative practices. Nonetheless, price increases, supplier capacity constraints, supplier production disruptions or the unavailability of some raw materials may have a material adverse effect on our competitive position, results of operations, cash flows or financial condition.

We Engage in Acquisitions and Divestitures, and May Encounter Difficulties Integrating Acquired Businesses with, or Disposing of Divested Businesses From, Our Current Operations; Therefore, We May Not Realize the Anticipated Benefits of these Acquisitions and Divestitures.

We seek to grow through strategic acquisitions in addition to internal growth. In the past several years, we have made various acquisitions and have entered into joint venture arrangements intended to complement and expand our businesses, including the pending acquisition of Rockwell Collins, and expect to continue to do so in the future. Our due diligence reviews may not identify all of the material issues necessary to accurately estimate the cost and potential loss contingencies of a particular transaction, including potential exposure to regulatory sanctions resulting from an acquisition target's previous activities. For example, we may incur unanticipated costs, expenses or other liabilities as a result of an acquisition target's violation of applicable laws, such as the U.S. Foreign Corrupt Practices Act (FCPA) or other anti-bribery and corruption laws in non-U.S. jurisdictions. We may incur unanticipated costs or expenses, including post-closing asset impairment charges, expenses associated with eliminating duplicate facilities, litigation, and other liabilities. We also may encounter difficulties in integrating acquired businesses with our operations, applying our internal controls processes to these acquired businesses, or in managing strategic investments. Additionally, we may not realize the degree or timing of benefits we anticipate when we first enter into a transaction. Any of the foregoing could adversely affect our business and results of operations. In addition,

accounting requirements relating to business combinations, including the requirement to expense certain acquisition costs as incurred, may cause us to incur greater earnings volatility and generally lower earnings during periods in which we acquire new businesses. Furthermore, we make strategic divestitures from time to time. Our divestitures may result in continued financial exposure to the divested businesses, such as through guarantees or other financial arrangements or continued supply and services arrangements, following the transaction. Under these arrangements, nonperformance by those divested businesses could result in obligations being imposed on us that could have a material adverse effect on our competitive position, cash flows, results of operations, or financial condition. The success of future acquisitions, including the Rockwell Collins transaction, and divestitures will depend on the satisfaction of conditions precedent to, and consummation of, the pending transactions, the timing of consummation of these pending transactions, and the ability of the parties to secure any required regulatory approvals in a timely manner, among other things. We also enter into joint ventures in which we maintain significant influence, but do not control the businesses. Accordingly, our ability to apply our internal controls and compliance policies to these businesses is limited and can result in additional financial and reputational risks.

We may not complete the acquisition of Rockwell Collins or complete the acquisition within the time frame we anticipate; the acquired business may underperform relative to our expectations; the acquisition may cause our financial results to differ from our expectations or the expectations of the investment community; we may not be able to achieve anticipated cost savings or other anticipated synergies.

The completion of the acquisition of Rockwell Collins is subject to a number of conditions, including the receipt of required regulatory approvals. The failure to satisfy all of the required conditions could delay the completion of the acquisition for a significant period of time or prevent it from occurring at all. Any delay in completing the acquisition could cause UTC not to realize some or all of the benefits, or realize them on a different timeline than expected, that UTC expects to achieve if the acquisition is successfully completed within the expected time frame. In addition, the terms and conditions of the required regulatory authorizations and consents for the acquisition that are granted, if any, may impose requirements, limitations or costs, or place restrictions on the conduct of the combined company's business or may materially delay the completion of the acquisition.

The ultimate success of the acquisition will depend, in part, on UTC's ability to successfully combine and integrate the businesses of UTC and Rockwell Collins, and realize the anticipated benefits, including synergies, cost savings, innovation opportunities and operational efficiencies, from the acquisition. If UTC is unable to achieve these objectives within the anticipated time frame, or at all, the anticipated benefits may not be realized fully or at all, or may take longer to realize than expected, and the value of UTC's common stock may decline.

The integration of the two companies may result in material challenges, including, without limitation:

- the diversion of management's attention from ongoing business concerns and performance shortfalls at one or both of the companies as a result of the devotion of management's attention to the acquisition;
- managing a larger combined aerospace systems business;
- maintaining employee morale and retaining key management and other employees;
- retaining existing business and operational relationships, including customers, suppliers and employees and other counterparties, as may be impacted by contracts containing consent and/or other provisions that may be triggered by the acquisition, and attracting new business and operational relationships;
- the possibility of faulty assumptions underlying expectations regarding the integration process;
- consolidating corporate and administrative infrastructures and eliminating duplicative operations;
- coordinating geographically separate organizations;
- unanticipated issues in integrating information technology, communications and other systems; and
- unforeseen expenses or delays associated with the acquisition.

Our Debt Levels and Related Debt Service Obligations Could Have Negative Consequences; Our Ability to Access Debt May Be Affected by Changes in Global Capital Markets, Our Financial Performance or Outlook or Our Credit Ratings.

We have outstanding debt and other financial obligations and significant unused borrowing capacity. In connection with the Rockwell Collins merger, we anticipate that approximately $15 billion will be required to pay the aggregate cash portion of the Merger Consideration. We expect to fund the cash portion of the Merger Consideration through debt issuances and cash on hand. We expect to assume approximately $7 billion of Rockwell Collins' outstanding debt upon completion of the merger. The increased indebtedness of UTC in connection with the merger may have the effect of, among other things:

- a downgrade of our credit ratings resulting in increased borrowing costs;

- requiring us to dedicate significant cash flow from operations to the payment of principal and interest on our debt, which would reduce funds we have available for other purposes, such as acquisitions, reinvestment in our businesses, dividends and repurchases of our common stock;
- reducing our flexibility in planning for or reacting to changes in our business and market conditions; and
- exposing us to interest rate risk at the time of refinancing outstanding debt or on the portion of our debt obligations that are issued at variable rates.

We depend, in part, upon the issuance of debt to fund our operations and contractual commitments. If we require additional funding in order to fund outstanding financing commitments or meet other business requirements, our market liquidity may not be sufficient. A number of factors could cause us to incur increased borrowing costs and to have greater difficulty accessing public and private markets for debt, including disruptions or declines in the global capital markets and/or a decline in our financial performance, outlook or credit ratings. In particular, following the announcement of the proposed Rockwell Collins acquisition, the credit rating agencies announced that they were reviewing our credit ratings for possible downgrades.

Quarterly Cash Dividends and Share Repurchases May Be Discontinued or Modified, Are Subject to a Number of Uncertainties and May Affect the Price of Our Common Stock.

Quarterly cash dividends and share repurchases under our share repurchase program constitute components of our capital allocation strategy, which we fund with free operating cash flow, borrowings and divestitures. However, we are not required to declare dividends or make any share repurchases under our share repurchase program. Dividends and share repurchases may be discontinued, accelerated, suspended or delayed at any time without prior notice. Even if not discontinued, the amount of such dividends and repurchases may be changed, and the amount, timing and frequency of such dividends and repurchases may vary from historical practice or from the company's stated expectations. Decisions with respect to dividends and share repurchases are subject to the discretion of our Board of Directors and will be based on a variety of factors. Important factors that could cause us to discontinue, limit, suspend, increase or delay our quarterly cash dividends or share repurchases include market conditions, the price of our common stock, the nature and timing of other investment opportunities, changes in our business strategy, the terms of our financing arrangements, our outlook as to the ability to obtain financing at attractive rates, the impact on our credit ratings and the availability of domestic cash. To help manage the cash flow and liquidity impact resulting from the pending Rockwell Collins acquisition, we have, among other things, suspended share repurchases, excluding activity relating to our employee savings plans. As we continue to assess the impacts of the TCJA, future opportunities for repatriation of our non-U.S. earnings, and accelerated de-leveraging, we may consider, in addition to investments in our operations, limited additional share repurchases to offset the effects of dilution related to our stock-based compensation programs - see Note 12 to the Consolidated Financial Statements in our 2017 Annual Report.

The reduction or elimination of our cash dividend or share repurchase program could adversely affect the market price of our common stock. Additionally, there can be no assurance that any share repurchases will enhance shareholder value because the market price of our common stock may decline below the levels at which we repurchased shares of common stock. Although our share repurchase program is intended to enhance long-term shareholder value, short-term stock price fluctuations could reduce the program's effectiveness.

See Item 5, "Market for Registrants Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities" in this Form 10-K for a description of our share repurchase program and past share repurchases, including our prior accelerated share repurchase (ASR) transactions.

We Design, Manufacture and Service Products that Incorporate Advanced Technologies; The Introduction of New Products and Technologies Involves Risks and We May Not Realize the Degree or Timing of Benefits Initially Anticipated.

We seek to achieve growth through the design, development, production, sale and support of innovative products that incorporate advanced technologies. The product, program and service needs of our customers change and evolve regularly, and we invest substantial amounts in research and development efforts to pursue advancements in a wide range of technologies, products and services. Of particular note, Pratt & Whitney is currently producing and delivering the PurePower PW1000G Geared TurboFan engine to power various aircraft, including the A320neo family of aircraft, which entered into service in January 2016. The level of orders received for the PurePower family of engines coupled with a requirement to achieve mature production levels in a very short time frame are necessitating significant additional manufacturing and supply chain capacity. If any of our production ramp-up efforts are delayed, if suppliers cannot timely deliver or perform to our standards, and/or if we identify or experience issues with in-service engines, we may not meet customers' production schedules, which could result in material additional costs, including penalties that could be assessed under existing contractual provisions. Our ability to realize the anticipated benefits of our technological advancements depends on a variety of factors, including meeting development, production, certification and regulatory approval schedules; execution of internal and external performance plans; availability

of supplier and internally produced parts and materials; performance of suppliers and subcontractors; availability of supplier and internal facility capacity to perform maintenance, repair and overhaul services on our products; hiring and training of qualified personnel; achieving cost and production efficiencies; identification of emerging technological trends in our target end-markets; validation of innovative technologies; the level of customer interest in new technologies and products; and customer acceptance of our products and products that incorporate technologies we develop. For example, certain of our aerospace products are incorporated into larger systems and end products manufactured by our customers. These systems and end products may incorporate additional technologies manufactured by third parties and involve additional risks and uncertainties. As a result, the performance and market acceptance of these larger systems and end products could affect the level of customer interest and acceptance of our own products in the marketplace.

Any development efforts divert resources from other potential investments in our businesses, and these efforts may not lead to the development of new technologies or products on a timely basis or meet the needs of our customers as fully as competitive offerings. In addition, the markets for our products or products that incorporate our technologies may not develop or grow as we anticipate. We or our customers, suppliers or subcontractors may encounter difficulties in developing and producing new products and services, and may not realize the degree or timing of benefits initially anticipated or may otherwise suffer significant adverse financial consequences. Due to the design complexity of our products, in the future we may experience delays in completing the development and introduction of new products. Any delays could result in increased development costs or deflect resources from other projects. In particular, we cannot predict with certainty whether, when and in what quantities our aerospace businesses will produce and sell aircraft engines, aircraft systems and components and other products currently in development or pending required certifications. Our contracts are typically awarded on a competitive basis. Our bids are based upon, among other items, the cost to provide the products and services. To generate an acceptable return on our investment in these contracts, we must be able to accurately estimate our costs to provide the services and deliver the products required by the contract and to be able to complete the contracts in a timely manner. If we fail to accurately estimate our costs or the time required to complete a contract, the profitability of our contracts may be materially and adversely affected. Some of our contracts provide for liquidated damages in the event that we are unable to perform and deliver in accordance with the contractual specifications and schedule. In addition, we may face customer directed cost reduction targets that could have a material adverse effect on the profitability of our contracts. Furthermore, we cannot be sure that our competitors will not develop competing technologies which gain market acceptance in advance of or instead of our products. The possibility also exists that our competitors might develop new technology or offerings that might cause our existing technology and offerings to become obsolete. In addition, the possibility exists that competitors will develop aftermarket services and aftermarket parts for our products which attract customers and adversely impact our return on investment on new products. Any of the foregoing could have a material adverse effect on our competitive position, results of operations, cash flows or financial condition.

Our Business May Be Affected by Government Contracting Risks.

Most of our government contracts are fixed-price contracts. While fixed price contracts enable us to benefit from performance improvements, cost reductions and efficiencies, they also subject us to the risk of reduced margins or losses if we are unable to achieve estimated costs. U.S. Government contracts are subject to termination by the government, either for the convenience or for default as a result of our failure to perform under the applicable contract. If terminated by the government as a result of our default, we could be liable for additional costs the government incurs in acquiring undelivered goods or services from another source and any other damages it suffers. We are now, and believe that in light of the current U.S. Government contracting environment we will continue to be, the subject of U.S. Government investigations relating to certain of our U.S. Government contracts. Such U.S. Government investigations often take years to complete and could result in administrative, civil or criminal liabilities, including repayments, fines, treble and other damages, forfeitures, restitution or penalties, or could lead to suspension or debarment of U.S. Government contracting or of export privileges. For instance, if we or one of our business units were charged with wrongdoing as a result of any U.S. Government investigation (including violation of certain environmental or export laws, as further described below), the U.S. Government could suspend us from bidding on or receiving awards of new U.S. Government contracts pending the completion of legal proceedings. If convicted or found liable, the U.S. Government could fine and debar us from new U.S. Government contracting for a period generally not to exceed three years. The U.S. Government also reserves the right to debar a contractor from receiving new government contracts for fraudulent, criminal or other seriously improper conduct. The U.S. Government could void any contracts found to be tainted by fraud. Our contracts with the U.S. Government are also subject to audits. Like many defense contractors, we have received audit reports, which recommend that certain contract prices should be reduced to comply with various government regulations, including because cost or pricing data we submitted in negotiation of the contract prices or cost accounting practices may not have conformed to government regulations, or that certain payments be delayed or withheld. Some of these audit reports involved substantial amounts. We also could suffer reputational harm if allegations of impropriety were made against us even if such allegations are later determined to be false.

Exports of Certain of Our Products Are Subject to Various Export Control and Sanctions Regulations and May Require Authorization From the U.S. Department of State, the U.S. Department of Commerce, the U.S. Department of the Treasury or Regulatory Agencies of Other Countries.

We must comply with various laws and regulations relating to the export of products, services and technology from the U.S. and other countries having jurisdiction over our operations. In the U.S., these laws include, among others, the Export Administration Regulations (EAR) administered by the U.S. Department of Commerce, the International Traffic in Arms Regulations (ITAR) administered by the U.S. Department of State and embargoes and sanctions regulations administered by the U.S. Department of the Treasury. Certain of our products, services and technologies have military or strategic applications and are on the U.S. Munitions List of the ITAR and the Commerce Control List of the EAR, or are otherwise subject to the EAR. In addition, U.S. foreign policy may restrict or prohibit our ability to engage in business dealings with certain individuals, entities or countries. As a result, our ability to export our products or services to certain countries or for particular end-uses or end-users may require authorization. Any failure by us or our customers or suppliers to comply with these laws and regulations could result in civil or criminal penalties, fines, seizure of our products, adverse publicity, restrictions on our ability to export our products, or the suspension or debarment from doing business with the U.S. Government. Moreover, any changes in export control or sanctions regulations may further restrict the export of our products or services, and the possibility of such changes requires constant monitoring to ensure we remain compliant. The length of time required by the licensing processes can vary, potentially delaying the shipment of products or performance of services and the recognition of the corresponding revenue. Any restrictions on the export of our products or product lines could have a material adverse effect on our competitive position, results of operations, cash flows or financial condition.

We Are Subject to Litigation, Environmental, Product Safety and Other Legal and Compliance Risks.

We are subject to a variety of litigation and legal compliance risks. These risks relate to, among other things, product safety, personal injuries, intellectual property rights, contract-related claims, government contracts, taxes, environmental matters and compliance with U.S. and foreign laws, competition laws and laws governing improper business practices. We or one of our business units could be charged with wrongdoing as a result of such matters. If convicted or found liable, we could be subject to significant fines, penalties, repayments, other damages (in certain cases, treble damages). As a global business, we are subject to complex laws and regulations in the U.S. and other countries in which we operate. Those laws and regulations may be interpreted in different ways. They may also change from time to time, as may related interpretations and other guidance. Changes in laws or regulations could result in higher expenses and payments, and uncertainty relating to laws or regulations may also affect how we conduct our operations and structure our investments and could limit our ability to enforce our rights. Changes in environmental and climate change laws or regulations, including laws relating to greenhouse gas emissions, could lead to new or additional investment in product designs and could increase environmental compliance expenditures. Changes in climate change concerns, or in the regulation of such concerns, including greenhouse gas emissions, could subject us to additional costs and restrictions, including increased energy and raw materials costs.

At times we are involved in disputes with private parties over environmental issues, including litigation over the allocation of cleanup costs, alleged personal injuries and alleged property damage. Personal injury lawsuits may involve individual and purported class actions alleging that contaminants originating from our or our subsidiaries' current or former operating facilities caused or contributed to medical conditions, including cancers incurred by employees, former employees or residents in the area and environmental damage or diminution of real estate values. Even in litigation where we believe our liability is remote, there is a risk that a negative finding or decision in a matter involving multiple plaintiffs or a purported class action could have a material adverse effect on our competitive position, results of operations, cash flows or financial condition, in particular with respect to environmental claims in regions where we have, or previously had, significant operations.

Product recalls and product liability claims (including claims related to the safety or reliability of our products) also can result in significant costs, including fines, as well as negative publicity, management distraction and damage to our reputation that could reduce demand for our products and services.

In addition, the FCPA and other anti-bribery and corruption laws generally prohibit companies and their intermediaries from making improper payments to non-U.S. officials for the purpose of obtaining or retaining business. The FCPA applies to companies, individual directors, officers, employees and agents. U.S. companies also may be held liable for actions taken by strategic or local partners or representatives. The FCPA also imposes accounting standards and requirements on publicly traded U.S. corporations and their foreign affiliates, which are intended to prevent the diversion of corporate funds to the payment of bribes and other improper payments. Certain of our customer relationships outside of the U.S. are with governmental entities and are therefore subject to the FCPA and other anti-bribery and corruption laws. Our policies mandate compliance with these anti-bribery and corruption laws. Despite meaningful measures that we undertake to seek to ensure lawful conduct, which include training and internal control policies, these measures may not always prevent our employees or agents from violating the FCPA or similar laws. As a result, we could be subject to criminal and civil penalties, disgorgement, further changes or

enhancements to our procedures, policies and controls, personnel changes or other remedial actions. Violations of these laws, or allegations of such violations, could disrupt our operations, cause reputational harm, involve significant management distraction and result in a material adverse effect on our competitive position, results of operations, cash flows or financial condition.

For a description of current material legal proceedings and regulatory matters, see "Legal Proceedings" in in this Form 10-K and Note 18 to the Consolidated Financial Statements in our 2017 Annual Report.

Additional Tax Expense or Additional Tax Exposures Could Affect Our Future Profitability.

We are subject to income taxes in the United States and various international jurisdictions. Changes in tax laws and regulations, as well as changes and conflicts in related interpretations and other tax guidance could materially impact our tax receivables and liabilities and our deferred tax assets and deferred tax liabilities. Additionally, in the ordinary course of business we are subject to examinations by various authorities, including tax authorities. In addition to ongoing investigations, there could be additional investigations launched in the future by governmental authorities in various jurisdictions, and existing investigations could be expanded. The global and diverse nature of our operations means that these risks will continue to exist and additional investigations, proceedings and contingencies will arise from time to time. Our competitive position, cash flows, results of operation or financial condition may be affected by the outcome of investigations, proceedings and other contingencies that cannot be predicted with certainty.

See Management's Discussion and Analysis of Financial Condition and Results of Operations under the headings "Business Overview", "Results of Operations - Income Taxes," and "Liquidity and Financial Condition" and Notes 1 and 11 to the Consolidated Financial Statements in our 2017 Annual Report for further discussion on income taxes and related contingencies, including our provisional accounting and assessment of the effect of the TCJA.

Our Defined Benefit Pension Plans are Subject to Financial Market Risk that Could Adversely Affect Our Results.

The performance of the financial markets and interest rates can impact our defined benefit pension plan expenses and funding obligations. Significant decreases in the discount rate or investment losses on plan assets may increase our funding obligations and adversely impact our financial results. See Note 12 to the Consolidated Financial Statements in our 2017 Annual Report for further discussion on pension plans and related obligations and contingencies.

We May Be Unable to Realize Expected Benefits From Our Cost Reduction and Restructuring Efforts and Our Profitability May Be Hurt or Our Business Otherwise Might Be Adversely Affected.

In order to operate more efficiently and control costs, we announce from time to time restructuring plans, which include workforce reductions as well as global facility consolidations and other cost reduction initiatives. These plans are intended to generate operating expense savings through reductions in direct and indirect expenses as well as other savings. We may undertake further workforce reductions or restructuring actions in the future. These types of cost reduction and restructuring activities are complex. If we do not successfully manage our current restructuring activities, or any future restructuring activities, expected efficiencies and benefits might be delayed or not realized, and our operations and business could be disrupted. Risks associated with these actions and other workforce management issues include unfavorable political responses to such actions, unforeseen delays in the implementation of anticipated workforce reductions, additional unexpected costs, adverse effects on employee morale and the failure to meet operational targets due to the loss of employees or work stoppages, any of which may impair our ability to achieve anticipated cost reductions, or otherwise harm our business, or have a material adverse effect on our competitive position, results of operations, cash flows or financial condition.

Our Business and Financial Performance May Be Adversely Affected By Attacks on Information Technology Infrastructure and Other Cyber-based and Business Disruptions.

Our business may be impacted by disruptions to our own or third-party information technology ("IT") infrastructure, which could result from (among other causes) cyber-attacks on or failures of such infrastructure or compromises to its physical security, as well as from damaging weather or other acts of nature. Cyber-based risks, in particular, are evolving and include, but are not limited to, both attacks on our IT infrastructure and attacks on the IT infrastructure of third parties (both on premises and in the cloud) attempting to gain unauthorized access to our confidential or other proprietary information, classified information, or information relating to our employees, customers and other third parties. Cyber-based risks could also include attacks targeting the security, integrity and/or availability of the hardware, software and information installed, stored or transmitted in our products, including after the purchase of those products and when they are incorporated into third-party products, facilities or infrastructure. Such attacks could disrupt our systems or those of third parties, impact business operations, result in unauthorized release of confidential or otherwise protected information, and corrupt our data or that of third parties. We have experienced cyber-based attacks, and due to the evolving threat landscape, may continue to experience them going forward, potentially with more frequency. We continue to make investments and adopt measures designed to

enhance our protection, detection, response, and recovery capabilities, and to mitigate potential risks to our technology, products, services and operations from potential cyber-attacks. However, given the unpredictability, nature and scope of cyber-attacks, it is possible that potential vulnerabilities could go undetected for an extended period. We could potentially be subject to production downtimes, operational delays, other detrimental impacts on our operations or ability to provide products and services to our customers, the compromise of confidential or otherwise protected information, misappropriation, destruction or corruption of data, security breaches, other manipulation or improper use of our or third-party systems, networks or products, financial losses from remedial actions, loss of business or potential liability, and/or damage to our reputation, any of which could have a material adverse effect on our competitive position, results of operations, cash flows or financial condition. Due to the evolving nature of such risks, the impact of any potential incident cannot be predicted.

We Depend On Our Intellectual Property, and Have Access to Certain Intellectual Property and Information of Our Customers and Suppliers; Infringement or Failure to Protect Our Intellectual Property Could Adversely Affect Our Future Growth and Success.

We rely on a combination of patents, trademarks, copyrights, trade secrets, nondisclosure agreements, information technology security systems, internal controls and compliance systems and other measures to protect our proprietary intellectual property. We also rely on nondisclosure agreements, information technology security systems and other measures to protect certain customer and supplier information and intellectual property that we have in our possession or to which we have access. Our efforts to protect intellectual property and proprietary rights may not be sufficient. We cannot be sure that our pending patent applications will result in the issuance of patents to us, that patents issued to or licensed by us in the past or in the future will not be challenged or circumvented by competitors, or that these patents will be found to be valid or sufficiently broad to preclude our competitors from introducing technologies similar to those covered by our patents and patent applications. Our ability to protect and enforce our intellectual property rights may be limited in certain countries outside the U.S. In addition, we may be the target of competitor or other third-party patent enforcement actions seeking substantial monetary damages or seeking to prevent our sale and marketing of certain of our products or services. Our competitive position also may be adversely impacted by limitations on our ability to obtain possession of, and ownership or necessary licenses concerning, data important to the development or provision of our products or service offerings, or by limitations on our ability to restrict the use by others of data related to our products or services. We may also be subject to disruptions, losses and liability resulting from various cybersecurity attacks or information technology failures, as described above. Any of these events or factors could have a material adverse effect on our competitive position, subject us to judgments, penalties and significant litigation costs or temporarily or permanently disrupt our sales and marketing of the affected products or services. Any of the foregoing could have a material adverse effect on our competitive position, results of operations, cash flows or financial condition.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

We operate in approximately 80 countries, with over 500 significant properties comprising approximately 80 million square feet of productive space. Approximately 49% of our significant properties are associated with our aerospace businesses and 51% are associated with our commercial businesses. Approximately 43% of our significant properties are leased and 57% are owned. Approximately 45% of our significant properties are located in the United States.

Our fixed assets as of December 31, 2017 include manufacturing facilities and non-manufacturing facilities such as warehouses, and a substantial quantity of machinery and equipment, most of which are general purpose machinery and equipment using special jigs, tools and fixtures and in many instances having automatic control features and special adaptations. The facilities, warehouses, machinery and equipment in use as of December 31, 2017 are in good operating condition, are well-maintained and substantially all are generally in regular use.

Item 3. Legal Proceedings

Federal Securities Laws Litigation

On January 2, 2018, a purported shareowner filed a second amended complaint in the United States District Court for the Southern District of New York under the federal securities laws against the Company and certain of its current and former executives (*Frankfurt-Trust Investment Luxemburg AG v. United Technologies Corporation et al.),* which further amends a previously disclosed complaint that was filed on May 10, 2017. In the second amended complaint, the plaintiff purports to

represent a class of shareowners who purchased the Company's stock between December 11, 2014 and July 20, 2015. The second amended complaint alleges violations of Sections 10(b) and 20(a) of the Securities Exchange Act of 1934, and Rule 10b-5 thereunder, related to alleged false and misleading statements and omissions of material fact made in connection with the Company's 2015 earnings expectations. This action is in a preliminary stage and the Company is unable to predict the outcome, or the possible loss or range of loss, if any, which could result from this action.

Telephone Consumer Protection Act

As previously disclosed, UTC Fire & Security Americas Corporation, Inc. (UTCFS) was named as a defendant in numerous putative class actions that were filed on behalf of purported classes of persons who alleged that third-party entities placed "robocalls" and/or placed calls to numbers listed on the "Do Not Call Registry" on behalf of UTCFS in contravention of the Telephone Consumer Protection Act (TCPA). In each putative class action suit, plaintiffs sought injunctive relief and monetary damages. Each violation under the TCPA provides for $500 in statutory damages or up to $1,500 for any willful violation. In August 2016, UTCFS moved for summary judgment in the Northern District of West Virginia, the court in which all of the pending TCPA cases has been consolidated, arguing that the third parties who placed the calls in alleged violation of the TCPA were not acting as UTCFS' agents and, therefore, UTCFS could not be vicariously liable for those calls under the TCPA. On December 22, 2016, the district court granted UTCFS' summary judgment motion and dismissed the claims against UTCFS. The plaintiffs appealed the decision on February 14, 2017. Oral arguments on the appeal were presented before the United States Court of Appeals for the Fourth Circuit on January 24, 2018.

DOJ/SEC Investigations

As previously disclosed, in December 2013 and January 2014, UTC made voluntary disclosures to the United States Department of Justice (DOJ), the Securities and Exchange Commission (SEC) Division of Enforcement and the United Kingdom's Serious Fraud Office to report the status of its internal investigation regarding a non-employee sales representative retained by United Technologies International Operations, Inc. (UTIO) and IAE for the sale of Pratt & Whitney and IAE engines and aftermarket services, respectively, in China. On April 7, 2014, the SEC notified UTC that it was conducting a formal investigation and issued a subpoena to UTC. The SEC issued a second subpoena on March 9, 2015 seeking documents related to internal allegations of violations of anti-bribery laws from UTC's aerospace and commercial businesses, including but not limited to Otis businesses in China. UTC continues to cooperate fully with the investigations and provide documents and information related to UTC's aerospace and commercial businesses worldwide. Because the investigations are ongoing, we cannot predict the outcome or the consequences thereof at this time.

Mos Otis FAS Investigation

As previously disclosed, following inspections carried out by the Russian Federal Anti-monopoly Service (FAS) at the offices of Mos Otis and the production of documents by Mos Otis, in October 2014 FAS notified Mos Otis that it had found indications of violations of Russian competition law in the market for maintenance of unified dispatch systems, which remotely monitor elevators and dispatch service technicians in Moscow. Mos Otis is an indirectly owned and controlled joint venture between Otis and the City of Moscow. FAS has not pursued an administrative action against Mos Otis, and the statute of limitations has run with regard to any such potential action related to this matter.

In addition, we are subject to a number of other lawsuits, investigations and claims (some of which involve substantial amounts). For a discussion of contingencies related to certain other legal proceedings, see Note 18 to the Consolidated Financial Statements in our 2017 Annual Report. Except as indicated herein or in Note 18 to the Consolidated Financial Statements in our 2017 Annual Report, we do not believe that these matters will have a material adverse effect upon our competitive position, results of operations, cash flows or financial condition.

A further discussion of government contracts and related investigations, as well as a discussion of our environmental liabilities, can be found under the heading "Other Matters Relating to Our Business as a Whole – Compliance with Environmental and Other Government Regulations" in Item 1, "Business," and in Item 1A, "Risk Factors," in this Form 10-K.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

The Performance Graph and Comparative Stock Data appearing in our 2017 Annual Report, filed as Exhibit 13 to this Form 10-K, containing the following data relating to our common stock: total shareholder return, principal market, quarterly high and low sales prices, approximate number of shareowners and frequency and amount of dividends, are incorporated herein by reference. The information required by Item 5 with respect to securities authorized for issuance under equity compensation plans is incorporated herein by reference to Part III, Item 12 of this Form 10-K.

Issuer Purchases of Equity Securities

The following table provides information about our purchases during the quarter ended December 31, 2017 of equity securities that are registered by us pursuant to Section 12 of the Exchange Act.

2017	Total Number of Shares Purchased (000's)	Average Price Paid per Share	Total Number of Shares Purchased as Part of a Publicly Announced Program (000's)	Approximate Dollar Value of Shares that May Yet Be Purchased Under the Program (dollars in millions)
October 1 - October 31	62	$ 119.23	62	$ 2,309
November 1 - November 30	60	118.71	60	$ 2,302
December 1 - December 31	60	126.10	60	$ 2,294
Total	182	$ 121.34	182	

On October 14, 2015, our Board of Directors authorized a share repurchase program for up to $12 billion of our common stock. At December 31, 2017, the maximum dollar value of shares that may yet be purchased under this program was approximately $2,294 million. Under this program, shares may be purchased on the open market, in privately negotiated transactions, under accelerated share repurchase (ASR) programs and under plans complying with Rules 10b5-1 and 10b-18 under the Securities Exchange Act of 1934, as amended. We may also reacquire shares outside of the program from time to time in connection with the surrender of shares to cover taxes on vesting of restricted stock. No shares were reacquired in transactions outside the program during the quarter ended December 31, 2017.

On September 4, 2017, we announced that we had entered into a merger agreement with Rockwell Collins, under which we agreed to acquire Rockwell Collins. To help manage the cash flow and liquidity impact resulting from the pending acquisition, we have, among other things, suspended share repurchases, excluding activity relating to our employee savings plans. The activity reflected in the table above represents repurchased shares related to our employee savings plans. As we continue to assess the impacts of the TCJA, future opportunities for repatriation of our non-U.S. earnings, and accelerated de-leveraging, we may consider, in addition to investments in our operations, limited additional share repurchases to offset the effects of dilution related to our stock-based compensation programs - see Note 12 to the Consolidated Financial Statements in our 2017 Annual Report.

Item 6. Selected Financial Data

The Five-Year Summary appearing in our 2017 Annual Report, filed as Exhibit 13 to this Form 10-K, is incorporated herein by reference. See "Notes to Consolidated Financial Statements" in our 2017 Annual Report for a description of any accounting changes and acquisitions or dispositions of businesses materially affecting the comparability of the information reflected in the Five-Year Summary.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

The information set forth in the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations" in our 2017 Annual Report, filed as Exhibit 13 to this Form 10-K, is incorporated herein by reference.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

For information concerning market risk sensitive instruments, see discussion under the heading "Market Risk and Risk Management" in "Management's Discussion and Analysis of Financial Condition and Results of Operations" in our 2017 Annual Report, filed as Exhibit 13 to this Form 10-K, and under the headings "Foreign Exchange" and "Derivatives and

Hedging Activity" in Note 1 and "Financial Instruments" in Note 14 to the Consolidated Financial Statements in our 2017 Annual Report, filed as Exhibit 13 to this Form 10-K.

Item 8. Financial Statements and Supplementary Data

The 2017 and 2016 Consolidated Balance Sheet, and other consolidated financial statements for the years ended 2017, 2016 and 2015, together with the report thereon of PricewaterhouseCoopers LLP dated February 8, 2018 in our 2017 Annual Report, filed as Exhibit 13 to this Form 10-K, are incorporated herein by reference. The 2017 and 2016 unaudited Selected Quarterly Financial Data appearing in our 2017 Annual Report, filed as Exhibit 13 to this Form 10-K, is incorporated herein by reference.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

As required by Rule 13a-15 under the Securities Exchange Act of 1934, as amended, we carried out an evaluation under the supervision and with the participation of our management, including the Chairman, President and Chief Executive Officer (CEO), the Executive Vice President & Chief Financial Officer (CFO) and the Corporate Vice President, Controller (Controller), of the effectiveness of the design and operation of our disclosure controls and procedures. There are inherent limitations to the effectiveness of any system of disclosure controls and procedures, including the possibility of human error and the circumvention or overriding of the controls and procedures. Accordingly, even effective disclosure controls and procedures can only provide reasonable assurance of achieving their control objectives. Based upon our evaluation, our CEO, CFO and Controller concluded that our disclosure controls and procedures were effective to provide reasonable assurance that information required to be disclosed by us in the reports that we file or submit under the Securities Exchange Act of 1934, as amended, is recorded, processed, summarized and reported within the time periods specified in the applicable rules and forms, and that it is accumulated and communicated to our management, including our CEO, CFO and Controller, as appropriate, to allow timely decisions regarding required disclosure.

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external reporting purposes in accordance with accounting principles generally accepted in the U.S. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Our management has assessed the effectiveness of our internal control over financial reporting as of December 31, 2017. In making its assessment, management has utilized the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in its 2013 Internal Control – Integrated Framework. Our management has concluded that based on its assessment, our internal control over financial reporting was effective as of December 31, 2017. The effectiveness of our internal control over financial reporting as of December 31, 2017 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in its report which appears in our 2017 Annual Report.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by Item 10 with respect to directors, the Audit Committee of the Board of Directors and audit committee financial experts is incorporated herein by reference to the sections of our Proxy Statement for the 2018 Annual Meeting of Shareowners titled "Election of Directors" (under the subheading "Nominees") and "Corporate Governance" (including under the subheadings "Board Committees," "Audit Committee" and "Governance and Public Policy Committee").

Executive Officers of the Registrant

The following persons are executive officers of United Technologies Corporation:

Name	Title	Other Business Experience Since 1/1/2013	Age as of 2/8/2018
Elizabeth B. Amato	Executive Vice President & Chief Human Resources Officer, United Technologies Corporation (since August 2012)*	Senior Vice President, Human Resources and Organization, United Technologies Corporation	61
Robert J. Bailey	Corporate Vice President, Controller, United Technologies Corporation (since September 2016)	Vice President & Chief Financial Officer, Pratt & Whitney	53
Michael R. Dumais	Executive Vice President, Operations & Strategy, United Technologies Corporation (since January 2017)	Senior Vice President, Strategic Planning, United Technologies Corporation; President, Power, Controls & Sensing Systems, UTC Aerospace Systems	51
Charles D. Gill	Executive Vice President & General Counsel, United Technologies Corporation (since 2007)*	Senior Vice President and General Counsel, United Technologies Corporation	53
David L. Gitlin	President, UTC Aerospace Systems (since January 2015)	President, Aircraft Systems, UTC Aerospace Systems; Senior Vice President, Aircraft Systems, UTC Aerospace Systems	48
Gregory J. Hayes	Chairman (since September 2016), President and Chief Executive Officer, United Technologies Corporation (since November 2014)	Senior Vice President and Chief Financial Officer, United Technologies Corporation	57
Akhil Johri	Executive Vice President & Chief Financial Officer, United Technologies Corporation (since January 2015)*	Senior Vice President and Chief Financial Officer, United Technologies Corporation; Chief Financial Officer, Pall Corporation; Vice President of Finance and Chief Financial Officer of UTC Propulsion & Aerospace Systems	56
Robert F. Leduc	President, Pratt & Whitney (since January 2016)	President, Sikorsky Aircraft; President, Boeing Programs and Space, Hamilton Sundstrand/UTC Aerospace Systems	61
Judith F. Marks	President, Otis Elevator (since October 2017)	Chief Executive Officer, Dresser-Rand (a Siemens company); Chief Executive Officer, Siemens USA; Executive Vice President, Dresser-Rand; President and Chief Executive Officer, Siemens Government Technologies Inc.	54
Robert J. McDonough	President, UTC Climate, Controls & Security (since September 2015)	Chief Operating Officer, Americas, UTC Building & Industrial Systems; Chief Operating Officer, Americas, UTC Climate, Controls & Security; President, UTC Climate, Controls & Security, Americas	58
David R. Whitehouse	Corporate Vice President, Treasurer, United Technologies Corporation (since April 2015)*	Vice President, Treasurer, United Technologies Corporation; Director, Capital Markets, United Technologies Corporation	51

*Certain executive officers' titles changed in November 2015 without any change in his or her responsibilities.

All of the officers serve at the pleasure of the Board of Directors of United Technologies Corporation or the subsidiary designated.

Information concerning Section 16(a) compliance is incorporated herein by reference to the section of our Proxy Statement for the 2018 Annual Meeting of Shareowners titled "Other Important Information" under the heading "Section 16(a) Beneficial Ownership Reporting Compliance." We have adopted a code of ethics that applies to all our directors, officers, employees and representatives. This code is publicly available on our website at http://www.utc.com/How-We-Work/Ethics-And-Compliance/Pages/Default.aspx. Amendments to the code of ethics and any grant of a waiver from a provision of the code requiring disclosure under applicable SEC rules will be disclosed on our website. Our Corporate Governance Guidelines and

the charters of our Board of Directors' Audit Committee, Compensation Committee, Finance Committee, and Governance and Public Policy Committee are available on our website at http://www.utc.com/Who-We-Are/Corporate-Governance/Pages/default.aspx. These materials may also be requested in print free of charge by writing to our Investor Relations Department at United Technologies Corporation, 10 Farm Springs Road, Investor Relations, Farmington, CT 06032.

Item 11. Executive Compensation

The information required by Item 11 is incorporated herein by reference to the sections of our Proxy Statement for the 2018 Annual Meeting of Shareowners titled "Executive Compensation," "Compensation of Directors" and "Report of the Compensation."

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information relating to security ownership of certain beneficial owners and management and the Equity Compensation Plan Information required by Item 12 is incorporated herein by reference to the sections of our Proxy Statement for the 2018 Annual Meeting of Shareowners titled "Share Ownership Information," "Executive Compensation" and "Approval of the UTC 2018 Long Term Incentive Plan."

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required by Item 13 is incorporated herein by reference to the sections of our Proxy Statement for the 2018 Annual Meeting of Shareowners titled "Corporate Governance" (under the subheading "Director Independence") and "Other Important Information" (under the subheading "Transactions with Related Persons").

Item 14. Principal Accounting Fees and Services

The information required by Item 14 is incorporated by reference to the section of our Proxy Statement for the 2018 Annual Meeting of Shareowners titled "Appointment of Independent Auditor for 2018," including the information provided in that section with regard to "Audit Fees," "Audit-Related Fees," "Tax Fees" and "All Other Fees."

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) Financial Statements, Financial Statement Schedules and Exhibits

(1) Financial Statements (incorporated herein by reference to the 2017 Annual Report):

	Page Number in Annual Report
Report of Independent Registered Public Accounting Firm	31
Consolidated Statement of Operations for the three years ended December 31, 2017	32
Consolidated Statement of Comprehensive Income for the three years ended December 31, 2017	33
Consolidated Balance Sheet as of December 31, 2017 and 2016	34
Consolidated Statement of Cash Flows for the three years ended December 31, 2017	35
Consolidated Statement of Changes in Equity for the three years ended December 31, 2017	36
Notes to Consolidated Financial Statements	38
Selected Quarterly Financial Data (Unaudited)	75

(2) Financial Statement Schedule for the three years ended December 31, 2017:

	Page Number in Form 10-K
SCHEDULE I—Report of Independent Registered Public Accounting Firm on Financial Statement Schedule	S-I
SCHEDULE II—Valuation and Qualifying Accounts	S-II

All other schedules are omitted because they are not applicable or the required information is shown in the financial statements or the notes thereto.

(3) Exhibits:

The following list of exhibits includes exhibits submitted with this Form 10-K as filed with the SEC and those incorporated by reference to other filings.

Exhibit Number	
2.1	Agreement and Plan of Merger, dated as of September 4, 2017, by and among United Technologies Corporation, Riveter Merger Sub Corp. and Rockwell Collins, Inc., incorporated by reference to UTC's Current Report on Form 8-K (Commission file number 1-812) filed with the SEC on September 6, 2017.
3(i)	Restated Certificate of Incorporation, restated as of April 25, 2016, incorporated by reference to Exhibit 3.1 to UTC's Current Report on Form 8-K (Commission file number 1-812) filed with the SEC on April 25, 2016.
3(ii)	Bylaws as amended and restated effective October 11, 2017, incorporated by reference to Exhibit 3.2 to UTC's Current Report on Form 8-K (Commission file number 1-812) filed with the SEC on October 13, 2017.
4.1	Amended and Restated Indenture, dated as of May 1, 2001, between UTC and The Bank of New York, as trustee, incorporated by reference to Exhibit 4(a) to UTC's Registration Statement on Form S-3 (Commission file number 333-60276) filed with the SEC on May 4, 2001. UTC hereby agrees to furnish to the Commission upon request a copy of each other instrument defining the rights of holders of long-term debt of UTC and its consolidated subsidiaries and any unconsolidated subsidiaries.
10.1	United Technologies Corporation Annual Executive Incentive Compensation Plan, incorporated by reference to Exhibit A to UTC's Proxy Statement for the 1975 Annual Meeting of Shareowners, Amendment No. 1 thereto, effective January 1, 1995, incorporated by reference to Exhibit 10.2 to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 1995, and Amendment No. 2 thereto, effective January 1, 2009, incorporated by reference to Exhibit 10.1 to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2008.
10.2	United Technologies Corporation Pension Preservation Plan, as amended and restated, effective December 31, 2009, incorporated by reference to Exhibit 10.3 to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2009.
10.3	United Technologies Corporation Senior Executive Severance Plan, incorporated by reference to Exhibit 10(vi) to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 1992, as amended by Amendment thereto, effective December 10, 2003, incorporated by reference to Exhibit 10.4 of UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2003, and Amendment thereto, effective June 11, 2008, incorporated by reference to Exhibit 10.4 of UTC's Quarterly Report on Form 10-Q (Commission file number 1-812) for the quarterly period ended June 30, 2008, and Amendment thereto, effective February 10, 2011, incorporated by reference to Exhibit 10.4 to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2010.
10.4	United Technologies Corporation Deferred Compensation Plan, as amended and restated, effective January 1, 2005, incorporated by reference to Exhibit 10.5 of UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2008.
10.5	United Technologies Corporation Long Term Incentive Plan, incorporated by reference to Exhibit 10.11 to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 1989, as amended by Amendment No. 1, incorporated by reference to Exhibit 10.11 to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 1995, and Amendment No. 2, incorporated by reference to Exhibit 10.6 to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2003.
10.6	United Technologies Corporation Executive Leadership Group Program, as amended and restated, effective October 15, 2013, incorporated by reference to Exhibit 10.11 to UTC's Quarterly Report on Form 10-Q (Commission file number 1-812) for the quarterly period ended September 30, 2013.
10.7	Schedule of Terms for Restricted Share Unit Retention Awards relating to the United Technologies Corporation Executive Leadership Group Program (referred to above in Exhibit 10.6), incorporated by reference to Exhibit 10.12 to UTC's Quarterly Report on Form 10-Q (Commission file number 1-812) for the quarterly period ended September 30, 2013.

10.8	Form of Award Agreement for Restricted Share Unit Retention Awards relating to the United Technologies Corporation Executive Leadership Group Program (referred to above in Exhibit 10.6), incorporated by reference to Exhibit 10.13 to UTC's Quarterly Report on Form 10-Q (Commission file number 1-812) for the quarterly period ended September 30, 2013.
10.9	United Technologies Corporation Board of Directors Deferred Stock Unit Plan, as Amended and Restated, effective as of April 24, 2017.
10.10	Retainer Payment Election Form for United Technologies Corporation Board of Directors Deferred Stock Unit Plan (referred to above in Exhibit 10.9).
10.11	Form of Deferred Restricted Stock Unit Award relating to the United Technologies Corporation Board of Directors Deferred Stock Unit Plan (referred to above in Exhibit 10.9).
10.12	United Technologies Corporation Long-Term Incentive Plan, as amended and restated effective April 28, 2014, incorporated by reference to Exhibit 10.1 to UTC's Current Report on Form 8-K (Commission file number 1-812) filed with the SEC on May 2, 2014, as further amended by Amendment No. 1, effective as of February 5, 2016, incorporated by reference to Exhibit 10.12 to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2015.
10.13	Schedule of Terms for restricted stock awards relating to the United Technologies Corporation Long-Term Incentive Plan (referred to above in Exhibit 10.12) (Rev. January 2016), incorporated by reference to Exhibit 10.13 to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2015.
10.14	Schedule of Terms for non-qualified stock option awards relating to the United Technologies Corporation Long-Term Incentive Plan (referred to above in Exhibit 10.12) (Rev. January 2016), incorporated by reference to Exhibit 10.15 to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2015.
10.15	Form of Award Agreement for non-qualified stock option awards relating to the United Technologies Corporation Long-Term Incentive Plan (referred to above in Exhibit 10.12).
10.16	Schedule of Terms for performance share unit awards relating to the United Technologies Corporation Long-Term Incentive Plan (referred to above in Exhibit 10.12) (Rev. January 2016), incorporated by reference to Exhibit 10.17 to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2015.
10.17	Schedule of Terms for stock appreciation rights awards relating to the United Technologies Corporation 2005 Long-Term Incentive Plan (referred to above in Exhibit 10.12) (Rev. January 2016), incorporated by reference to Exhibit 10.18 to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2015.
10.18	Form of Award Agreement for restricted stock unit, performance share unit and stock appreciation rights awards relating to the United Technologies Corporation Long-Term Incentive Plan (referred to above in Exhibit 10.12).
10.19	United Technologies Corporation LTIP Performance Share Unit Deferral Plan, relating to the Long-Term Incentive Plan (referred to above in Exhibit 10.12), incorporated by reference to Exhibit 10.36 of UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2008.
10.20	United Technologies Corporation International Deferred Compensation Replacement Plan, effective January 1, 2005, incorporated by reference to Exhibit 10.35 of UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2008.
10.21	United Technologies Corporation Company Automatic Excess Plan, effective January 1, 2010, incorporated by reference to Exhibit 10.30 to UTC's Annual Report on Form 10-K (Commission file number 1-812) for the fiscal year ended December 31, 2009.
11	Statement Re: Computation of Per Share Earnings.*
12	Statement Re: Computation of Ratios.*
13	Excerpts from UTC's 2017 Annual Report to Shareowners for the year ended December 31, 2017.*
14	Code of Ethics. The UTC Code of Ethics may be accessed via UTC's website at http://www.utc.com/How-We-Work/Ethics-And-Compliance/Pages/Default.aspx.
21	Subsidiaries of the Registrant.*
23	Consent of PricewaterhouseCoopers LLP.*

24	Powers of Attorney of Lloyd J. Austin III, Diane M. Bryant, John V. Faraci, Jean-Pierre Garnier, Edward A. Kangas, Ellen J. Kullman, Marshall O. Larsen, Harold W. McGraw III, Margaret L. O'Sullivan, Fredric G. Reynolds, Brian C. Rogers, and Christine Todd Whitman.*
31.1	Rule 13a-14(a)/15d-14(a) Certification.*
31.2	Rule 13a-14(a)/15d-14(a) Certification.*
31.3	Rule 13a-14(a)/15d-14(a) Certification.*
32	Section 1350 Certifications.*
101.INS	XBRL Instance Document.* (File name: utx-20171231.xml)
101.SCH	XBRL Taxonomy Extension Schema Document.* (File name: utx-20171231.xsd)
101.CAL	XBRL Taxonomy Calculation Linkbase Document.* (File name: utx-20171231_cal.xml)
101.DEF	XBRL Taxonomy Definition Linkbase Document.* File name: : utx-20171231_def.xml)
101.LAB	XBRL Taxonomy Label Linkbase Document.* (File name: utx-20171231_lab.xml)
101.PRE	XBRL Taxonomy Presentation Linkbase Document.* (File name: utx-20171231_pre.xml)

Notes to Exhibits List:

* Submitted electronically herewith.

Exhibits 10.1 through 10.23 are contracts, arrangements or compensatory plans filed as exhibits pursuant to Item 15(b) of the requirements for Form 10-K reports.

Attached as Exhibit 101 to this report are the following formatted in XBRL (Extensible Business Reporting Language): (i) Consolidated Statement of Operations for the three years ended December 31, 2017, (ii) Consolidated Statement of Comprehensive Income for the three years ended December 31, 2017, (iii) Consolidated Balance Sheet as of December 31, 2017 and 2016, (iv) Consolidated Statement of Cash Flows for the three years ended December 31, 2017, (v) Consolidated Statement of Changes in Equity for the three years ended December 31, 2017, (vi) Notes to Consolidated Financial Statements, and (vii) Financial Schedule of Valuation and Qualifying Accounts.

Table of Contents

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

UNITED TECHNOLOGIES CORPORATION
(Registrant)

By: /s/ AKHIL JOHRI

Akhil Johri

Executive Vice President & Chief Financial Officer

By: /s/ ROBERT J. BAILEY

Robert J. Bailey

Corporate Vice President, Controller

Date: February 8, 2018

Table of Contents

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ GREGORY J. HAYES **(Gregory J. Hayes)**	Director, Chairman, President and Chief Executive Officer (Principal Executive Officer)	February 8, 2018
/s/ AKHIL JOHRI **(Akhil Johri)**	Executive Vice President & Chief Financial Officer (Principal Financial Officer)	February 8, 2018
/s/ ROBERT J. BAILEY **(Robert J. Bailey)**	Corporate Vice President, Controller (Principal Accounting Officer)	February 8, 2018
/s/ LLOYD J. AUSTIN III * **(Lloyd J. Austin III)**	Director	
/s/ DIANE M. BRYANT * **(Diane M. Bryant)**	Director	
/s/ JOHN V. FARACI * **(John V. Faraci)**	Director	
/s/ JEAN-PIERRE GARNIER * **(Jean-Pierre Garnier)**	Director	
/s/ EDWARD A. KANGAS * **(Edward A. Kangas)**	Director	
/s/ ELLEN J. KULLMAN * **(Ellen J. Kullman)**	Director	
/s/ MARSHALL O. LARSEN * **(Marshall O. Larsen)**	Director	
/s/ HAROLD W. MCGRAW III * **(Harold W. McGraw III)**	Director	
/s/ MARGARET L. O'SULLIVAN * **(Margaret L. O'Sullivan)**	Director	
/s/ FREDRIC G. REYNOLDS * **(Fredric G. Reynolds)**	Director	
/s/ BRIAN C. ROGERS * **(Brian C. Rogers)**	Director	
/s/ CHRISTINE TODD WHITMAN * **(Christine Todd Whitman)**	Director	

*By: /s/ CHARLES D. GILL

Charles D. Gill
Executive Vice President &
General Counsel, as Attorney-in-Fact

Date: February 8, 2018

Table of Contents

SCHEDULE I

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM ON

FINANCIAL STATEMENT SCHEDULE

To the Shareowners and Board of Directors
of United Technologies Corporation:

Our audits of the consolidated financial statements referred to in our report dated February 8, 2018 appearing in the 2017 Annual Report to Shareowners of United Technologies Corporation (which report and consolidated financial statements are incorporated by reference in this Annual Report on Form 10-K) also included an audit of the financial statement schedule listed in Item 15(a)(2) of this Form 10-K. In our opinion, this financial statement schedule presents fairly, in all material respects, the information set forth therein when read in conjunction with the related consolidated financial statements.

/s/ PricewaterhouseCoopers LLP

Hartford, Connecticut
February 8, 2018

Table of Contents

SCHEDULE II

UNITED TECHNOLOGIES CORPORATION AND SUBSIDIARIES
Valuation and Qualifying Accounts
Three years ended December 31, 2017
(Millions of Dollars)

Allowances for Doubtful Accounts and Other Customer Financing Activity:		
Balance, December 31, 2014	$	494
Provision charged to income		137
Doubtful accounts written off (net)		(59)
Other adjustments		(19)
Balance, December 31, 2015		553
Provision charged to income		64
Doubtful accounts written off (net)		(105)
Other adjustments		(45)
Balance, December 31, 2016		467
Provision charged to income		**88**
Doubtful accounts written off (net)		**(82)**
Other adjustments		**(17)**
Balance, December 31, 2017	**$**	**456**
Future Income Tax Benefits—Valuation allowance:		
Balance, December 31, 2014	$	612
Additions charged to income tax expense		42
Additions charged to goodwill, due to acquisitions		7
Reductions credited to income tax expense		(41)
Other adjustments		(29)
Balance, December 31, 2015		591
Additions charged to income tax expense		32
Reductions credited to income tax expense		(61)
Other adjustments		(17)
Balance, December 31, 2016		545
Additions charged to income tax expense		**45**
Reductions credited to income tax expense		**(29)**
Other adjustments		**21**
Balance, December 31, 2017	**$**	**582**

EX-13 4 a2017-12x3110xkexhibit13.htm EXCERPTS FROM UTCS 2017 ANNUAL REPORT TO SHAREOWNERS FOR THE YEAR ENDED DECEMBER

Exhibit 13

Five-Year Summary

(dollars in millions, except per share amounts)	**2017**	2016	2015	2014	2013
For The Year					
Net sales	**$ 59,837**	$ 57,244	$ 56,098	$ 57,900	$ 56,600
Research and development	**2,387**	2,337	2,279	2,475	2,342
Restructuring costs	**253**	290	396	354	431
Net income from continuing operations [1]	**4,920**	5,436	4,356	6,468	5,655
Net income from continuing operations attributable to common shareowners [1]	**4,552**	5,065	3,996	6,066	5,265
Basic earnings per share—Net income from continuing operations attributable to common shareowners	**5.76**	6.19	4.58	6.75	5.84
Diluted earnings per share—Net income from continuing operations attributable to common shareowners	**5.70**	6.13	4.53	6.65	5.75
Cash dividends per common share	**2.72**	2.62	2.56	2.36	2.20
Average number of shares of Common Stock outstanding:					
Basic	**790**	818	873	898	901
Diluted	**799**	826	883	912	915
Cash flows provided by operating activities of continuing operations	**5,631**	6,412	6,755	6,979	7,341
Capital expenditures [2]	**2,014**	1,699	1,652	1,594	1,569
Acquisitions, including debt assumed	**231**	712	556	530	151
Repurchases of Common Stock [3]	**1,453**	2,254	10,000	1,500	1,200
Dividends paid on Common Stock (excluding ESOP)	**2,074**	2,069	2,184	2,048	1,908
At Year End					
Working capital [2,4]	**$ 8,467**	$ 6,644	$ 4,088	$ 5,921	$ 5,733
Total assets [2]	**96,920**	89,706	87,484	86,338	85,029
Long-term debt, including current portion [2,5]	**27,093**	23,300	19,499	19,575	19,744
Total debt [2,5]	**27,485**	23,901	20,425	19,701	20,132
Total debt to total capitalization [5]	**47%**	45%	41%	38%	38%
Total equity [5,6]	**31,421**	29,169	28,844	32,564	33,219
Number of employees [7]	**204,700**	201,600	197,200	211,500	212,400

Note 1 2017 amounts include unfavorable tax charges of approximately $690 million related to U.S. tax reform legislation enacted in December, 2017, commonly referred to as the Tax Cuts and Jobs Act of 2017 (TCJA), and a $196 million pre-tax charge resulting from customer contract matters, partially offset by pre-tax gains of approximately $500 million on sales of available for sale securities. 2016 amounts include a $423 million pre-tax pension settlement charge resulting from defined benefit plan de-risking actions. 2015 amounts include pre-tax charges of: $867 million as a result of a settlement with the Canadian government, $295 million from customer contract negotiations at UTC Aerospace Systems, and $237 million related to pending and future asbestos claims.

Note 2 Excludes assets and liabilities of discontinued operations held for sale, for all periods presented.

Note 3 In connection with the agreement to merge with Rockwell Collins announced on September 4, 2017, we have suspended share repurchases, excluding activity relating to our employee savings plans. As we continue to assess the impacts of the TCJA, future opportunities for repatriation of our non-U.S. earnings, additional investments in our operations and accelerated de-leveraging, we may consider limited additional share repurchases to offset the effects of dilution related to our stock-based compensation programs. Share repurchases in 2015 include share repurchases under accelerated repurchase agreements of $2.6 billion in the first quarter of 2015 and $6.0 billion in the fourth quarter of 2015.

Note 4 Working capital in 2015 includes approximately $2.4 billion of taxes payable related to the gain on the sale of Sikorsky, which were paid in 2016. As compared with 2014, 2015 working capital also reflects the reclassification of current deferred tax assets and liabilities to non-current assets and liabilities in connection with the adoption of Accounting Standards Update 2015-17.

Note 5 The increase in the 2017 and 2016 debt to total capitalization ratio primarily reflects additional borrowings to fund share repurchases, 2017 discretionary pension contributions, and for general corporate purposes.

Note 6 The decrease in total equity in 2015, as compared with 2014, reflects the sale of Sikorsky and the share repurchase program. The decrease in total equity in 2014, as compared with 2013, reflects unrealized losses of approximately $2.9 billion, net of taxes, associated with the effect of market conditions on our pension plans.

Note 7 The decrease in employees in 2015, as compared with 2014, primarily reflects the 2015 divestiture of Sikorsky.

Management's Discussion and Analysis of Financial Condition and Results of Operations

BUSINESS OVERVIEW

We are a global provider of high technology products and services to the building systems and aerospace industries. Our operations for the periods presented herein are classified into four principal business segments: Otis, UTC Climate, Controls & Security, Pratt & Whitney, and UTC Aerospace Systems. Otis and UTC Climate, Controls & Security are referred to as the "commercial businesses," while Pratt & Whitney and UTC Aerospace Systems are referred to as the "aerospace businesses." On November 6, 2015, we completed the sale of the Sikorsky Aircraft business (Sikorsky) to Lockheed Martin Corp. for approximately $9.1 billion in cash. The results of operations and the related cash flows of Sikorsky have been reclassified to Discontinued Operations in our Consolidated Statements of Operations and Cash Flows for all periods presented.

The commercial businesses generally serve customers in the worldwide commercial and residential property industries, with UTC Climate, Controls & Security also serving customers in the commercial and transport refrigeration industries. The aerospace businesses serve commercial and government aerospace customers in both the original equipment and aftermarket parts and services markets. Our consolidated net sales were derived from the commercial and aerospace businesses as follows:

	2017	2016	2015
Commercial and industrial	**50%**	50%	52%
Military aerospace and space	**13%**	12%	12%
Commercial aerospace	**37%**	38%	36%
	100%	100%	100%

Our consolidated net sales were derived from original equipment manufacturing (OEM) and aftermarket parts and services as follows:

	2017	2016	2015
OEM	**53%**	55%	56%
Aftermarket parts and services	**47%**	45%	44%
	100%	100%	100%

Our worldwide operations can be affected by industrial, economic and political factors on both a regional and global level. To limit the impact of any one industry or the economy of any single country on our consolidated operating results, our strategy has been, and continues to be, the maintenance of a balanced and diversified portfolio of businesses. Our operations include original equipment manufacturing (OEM) and extensive related aftermarket parts and services in both our commercial and aerospace businesses. Our business mix also reflects the combination of shorter cycles at UTC Climate, Controls & Security and in our commercial aerospace spares businesses, and longer cycles at Otis and in our aerospace OEM and aftermarket maintenance businesses. Our customers include companies in both the public and private sectors, and our businesses reflect an extensive geographic diversification that has evolved with continued globalization. The composition of net sales from outside the U.S., including U.S. export sales, as a percentage of total segment sales, is as follows:

(dollars in millions)	**2017**	2016	2015	**2017**	2016	2015
Europe	**$ 11,879**	$ 11,151	$ 10,945	**20%**	19%	19%
Asia Pacific	**8,770**	8,260	8,425	**14%**	14%	15%
Other Non-U.S.	**5,262**	5,479	5,584	**9%**	9%	10%
U.S. Exports	**11,124**	10,827	9,741	**18%**	19%	17%
International segment sales	**$ 37,035**	$ 35,717	$ 34,695	**61%**	61%	61%

As part of our growth strategy, we invest in businesses in certain countries that carry high levels of currency, political and/or economic risk, such as Argentina, Brazil, China, India, Indonesia, Mexico, Poland, Russia, South Africa, Ukraine and countries in the Middle East. As of December 31, 2017, the net assets in any one of these countries did not exceed 7% of consolidated shareowners' equity.

In a referendum on June 23, 2016, voters in the United Kingdom (the U.K.) voted in favor of the U.K.'s exiting the European Union (the EU). The manner in which the U.K. decides to exit the EU could have negative macroeconomic consequences. Our 2017 full year sales in the U.K. were approximately $3 billion and represented less than 5% of our overall sales, and we do not believe the U.K.'s withdrawal from the EU will significantly impact our businesses in the near term.

Organic sales growth was 4% in 2017, reflecting growth across all segments driven by:

- higher commercial aftermarket and military sales at Pratt & Whitney
- higher North America residential heating, ventilating and air conditioning (HVAC), global commercial HVAC, and commercial refrigeration sales at UTC Climate, Controls & Security
- higher commercial aftermarket sales at UTC Aerospace Systems
- higher service sales in North America and Asia and higher new equipment sales in North America and in Europe, partially offset by lower new equipment sales in China at Otis

We expect organic sales growth in 2018 to be 4% to 6%, with foreign exchange expected to have a favorable impact of approximately 1%. We continue to invest in new platforms and new markets to position the Company for long-term growth, while remaining focused on innovation, structural cost reduction, disciplined capital allocation and the execution of customer and shareowner commitments.

As discussed below in "Results of Operations," operating profit in both 2017 and 2016 includes the impact from activities that are not expected to recur often or that are not otherwise reflective of the underlying operations, such as charges related to the strategic de-risking of our defined benefit pension plans, the unfavorable impact of contract matters with customers, the beneficial impact of net gains from sales of investments, and other significant non-recurring and non-operational items. Our earnings growth strategy contemplates earnings from organic sales growth, including growth from new product development and product improvements, structural cost reductions, operational improvements, and incremental earnings from our investments in acquisitions.

Our investments in businesses in 2017 and 2016 totaled $231 million and $712 million (including debt assumed of $2 million), respectively. Acquisitions completed in 2017 include a number of small acquisitions primarily in our commercial businesses. Our investments in businesses in 2016 included the acquisition of a majority interest in an Italian-based heating products and services company by UTC Climate, Controls & Security, the acquisition of a Japanese services company by Otis and a number of small acquisitions primarily in our commercial businesses.

Both acquisition and restructuring costs associated with business combinations are expensed as incurred. Depending on the nature and level of acquisition activity, earnings could be adversely impacted due to acquisition and restructuring actions initiated in connection with the integration of businesses acquired. For additional discussion of acquisitions and restructuring, see "Liquidity and Financial Condition," "Restructuring Costs" and Notes 2 and 13 to the Consolidated Financial Statements.

On September 4, 2017, we announced that we had entered into a merger agreement with Rockwell Collins, under which we agreed to acquire Rockwell Collins. Under the terms of the merger agreement, each Rockwell Collins shareowner will receive $93.33 per share in cash and a fraction of a share of UTC common stock equal to the quotient obtained by dividing $46.67 by the average of the volume-weighted average price per share of UTC common stock on the NYSE on each of the 20 consecutive trading days ending with the trading day immediately prior to the closing date (the “UTC Stock Price”), subject to adjustment based on a two-way collar mechanism as described below (the “Stock Consideration”). The cash and UTC stock payable in exchange for each such share of Rockwell Collins common stock are collectively the “Merger Consideration.” The fraction of a share of UTC common stock into which each such share of Rockwell Collins common stock will be converted is the “Exchange Ratio.” The Exchange Ratio will be determined based upon the UTC Stock Price. If the UTC Stock Price is greater than $107.01 but less than $124.37, the Exchange Ratio will be equal to the quotient of (i) $46.67 divided by (ii) the UTC Stock Price, which, in each case, will result in the Stock Consideration having a value equal to $46.67. If the UTC Stock Price is less than or equal to $107.01 or greater than or equal to $124.37, then a two-way collar mechanism will apply, pursuant to which, (x) if the UTC Stock Price is greater than or equal to $124.37, the Exchange Ratio will be fixed at 0.37525 and the value of the Stock Consideration will be greater than $46.67, and (y) if the UTC Stock Price is less than or equal to $107.01, the Exchange Ratio will be fixed at 0.43613 and the value of the Stock Consideration will be less than $46.67. On January 11, 2018, the merger was approved by Rockwell Collins' shareowners. We currently expect that the merger will be completed in the third quarter of 2018, subject to customary closing conditions, including the receipt of required regulatory approvals.

We anticipate that approximately $15 billion will be required to pay the aggregate cash portion of the Merger Consideration. We expect to fund the cash portion of the Merger Consideration through debt issuances and cash on hand. We have entered into a $6.5 billion 364-day unsecured bridge loan credit agreement that would be funded only to the extent certain of the anticipated debt issuances are not completed prior to the completion of the merger. Additionally, we expect to assume approximately $7 billion of Rockwell Collins' outstanding debt upon completion of the merger. To help manage the cash flow and liquidity resulting from the proposed acquisition, we have suspended share repurchases, excluding activity relating to our employee savings plans. On December 22, 2017 Public Law 115-97 *“An Act to Provide for Reconciliation Pursuant to Titles II and V of the Concurrent Resolution on the Budget for Fiscal Year 2018”* was enacted. This law is commonly referred to as the Tax Cuts and Jobs Act of 2017 (TCJA). As we continue to assess the impacts of the TCJA, future opportunities for repatriation

of our non-U.S. earnings, and accelerated de-leveraging, we may consider, in addition to investments in out operations, limited additional share repurchases to offset the effects of dilution related to our stock-based compensation programs - see Note 12.

Discontinued Operations

On November 6, 2015, we completed the sale of Sikorsky to Lockheed Martin Corp. for approximately $9.1 billion in cash. As noted above, the results of operations and the related cash flows of Sikorsky have been reclassified to Discontinued Operations in our Consolidated Statements of Operations, Comprehensive Income and Cash Flows for all periods presented. Proceeds from the sale were used to fund $6 billion of share repurchases through accelerated share repurchase (ASR) agreements entered into on November 11, 2015. In connection with the sale of Sikorsky, we made tax payments of approximately $2.5 billion in 2016.

Net income from discontinued operations attributable to common shareowners for the year ended December 31, 2016 reflects the final purchase price adjustment for the sale of Sikorsky, and the net effects of filing Sikorsky's 2015 tax returns. Net income from discontinued operations attributable to common shareowners for the year ended December 31, 2015 includes the gain on the sale of Sikorsky, net of tax expense, of $3.4 billion and includes $122 million of costs incurred in connection with the sale. Net income from discontinued operations attributable to common shareowners also includes income from Sikorsky's operations, net of tax expense, of $169 million, including pension curtailment charges associated with our domestic pension plans.

RESULTS OF OPERATIONS

Net Sales

(dollars in millions)	**2017**	2016	2015
Net sales	**$ 59,837**	$ 57,244	$ 56,098
Percentage change year-over-year	**5%**	2%	(3)%

The factors contributing to the total percentage change year-over-year in total net sales are as follows:

	2017	2016
Organic volume	**4%**	2 %
Foreign currency translation	**—**	(1)%
Acquisitions and divestitures, net	**1%**	1 %
Total % Change	**5%**	2 %

All four segments experienced organic sales growth during 2017. Pratt & Whitney sales were up 9% organically, reflecting higher commercial aftermarket sales and higher military sales, partially offset by lower commercial engine sales. Organic sales at UTC Climate, Controls & Security increased 4%, driven by growth in North America residential HVAC, global commercial HVAC, and commercial refrigeration sales. Organic sales at UTC Aerospace Systems grew 2%, primarily driven by an increase in commercial aerospace aftermarket sales partially offset by lower commercial aerospace OEM sales. Otis sales increased 2% organically, reflecting higher service sales in North America and Asia, and higher new equipment sales growth in North America and Europe, partially offset by a decline in China.

Three of our four segments experienced organic sales growth during 2016, as organic sales growth at Pratt & Whitney (6%), UTC Aerospace Systems (2%), and Otis (1%), was partially offset by a decline at UTC Climate, Controls & Security (1%). The organic sales growth at Pratt & Whitney primarily reflects higher commercial aftermarket sales. The organic sales growth at UTC Aerospace Systems was primarily due to an increase in commercial OEM and aftermarket sales volume. The organic sales growth at Otis was primarily driven by higher service sales in the Americas and Asia and higher new equipment sales in North America partially offset by lower new equipment sales in China. The decline in sales at UTC Climate, Controls & Security was primarily driven by declines in commercial HVAC sales in the Middle East and lower fire products and transport refrigeration sales, partially offset by growth in North America residential HVAC. The sales increase from net acquisitions and divestitures was primarily a result of sales from newly acquired businesses at UTC Climate, Controls & Security.

Cost of Products and Services Sold

(dollars in millions)	**2017**	2016	2015
Total cost of products and services sold	**$ 43,953**	$ 41,460	$ 40,431
Percentage change year-over-year	**6%**	3%	(1)%

The factors contributing to the total percentage change year-over-year in total cost of products and services sold are as follows:

	2017	2016
Organic volume	**6%**	3 %
Foreign currency translation	—	(1)%
Acquisitions and divestitures, net	—	1 %
Total % Change	**6%**	3 %

The organic increase in total cost of products and services sold in 2017 was primarily driven by the organic sales increases noted above and higher negative engine margin at Pratt & Whitney due to unfavorable mix and ramp-related costs.

The organic increase in total cost of products and services sold in 2016 was driven by the organic sales increase noted above, as well as unfavorable year-over-year contract performance, contract termination benefits and settlements at Pratt & Whitney, along with unfavorable commercial OEM mix at UTC Aerospace Systems. This adverse impact was partially offset by the impact of lower pension expense across all of the segments and lower commodity costs at UTC Climate, Controls & Security.

Gross Margin

(dollars in millions)	2017	2016	2015
Gross margin	**$ 15,884**	$ 15,784	$ 15,667
Percentage of net sales	**26.5%**	27.6%	27.9%

The 110 basis point decrease in gross margin as a percentage of sales in 2017, as compared with 2016, primarily reflects lower gross margin at Pratt & Whitney (50 basis points) driven by higher negative engine margin due to unfavorable mix and ramp related costs; a decline in gross margin at Otis (40 basis points) driven by unfavorable price and mix, primarily in China; and a decline in gross margin at UTC Climate, Controls & Security (40 basis points) reflecting adverse price and mix and the unfavorable impact of a product recall program. These decreases were partially offset by higher gross margin at UTC Aerospace Systems (10 basis points) driven by higher commercial aftermarket volumes.

The 30 basis point decrease in gross margin as a percentage of sales in 2016, as compared with 2015, is primarily due to lower gross margin at Pratt & Whitney (60 basis points) driven by unfavorable year-over-year contract performance and contract termination benefits and settlements, and an increase in negative engine margin, partially offset by an increase in gross margin at UTC Aerospace Systems (30 basis points) primarily attributable to the absence of the prior year unfavorable impact of significant customer contract negotiations. Lower gross margin at Otis resulting from unfavorable pricing, was offset by higher gross margin at UTC Climate, Controls & Security primarily driven by lower commodities cost.

Research and Development

(dollars in millions)	2017	2016	2015
Company-funded	**$ 2,387**	$ 2,337	$ 2,279
Percentage of net sales	**4.0%**	4.1%	4.1%
Customer-funded	**$ 1,479**	$ 1,389	$ 1,589
Percentage of net sales	**2.5%**	2.4%	2.8%

Research and development spending is subject to the variable nature of program development schedules and, therefore, year-over-year variations in spending levels are expected. The majority of the company-funded spending is incurred by the aerospace businesses and relates largely to the next generation engine product family at Pratt & Whitney and the Embraer E-Jet E2, Bombardier Global 7000/8000, Mitsubishi Regional Jet, Airbus A320neo and Airbus A350 programs at UTC Aerospace Systems. In 2017, company-funded research and development increased 2% driven by continued investment in new products at UTC Climate, Controls & Security (1%) and increased spending on strategic initiatives at Otis (1%). Customer-funded research and development increased 6% primarily driven by increased spending on U.S. Government development programs at Pratt & Whitney, partially offset by lower spend within UTC Aerospace Systems related to several commercial and military aerospace programs.

The year-over-year increase in company-funded research and development (3%) in 2016, compared with 2015, is primarily driven by higher research and development costs within Pratt & Whitney (2%) as development programs progress towards certification, and higher spending at Otis (2%). These increases were partially offset by lower spend within UTC

Aerospace Systems related to several commercial aerospace programs (1%). Customer-funded research and development declined (13%) due primarily to lower spending on U.S. Government and commercial engine programs at Pratt & Whitney (4%), and lower spend within UTC Aerospace Systems related to several commercial and military aerospace programs (9%).

Selling, General and Administrative

(dollars in millions)	2017	2016	2015
Selling, general and administrative	**$ 6,183**	$ 6,060	$ 5,886
Percentage of net sales	**10.3%**	10.6%	10.5%

Selling, general and administrative expenses increased 2% in 2017 and reflect an increase in expenses related to recent acquisitions (1%) and the impact of higher restructuring expenses (1%). The increase also reflects higher expenses at Pratt & Whitney (2%) driven by increased headcount and employee compensation related expenses; higher expenses at Otis (1%) resulting from higher labor and information technology costs; and higher expenses at UTC Aerospace Systems (1%) and UTC Climate, Controls & Security (1%) primarily driven by employee compensation related expenses. These increases were offset by the absence of a prior year pension settlement charge resulting from pension de-risking actions (6%).

Selling, general and administrative expenses increased 3% in 2016, compared with 2015, largely driven by a pension settlement charge resulting from pension de-risking actions (6%) and increased selling, general and administrative expenses at Otis (2%) reflecting higher labor and information technology costs. These increases were partially offset by lower spend at UTC Aerospace Systems (2%) and at UTC Climate, Controls & Security (1%) primarily driven by lower pension expense. Pratt & Whitney selling, general and administrative expenses were flat relative to the prior year as lower pension expense was largely offset by higher employee compensation related expenses driven by increased hiring.

Other Income, Net

(dollars in millions)	2017	2016	2015
Other income (expense), net	**$ 1,358**	$ 785	$ (211)

Other income (expense), net includes the operational impact of equity earnings in unconsolidated entities, royalty income, foreign exchange gains and losses as well as other ongoing and infrequently occurring items. The year-over-year increase in other income, net ($573 million, 73%) in 2017 compared with 2016 is primarily driven by $379 million of gains resulting from UTC Climate, Controls & Security's sale of its investments in Watsco, Inc. (48%), as well as higher year-over year foreign exchange gains and losses (9%), and higher year-over-year gains on the sale of securities (8%) across the UTC businesses.

Other income (expense), net increased $996 million in 2016, compared with 2015, largely driven by the absence of a 2015 charge related to a Canadian government settlement ($867 million) and the absence of a 2015 charge for pending and future asbestos claims ($237 million), partially offset by the absence of a 2015 gain on re-measurement to fair value of a previously held equity interest in UTC Climate, Controls & Security joint venture investments ($126 million).

See Note 8 "Accrued Liabilities" of our Consolidated Financial Statements for further discussion of the charge related to the 2015 Canadian government settlement and Note 18 "Contingent Liabilities" for further discussion of the 2015 charge for pending and future asbestos claims.

Interest Expense, Net

(dollars in millions)	2017	2016	2015
Interest expense	**$ 1,017**	$ 1,161	$ 945
Interest income	**(108)**	(122)	(121)
Interest expense, net	**$ 909**	$ 1,039	$ 824
Average interest expense rate - average outstanding borrowings during the year:			
Short-term borrowings	**1.1%**	1.3%	0.6%
Total debt	**3.5%**	4.1%	4.1%
Average interest expense rate - outstanding borrowings as of December 31:			
Short-term borrowings	**2.3%**	0.6%	0.8%
Total debt	**3.5%**	3.7%	4.4%

The decrease in interest expense during 2017, as compared with 2016, was primarily driven by the absence of a net extinguishment loss of approximately $164 million related to the December 1, 2016 redemption of certain outstanding notes. The unfavorable impact of the May 4, 2017 and November 1, 2016 issuance of notes representing $8 billion in aggregate principal was largely offset by the favorable impact of the significantly lower interest rates on these notes as compared to the 5.375% and 6.125% notes redeemed on December 1, 2016, representing $2.25 billion in aggregate principal, and the favorable impact of these early redemptions and the repayment at maturity of our 1.800% notes due 2017, representing $1.5 billion in aggregate principal. The average maturity of our long-term debt at December 31, 2017 is approximately 11 years. See Note 9 to our Consolidated Financial Statements for further discussion of our borrowing activity.

Interest expense was higher in 2016, as compared with 2015, primarily driven by a net extinguishment loss of approximately $164 million related to the December 1, 2016 redemption of certain outstanding notes. See Note 9 to our Consolidated Financial Statements for further discussion. The increase also includes additional interest expense on higher average outstanding long-term debt, primarily driven by debt issued in 2016, partially offset by lower average commercial paper balances and related interest expense.

The decrease in the weighted-average interest rates for short-term borrowings for 2017 was primarily due to higher average Euro-denominated commercial paper borrowings as compared to 2016. The increase in the weighted-average interest rates for short-term borrowings for 2016 was primarily due to lower average commercial paper borrowings relative to other short-term borrowings as compared to 2015. We had no Euro-denominated commercial paper borrowing outstanding at December 31, 2017, resulting in the higher weighted-average interest rate for short-term borrowings as of December 31, 2017, as compared to December 31, 2016.

Income Taxes

	2017	2016	2015
Effective income tax rate	**36.6%**	23.8%	32.6%

On December 22, 2017 Public Law 115-97 *"An Act to Provide for Reconciliation Pursuant to Titles II and V of the Concurrent Resolution on the Budget for Fiscal Year 2018"* was enacted. This law is commonly referred to as the Tax Cuts and Jobs Act of 2017 (TCJA).

The 2017 effective tax rate reflects a tax charge of $690 million attributable to the passage of the TCJA. This amount relates to U.S. income tax attributable to previously undistributed earnings of UTC's international subsidiaries and equity investments, net of foreign tax credits, and the revaluation of U.S. deferred income taxes. In accordance with Staff Accounting Bulletin 118 (SAB 118) issued on December 22, 2017, provisional amounts have been recorded for the U.S. income tax attributable to the TCJA's deemed repatriation provision, the revaluation of U.S. deferred taxes and the tax consequences relating to states with current conformity to the Internal Revenue Code. Due to the enactment date and tax complexities of the TCJA, the Company has not completed its accounting related to these items.

The effective income tax rates for 2017, 2016, and 2015 reflect tax benefits associated with lower tax rates on international earnings. The expiration of statutes of limitations during 2017 resulted in a favorable adjustment of $55 million largely offset by the unfavorable impact related to a retroactive Quebec tax law change enacted on December 7, 2017 and the absence of certain credits, tax law changes and audit settlements included in 2016 described below.

The 2016 effective tax rate reflects $206 million of favorable adjustments related to the conclusion of the review by the Examination Division of the Internal Revenue Service of both the UTC 2011 and 2012 tax years and the Goodrich Corporation 2011 and 2012 tax years through the date of its acquisition as well as the absence of 2015 items described below. In addition, at the end of 2016, France enacted a tax law change reducing its corporate income tax rate which resulted in a tax benefit of $25 million.

The effective tax rate for 2015 includes a charge of approximately $274 million related to the repatriation of certain foreign earnings, the majority of which were current year earnings. It further includes a favorable impact of approximately $45 million related to a non-taxable gain recorded in the first quarter. France, the U.K. and certain U.S. states enacted tax law changes in the fourth quarter which resulted in a net incremental cost of approximately $68 million in 2015.

We currently estimate our full year annual effective income tax rate in 2018 to be approximately 25.5% excluding restructuring, non-operational non-recurring items and the refinement of provisional adjustments related to the TCJA. The annual effective income tax rate may be impacted by several factors including tax on the Company's international activities, which represent approximately 60% of our earnings. The rate may also change due to additional guidance and interpretations related to the TCJA. We anticipate some variability in the tax rate quarter to quarter in 2018 from potential discrete items.

For additional discussion of income taxes and the effective income tax rate, see "Critical Accounting Estimates—Income Taxes" and Note 11 to the Consolidated Financial Statements.

Net Income Attributable to Common Shareowners from Continuing Operations

(dollars in millions, except per share amounts)	**2017**	2016	2015
Net income attributable to common shareowners from continuing operations	**$ 4,552**	$ 5,065	$ 3,996
Diluted earnings per share from continuing operations	**$ 5.70**	$ 6.13	$ 4.53

To help mitigate the volatility of foreign currency exchange rates on our operating results, we maintain foreign currency hedging programs, the majority of which are entered into by Pratt & Whitney Canada (P&WC). In 2017, foreign currency, including hedging at P&WC, had a favorable impact on our consolidated operational results of $0.13 per diluted share. In 2016, foreign currency, including hedging at P&WC, had a favorable impact on our consolidated operational results of $0.05 per diluted share. In 2015, foreign currency generated a net adverse impact on our consolidated operational results of $0.19 per diluted share. For additional discussion of foreign currency exposure, see "Market Risk and Risk Management—Foreign Currency Exposures."

Net income from continuing operations attributable to common shareowners for the year ended December 31, 2017 includes restructuring charges, net of tax benefit, of $176 million ($253 million pre-tax) as well as the net unfavorable impact of significant non-operational and/or nonrecurring items, net of tax, of $587 million. Non-operational and/or nonrecurring items include a tax charge in connection with the passage of the TCJA as described in Note 11, the unfavorable impact of customer contract matters at Pratt & Whitney, and the unfavorable impact of a product recall program at UTC Climate, Controls & Security, partially offset by gains resulting from UTC Climate, Controls & Security's sale of its investments in Watsco, Inc. The effect of restructuring charges and nonrecurring items on diluted earnings per share for 2017 was $0.95 per share.

Net income from continuing operations attributable to common shareowners for the year ended December 31, 2016 includes restructuring charges, net of tax benefit, of $192 million ($290 million pre-tax) as well as the net unfavorable impact of significant non-operational and/or non-recurring items, net of tax, of $203 million. Non-operational and/or nonrecurring items include a pension settlement charge resulting from pension de-risking actions, a net extinguishment loss related to the early redemption of certain outstanding notes, and the unfavorable impact of customer contract matters at Pratt & Whitney. These items were partially offset by favorable tax adjustments related to the conclusion of the review by the Examination Division of the Internal Revenue Service of the 2011 and 2012 tax years. The effect of restructuring charges and non-recurring items on diluted earnings per share for the year ended December 31, 2016 was $0.48 per share.

Net income attributable to common shareowners from continuing operations in 2015 includes restructuring charges, net of tax benefit, of $274 million ($396 million pre-tax) as well as the net unfavorable impact of significant non-recurring and non-operational items, net of tax benefit, of $1,293 million. Non-operational and/or nonrecurring items include a charge recorded by Pratt & Whitney resulting from amendments to research and development support arrangements previously entered into with federal and provincial Canadian government agencies; the unfavorable impact of customer contract negotiations at UTC Aerospace Systems; an unfavorable tax adjustment related to the planned repatriation of certain foreign earnings; and a charge for pending and future asbestos claims. The effect of restructuring charges on diluted earnings per share for 2015 was a charge of $0.31 per share, while the effect of significant non-operational items on diluted earnings per share for 2015 was a charge of $1.46 per share.

Net (Loss) Income Attributable to Common Shareowners from Discontinued Operations

(dollars in millions, except per share amounts)	**2017**	2016	2015
Net (loss) income attributable to common shareowners from discontinued operations	**$ —**	$ (10)	$ 3,612
Diluted earnings per share from discontinued operations	**$ —**	$ (0.01)	$ 4.09

Net loss from discontinued operations attributable to common shareowners for the year ended December 31, 2016 reflects the final purchase price adjustment for the sale of Sikorsky, and the net effects of filing Sikorsky's 2015 tax returns. Net income from discontinued operations attributable to common shareowners for the year ended December 31, 2015 includes the gain on the sale of Sikorsky, net of tax expense, of $3.4 billion and $122 million of costs incurred in connection with the sale, as well as income from Sikorsky's operations, net of tax expense, of $169 million, including pension curtailment charges associated with our domestic pension plans.

RESTRUCTURING COSTS

(dollars in millions)	2017	2016	2015
Restructuring costs included within continuing operations	**$ 253**	$ 290	$ 396
Restructuring costs included within discontinued operations	**—**	—	139
Restructuring costs	**$ 253**	$ 290	$ 535

Restructuring actions are an essential component of our operating margin improvement efforts and relate to both existing operations and those recently acquired. Charges generally relate to severance incurred on workforce reductions and facility exit and lease termination costs associated with the consolidation of field and manufacturing operations. We expect the amount of restructuring costs incurred in 2018 to be consistent with 2017, including trailing costs related to prior actions associated with our continuing cost reduction efforts and the integration of acquisitions. We continue to closely monitor the economic environment and may undertake further restructuring actions to keep our cost structure aligned with the demands of the prevailing market conditions. In 2015, restructuring costs included within discontinued operations included approximately $109 million of net settlement and curtailment losses for pension benefits.

2017 Actions. During 2017, we recorded net pre-tax restructuring charges of $176 million relating to ongoing cost reduction actions initiated in 2017. We are targeting to complete in 2018 and 2019 the majority of the remaining workforce and facility related cost reduction actions initiated in 2017. Approximately 66% of the total pre-tax charge will require cash payments, which we have funded and expect to continue to fund with cash generated from operations. During 2017, we had cash outflows of approximately $83 million related to the 2017 actions. We expect to incur additional restructuring and other charges of $122 million to complete these actions. We expect recurring pre-tax savings to increase over the two-year period subsequent to initiating the actions to approximately $160 million annually, of which, approximately $69 million was realized in 2017.

2016 Actions. During 2017 and 2016, we recorded net pre-tax restructuring charges of $57 million and $242 million, respectively, for actions initiated in 2016. We are targeting to complete in 2018 the majority of the remaining workforce and all facility related cost reduction actions initiated in 2016. Approximately 69% of the total pre-tax charge will require cash payments, which we have and expect to continue to fund with cash generated from operations. During 2017, we had cash outflows of approximately $84 million related to the 2016 actions. We expect to incur additional restructuring charges of $34 million to complete these actions. We expect recurring pre-tax savings to increase over the two-year period subsequent to initiating the actions to approximately $180 million annually.

In addition, during 2017, we recorded net pre-tax restructuring costs totaling $20 million for restructuring actions initiated in 2015 and prior. For additional discussion of restructuring, see Note 13 to the Consolidated Financial Statements.

SEGMENT REVIEW

	Net Sales			Operating Profits			Operating Profit Margin		
(dollars in millions)	2017	2016	2015	2017	2016	2015	2017	2016	2015
Otis	**$ 12,341**	$ 11,893	$ 11,980	**$ 2,021**	$ 2,147	$ 2,338	**16.4%**	18.1%	19.5%
UTC Climate, Controls & Security	**17,812**	16,851	16,707	**3,300**	2,956	2,936	**18.5%**	17.5%	17.6%
Pratt & Whitney	**16,160**	14,894	14,082	**1,460**	1,545	861	**9.0%**	10.4%	6.1%
UTC Aerospace Systems	**14,691**	14,465	14,094	**2,370**	2,298	1,888	**16.1%**	15.9%	13.4%
Total segment	**61,004**	58,103	56,863	**9,151**	8,946	8,023	**15.0%**	15.4%	14.1%
Eliminations and other	**(1,167)**	(859)	(765)	**(38)**	(368)	(268)			
General corporate expenses	**—**	—	—	**(441)**	(406)	(464)			
Consolidated	**$ 59,837**	$ 57,244	$ 56,098	**$ 8,672**	$ 8,172	$ 7,291	**14.5%**	14.3%	13.0%

Commercial Businesses

The financial performance of our commercial businesses can be influenced by a number of external factors including fluctuations in residential and commercial construction activity, regulatory changes, interest rates, labor costs, foreign currency exchange rates, customer attrition, raw material and energy costs, credit markets and other global and political factors. UTC Climate, Controls & Security's financial performance can also be influenced by production and utilization of transport equipment, and weather conditions for its residential business. Geographic and industry diversity across the commercial businesses help to balance the impact of such factors on our consolidated operating results, particularly in the face of uneven economic growth. At constant currency and excluding the effect of acquisitions and divestitures, UTC Climate, Controls & Security equipment orders for 2017 increased 7% in comparison to 2016 driven by growth in transport refrigeration (17%), commercial HVAC (9%), commercial refrigeration (8%), and residential HVAC orders (5%). Within the Otis segment, new

equipment orders were flat in comparison to the prior year as order growth in Europe (8%), and the Americas (2%) was offset by order declines in Asia (3%) and the Middle East (12%).

Total commercial business sales generated outside the U.S., including U.S. export sales, were 63% in both 2017 and 2016. The following table shows sales generated outside the U.S., including U.S. export sales, for each of the commercial business segments:

	2017	2016
Otis	**73%**	75%
UTC Climate, Controls & Security	**55%**	55%

Otis is the world's largest elevator and escalator manufacturing, installation and service company. Otis designs, manufactures, sells and installs a wide range of passenger and freight elevators as well as escalators and moving walkways. In addition to new equipment, Otis provides modernization products to upgrade elevators and escalators as well as maintenance and repair services for both its products and those of other manufacturers. Otis serves customers in the commercial and residential property industries around the world. Otis sells directly to the end customer and through sales representatives and distributors.

				Total Increase (Decrease) Year-Over-Year for:			
(dollars in millions)	**2017**	2016	2015	**2017 Compared with 2016**		2016 Compared with 2015	
Net Sales	**$ 12,341**	$ 11,893	$ 11,980	**$ 448**	**4 %**	$ (87)	(1)%
Cost of Sales	**8,605**	8,072	8,122	**533**	**7 %**	(50)	(1)%
	3,736	3,821	3,858				
Operating Expenses and Other	**1,715**	1,674	1,520				
Operating Profits	**$ 2,021**	$ 2,147	$ 2,338	**$ (126)**	**(6)%**	$ (191)	(8)%

	Factors Contributing to Total % Increase (Decrease) Year-Over-Year in:					
	2017			2016		
	Net Sales	**Cost of Sales**	**Operating Profits**	Net Sales	Cost of Sales	Operating Profits
Organic / Operational	**2%**	**5%**	**(7)%**	1 %	2 %	(7)%
Foreign currency translation	—	—	**1 %**	(2)%	(3)%	(2)%
Acquisitions and divestitures, net	**1%**	**1%**	—	—	—	—
Other	**1%**	**1%**	—	—	—	1 %
Total % change	**4%**	**7%**	**(6)%**	(1)%	(1)%	(8)%

2017 Compared with 2016

The organic sales increase of 2% primarily reflects higher service sales (1%) driven by growth in North America and Asia, and higher new equipment sales (1%) driven by growth in North America and Europe, partially offset by a decline in China.

The operational profit decrease of 7% was driven by:

- unfavorable price and mix (11%), primarily in China
- higher selling, general and administrative expenses (2%), primarily labor and information technology costs
- higher research and development costs (1%)

These decreases were partially offset by:

- profit contribution from the higher sales volumes noted above (4%)
- favorable productivity (3%)

2016 Compared with 2015

The organic sales increase of 1% primarily reflects higher service sales (1%), driven by growth in the Americas and Asia. New equipment sales growth in the Americas (2%) was offset by a decline in new equipment sales in China (2%).

The operational profit decrease of 7% was driven by unfavorable price and mix (12%), primarily in China and Europe; higher selling, general and administrative expenses (5%), driven by higher labor and information technology costs; and higher research and development spending (2%); partially offset by favorable productivity and commodity costs (combined 8%) and higher volume (4%).

UTC Climate, Controls & Security is a leading provider of heating, ventilating, air conditioning (HVAC), refrigeration, fire, security and building automation products, solutions and services for residential, commercial, industrial and transportation applications. UTC Climate, Controls & Security provides a wide range of building systems, including cooling, heating, ventilation, refrigeration, fire and smoke detection, portable fire extinguishers, fire suppression, gas and flame safety, intruder alarms, access control systems, video surveillance and building control systems. UTC Climate, Controls & Security also provides a broad array of related building services, including audit, design, installation, system integration, repair, maintenance, and monitoring services.

UTC Climate, Controls & Security sells its HVAC and refrigeration solutions directly to end customers, including building contractors and owners, homeowners, transportation companies, retail stores and food service companies, and through joint ventures, manufacturer's representatives, distributors, wholesalers, dealers and retail outlets. These products and services are sold under the Carrier name and other brand names. UTC Climate, Controls & Security's security and fire safety products and services are used by governments, financial institutions, architects, building owners and developers, security and fire consultants, homeowners and other end-users requiring a high level of security and fire protection for their businesses and residences. UTC Climate, Controls & Security provides its security and fire safety products and services under Chubb, Kidde and other brand names and sells directly to customers as well as through manufacturer's representatives, distributors, dealers, value-added resellers and retail distribution.

Certain UTC Climate, Controls & Security HVAC businesses are seasonal, and sales and service activity can be impacted by weather. UTC Climate, Controls & Security customarily offers its customers incentives to purchase products to ensure an adequate supply of its products in the distribution channels. The principal incentive program provides reimbursements to distributors for offering promotional pricing on UTC Climate, Controls & Security products.

				Total Increase (Decrease) Year-Over-Year for:			
(dollars in millions)	**2017**	2016	2015	**2017 Compared with 2016**		2016 Compared with 2015	
Net Sales	**$ 17,812**	$ 16,851	$ 16,707	**$ 961**	**6%**	$ 144	1%
Cost of Sales	**12,602**	11,700	11,611	**902**	**8%**	89	1%
	5,210	5,151	5,096				
Operating Expenses and Other	**1,910**	2,195	2,160				
Operating Profits	**$ 3,300**	$ 2,956	$ 2,936	**$ 344**	**12%**	$ 20	1%

	Factors Contributing to Total % Increase (Decrease) Year-Over-Year in:					
	2017			2016		
	Net Sales	**Cost of Sales**	**Operating Profits**	Net Sales	Cost of Sales	Operating Profits
Organic / Operational	**4%**	**5%**	**—**	(1)%	(1)%	5 %
Foreign currency translation	**1%**	**—**	**—**	(1)%	(1)%	(1)%
Acquisitions and divestitures, net	**1%**	**2%**	**—**	3 %	3 %	1 %
Restructuring costs	**—**	**—**	**(2)%**	—	—	1 %
Other	**—**	**1%**	**14 %**	—	—	(5)%
Total % change	**6%**	**8%**	**12 %**	1 %	1 %	1 %

2017 Compared with 2016

The organic sales increase of 4% was driven by growth in North America residential HVAC (1%), global commercial HVAC (1%), and commercial refrigeration (1%).

Operational profit was consistent with the prior year as the profit contribution from higher sales volumes, net of adverse price (6%) and the beneficial impact from restructuring savings (2%), were offset by the impact of unfavorable mix (6%) and unfavorable contract adjustments related to a large commercial project (1%). The 14% increase in "other" primarily reflects gains on the sale of investments (16%), primarily Watsco, Inc., and the absence of prior year acquisition and integration costs (1%), partially offset by the impact of a product recall program (3%).

2016 Compared with 2015

Organic sales decreased by 1% driven by declines in commercial HVAC sales in Europe and the Middle East, fire products, and transport refrigeration (combined 1%), partially offset by growth in North America HVAC (1%).

The 5% operational profit increase was driven by lower commodities cost (5%) and productivity and restructuring savings (combined 4%), partly offset by the impact of lower sales volume and adverse sales mix (combined 4%). The 5% decrease in "Other" is driven by the absence of a prior year gain as a result of a fair value adjustment related to acquisitions of a controlling interest in joint venture investments (5%). "Other" also includes current year gains related to the acquisition of a controlling interest in a joint venture investment in the Middle East and from the sale of an investment in Australia (combined 1%), which were offset by a prior year gain from an acquisition of a controlling interest in another joint venture investment.

Aerospace Businesses

The financial performance of Pratt & Whitney and UTC Aerospace Systems is directly tied to the economic conditions of the commercial aerospace and defense aerospace industries. In particular, Pratt & Whitney experiences intense competition for new commercial airframe/engine combinations. Engine suppliers may offer substantial discounts and other financial incentives, performance and operating cost guarantees, and participate in financing arrangements in an effort to compete for the aftermarket associated with these engine sales. These OEM engine sales may result in losses on the engine sales, which economically are recovered through the sales and profits generated over the engine's maintenance cycle. At times, the aerospace businesses also enter into development programs and firm fixed-price development contracts, which may require the company to bear cost overruns related to unforeseen technical and design challenges that arise during the development stage of the program. Customer selections of engines and components can also have a significant impact on later sales of parts and service. Predicted traffic levels, load factors, worldwide airline profits, general economic activity and global defense spending have been reliable indicators for new aircraft and aftermarket orders within the aerospace industry. Spare part sales and aftermarket service trends are affected by many factors, including usage, technological improvements, pricing, regulatory changes and the retirement of older aircraft. Our commercial aftermarket businesses continue to evolve as an increasing proportion of our aerospace businesses' customers are covered under Fleet Management Programs (FMPs). FMPs are comprehensive long-term spare part and maintenance agreements with our customers. We expect a continued shift to FMPs in lieu of transactional spare part sales as new engines enter customers' fleets on FMP and legacy fleets are retired. In 2017, as compared with 2016, total commercial aerospace aftermarket sales increased 11% at Pratt & Whitney and 10% at UTC Aerospace Systems.

Our long-term aerospace contracts are subject to strict safety and performance regulations which can affect our ability to estimate costs precisely. Contract cost estimation for the development of complex projects, in particular, requires management to make significant judgments and assumptions regarding the complexity of the work to be performed, availability of materials, the performance by subcontractors, the timing of funding from customers and the length of time to complete the contract. As a result, we review and update our cost estimates on significant contracts on a quarterly basis, and no less frequently than annually for all others, and when circumstances change and warrant a modification to a previous estimate. Changes in estimates relate to the current period impact of revisions to total estimated contract sales and costs at completion. We record changes in contract estimates primarily using the cumulative catch-up method. Operating profits included significant net unfavorable changes in aerospace contract estimates of approximately $110 million and $157 million in 2017 and 2016, respectively, primarily the result of unexpected increases in estimated costs related to Pratt & Whitney long term aftermarket contracts. Operating profits included significant net favorable changes in aerospace contract estimates of approximately $115 million in 2015, primarily representing favorable contract adjustments at Pratt & Whitney. In accordance with our revenue recognition policy, losses, if any, on long-term contracts are provided for when anticipated. There were no material loss provisions recorded on OEM contracts in continuing operations in 2017 or 2016.

Performance in the general aviation sector is closely tied to the overall health of the economy. We continue to see growth in a strong commercial airline industry. Airline traffic, as measured by revenue passenger miles (RPMs), grew approximately 8% in the first eleven months of 2017.

Our military sales are affected by U.S. Department of Defense spending levels. However, the sale of Sikorsky during 2015 reduced our U.S. Government defense-spending exposure. Excluding Sikorsky, total sales to the U.S. Government were $5.8 billion in 2017, $5.6 billion in 2016, and $5.6 billion in 2015, and were 10% of total UTC sales in 2017, 2016 and 2015. The defense portion of our aerospace business is also affected by changes in market demand and the global political environment. Our participation in long-term production and development programs for the U.S. Government has contributed positively to our results in 2017 and is expected to continue to benefit results in 2018.

As previously disclosed, Pratt & Whitney's PurePower PW1500G engine models have been selected by Bombardier to power the new CSeries passenger aircraft, which entered into service on July 15, 2016. There have been multi-year delays in the development of the CSeries aircraft. Notwithstanding these delays, Bombardier reports that they have received over 300

orders for the aircraft and that both the CS100 and CS300 aircraft models have been certified and have entered into revenue service. We have made various investments in support of the production and delivery of our PW1500G engines and systems for the CSeries program, which we currently expect to recover through future deliveries of PW1500G powered CSeries aircraft. On October 16, 2017, Bombardier and Airbus announced an agreement to become partners on the CSeries aircraft program. We will continue to monitor the progress of the program and our ability to recover our investments, which we believe would be strengthened by this partnership.

Pratt & Whitney is among the world's leading suppliers of aircraft engines for the commercial, military, business jet and general aviation markets. Pratt & Whitney provides fleet management services and aftermarket maintenance, repair and overhaul services. Pratt & Whitney produces and develops families of large engines for wide- and narrow-body and large regional aircraft in the commercial market and for fighter, bomber, tanker and transport aircraft in the military market. P&WC is among the world's leading suppliers of engines powering general and business aviation, as well as regional airline, utility and military airplanes, and helicopters. Pratt & Whitney and P&WC also produce, sell and service auxiliary power units for commercial and military aircraft.

The development of new engines and improvements to current production engines present important growth opportunities. In view of the risks and costs associated with developing new engines, Pratt & Whitney has entered into collaboration arrangements in which revenues, costs and risks are shared with third parties. At December 31, 2017, the interests of third-party participants in Pratt & Whitney-directed commercial jet engine programs ranged from approximately 14 percent to 50 percent. UTC holds a 61 percent interest in the IAE collaboration with MTU and JAEC. Pratt & Whitney also holds a 59 percent program share interest in the IAE LLC collaboration with MTU and JAEC. IAE LLC sells the PW1100G-JM engine for the Airbus A320neo aircraft and the PW1400G-JM engine for the Irkut MC-21 aircraft. In addition, Pratt & Whitney has interests in other engine programs, including a 50 percent ownership interest in the EA, a joint venture with GE Aviation, which markets and manufactures the GP7000 engine for the Airbus A380 aircraft. Pratt & Whitney has entered into risk and revenue sharing arrangements with third parties for 40 percent of the products and services that Pratt & Whitney is responsible for providing to the EA. Pratt & Whitney accounts for its interests in the EA joint venture under the equity method of accounting. See Note 1 to the Consolidated Financial Statements in our 2017 Annual Report for a description of our accounting for collaborative arrangements.

Pratt & Whitney produces the PurePower PW1000G Geared TurboFan engine family, the first of which, the PW1100G-JM, entered into service in January 2016. The PurePower PW1000G engine has demonstrated a significant reduction in fuel burn and noise levels with lower environmental emissions and operating costs than current production engines. The PW1100G-JM engine is offered on the Airbus A320neo family of aircraft. PurePower PW1000G engine models also power Bombardier's CSeries passenger aircraft. Additionally, the PurePower PW1000G engine models have been selected to power the new Mitsubishi Regional Jet, the new Irkut MC-21 passenger aircraft and Embraer's E-Jet family of aircraft. The Irkut MC-21 and Embraer's E-Jet family aircraft are scheduled to enter service in 2018. The Mitsubishi Regional Jet is scheduled to enter service in 2020. As previously disclosed, Gulfstream announced the selection of the PurePower PW 800 engine to exclusively power Gulfstream's new G500 and G600 business jets scheduled to enter service in 2018. P&WC's PurePower PW 800 engine has also been selected to power the new Falcon business jet by Dassault Aviation. P&WC has developed and certified the PW210 engine family for helicopters manufactured by Sikorsky and Leonardo Helicopters. Pratt & Whitney continues to enhance its programs through performance improvement measures and product base expansion. The success of these aircraft and engines is dependent upon many factors, including technological accomplishments, program execution, aircraft demand, and regulatory approval. As a result of these factors, as well as the level of success of aircraft program launches by aircraft manufacturers and other conditions, additional investment in these engine programs may be required.

In 2017, Pratt & Whitney's commercial products supported engine certification of the PW1200G and PW 1700G for the Mitsubishi Regional Jet and Embraer E190-E2 and E-195-E2, the first flight of the Irkut MC21. Pratt & Whitney Canada has developed and received European Aviation Safety Agency (EASA) and the Federal Aviation Administration (FAA) Type Certifications for the PurePower PW800 turbofan engine for the Gulfstream G500 and G600 aircraft. Also during the year, the Pratt & Whitney F-135 program experienced the first engine delivery from the Japan Final Assembly and Check Out facility and the Israeli Air Force achieved initial operational capability for their F-35I 'Adir' fleet. The military business also supported FAR Part 25 aircraft certification for the Boeing Tanker KC-46A aircraft.

Pratt & Whitney is under contract with the U.S. Government's F-35 Joint Program Office to produce and sustain the F135 engine to power the single-engine F-35 Lightning II aircraft (commonly known as the Joint Strike Fighter) being produced by Lockheed Martin. The two F135 propulsion system configurations for the F-35A, F-35B and F-35C jets are used by the U.S. Air Force, U.S. Marine Corps and U.S. Navy, respectively. F135 engines are also used on F-35 aircraft purchased by Joint Strike Fighter partner countries and foreign military sales countries.

Pratt & Whitney's products are sold principally to aircraft manufacturers, airlines and other aircraft operators, aircraft leasing companies and the U.S. and foreign governments. Pratt & Whitney's products and services must adhere to strict regulatory and market-driven safety and performance standards. The frequently changing nature of these standards, along with the long duration of aircraft engine development, production and support programs, creates uncertainty regarding engine program profitability.

				Total Increase (Decrease) Year-Over-Year for:			
(dollars in millions)	**2017**	2016	2015	**2017 Compared with 2016**		2016 Compared with 2015	
Net Sales	**$ 16,160**	$ 14,894	$ 14,082	**$ 1,266**	**9 %**	$ 812	6%
Cost of Sales	**12,984**	11,805	10,910	**1,179**	**10 %**	895	8%
	3,176	3,089	3,172				
Operating Expenses and Other	**1,716**	1,544	2,311				
Operating Profits	**$ 1,460**	$ 1,545	$ 861	**$ (85)**	**(6)%**	$ 684	79%

	Factors Contributing to Total % Increase (Decrease) Year-Over-Year in:					
	2017			2016		
	Net Sales	**Cost of Sales**	**Operating Profits**	Net Sales	Cost of Sales	Operating Profits
Organic* / Operational*	**9 %**	**12 %**	**(9)%**	6%	9 %	(28)%
Foreign currency (including P&WC net hedging)*	**1 %**	**—**	**9 %**	—	(1)%	10 %
Acquisitions and divestitures, net	**—**	**—**	**(1)%**	—	—	—
Restructuring costs	**—**	**(1)%**	**7 %**	—	—	(1)%
Other	**(1)%**	**(1)%**	**(12)%**	—	—	98 %
Total % change	**9 %**	**10 %**	**(6)%**	6%	8 %	79 %

* As discussed further in the "Business Overview" and "Results of Operations" sections, for Pratt & Whitney only, the transactional impact of foreign exchange hedging at P&WC has been netted against the translational foreign exchange impact for presentation purposes in the above table. For all other segments, these foreign exchange transactional impacts are included within the organic sales/operational operating profit caption in their respective tables. Due to its significance to Pratt & Whitney's overall operating results, we believe it is useful to segregate the foreign exchange transactional impact in order to clearly identify the underlying financial performance.

2017 Compared with 2016

The organic sales increase of 9% primarily reflects higher commercial aftermarket sales (8%) and higher military sales (4%), partially offset by lower commercial engine sales (2%), unfavorable year-over-year contract settlements (1%), and the absence of prior year sales of legacy hardware (1%). The 1% decrease in Other reflects the year-over-year impact of customer contract matters.

The operational profit decrease of 9% was primarily driven by:

- lower OEM profit contribution (26%) reflecting higher negative engine margin and other ramp-related costs and lower volume at P&WC partially offset by the profit contribution from higher military sales
- higher selling, general and administrative expenses and research and development costs (8%)
- unfavorable year-over-year contract settlements (5%)
- the absence of prior year sales of legacy hardware (3%)

These decreases were partially offset by:

- higher aftermarket profit contribution (28%) driven by increases in both commercial and military aftermarket sales
- the favorable impact of a licensing agreement (3%)
- lower pension expense (2%)

The 12% decrease in Other primarily reflects the year-over-year impact of customer contract matters (7%), the absence of the favorable impact of a prior year program termination (2%), and the absence of a prior year benefit from the licensing of certain intellectual property rights (2%).

2016 Compared with 2015

The organic sales increase of 6% primarily reflects higher commercial aftermarket sales (8%), and higher military engine and aftermarket sales (2%), partially offset by unfavorable year-over-year contract performance, contract termination benefits and contract settlements (2%) and lower commercial engine sales volume (1%).

Pratt & Whitney's operating profit includes lower pension cost and restructuring savings across its businesses. The operational profit decrease of 28% was primarily driven by:

- unfavorable year-over-year contract adjustments, contract termination benefits and contract settlements (38%)
- higher research and development spending (6%)
- lower large commercial engine profit contribution (8%) primarily driven by higher negative engine margin
- lower profit contribution at P&WC (3%) primarily driven by lower volume
- the absence of prior year licensing arrangements (5%)
- lower military engine profit contribution (1%) driven by adverse engine mix, partially offset by profit contribution from higher military aftermarket sales

These decreases were partially offset by:

- profit contribution from strong commercial aftermarket volume (33%)
- sales of legacy hardware (3%)

"Other" primarily reflects the absence of a prior year charge resulting from amendments to research and development support arrangements previously entered into with federal and provincial Canadian government agencies (101%), partially offset by the year-over-year profit impact associated with customer contract negotiations (2%).

UTC Aerospace Systems is a leading global provider of technologically advanced aerospace products and aftermarket service solutions for aircraft manufacturers, airlines, regional, business and general aviation markets, military, space and undersea operations. UTC Aerospace Systems' product portfolio includes electric power generation, power management and distribution systems, air data and aircraft sensing systems, engine control systems, intelligence, surveillance and reconnaissance systems, engine components, environmental control systems, fire and ice detection and protection systems, propeller systems, engine nacelle systems, including thrust reversers and mounting pylons, interior and exterior aircraft lighting, aircraft seating and cargo systems, actuation systems, landing systems, including landing gear, wheels and brakes, and space products and subsystems. Aftermarket services include spare parts, overhaul and repair, engineering and technical support and fleet management solutions. UTC Aerospace Systems sells aerospace products to aircraft manufacturers, airlines and other aircraft operators, the U.S. and foreign governments, maintenance, repair and overhaul providers, and independent distributors.

				Total Increase (Decrease) Year-Over-Year for:			
(dollars in millions)	**2017**	2016	2015	**2017 Compared with 2016**		2016 Compared with 2015	
Net Sales	**$ 14,691**	$ 14,465	$ 14,094	**$ 226**	**2%**	$ 371	3%
Cost of Sales	**10,733**	10,607	10,533	**126**	**1%**	74	1%
	3,958	3,858	3,561				
Operating Expenses and Other	**1,588**	1,560	1,673				
Operating Profits	**$ 2,370**	$ 2,298	$ 1,888	**$ 72**	**3%**	$ 410	22%

	Factors Contributing to Total % Increase (Decrease) Year-Over-Year in:					
	2017			2016		
	Net Sales	**Cost of Sales**	**Operating Profits**	Net Sales	Cost of Sales	Operating Profits
Organic / Operational	**2%**	**2 %**	**5 %**	2%	3 %	(3)%
Foreign currency translation	—	—	—	—	(1)%	3 %
Acquisitions and divestitures, net	—	**(1)%**	**(1)%**	—	—	—
Restructuring costs	—	—	**(1)%**	—	—	3 %
Other	—	—	—	1%	(1)%	19 %
Total % change	**2%**	**1 %**	**3 %**	3%	1 %	22 %

2017 Compared with 2016

The organic sales growth of 2% primarily reflects an increase in commercial aerospace aftermarket sales (3%), partially offset by lower commercial aerospace OEM sales (1%).

The increase in operational profit of 5% primarily reflects:

- higher commercial aerospace profit contribution driven by the commercial aftermarket sales growth noted above partially offset by lower commercial aerospace OEM profit contribution (net, 7%)
- lower pension costs (2%)

These increases were partially offset by higher selling, general, and administrative expenses (3%).

2016 Compared with 2015

The organic sales growth of 2% primarily reflects an increase in commercial aerospace OEM and commercial aftermarket sales volume (3%), partially offset by lower military OEM and military aftermarket sales volume (1%). "Other" represents the absence of the prior year unfavorable impact of significant customer contract negotiations (1%).

The organic decrease in operational profit of 3% primarily reflects:

- the absence of the favorable impact from prior year customer contract negotiations, dispute resolution, contract terminations and other settlements (8%)
- lower military profit contribution (4%) driven primarily by lower sales volume
- lower commercial aerospace OEM profit contribution (4%), primarily due to adverse mix

These decreases were partially offset by:

- lower pension costs (8%)
- higher commercial aftermarket profit contribution (5%)
- lower research and development costs (1%)

"Other" primarily represents the absence of the prior year unfavorable impact from significant customer contract negotiations (16%) and the absence of a prior year impairment of certain assets held for sale (3%).

Eliminations and other

	Net Sales			Operating Profits		
(dollars in millions)	**2017**	2016	2015	**2017**	2016	2015
Eliminations and other	**$ (1,167)**	$ (859)	$ (765)	**$ (38)**	$ (368)	$ (268)
General corporate expenses	**—**	—	—	**(441)**	(406)	(464)

Eliminations and other reflects the elimination of sales, other income and operating profit transacted between segments, as well as the operating results of certain smaller businesses. The year-over-year increase in the amount of sales eliminations in 2017 as compared with 2016 reflects an increase in the amount of inter-segment sales eliminations, principally between our aerospace businesses. The year-over-year increase in operating profit for 2017 as compared with 2016 is largely driven by the absence of a $423 million pension settlement charge resulting from pension de-risking actions taken in the prior year, partially offset by transaction costs related to the merger agreement with Rockwell Collins, and an increase in the amount of inter-segment eliminations between our aerospace businesses. The year-over-year increase in general corporate expenses for 2017, as compared with 2016 primarily reflects higher expenses related to salaries, wages and employee benefits.

The change in sales in 2016, as compared with 2015, reflects an increase in the amount of inter-segment sales eliminations, principally between our aerospace businesses. The year-over-year decrease in operating profit for 2016 as compared with 2015 is largely driven by a $423 million pension settlement charge resulting from pension de-risking actions, partially offset by the absence of a $237 million charge taken in 2015 for pending and future asbestos claims and higher proceeds from the sale of marketable securities of $47 million. The year-over-year decline in general corporate expenses for 2016, as compared with 2015 primarily reflects lower expenses related to salaries, wages and employee benefits.

LIQUIDITY AND FINANCIAL CONDITION

(dollars in millions)	2017	2016
Cash and cash equivalents	**$ 8,985**	$ 7,157
Total debt	**27,485**	23,901
Net debt (total debt less cash and cash equivalents)	**18,500**	16,744
Total equity	**31,421**	29,169
Total capitalization (total debt plus total equity)	**58,906**	53,070
Net capitalization (total debt plus total equity less cash and cash equivalents)	**49,921**	45,913
Total debt to total capitalization	**47%**	45%
Net debt to net capitalization	**37%**	36%

We assess our liquidity in terms of our ability to generate cash to fund our operating, investing and financing activities. Our principal source of liquidity is operating cash flows from continuing operations, which, after netting out capital expenditures, we target to equal or exceed net income attributable to common shareowners from continuing operations. For 2018, we expect this to approximate $4.5 billion to $5.0 billion. In addition to operating cash flows, other significant factors that affect our overall management of liquidity include: capital expenditures, customer financing requirements, investments in businesses, dividends, common stock repurchases, pension funding, access to the commercial paper markets, adequacy of available bank lines of credit, redemptions of debt, and the ability to attract long-term capital at satisfactory terms.

Our domestic pension funds experienced a positive return on assets of 15.0% during 2017. Approximately 90% of these domestic pension plans' funds are invested in readily-liquid investments, including equity, fixed income, asset-backed receivables and structured products. The balance of these domestic pension plans' funds (10%) is invested in less-liquid but market-valued investments, including real estate and private equity. As part of our long-term strategy to de-risk our defined benefit pension plans, we made discretionary contributions of approximately $1.9 billion to our domestic defined benefit pension plans in the quarter ended September 30, 2017. Across our global pension plans, the impact of changing the structure of our significant domestic plans to segregate active participants and inactive participants, 2017 actual returns on plan assets, pension contributions and lower discount rates for interest costs, partially offset by lower discount rates for pension obligations and a reduction in the expected return on plan assets, will result in a net periodic pension benefit in 2018 that is approximately $200 million favorable relative to 2017 amounts.

In 2016, as part of our long-term strategy to de-risk our defined benefit pension plans, we entered into an agreement to purchase a group annuity contract to transfer approximately $768 million of our outstanding pension benefit obligations related to certain U.S. retirees or beneficiaries. We also offered certain former U.S. employees or beneficiaries (generally all former U.S. participants not yet in receipt of their vested pension benefits) an option to take a one-time lump-sum distribution in lieu of future monthly pension payments, which reduced our pension benefit obligations by approximately $935 million as of December 31, 2016. These transactions reduced the assets of our defined benefit pension plans by approximately $1.5 billion. As a result of these transactions, we recognized a one-time pre-tax pension settlement charge of approximately $423 million in the fourth quarter of 2016. See Note 12 to the Consolidated Financial Statements for further discussion.

Historically, our strong debt ratings and financial position have enabled us to issue long-term debt at favorable market rates. Our ability to obtain debt financing at comparable risk-based interest rates is partly a function of our existing debt-to-total-capitalization level as well as our credit standing. Our debt-to-total-capitalization increased 200 basis points from 45% at December 31, 2016 to 47% at December 31, 2017 primarily reflecting additional borrowings in 2017 used to fund the discretionary contributions to our domestic defined benefit pension plans, share repurchases and other general corporate purposes. The average maturity of our long-term debt at December 31, 2017 is approximately 11 years. We use our commercial paper borrowings for general corporate purposes, including the funding of potential acquisitions, discretionary pension contributions, debt refinancing, dividend payments and repurchases of our common stock. The need for commercial paper borrowings arises when the use of domestic cash for general corporate purposes exceeds the sum of domestic cash generation and foreign cash repatriated to the U.S.

On September 4, 2017, we announced that we had entered into a merger agreement with Rockwell Collins, under which we agreed to acquire Rockwell Collins. Under the terms of the merger agreement, each Rockwell Collins shareowner will receive $93.33 per share in cash and a fraction of a share of UTC common stock equal to the quotient obtained by dividing $46.67 by the average of the volume-weighted average prices per share of UTC common stock on the NYSE on each of the 20 consecutive trading days ending with the trading day immediately prior to the closing date (the “UTC Stock Price”), subject to adjustment based on a two-way collar mechanism as described below (the “Stock Consideration”). The cash and UTC stock payable in exchange for each such share of Rockwell Collins common stock are collectively the “Merger Consideration.” The

fraction of a share of UTC common stock into which each such share of Rockwell Collins common stock will be converted is the "Exchange Ratio." The Exchange Ratio will be determined based upon the UTC Stock Price. If the UTC Stock Price is greater than $107.01 but less than $124.37, the Exchange Ratio will be equal to the quotient of (i) $46.67 divided by (ii) the UTC Stock Price, which, in each case, will result in the Stock Consideration having a value equal to $46.67. If the UTC Stock Price is less than or equal to $107.01 or greater than or equal to $124.37, then a two-way collar mechanism will apply, pursuant to which, (x) if the UTC Stock Price is greater than or equal to $124.37, the Exchange Ratio will be fixed at 0.37525 and the value of the Stock Consideration will be greater than $46.67, and (y) if the UTC Stock Price is less than or equal to $107.01, the Exchange Ratio will be fixed at 0.43613 and the value of the Stock Consideration will be less than $46.67. On January 11, 2018, the merger was approved by Rockwell Collins' shareowners. We currently expect that the merger will be completed in the third quarter of 2018, subject to customary closing conditions, including the receipt of required regulatory approvals.

We anticipate that approximately $15 billion will be required to pay the aggregate cash portion of the Merger Consideration. We expect to fund the cash portion of the Merger Consideration through debt issuances and cash on hand. Additionally, we have entered into a $6.5 billion 364-day unsecured bridge loan credit agreement that would be funded only to the extent certain anticipated debt issuances are not completed prior to the completion of the merger. We expect to assume approximately $7 billion of Rockwell Collins' outstanding debt. To help manage the cash flow and liquidity impact resulting from the proposed acquisition, we have suspended share repurchases, excluding activity relating to our employee savings plans. As we continue to assess the impacts of the TCJA, future opportunities for repatriation of our non-U.S. earnings, and accelerated de-leveraging, we may consider, in addition to investments in our operations, limited additional share repurchases to offset the effects of dilution related to our stock-based compensation programs - see Note 12.

On November 13, 2017, we issued €750 million aggregate principal amount of floating rate notes due 2019. The net proceeds from this debt issuance were used to fund the repayment of commercial paper and for other general corporate purposes.

On May 4, 2017, we issued $1.0 billion aggregate principal amount of 1.900% notes due 2020, $500 million aggregate principal amount of 2.300% notes due 2022, $800 million aggregate principal amount of 2.800% notes due 2024, $1.1 billion aggregate principal amount of 3.125% notes due 2027 and $600 million aggregate principal amount of 4.050% notes due 2047. The net proceeds received from these debt issuances were used to fund the repayment at maturity of our 1.800% notes due 2017, representing $1.5 billion in aggregate principal and other general corporate purposes.

On December 1, 2016, we redeemed all outstanding 5.375% notes due in 2017, representing $1.0 billion in aggregate principal, and all outstanding 6.125% notes due in 2019, representing $1.25 billion in aggregate principal, under our redemption notice issued on November 1, 2016. A combined net extinguishment loss of approximately $164 million was recognized within Interest expense, net in the accompanying Consolidated Statement of Operations.

On November 1, 2016, we issued $650 million aggregate principal amount of 1.500% notes due 2019, $750 million aggregate principal amount of 1.950% notes due 2021, $1,150 million aggregate principal amount of 2.650% notes due 2026, $1,100 million aggregate principal amount of 3.750% notes due 2046 and $350 million aggregate principal amount of floating rate notes due 2019. We used the net proceeds received from these issuances to fund the redemption price of the 5.375% notes due 2017 and the 6.125% notes due 2019, to fund the repayment of commercial paper, and for other general corporate purposes.

On February 22, 2016, we issued €950 million aggregate principal amount of 1.125% notes due 2021, €500 million aggregate principal amount of 1.875% notes due 2026 and €750 million aggregate principal amount of floating rate notes due 2018. The net proceeds from these debt issuances were used for general corporate purposes.

On November 6, 2015, we completed the sale of Sikorsky to Lockheed Martin Corp. for approximately $9.1 billion in cash. In connection with the sale of Sikorsky, we made tax payments of approximately $2.5 billion in 2016. On November 11, 2015, we entered into ASR agreements to repurchase an aggregate of $6 billion of our common stock utilizing the net after-tax proceeds from the sale of Sikorsky. Under the terms of the ASR agreements, we made the aggregate payments and received an initial delivery of approximately 51.9 million shares of our common stock, representing approximately 85% of the shares expected to be repurchased. In 2016, the shares associated with the remaining portion of the aggregate purchase were settled upon final delivery to us of approximately 10.1 million additional shares of common stock.

On March 13, 2015, we entered into ASR agreements to repurchase an aggregate of $2.65 billion of our common stock, which was largely funded by our commercial paper borrowings. Under the terms of the ASR agreements, we made the aggregate payments and received an initial delivery of approximately 18.6 million shares of our common stock, representing approximately 85% of the shares expected to be repurchased. On July 31, 2015, the shares associated with the remaining portion of the aggregate purchase were settled upon final delivery of approximately 4.2 million additional shares of common stock.

At December 31, 2017, we had revolving credit agreements with various banks permitting aggregate borrowings of up to $4.35 billion pursuant to a $2.20 billion revolving credit agreement and a $2.15 billion multicurrency revolving credit agreement, both of which expire in August 2021. As of December 31, 2017 and 2016, there were no borrowings under either of these revolving credit agreements. The undrawn portions of our revolving credit agreements are also available to serve as backup facilities for the issuance of commercial paper. As of December 31, 2017, our maximum commercial paper borrowing authority was $4.35 billion.

At December 31, 2017, approximately 90% of our cash was held by UTC's foreign subsidiaries, due to our extensive international operations. We manage our worldwide cash requirements by reviewing available funds among the many subsidiaries through which we conduct our business and the cost effectiveness with which those funds can be accessed. As previously discussed, on December 22, 2017, the TCJA was enacted. Prior to enactment of the TCJA, with few exceptions, the Company had intended to reinvest its undistributed foreign earnings permanently outside the U.S. or to repatriate the earnings only when it was tax effective to do so. Due to the inherent complexities in determining any remaining U.S. federal and state taxes and the non-U.S. taxes that may be due if these earnings were remitted to the U.S., we are evaluating our intention with regards to these undistributed earnings.

We continue to be involved in litigation with the German Tax Office in the German Tax Court with respect to certain tax benefits that we have claimed related to a 1998 reorganization of the corporate structure of Otis operations in Germany. We made tax and interest payments of approximately $300 million during 2015 to avoid additional interest accruals while we continue to litigate this matter. We do not expect to make significant additional tax or interest payments pending final resolution of this matter. See Note 18 for a further discussion of this German tax litigation.

On occasion, we are required to maintain cash deposits with certain banks with respect to contractual obligations related to acquisitions or divestitures or other legal obligations. As of December 31, 2017, 2016 and 2015, the amount of such restricted cash was approximately $33 million, $32 million and $45 million, respectively.

We believe our future operating cash flows will be sufficient to meet our future operating cash needs. Further, we continue to have access to the commercial paper markets and our existing credit facilities, and our ability to obtain debt or equity financing, as well as the availability under committed credit lines, provides additional potential sources of liquidity should they be required or appropriate.

Cash Flow—Operating Activities of Continuing Operations

(dollars in millions)	**2017**	2016	2015
Net cash flows provided by operating activities of continuing operations	**$ 5,631**	$ 6,412	$ 6,755

2017 Compared with 2016

As part of our long-term strategy to de-risk our defined benefit pension plans, we made discretionary contributions of approximately $1.9 billion to our domestic defined benefit pension plans in the quarter ended September 30, 2017. Including the effects of this contribution, cash generated from operating activities of continuing operations in 2017 was $781 million lower than 2016. Lower net income and the higher global pension contributions were partially offset by lower investments in working capital of approximately $1.1 billion and approximately $0.6 billion favorable Other operating activities, net. The 2017 Other operating activities, net was driven by increases in net noncurrent income tax liabilities resulting from the TCJA enacted in December 2017 as discussed above, partially offset by gains on sales of investments included in net income, including UTC Climate, Controls & Security's sale of investments in Watsco, Inc.

The 2017 cash outflows for working capital ($52 million) were primarily driven by increases in inventories of approximately $1.1 billion, primarily in our aerospace businesses supporting an increase in forecasted OEM deliveries and related aftermarket demand, and including approximately $200 million of inventory costs attributable to new engine offerings recognized based on the average cost per unit expected over the life of each contract using the units-of-delivery method of percentage of completion accounting, as discussed in Note 6. Accounts receivable increases at Pratt & Whitney were partially offset by declines at UTC Climate, Controls & Security. Factoring activity provided an increase of approximately $700 million in cash generated from operating activities of continuing operations in 2017, as compared to the prior year period. This increase does not reflect the factoring of certain aerospace receivables performed at customer request for which we are compensated by the customer for the extended payment cycle. These investments were largely offset by the net increase in accrued liabilities and accounts payable of approximately $1.6 billion, primarily driven by production volumes at Pratt & Whitney.

For 2016, cash outflows for working capital ($1,161 million) were primarily driven by increases in inventory in our aerospace businesses to support deliveries and other contractual commitments, including approximately $220 million of

inventory costs attributable to new engine offerings recognized based on the average cost per unit expected over the life of each contract using the units-of-delivery method of percentage of completion accounting, as discussed in Note 6. Increases in accounts receivable at Pratt & Whitney and our commercial businesses were partially offset by increases in accounts payable and accrued liabilities across all of our businesses.

The funded status of our defined benefit pension plans is dependent upon many factors, including returns on invested assets, the level of market interest rates and actuarial mortality assumptions. We can contribute cash or UTC shares to our plans at our discretion, subject to applicable regulations. Total cash contributions to our global defined benefit pension plans were $2,112 million, $303 million and $147 million during 2017, 2016 and 2015, respectively. In 2015, we made noncash contributions of $250 million in UTC common stock to our defined benefit pension plans. As of December 31, 2017, the total investment by the global defined benefit pension plans in our securities was approximately 1% of total plan assets. Our domestic defined benefit pension plans are approximately 101% funded on a projected benefit obligation basis as of December 31, 2017, and we are not required to make additional contributions through the end of 2028. We expect to make total contributions of approximately $100 million to our global defined benefit pension plans in 2018. Contributions to our global defined benefit pension plans in 2018 are expected to meet or exceed the current funding requirements.

2016 Compared with 2015

Cash generated from operating activities of continuing operations in 2016 was approximately $343 million lower than 2015, driven primarily by $392 million higher investment in working capital, $156 million higher contributions to our global defined benefit pension plans, and the first of four annual payments of $237 million related to the 2015 Canadian government settlement; partially offset by the absence of the noncash portion of other infrequently occurring items, as discussed in Results of Operations, which are included in Other operating activities, net in the Consolidated Statement of Cash Flows for the year ended December 31, 2015. The 2016 cash outflows for working capital were primarily driven by increases in inventory in our aerospace businesses to support deliveries and other contractual commitments, including approximately $220 million of inventory costs attributable to new engine offerings recognized based on the average cost per unit expected over the life of each contract using the units-of-delivery method of percentage of completion accounting, as discussed in Note 6. Increases in accounts receivable at Pratt & Whitney and our commercial businesses were partially offset by increases in accounts payable and accrued liabilities across all of our businesses. For 2015, cash outflows for working capital were primarily driven by increases in inventory in our aerospace businesses to support deliveries and other contractual commitments, and were partially offset by increases in accounts payable and accrued liabilities in these businesses. Increases in accounts receivable in our commercial businesses were largely offset by increases in accounts payable and customer advances in these businesses. Reductions in accrued liabilities also include payments of interest and taxes of approximately $300 million related to the German tax matter, as discussed in Note 18.

Cash Flow—Investing Activities of Continuing Operations

(dollars in millions)	**2017**	2016	2015
Net cash flows used in investing activities of continuing operations	**$ (3,019)**	$ (2,509)	$ (2,794)

2017 Compared with 2016

Cash flows used in investing activities of continuing operations for 2017 and 2016 primarily reflect capital expenditures, cash investments in customer financing assets, cash investments in businesses, and payments related to our collaboration intangible assets and contractual rights to provide product on new aircraft platforms. In 2017, we realized net proceeds of $596 million from UTC Climate, Controls & Security's sale of investments in Watsco, Inc.

In 2017, we increased our collaboration intangible assets by approximately $380 million, of which approximately $340 million represented payments made under our 2012 agreement to acquire Rolls-Royce's ownership and collaboration interests in IAE. Capital expenditures for 2017 ($2,014 million) primarily relate to investments in production capacity at Pratt & Whitney and UTC Aerospace Systems, as well as new facilities at Pratt & Whitney and UTC Climate, Controls & Security. Cash investments in businesses in 2017 ($231 million) consisted of a number of small acquisitions, primarily in our commercial businesses. Other than the merger with Rockwell Collins discussed above, we do not expect to make significant investments in acquisitions in 2018. However, actual acquisition spending may vary depending upon the timing, availability and appropriate value of acquisition opportunities. We expect capital expenditures in 2018 to be consistent with 2017 levels.

As discussed in Note 14 to the Consolidated Financial Statements, we enter into derivative instruments for risk management purposes only, including derivatives designated as hedging instruments under the Derivatives and Hedging Topic of the Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) and those utilized as economic hedges. We operate internationally and, in the normal course of business, are exposed to fluctuations in interest rates, foreign

exchange rates and commodity prices. These fluctuations can increase the costs of financing, investing and operating the business. We have used derivative instruments, including swaps, forward contracts and options to manage certain foreign currency, interest rate and commodity price exposures. During the years ended December 31, 2017 and 2016, we made net cash payments of approximately $317 million and had net cash receipts of approximately $249 million, respectively, from the settlement of these derivative instruments.

Customer financing activities, primarily driven by additional Geared Turbofan engines to support customer fleets, were a net use of cash of $975 million and $221 million in 2017 and 2016, respectively. We expect 2018 investments in customer financing assets to be slightly higher than 2017 investments, as we continue to invest in commercial aircraft engines and products under lease. While we expect that 2018 customer financing activity will be a net use of funds, actual funding is subject to usage under existing customer financing commitments during the year. We may also arrange for third-party investors to assume a portion of our commitments. At December 31, 2017, we had commercial aerospace financing and other contractual commitments of approximately $15.3 billion related to commercial aircraft and certain contractual rights to provide product on new aircraft platforms, of which as much as $1.3 billion may be required to be disbursed during 2018. As discussed in Note 1 to the Consolidated Financial Statements, we have entered into certain collaboration arrangements, which may include participation by our collaborators in these commitments. At December 31, 2017, our collaborators' share of these commitments was approximately $5.1 billion of which as much as $374 million may be required to be disbursed to us during 2018. Refer to Note 5 to the Consolidated Financial Statements for additional discussion of our commercial aerospace industry assets and commitments.

2016 Compared with 2015

Cash flows used in investing activities of continuing operations for 2016 and 2015 primarily reflect capital expenditures, cash investments in businesses, and payments related to our collaboration intangible assets and contractual rights to provide product on new aircraft platforms.

Cash investments in businesses in 2016 ($710 million) consisted of the acquisition of a majority interest in an Italian heating products and services company by UTC Climate, Controls & Security, the acquisition of a Japanese services company by Otis and a number of small acquisitions, primarily in our commercial businesses. Cash investments in businesses in 2015 ($538 million) consisted of the acquisition of the majority interest in a UTC Climate, Controls & Security business, the acquisition of an imaging technology company by UTC Aerospace Systems and a number of small acquisitions, primarily in our commercial businesses, and were partially offset by net proceeds of approximately $200 million from business dispositions. Customer financing activities were a net use of cash of $221 million and $247 million in 2016 and 2015, respectively.

Cash Flow—Financing Activities of Continuing Operations

(dollars in millions)	**2017**	2016	2015
Net cash flows used in financing activities of continuing operations	**$ (993)**	$ (1,188)	$ (10,776)

2017 Compared with 2016

The timing and levels of certain cash flow activities, such as acquisitions and repurchases of our stock, have resulted in the issuance of both long-term and short-term debt, including approximately $3.4 billion and $4.0 billion of net long-term debt issuances in 2017 and 2016, respectively. Commercial paper borrowings and revolving credit facilities provide short-term liquidity to supplement operating cash flows and are used for general corporate purposes, including the funding of potential acquisitions and repurchases of our stock. We had approximately $300 million and $522 million of outstanding commercial paper at December 31, 2017 and 2016, respectively. Commercial paper borrowings at December 31, 2016 were comprised of approximately €500 million ($522 million) of Euro-denominated commercial paper. We had no Euro-denominated commercial paper borrowings outstanding at December 31, 2017.

At December 31, 2017, management had remaining authority to repurchase approximately $2.3 billion of our common stock under the October 14, 2015 share repurchase program. Under this program, shares may be purchased on the open market, in privately negotiated transactions, under accelerated share repurchase programs, and under plans complying with Rules 10b5-1 and 10b-18 under the Securities Exchange Act of 1934, as amended. We may also reacquire shares outside of the program from time to time in connection with the surrender of shares to cover taxes on vesting of restricted stock and in connection with our employee savings plan. We made cash payments of approximately $1.45 billion to repurchase approximately 12.9 million shares of our common stock during the year ended December 31, 2017. In addition to the transactions under the ASR agreements discussed above, we repurchased approximately 22 million shares of our common stock for approximately $2.25 billion during the year ended December 31, 2016. In connection with the merger agreement with Rockwell Collins announced on September 4, 2017, we have suspended share repurchases, excluding activity relating to our

employee savings plans. As we continue to assess the impacts of the TCJA, future opportunities for repatriation of our non-U.S. earnings, and accelerated de-leveraging, we may consider, in addition to investments in our operations, limited additional share repurchases to offset the effects of dilution related to our stock-based compensation programs - see Note 12.

We paid aggregate dividends on common stock of approximately $2.1 billion in both 2017 and 2016. On February 5, 2018, the Board of Directors declared a dividend of $0.70 per share payable March 10, 2018 to shareowners of record at the close of business on February 16, 2018.

We have an existing universal shelf registration statement filed with the SEC for an indeterminate amount of debt and equity securities for future issuance, subject to our internal limitations on the amount of debt to be issued under this shelf registration statement.

2016 Compared with 2015

In 2015, we completed the optional remarketing of the 1.550% junior subordinated notes, which were originally issued as part of our equity units on June 18, 2012. As a result of the remarketing, these notes were redesignated as our 1.778% junior subordinated notes due May 4, 2018. We received approximately $1.1 billion from the proceeds of the remarketing, and issued approximately 11.3 million shares of Common Stock to settle the purchase obligation of the holders of the equity units under the purchase contract entered into at the time of the original issuance of the equity units.

We had approximately $4 billion of net long-term debt issuances in 2016, and made net repayments of long-term debt of $20 million in 2015. We had approximately $522 million and $727 million of outstanding commercial paper at December 31, 2016 and 2015, respectively. In addition to the transactions under the ASR agreements discussed above, we repurchased approximately 14 million shares of our common stock for approximately $1.35 billion during the year ended December 31, 2015.

In 2016 and 2015, we paid aggregate dividends on common stock of approximately $2.1 billion and $2.2 billion, respectively.

Cash Flow—Discontinued Operations

(dollars in millions)	**2017**	2016	2015
Net cash flows (used in) provided by discontinued operations	**$ —**	$ (2,526)	$ 8,619

Cash flows used in operating activities of discontinued operations in 2016 primarily reflect the payment of taxes associated with the net gain realized on the sale of Sikorsky to Lockheed Martin Corp. in November 2015.

For the year ended December 31, 2015, cash flows provided by discontinued operations primarily reflect those from investing activities, which includes the proceeds of $9.1 billion from the sale of Sikorsky to Lockheed Martin Corp. in November 2015, partially offset by capital expenditures of Sikorsky in 2015. Cash outflows from operating activities of discontinued operations for the year ended December 31, 2015 primarily reflect operating income and noncash expenses, as well as net investments in working capital and other net operating assets of Sikorsky.

CRITICAL ACCOUNTING ESTIMATES

Preparation of our financial statements requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses. Note 1 to the Consolidated Financial Statements describes the significant accounting policies used in preparation of the Consolidated Financial Statements. Management believes the most complex and sensitive judgments, because of their significance to the Consolidated Financial Statements, result primarily from the need to make estimates about the effects of matters that are inherently uncertain. The most significant areas involving management judgments and estimates are described below. Actual results in these areas could differ from management's estimates.

Long-Term Contract Accounting. We utilize percentage-of-completion accounting on certain of our long-term contracts. The percentage-of-completion method requires estimates of future revenues and costs over the full term of product and/or service delivery. We also utilize the completed-contract method of accounting on certain lesser value commercial contracts. Under the completed-contract method, sales and cost of sales are recognized when a contract is completed.

Losses, if any, on long-term contracts are provided for when anticipated. We recognize loss provisions on original equipment contracts to the extent that estimated inventoriable manufacturing, engineering, product warranty and product performance guarantee costs, as appropriate, exceed the projected revenue from the products and services contemplated under the contractual arrangement. For new commitments, we generally record loss provisions at the earlier of contract announcement or contract signing except for certain requirements contracts under which losses are recorded based upon receipt of the purchase

order which obligates us to perform. For existing commitments, anticipated losses on contracts are recognized in the period in which losses become evident. Products contemplated under the contractual arrangement include products purchased under the contract and, in the large commercial engine and wheels and brakes businesses, future highly probable sales of replacement parts required by regulation that are expected to be purchased subsequently for incorporation into the original equipment. Revenue projections used in determining contract loss provisions are based upon estimates of the quantity, pricing and timing of future product deliveries. We measure the extent of progress toward completion on our long-term commercial aerospace equipment contracts using units-of-delivery. In addition, we use the cost-to-cost method for elevator and escalator sales, installation and modernization contracts in the commercial businesses and certain aerospace development contracts. For long-term aftermarket contracts, we recognize revenue over the contract period in proportion to the costs expected to be incurred in performing services under the contract. Within commercial aerospace, inventory costs attributable to new engine offerings are recognized based on the average cost per unit expected over the life of each contract using the units-of-delivery method of percentage of completion accounting. Under this method, costs of initial engine deliveries in excess of the projected contract per unit average cost are capitalized, and these capitalized amounts are subsequently expensed as additional engine deliveries occur for engines with costs below the projected contract per unit average cost over the life of the contract. As of December 31, 2017 and 2016, inventories included $438 million and $233 million, respectively, of such capitalized amounts. As described in Note 1 to the Consolidated Financial Statements, these costs will be eliminated through retained earnings and will not be amortized into future earnings upon adoption of *Accounting Standards Update (ASU) 2014-09, Revenue from Contracts with Customers* effective January 1, 2018. Contract accounting also requires estimates of future costs over the performance period of the contract as well as an estimate of award fees and other sources of revenue.

Contract costs are incurred over a period of time, which can be several years, and the estimation of these costs requires management's judgment. The long-term nature of these contracts, the complexity of the products, and the strict safety and performance standards under which they are regulated can affect our ability to estimate costs precisely. As a result, we review and update our cost estimates on significant contracts on a quarterly basis, no less frequently than annually for all others, and when circumstances change and warrant a modification to a previous estimate. We record changes in contract estimates primarily using the cumulative catch-up method in accordance with the Revenue Recognition Topic of the FASB ASC.

Income Taxes. The future tax benefit arising from deductible temporary differences and tax carryforwards was $3.8 billion at December 31, 2017 and $5.7 billion at December 31, 2016. Management believes that our earnings during the periods when the temporary differences become deductible will be sufficient to realize the related future income tax benefits, which may be realized over an extended period of time. For those jurisdictions where the expiration date of tax carryforwards or the projected operating results indicate that realization is not likely, a valuation allowance is provided.

In assessing the need for a valuation allowance, we estimate future taxable income, considering the feasibility of ongoing tax planning strategies and the realizability of tax loss carryforwards. Valuation allowances related to deferred tax assets can be affected by changes to tax laws, changes to statutory tax rates and future taxable income levels. In the event we were to determine that we would not be able to realize all or a portion of our deferred tax assets in the future, we would reduce such amounts through an increase to tax expense in the period in which that determination is made or when tax law changes are enacted. Conversely, if we were to determine that we would be able to realize our deferred tax assets in the future in excess of the net carrying amounts, we would decrease the recorded valuation allowance through a decrease to tax expense in the period in which that determination is made.

In the ordinary course of business there is inherent uncertainty in quantifying our income tax positions. We assess our income tax positions and record tax benefits for all years subject to examination based upon management's evaluation of the facts, circumstances and information available at the reporting date. For those tax positions where it is more likely than not that a tax benefit will be sustained, we have recorded the largest amount of tax benefit with a greater than 50% likelihood of being realized upon ultimate settlement with a taxing authority that has full knowledge of all relevant information. For those income tax positions where it is not more likely than not that a tax benefit will be sustained, no tax benefit has been recognized in the financial statements. See Notes 1 and 11 to the Consolidated Financial Statements for further discussion. Also see Note 18 for discussion of UTC administrative review proceedings with the German Tax Office.

See Note 11 to the Consolidated Financial Statements for additional provision items recorded in regards to TCJA.

Goodwill and Intangible Assets. Our investments in businesses in 2017 totaled $231 million. The assets and liabilities of acquired businesses are recorded under the acquisition method of accounting at their estimated fair values at the dates of acquisition. Goodwill represents costs in excess of fair values assigned to the underlying identifiable net assets of acquired businesses. Intangible assets consist of service portfolios, patents, trademarks/tradenames, customer relationships and other intangible assets including a collaboration asset established in connection with our 2012 agreement to acquire Rolls-Royce's ownership and collaboration interests in IAE, as discussed above and in Note 2 to the Consolidated Financial Statements.

Also included within other intangible assets are payments made to secure certain contractual rights to provide product on new commercial aerospace platforms. Such payments are capitalized when there are distinct rights obtained and there are sufficient incremental cash flows to support the recoverability of the assets established. Otherwise, the applicable portion of the payments are expensed. Capitalized payments made on these contractual commitments are amortized as a reduction of sales. We amortize these intangible assets based on the pattern of economic benefit, which typically results in an amortization method other than straight-line. In the aerospace industry, amortization based on the pattern of economic benefit generally results in lower amortization expense during the development period with increasing amortization expense as programs enter full production and aftermarket cycles. If a pattern of economic benefit cannot be reliably determined, a straight-line amortization method is used. The gross value of these contractual commitments at December 31, 2017 was approximately $10.6 billion, of which approximately $2.3 billion has been paid to date. We record these payments as intangible assets when such payments are no longer conditional. The recoverability of these intangibles is dependent upon the future success and profitability of the underlying aircraft platforms including the associated aftermarket revenue streams.

Goodwill and intangible assets deemed to have indefinite lives are not amortized, but are subject to annual, or more frequent if necessary, impairment testing using the guidance and criteria described in the Intangibles—Goodwill and Other Topic of the FASB ASC. On July 1, 2017, we early adopted ASU 2017-04, which eliminates Step 2 of the goodwill impairment test, which required a hypothetical purchase price allocation to measure goodwill impairment. A goodwill impairment loss is now measured at the amount by which a reporting unit's carrying value exceeds its fair value, without exceeding the recorded amount of goodwill. In developing our estimates for the fair value of our reporting units, significant judgment is required in the determination of the appropriateness of using a qualitative assessment or quantitative assessment. For these quantitative assessments that are performed, fair value is primarily based on income approaches using discounted cash flow models which have significant assumptions. Such assumptions are subject to variability from year to year and are directly impacted by global market conditions. We completed our annual impairment testing as of July 1, 2017 and determined that no significant adjustments to the carrying value of goodwill or indefinite lived intangible assets were necessary. Although these assets are not currently impaired, there can be no assurance that future impairments will not occur. See Note 2 to the Consolidated Financial Statements for further discussion.

Contingent Liabilities. Our operating units include businesses which sell products and services and conduct operations throughout the world. As described in Note 18 to the Consolidated Financial Statements, contractual, regulatory and other matters, including asbestos claims, in the normal course of business may arise that subject us to claims or litigation. Of note, the design, development, production and support of new aerospace technologies is inherently complex and subject to risk. Since the PurePower PW1000G Geared TurboFan engine entered into service in 2016, technical issues have been identified and experienced with the engine, which is usual for new engines and new aerospace technologies. Pratt & Whitney has addressed these issues through various improvements and modifications. These issues have resulted in financial impacts, including increased warranty provisions, customer contract settlements, and reductions in contract performance estimates. Additional technical issues have been identified, for which a reasonable estimate of the impact cannot currently be made, and such issues may also arise in the normal course, which may result in financial impacts that could be material to the Company's financial position, results of operations and cash flows.

Additionally, we have significant contracts with the U.S. Government, subject to government oversight and audit, which may require significant adjustment of contract prices. We accrue for liabilities associated with these matters when it is probable that a liability has been incurred and the amount can be reasonably estimated. The most likely cost to be incurred is accrued based on an evaluation of then currently available facts with respect to each matter. When no amount within a range of estimates is more likely, the minimum is accrued. The inherent uncertainty related to the outcome of these matters can result in amounts materially different from any provisions made with respect to their resolution.

Employee Benefit Plans. We sponsor domestic and foreign defined benefit pension and other postretirement plans. Major assumptions used in the accounting for these employee benefit plans include the discount rate, expected return on plan assets, rate of increase in employee compensation levels, mortality rates, and health care cost increase projections. Assumptions are determined based on company data and appropriate market indicators, and are evaluated each year at December 31. A change in any of these assumptions would have an effect on net periodic pension and postretirement benefit costs reported in the Consolidated Financial Statements.

In the following table, we show the sensitivity of our pension and other postretirement benefit plan liabilities and net annual periodic cost to a 25 basis point change in the discount rates for benefit obligations, interest cost and service cost as of December 31, 2017:

(dollars in millions)	Increase in Discount Rate of 25 bps	Decrease in Discount Rate of 25 bps
Pension plans		
Projected benefit obligation	$ (1,051)	$ 1,107
Net periodic pension (benefit) cost	(44)	44
Other postretirement benefit plans		
Accumulated postretirement benefit obligation	(12)	13
Net periodic postretirement benefit cost	—	—

These estimates assume no change in the shape or steepness of the company-specific yield curve used to plot the individual spot rates that will be applied to the future cash outflows for future benefit payments in order to calculate interest and service cost. A flattening of the yield curve, from a narrowing of the spread between interest and obligation discount rates, would increase our net periodic pension cost. Conversely, a steepening of the yield curve, from an increase in the spread between interest and obligation discount rates, would decrease our net periodic pension cost.

Pension expense is also sensitive to changes in the expected long-term rate of asset return. An increase or decrease of 25 basis points in the expected long-term rate of asset return would have decreased or increased 2017 pension expense by approximately $80 million.

The weighted-average discount rates used to measure pension liabilities and costs are set by reference to UTC-specific analyses using each plan's specific cash flows and are then compared to high-quality bond indices for reasonableness. For our significant plans, we utilize a full yield curve approach in the estimation of the service cost and interest cost components by applying the specific spot rates along the yield curve used in determination of the benefit obligation to the relevant projected cash flows. Global market interest rates have decreased in 2017 as compared with 2016 and, as a result, the weighted-average discount rate used to measure pension liabilities decreased from 3.8% in 2016 to 3.4% in 2017. The weighted-average discount rates used to measure service cost and interest cost were 3.6% and 3.3% in 2017, respectively. In December 2009, we amended the salaried retirement plans (qualified and non-qualified) to change the retirement formula effective January 1, 2015. The formula changed from a final average earnings (FAE) and credited service formula to the existing cash balance formula that was adopted in 2003 for newly hired non-union employees and for other non-union employees who made a one-time voluntary election to have future benefit accruals determined under this formula. Employees hired after 2009 are not eligible for any defined benefit pension plan and will instead receive an enhanced benefit under the UTC Savings Plan. As of July 26, 2012 the same amendment was applied to legacy Goodrich salaried employees. Across our global pension plans, the impact of changing the structure of our significant domestic plans to segregate active participants and inactive participants, 2017 actual returns on plan assets, pension contributions and lower discount rates for interest costs, partially offset by lower discount rates for pension obligations and a reduction in the expected return on plan assets, will result in a net periodic pension benefit in 2018 that is approximately $200 million favorable relative to 2017 amounts.

See Note 12 to the Consolidated Financial Statements for further discussion.

OFF-BALANCE SHEET ARRANGEMENTS AND CONTRACTUAL OBLIGATIONS

We extend a variety of financial guarantees to third parties in support of unconsolidated affiliates and for potential financing requirements of commercial aerospace customers. We also have obligations arising from sales of certain businesses and assets, including indemnities for representations and warranties and environmental, health and safety, tax and employment matters. Circumstances that could cause the contingent obligations and liabilities arising from these arrangements to come to fruition include changes in an underlying transaction (e.g., hazardous waste discoveries, etc.), nonperformance under a contract, customer requests for financing, or deterioration in the financial condition of the guaranteed party.

A summary of our consolidated contractual obligations and commitments as of December 31, 2017 is as follows:

		Payments Due by Period			
(dollars in millions)	Total	2018	2019-2020	2021-2022	Thereafter
Long-term debt—principal	**$ 27,118**	$ 2,104	$ 4,750	$ 4,979	$ 15,285
Long-term debt—future interest	**13,736**	943	1,760	1,487	9,546
Operating leases	**2,252**	498	755	364	635
Purchase obligations	**11,300**	8,102	3,029	138	31
Other long-term liabilities	**3,622**	922	1,247	419	1,034
Total contractual obligations	**$ 58,028**	$ 12,569	$ 11,541	$ 7,387	$ 26,531

Purchase obligations include amounts committed for the purchase of goods and services under legally enforceable contracts or purchase orders. Where it is not practically feasible to determine the legally enforceable portion of our obligation under certain of our long-term purchase agreements, we include additional expected purchase obligations beyond what is legally enforceable. Approximately 19% of the purchase obligations disclosed above represent purchase orders for products to be delivered under firm contracts with the U.S. Government for which we have full recourse under customary contract termination clauses.

Other long-term liabilities primarily include those amounts on our December 31, 2017 balance sheet representing obligations under product service and warranty policies, performance and operating cost guarantees, estimated environmental remediation costs and expected contributions under employee benefit programs. The timing of expected cash flows associated with these obligations is based upon management's estimates over the terms of these agreements and is largely based upon historical experience.

In connection with the acquisition of Goodrich in 2012, we recorded assumed liabilities of approximately $2.2 billion related to customer contractual obligations on certain OEM development programs where the expected costs exceeded the expected revenue under contract. These liabilities are being liquidated in accordance with the underlying economic pattern of obligations, as reflected by the net cash outflows incurred on the OEM contracts. Total consumption of the contractual obligations for the year ended December 31, 2017 was approximately $217 million. Total future consumption of the contractual obligations is expected to be as follows: $257 million in 2018, $229 million in 2019, $150 million in 2020, $84 million in 2021, $37 million in 2022 and $229 million thereafter. These amounts are not included in the table above.

The above table also does not reflect unrecognized tax benefits of $1,189 million, the timing of which is uncertain, except for approximately $9 million that may become payable during 2018. Refer to Note 11 to the Consolidated Financial Statements for additional discussion on unrecognized tax benefits.

COMMERCIAL COMMITMENTS

The following table summarizes our commercial commitments outstanding as of December 31, 2017:

		Amount of Commitment Expiration per Period			
(dollars in millions)	Committed	2018	2019-2020	2021-2022	Thereafter
Commercial aerospace financing commitments	**$ 4,012**	$ 371	$ 1,314	$ 1,674	$ 653
Other commercial aerospace commitments	**11,270**	910	1,524	1,380	7,456
Commercial aerospace financing arrangements	**336**	2	16	10	308
Credit facilities and debt obligations (expire 2018 to 2028)	**256**	205	39	—	12
Performance guarantees	**56**	7	39	—	10
Total commercial commitments	**$ 15,930**	$ 1,495	$ 2,932	$ 3,064	$ 8,439

In connection with our 2012 agreement to acquire Rolls-Royce's ownership and collaboration interests in IAE, additional payments are due to Rolls-Royce contingent upon each hour flown through June 2027 by the V2500-powered aircraft in service as of the acquisition date. These flight hour payments, included in "Other commercial aerospace commitments" in the table above, are being capitalized as collaboration intangible assets. The collaboration intangible assets are amortized based upon the pattern of economic benefit as represented by the underlying cash flows.

We also have other contractual commitments, including commitments to secure certain contractual rights to provide product on new aircraft platforms, which are included in "Other commercial aerospace commitments" in the table above. Such payments are capitalized when distinct rights are obtained and there are sufficient incremental cash flows to support the recoverability of the assets established. Otherwise, the applicable portion of the payments are expensed. Capitalized payments made on these contractual commitments are included in intangible assets and are amortized over the term of underlying economic benefit.

Refer to Notes 1, 5 and 17 to the Consolidated Financial Statements for additional discussion on contractual and commercial commitments.

MARKET RISK AND RISK MANAGEMENT

We are exposed to fluctuations in foreign currency exchange rates, interest rates and commodity prices. To manage certain of those exposures, we use derivative instruments, including swaps, forward contracts and options. Derivative instruments utilized by us in our hedging activities are viewed as risk management tools, involve relatively little complexity and are not used for trading or speculative purposes. We diversify the counterparties used and monitor the concentration of risk to limit our counterparty exposure.

We have evaluated our exposure to changes in foreign currency exchange rates, interest rates and commodity prices in our market risk sensitive instruments, which are primarily cash, debt, and derivative instruments, using a value at risk analysis. Based on a 95% confidence level and a one-day holding period, at December 31, 2017, the potential loss in fair value on our market risk sensitive instruments was not material in relation to our financial position, results of operations or cash flows. Our calculated value at risk exposure represents an estimate of reasonably possible net losses based on volatilities and correlations and is not necessarily indicative of actual results. Refer to Notes 1, 9 and 14 to the Consolidated Financial Statements for additional discussion of foreign currency exchange, interest rates and financial instruments.

Foreign Currency Exposures. We have a large volume of foreign currency exposures that result from our international sales, purchases, investments, borrowings and other international transactions. International segment sales, excluding U.S. export sales, averaged approximately $25 billion over the last three years. We actively manage foreign currency exposures that are associated with committed foreign currency purchases and sales, and other assets and liabilities created in the normal course of business at the operating unit level. More than insignificant exposures that cannot be naturally offset within an operating unit are hedged with foreign currency derivatives. We also have a significant amount of foreign currency net asset exposures. As discussed in Note 9 to the Consolidated Financial Statements, at December 31, 2017 we have approximately €3.7 billion of Euro-denominated long-term debt, which qualify as a net investment hedge against our investments in European businesses. We had no Euro-denominated commercial paper borrowings outstanding at December 31, 2017. As of December 31, 2017, the net investment hedge is deemed to be effective. Currently, we do not hold any derivative contracts that hedge our foreign currency net asset exposures but may consider such strategies in the future.

Within aerospace, our sales are typically denominated in U.S. Dollars under accepted industry convention. However, for our non-U.S. based entities, such as P&WC, a substantial portion of their costs are incurred in local currencies. Consequently, there is a foreign currency exchange impact and risk to operational results as U.S. Dollars must be converted to local currencies such as the Canadian Dollar in order to meet local currency cost obligations. In order to minimize the exposure that exists from changes in the exchange rate of the U.S. Dollar against these other currencies, we hedge a certain portion of sales to secure the rates at which U.S. Dollars will be converted. The majority of this hedging activity occurs at P&WC, and hedging activity also occurs to a lesser extent at certain UTC Aerospace Systems businesses. At P&WC, firm and forecasted sales for both engines and spare parts are hedged at varying amounts for up to 48 months on the U.S. Dollar sales exposure as represented by the excess of U.S. Dollar sales over U.S. Dollar denominated purchases. Hedging gains and losses resulting from movements in foreign currency exchange rates are partially offset by the foreign currency translation impacts that are generated on the translation of local currency operating results into U.S. Dollars for reporting purposes. While the objective of the hedging program is to minimize the foreign currency exchange impact on operating results, there are typically variances between the hedging gains or losses and the translational impact due to the length of hedging contracts, changes in the sales profile, volatility in the exchange rates and other such operational considerations.

Interest Rate Exposures. Our long-term debt portfolio consists mostly of fixed-rate instruments. From time to time, we may hedge to floating rates using interest rate swaps. The hedges are designated as fair value hedges and the gains and losses on the swaps are reported in interest expense, reflecting that portion of interest expense at a variable rate. We issue commercial paper, which exposes us to changes in interest rates. Currently, we do not hold any derivative contracts that hedge our interest exposures, but may consider such strategies in the future.

Commodity Price Exposures. We are exposed to volatility in the prices of raw materials used in some of our products and from time to time we may use forward contracts in limited circumstances to manage some of those exposures. In the future, if

hedges are used, gains and losses may affect earnings. There were no significant outstanding commodity hedges as of December 31, 2017.

ENVIRONMENTAL MATTERS

Our operations are subject to environmental regulation by federal, state and local authorities in the United States and regulatory authorities with jurisdiction over our foreign operations. As a result, we have established, and continually update, policies relating to environmental standards of performance for our operations worldwide. We believe that expenditures necessary to comply with the present regulations governing environmental protection will not have a material effect upon our competitive position, results of operations, cash flows or financial condition.

We have identified 734 locations, mostly in the United States, at which we may have some liability for remediating contamination. We have resolved our liability at 341 of these locations. We do not believe that any individual location's exposure will have a material effect on our results of operations. Sites in the investigation, remediation or operation and maintenance stage represent approximately 93% of our accrued environmental remediation reserve.

We have been identified as a potentially responsible party under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA or Superfund) at 128 sites. The number of Superfund sites, in and of itself, does not represent a relevant measure of liability because the nature and extent of environmental concerns vary from site to site and our share of responsibility varies from sole responsibility to very little responsibility. In estimating our liability for remediation, we consider our likely proportionate share of the anticipated remediation expense and the ability of other potentially responsible parties to fulfill their obligations.

At December 31, 2017 and 2016, we had $830 million and $829 million reserved for environmental remediation, respectively. Cash outflows for environmental remediation were $42 million in 2017, $44 million in 2016 and $50 million in 2015. We estimate that ongoing environmental remediation expenditures in each of the next two years will not exceed approximately $91 million.

ASBESTOS MATTERS

As a result of the definitization of the insurance coverage for existing and potential future asbestos claims through the negotiation and establishment of settlement agreements during 2015, as well as the stabilization of company and industry experience, we established a reserve for our potential asbestos exposure, recording a noncash pretax charge to earnings of $237 million in the fourth quarter of 2015.

Our estimated total liability to resolve all pending and unasserted potential future asbestos claims through 2059 is approximately $344 million and is principally recorded in Other long-term liabilities on our Consolidated Balance Sheet as of December 31, 2017. This amount is on a pre-tax basis, not discounted, and excludes the Company’s legal fees to defend the asbestos claims (which will continue to be expensed by the Company as they are incurred). In addition, the Company has an insurance recovery receivable for probable asbestos related recoveries of approximately $120 million, which is included primarily in Other assets on our Consolidated Balance Sheet as of December 31, 2017. See Note 18 "Contingent Liabilities" of our Consolidated Financial Statements for further discussion of this matter.

GOVERNMENT MATTERS

As described in "Critical Accounting Estimates—Contingent Liabilities," our contracts with the U.S. Government are subject to audits. Such audits may recommend that certain contract prices should be reduced to comply with various government regulations, or that certain payments be delayed or withheld. We are also the subject of one or more investigations and legal proceedings initiated by the U.S. Government with respect to government contract matters. See "Legal Proceedings" in Item 1 to this Form 10-K, and Note 11 "Income Taxes" and Note 18 "Contingent Liabilities" of our Consolidated Financial Statements for further discussion of these and other government matters.

Cautionary Note Concerning Factors That May Affect Future Results

This 2017 Annual Report to Shareowners (2017 Annual Report) contains statements which, to the extent they are not statements of historical or present fact, constitute "forward-looking statements" under the securities laws. From time to time, oral or written forward-looking statements may also be included in other information released to the public. These forward-looking statements are intended to provide management's current expectations or plans for our future operating and financial performance, based on assumptions currently believed to be valid. Forward-looking statements can be identified by the use of words such as "believe," "expect," "expectations," "plans," "strategy," "prospects," "estimate," "project," "target," "anticipate," "will," "should," "see," "guidance," "outlook," "confident" and other words of similar meaning in connection with a discussion of future operating or financial performance. Forward-looking statements may include, among other things, statements relating to future sales, earnings, cash flow, results of operations, uses of cash, share repurchases, tax rates and other measures of financial performance or potential future plans, strategies or transactions of United Technologies or the combined company following United Technologies' pending acquisition of Rockwell Collins, the anticipated benefits of the pending acquisition, including estimated synergies, the expected timing of completion of the transaction and other statements that are not historical facts. All forward-looking statements involve risks, uncertainties and other factors that may cause actual results to differ materially from those expressed or implied in the forward-looking statements. For those statements, we claim the protection of the safe harbor for forward-looking statements contained in the U.S. Private Securities Litigation Reform Act of 1995. Such risks, uncertainties and other factors include, without limitation:

- the effect of economic conditions in the industries and markets in which we and Rockwell Collins operate in the U.S. and globally and any changes therein, including financial market conditions, fluctuations in commodity prices, interest rates and foreign currency exchange rates, levels of end market demand in construction and in both the commercial and defense segments of the aerospace industry, levels of air travel, financial condition of commercial airlines, the impact of weather conditions and natural disasters and the financial condition of our customers and suppliers;
- challenges in the development, production, delivery, support, performance and realization of the anticipated benefits of advanced technologies and new products and services;
- the scope, nature, impact or timing of acquisition and divestiture activity, including the pending acquisition of Rockwell Collins, including among other things integration of acquired businesses into UTC's existing businesses and realization of synergies and opportunities for growth and innovation;
- future levels of indebtedness, including indebtedness expected to be incurred by UTC in connection with the pending Rockwell Collins acquisition, and capital spending and research and development spending, including in connection with the pending Rockwell Collins acquisition;
- future availability of credit and factors that may affect such availability, including credit market conditions and our capital structure;
- the timing and scope of future repurchases of our common stock, which may be suspended at any time due to various factors, including market conditions and the level of other investing activities and uses of cash;
- delays and disruption in delivery of materials and services from suppliers;
- company and customer-directed cost reduction efforts and restructuring costs and savings and other consequences thereof;
- new business and investment opportunities;
- our ability to realize the intended benefits of organizational changes;
- the anticipated benefits of diversification and balance of operations across product lines, regions and industries;
- the outcome of legal proceedings, investigations and other contingencies;
- pension plan assumptions and future contributions;
- the impact of the negotiation of collective bargaining agreements and labor disputes;
- the effect of changes in political conditions in the U.S. and other countries in which we and Rockwell Collins operate, including the effect of changes in U.S. trade policies or the U.K.'s pending withdrawal from the EU, on general market conditions, global trade policies and currency exchange rates in the near term and beyond; and
- the effect of changes in tax (including the new U.S. tax law that was enacted on December 22, 2017 and is commonly referred to as the Tax Cuts and Jobs Act of 2017), environmental, regulatory (including among other things import/export) and other laws and regulations in the U.S. and other countries in which we and Rockwell Collins operate;
- the ability of UTC and Rockwell Collins to receive the required regulatory approvals (and the risk that such approvals may result in the imposition of conditions that could adversely affect the combined company or the expected benefits of the merger) and to satisfy the other conditions to the closing of the proposed merger on a timely basis or at all;
- the occurrence of events that may give rise to a right of one or both of UTC or Rockwell Collins to terminate the merger agreement, including in circumstances that might require Rockwell Collins to pay a termination fee of $695 million to UTC or $50 million of expense reimbursement;

- negative effects of the announcement or the completion of the merger on the market price of UTC's and/or Rockwell Collins' common stock and/or on their respective financial performance;
- the risks related to Rockwell Collins and UTC being restricted in their operation of their businesses while the merger agreement is in effect;
- risks relating to the value of the UTC's shares to be issued in connection with the proposed Rockwell merger, significant merger costs and/or unknown liabilities;
- risks associated with third-party contracts containing consent and/or other provisions that may be triggered by the Rockwell merger agreement;
- risks associated with merger-related litigation or appraisal proceedings; and
- the ability of UTC and Rockwell Collins, or the combined company, to retain and hire key personnel.

In addition, our Annual Report on Form 10-K for 2017 includes important information as to risks, uncertainties and other factors that may cause actual results to differ materially from those expressed or implied in the forward-looking statements. See the "Notes to Consolidated Financial Statements" under the heading "Note 18: Contingent Liabilities," the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" under the headings "Business Overview," "Results of Operations," "Liquidity and Financial Condition," and "Critical Accounting Estimates," and the section titled "Risk Factors." Our Annual Report on Form 10-K for 2017 also includes important information as to these factors in the "Business" section under the headings "General," "Description of Business by Segment" and "Other Matters Relating to Our Business as a Whole," and in the "Legal Proceedings" section. Additional important information as to these factors is included in this 2017 Annual Report in the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" under the headings "Restructuring Costs," "Environmental Matters" and "Governmental Matters." The forward-looking statements speak only as of the date of this report or, in the case of any document incorporated by reference, the date of that document. We undertake no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable law. Additional information as to factors that may cause actual results to differ materially from those expressed or implied in the forward-looking statements is disclosed from time to time in our other filings with the SEC.

Management's Report on Internal Control over Financial Reporting

The management of UTC is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external reporting purposes in accordance with accounting principles generally accepted in the United States of America. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Management has assessed the effectiveness of UTC's internal control over financial reporting as of December 31, 2017. In making its assessment, management has utilized the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in its *Internal Control—Integrated Framework*, released in 2013. Management concluded that based on its assessment, UTC's internal control over financial reporting was effective as of December 31, 2017. The effectiveness of UTC's internal control over financial reporting, as of December 31, 2017, has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which is included herein.

/s/ Gregory J. Hayes

Gregory J. Hayes
Chairman, President and Chief Executive Officer

/s/ Akhil Johri

Akhil Johri
Executive Vice President & Chief Financial Officer

/s/ Robert J. Bailey

Robert J. Bailey
Corporate Vice President, Controller

Report of Independent Registered Public Accounting Firm

To the Shareowners and Board of Directors of United Technologies Corporation

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of United Technologies Corporation and its subsidiaries as of December 31, 2017 and 2016, and the related consolidated statements of operations, of comprehensive income, of changes in equity and of cash flows for each of the three years in the period ended December 31, 2017, including the related notes (collectively referred to as the “consolidated financial statements”). We also have audited the Corporation's internal control over financial reporting as of December 31, 2017, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Corporation as of December 31, 2017 and 2016, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2017 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Corporation maintained, in all material respects, effective internal control over financial reporting as of December 31, 2017, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Basis for Opinions

The Corporation's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s Report on Internal Control over Financial Reporting. Our responsibility is to express opinions on the Corporation’s consolidated financial statements and on the Corporation's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Corporation in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A corporation’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A corporation’s internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the corporation; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the corporation are being made only in accordance with authorizations of management and directors of the corporation; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the corporation’s assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ PricewaterhouseCoopers LLP

PricewaterhouseCoopers LLP
Hartford, Connecticut
February 8, 2018

We have served as the Corporation's auditor since 1947.

Consolidated Statement of Operations

(dollars in millions, except per share amounts; shares in millions)	**2017**	2016	2015
Net Sales:			
Product sales	**$ 41,361**	$ 40,735	$ 39,801
Service sales	**18,476**	16,509	16,297
	59,837	57,244	56,098
Costs and Expenses:			
Cost of products sold	**31,027**	30,325	29,771
Cost of services sold	**12,926**	11,135	10,660
Research and development	**2,387**	2,337	2,279
Selling, general and administrative	**6,183**	6,060	5,886
	52,523	49,857	48,596
Other income (expense), net	**1,358**	785	(211)
Operating profit	**8,672**	8,172	7,291
Interest expense, net	**909**	1,039	824
Income from continuing operations before income taxes	**7,763**	7,133	6,467
Income tax expense	**2,843**	1,697	2,111
Net income from continuing operations	**4,920**	5,436	4,356
Less: Noncontrolling interest in subsidiaries' earnings from continuing operations	**368**	371	360
Income from continuing operations attributable to common shareowners	**4,552**	5,065	3,996
Discontinued operations (Note 3):			
Income from operations	**—**	1	252
Gain on disposal	**—**	13	6,042
Income tax expense		(24)	(2,684)
Net (loss) income from discontinued operations	**—**	(10)	3,610
Less: Noncontrolling interest in subsidiaries' loss from discontinued operations	**—**	—	(2)
(Loss) Income from discontinued operations attributable to common shareowners	**—**	(10)	3,612
Net income attributable to common shareowners	**$ 4,552**	$ 5,055	$ 7,608
Earnings Per Share of Common Stock—Basic:			
Net income from continuing operations attributable to common shareowners	**$ 5.76**	$ 6.19	$ 4.58
Net income attributable to common shareowners	**$ 5.76**	$ 6.18	$ 8.72
Earnings Per Share of Common Stock—Diluted:			
Net income from continuing operations attributable to common shareowners	**$ 5.70**	$ 6.13	$ 4.53
Net income attributable to common shareowners	**$ 5.70**	$ 6.12	$ 8.61
Dividends Per Share of Common Stock	**$ 2.72**	$ 2.62	$ 2.56
Weighted average number of shares outstanding:			
Basic shares	**790.0**	818.2	872.7
Diluted shares	**799.1**	826.1	883.2

See accompanying Notes to Consolidated Financial Statements

Consolidated Statement of Comprehensive Income

(dollars in millions)	2017	2016	2015
Net income from continuing operations	**$ 4,920**	$ 5,436	$ 4,356
Net (loss) income from discontinued operations	**—**	(10)	3,610
Net income	**4,920**	5,426	7,966
Other comprehensive income (loss), net of tax			
Foreign currency translation adjustments			
Foreign currency translation adjustments arising during period	**620**	(1,089)	(1,502)
Reclassification adjustments from sale of an investment in a foreign entity recognized in net income	**(10)**	—	42
	610	(1,089)	(1,460)
Pension and postretirement benefit plans			
Net actuarial gain (loss) arising during period	**241**	(785)	(284)
Prior service credit (cost) arising during period	**2**	(13)	(37)
Other	**(116)**	542	326
Amortization of actuarial loss and prior service cost	**529**	535	867
	656	279	872
Tax expense	**(263)**	(189)	(298)
	393	90	574
Unrealized (loss) gain on available-for-sale securities			
Unrealized holding gain arising during period	**5**	190	28
Reclassification adjustments for gain included in Other income, net	**(566)**	(94)	(54)
	(561)	96	(26)
Tax benefit (expense)	**213**	(36)	11
	(348)	60	(15)
Change in unrealized cash flow hedging			
Unrealized cash flow hedging gain (loss) arising during period	**347**	75	(415)
(Gain) loss reclassified into Product sales	**(39)**	171	234
	308	246	(181)
Tax (expense) benefit	**(74)**	(69)	51
	234	177	(130)
Other comprehensive income (loss), net of tax	**889**	(762)	(1,031)
Comprehensive income	**5,809**	4,664	6,935
Less: comprehensive income attributable to noncontrolling interest	**(448)**	(324)	(285)
Comprehensive income attributable to common shareowners	**$ 5,361**	$ 4,340	$ 6,650

See accompanying Notes to Consolidated Financial Statements

Consolidated Balance Sheet

(dollars in millions, except per share amounts; shares in thousands)	2017	2016
Assets		
Cash and cash equivalents	**$ 8,985**	$ 7,157
Accounts receivable (net of allowance for doubtful accounts of $456 and $450)	**12,595**	11,481
Inventories and contracts in progress, net	**9,881**	8,704
Other assets, current	**1,397**	1,208
Total Current Assets	**32,858**	28,550
Customer financing assets	**2,372**	1,398
Future income tax benefits	**1,723**	1,809
Fixed assets, net	**10,186**	9,158
Goodwill	**27,910**	27,059
Intangible assets, net	**15,883**	15,684
Other assets	**5,988**	6,048
Total Assets	**$ 96,920**	$ 89,706
Liabilities and Equity		
Short-term borrowings	**$ 392**	$ 601
Accounts payable	**9,579**	7,483
Accrued liabilities	**12,316**	12,219
Long-term debt currently due	**2,104**	1,603
Total Current Liabilities	**24,391**	21,906
Long-term debt	**24,989**	21,697
Future pension and postretirement benefit obligations	**3,036**	5,612
Other long-term liabilities	**12,952**	11,026
Total Liabilities	**65,368**	60,241
Commitments and contingent liabilities (Notes 5 and 18)		
Redeemable noncontrolling interest	**131**	296
Shareowners' Equity:		
Capital Stock:		
Preferred Stock, $1 par value; 250,000 shares authorized; None issued or outstanding	**—**	—
Common Stock, $1 par value; 4,000,000 shares authorized; 1,444,187 and 1,440,982 shares issued	**17,574**	17,285
Treasury Stock— 645,057 and 632,281 common shares at average cost	**(35,596)**	(34,150)
Retained earnings	**55,242**	52,873
Unearned ESOP shares	**(85)**	(95)
Total Accumulated other comprehensive loss	**(7,525)**	(8,334)
Total Shareowners' Equity	**29,610**	27,579
Noncontrolling interest	**1,811**	1,590
Total Equity	**31,421**	29,169
Total Liabilities and Equity	**$ 96,920**	$ 89,706

See accompanying Notes to Consolidated Financial Statements

Consolidated Statement of Cash Flows

(dollars in millions)	2017	2016	2015
Operating Activities of Continuing Operations:			
Net income from continuing operations	**$ 4,920**	$ 5,436	$ 4,356
Adjustments to reconcile income from continuing operations to net cash flows provided by operating activities of continuing operations:			
Depreciation and amortization	**2,140**	1,962	1,863
Deferred income tax provision	**62**	398	662
Stock compensation cost	**192**	152	158
Change in:			
Accounts receivable	**(448)**	(941)	(438)
Inventories and contracts in progress	**(1,074)**	(719)	(766)
Other current assets	**(101)**	49	(55)
Accounts payable and accrued liabilities	**1,571**	450	490
Global pension contributions	**(2,112)**	(303)	(147)
Canadian government settlement	**(285)**	(237)	867
Other operating activities, net	**766**	165	(235)
Net cash flows provided by operating activities of continuing operations	**5,631**	6,412	6,755
Investing Activities of Continuing Operations:			
Capital expenditures	**(2,014)**	(1,699)	(1,652)
Increase in customer financing assets	**(1,197)**	(438)	(364)
Decrease in customer financing assets	**222**	217	117
Investments in businesses	**(231)**	(710)	(538)
Dispositions of businesses	**70**	211	200
Proceeds from sale of investments in Watsco, Inc.	**596**	—	—
Increase in collaboration intangible assets	**(380)**	(388)	(437)
(Payments) receipts from settlements of derivative contracts	**(317)**	249	160
Other investing activities, net	**232**	49	(280)
Net cash flows used in investing activities of continuing operations	**(3,019)**	(2,509)	(2,794)
Financing Activities of Continuing Operations:			
Issuance of long-term debt	**4,954**	6,469	1,744
Repayment of long-term debt	**(1,604)**	(2,452)	(1,764)
(Decrease) increase in short-term borrowings, net	**(271)**	(331)	795
Proceeds from Common Stock issuance - equity unit settlement	**—**	—	1,100
Proceeds from Common Stock issued under employee stock plans	**31**	13	41
Dividends paid on Common Stock	**(2,074)**	(2,069)	(2,184)
Repurchase of Common Stock	**(1,453)**	(2,254)	(10,000)
Other financing activities, net	**(576)**	(564)	(508)
Net cash flows used in financing activities of continuing operations	**(993)**	(1,188)	(10,776)
Discontinued Operations:			
Net cash used in operating activities	**—**	(2,532)	(372)
Net cash provided by investing activities	**—**	6	9,000
Net cash used in financing activities	**—**	—	(9)
Net cash flows (used in) provided by discontinued operations	**—**	(2,526)	8,619
Effect of foreign exchange rate changes on cash and cash equivalents	**210**	(120)	(174)
Net increase in cash, cash equivalents and restricted cash	**1,829**	69	1,630
Cash, cash equivalents and restricted cash, beginning of year	**7,189**	7,120	5,490
Cash, cash equivalents and restricted cash, end of year	**9,018**	7,189	7,120
Less: Restricted cash, included in Other assets	**33**	32	45
Cash and cash equivalents of continuing operations, end of year	**$ 8,985**	$ 7,157	$ 7,075
Supplemental Disclosure of Cash Flow Information:			
Interest paid, net of amounts capitalized	**$ 974**	$ 1,157	$ 1,057
Income taxes paid, net of refunds	**$ 1,326**	$ 4,096	$ 2,060

Noncash investing and financing activities include:			
Contributions of UTC Common Stock to domestic defined benefit pension plans	$ —	$ —	$ 250

See accompanying Notes to Consolidated Financial Statements

Consolidated Statement of Changes in Equity

(dollars in millions)

	Common Stock
Balance at December 31, 2014	**$ 15,300**
Comprehensive income (loss):	
Net income	
Redeemable noncontrolling interest in subsidiaries' earnings	
Other comprehensive loss, net of tax	
Common Stock issued - equity unit settlement (11.3 million shares)	1,100
Common Stock issued under employee plans (3.7 million shares), net of tax benefit of $64	379
Common Stock contributed to defined benefit pension plans (2.7 million shares)	112
Common Stock repurchased (88.7 million shares)	(870)
Dividends on Common Stock	
Dividends on ESOP Common Stock	
Dividends attributable to noncontrolling interest	
Purchase of subsidiary shares from noncontrolling interest	(12)
Sale of subsidiary shares in noncontrolling interest	24
Acquisition of noncontrolling interest	
Disposition of noncontrolling interest	
Redeemable noncontrolling interest reclassification to noncontrolling interest	
Balance at December 31, 2015	**$ 16,033**
Comprehensive income (loss):	
Net income	
Redeemable noncontrolling interest in subsidiaries' earnings	
Other comprehensive loss, net of tax	
Common Stock issued under employee plans (2.5 million shares)	262
Common Stock repurchased (32.3 million shares)	998
Dividends on Common Stock	
Dividends on ESOP Common Stock	
Dividends attributable to noncontrolling interest	
Purchase of subsidiary shares from noncontrolling interest	(8)
Sale of subsidiary shares in noncontrolling interest	
Acquisition of noncontrolling interest	
Redeemable noncontrolling interest fair value adjustment	
Redeemable non-controlling interest reclassification to non-controlling interest	
Other	
Balance at December 31, 2016	**$ 17,285**
Comprehensive income (loss):	
Net income	
Redeemable noncontrolling interest in subsidiaries' earnings	
Other comprehensive income, net of tax	
Common Stock issued under employee plans (3.2 million shares)	**331**
Common Stock repurchased (12.9 million shares)	**1**
Dividends on Common Stock	
Dividends on ESOP Common Stock	
Dividends attributable to noncontrolling interest	
Purchase of subsidiary shares from noncontrolling interest	**4**
Sale of subsidiary shares in noncontrolling interest	
Acquisition of noncontrolling interest	

Redeemable noncontrolling interest fair value adjustment	**(47)**
Other	
Balance at December 31, 2017	**$ 17,574**

See accompanying Notes to Consolidated Financial Statements

Shareowners' Equity						
Treasury Stock	Retained Earnings	Unearned ESOP Shares	Accumulated Other Comprehensive (Loss) Income	Noncontrolling Interest	Total Equity	Redeemable Noncontrolling Interest
$ (21,922)	**$ 44,611**	**$ (115)**	**$ (6,661)**	**$ 1,351**	**$ 32,564**	**$ 140**
	7,608			358	7,966	
				(4)	(4)	4
			(958)	(61)	(1,019)	(12)
					1,100	
7	(2)	10			394	
138					250	
(9,130)					(10,000)	
	(2,184)				(2,184)	
	(75)				(75)	
				(337)	(337)	(3)
				(5)	(17)	(9)
				15	39	
				173	173	
				(4)	(4)	
	(2)				(2)	2
$ (30,907)	**$ 49,956**	**$ (105)**	**$ (7,619)**	**$ 1,486**	**$ 28,844**	**$ 122**
	5,055			371	5,426	
				(6)	(6)	6
			(715)	(27)	(742)	(20)
9		10			281	
(3,252)					(2,254)	
	(2,069)				(2,069)	
	(74)				(74)	
				(345)	(345)	(2)
				(1)	(9)	(4)
				25	25	
				98	98	$ 189
	(1)				(1)	1
				(12)	(12)	$ 12
	6			$ 1	7	(8)
$ (34,150)	**$ 52,873**	**$ (95)**	**$ (8,334)**	**$ 1,590**	**$ 29,169**	**$ 296**
	4,552			**368**	**4,920**	
				(17)	**(17)**	**17**
			809	**56**	**865**	**24**
7		**10**			**348**	
(1,453)					**(1,452)**	
	(2,074)				**(2,074)**	
	(72)				**(72)**	
				(336)	**(336)**	**(7)**
				(8)	**(4)**	**(288)**
				8	**8**	
				14	**14**	
	(42)				**(89)**	**89**
	5			**136**	**141**	

$ (35,596)	**$ 55,242**	**$ (85)**	**$ (7,525)**	**$ 1,811**	**$ 31,421**	**$ 131**

Notes to Consolidated Financial Statements

NOTE 1: SUMMARY OF ACCOUNTING PRINCIPLES

The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses. Actual results could differ from those estimates. Certain reclassifications have been made to the prior year amounts to conform to the current year presentation.

Consolidation. The Consolidated Financial Statements include the accounts of United Technologies Corporation (UTC) and its controlled subsidiaries. Intercompany transactions have been eliminated.

Cash and Cash Equivalents. Cash and cash equivalents includes cash on hand, demand deposits and short-term cash investments that are highly liquid in nature and have original maturities of three months or less.

On occasion, we are required to maintain cash deposits with certain banks with respect to contractual obligations related to acquisitions or divestitures or other legal obligations. As of December 31, 2017 and 2016, the amount of such restricted cash was approximately $33 million and $32 million, respectively.

Accounts Receivable. Current and long-term accounts receivable as of December 31, 2017 include retainage of $118 million and unbilled receivables of $2,770 million, which includes approximately $1,109 million of unbilled receivables under commercial aerospace long-term aftermarket contracts. Current and long-term accounts receivable as of December 31, 2016 include retainage of $106 million and unbilled receivables of $2,786 million, which includes approximately $1,169 million of unbilled receivables under commercial aerospace long-term aftermarket contracts. See Note 5 for discussion of commercial aerospace industry assets and commitments.

Retainage represents amounts that, pursuant to the applicable contract, are not due until project completion and acceptance by the customer. Unbilled receivables represent revenues that are not currently billable to the customer under the terms of the contract. These items are expected to be billed and collected in the normal course of business.

Marketable Equity Securities. Equity securities that have a readily determinable fair value and that we do not intend to trade are classified as available-for-sale and carried at fair value. Unrealized holding gains and losses are recorded as a separate component of shareowners' equity, net of deferred income taxes.

In January 2016, the FASB issued ASU 2016-01, *Financial Instruments - Overall: Recognition and Measurement of Financial Assets and Financial Liabilities*. This ASU modifies how entities measure equity investments and present changes in the fair value of financial liabilities. Upon adoption, investments that do not result in consolidation and are not accounted for under the equity method generally must be carried at fair value, with changes in fair value recognized in net income. As discussed in Note 10, we have approximately $5 million of unrealized gains on these securities recorded in Accumulated other comprehensive loss in our Consolidated Balance Sheet as of December 31, 2017. We adopted this standard effective January 1, 2018, with these amounts recorded directly to retained earnings as of that date.

Inventories and Contracts in Progress. Inventories and contracts in progress are stated at the lower of cost or estimated realizable value and are primarily based on first-in, first-out (FIFO) or average cost methods; however, certain UTC Aerospace Systems and UTC Climate, Controls & Security entities use the last-in, first-out (LIFO) method. If inventories that were valued using the LIFO method had been valued under the FIFO method, they would have been higher by $106 million and $114 million at December 31, 2017 and 2016, respectively.

Costs accumulated against specific contracts or orders are at actual cost. Valuation reserves for excess, obsolete, and slow-moving inventory are estimated by comparing the inventory levels of individual parts to both future sales forecasts or production requirements and historical usage rates in order to identify inventory where the resale value or replacement value is less than inventoriable cost. Other factors that management considers in determining the adequacy of these reserves include whether individual inventory parts meet current specifications and cannot be substituted for a part currently being sold or used as a service part, overall market conditions, and other inventory management initiatives. Manufacturing costs are allocated to current production and firm contracts. Within commercial aerospace, inventory costs attributable to new engine offerings are recognized based on the average cost per unit expected over the life of each contract using the units-of-delivery method of percentage of completion accounting. Under this method, costs of initial engine deliveries in excess of the projected contract per unit average cost are capitalized, and these capitalized amounts are subsequently expensed as additional engine deliveries occur for engines with costs below the projected contract per unit average cost over the life of the contract. As described in the "Revenue Recognition" section of Note 1 below, these costs will be eliminated through retained earnings and will not be amortized into future earnings upon adoption of *Accounting Standards Update (ASU) 2014-09, Revenue from Contracts with Customers* effective January 1, 2018.

Equity Method Investments. Investments in which we have the ability to exercise significant influence, but do not control, are accounted for under the equity method of accounting and are included in Other assets on the Consolidated Balance Sheet. Under this method of accounting, our share of the net earnings or losses of the investee is included in Other income, net on the Consolidated Statement of Operations since the activities of the investee are closely aligned with the operations of the business segment holding the investment. We evaluate our equity method investments whenever events or changes in circumstance indicate that the carrying amounts of such investments may be impaired. If a decline in the value of an equity method investment is determined to be other than temporary, a loss is recorded in earnings in the current period.

Goodwill and Intangible Assets. Goodwill represents costs in excess of fair values assigned to the underlying net assets of acquired businesses. Goodwill and intangible assets deemed to have indefinite lives are not amortized. Goodwill and indefinite-lived intangible assets are subject to annual impairment testing using the guidance and criteria described in the Intangibles - Goodwill and Other Topic of the FASB ASC. This testing compares carrying values to fair values and, when appropriate, the carrying value of these assets is reduced to fair value.

In January 2017, the FASB issued ASU 2017-04, *Intangibles - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment*. This ASU eliminates Step 2 of the current goodwill impairment test, which requires a hypothetical purchase price allocation to measure goodwill impairment. A goodwill impairment loss will instead be measured at the amount by which a reporting unit's carrying value exceeds its fair value, not to exceed the recorded amount of goodwill. The provisions of this ASU are effective for years beginning after December 15, 2019, with early adoption permitted for any impairment test performed on testing dates after January 1, 2017. We early adopted this standard as of July 1, 2017 and this ASU did not have a significant impact on our financial statements or disclosures.

Intangible assets consist of service portfolios, patents, trademarks/tradenames, customer relationships and other intangible assets including a collaboration asset, as discussed further in Note 2. Acquired intangible assets are recognized at fair value in purchase accounting and then amortized to cost of sales and selling, general & administrative expenses over the applicable useful lives. Also included within other intangible assets are commercial aerospace payments made to secure certain contractual rights to provide product on new aircraft platforms. We classify amortization of such payments as a reduction of sales. Such payments are capitalized when there are distinct rights obtained and there are sufficient incremental cash flows to support the recoverability of the assets established. Otherwise, the applicable portion of the payments are expensed. Consideration paid on these contractual commitments is capitalized when it is no longer conditional.

Useful lives of finite-lived intangible assets are estimated based upon the nature of the intangible asset and the industry in which the intangible asset is used. These intangible assets are amortized based on the pattern in which the economic benefits of the intangible assets are consumed. For both our commercial aerospace collaboration assets and exclusivity arrangements, the pattern of economic benefit generally results in lower amortization during the development period with increasing amortization as programs enter full rate production and aftermarket cycles. If a pattern of economic benefit cannot be reliably determined, a straight-line amortization method is used. The range of estimated useful lives is as follows:

Collaboration assets	30 years
Customer relationships and related programs	1 to 50 years
Purchased service contracts	5 to 25 years
Patents & trademarks	4 to 40 years
Exclusivity assets	5 to 25 years

Other Long-Lived Assets. We evaluate the potential impairment of other long-lived assets whenever events or changes in circumstances indicate that the related carrying amounts may not be recoverable. If the carrying value of other long-lived assets held and used exceeds the sum of the undiscounted expected future cash flows, the carrying value is written down to fair value.

Long-Term Financing Receivables. Our long-term financing receivables primarily represent balances related to the aerospace businesses such as long-term trade accounts receivable, leases, and notes receivable. We also have other long-term receivables in our commercial businesses; however, both the individual and aggregate amounts of those other receivables are not significant.

Long-term trade accounts receivable, including unbilled receivables related to long-term aftermarket contracts, are principally amounts arising from the sale of goods and services with a contractual maturity date or realization period of greater than one year and are recognized as "Other assets" in our Consolidated Balance Sheet. Notes and leases receivable represent notes and lease receivables other than receivables related to operating leases, and are recognized as "Customer financing assets" in our Consolidated Balance Sheet. The following table summarizes the balance by class of aerospace business-related long-term receivables as of December 31, 2017 and 2016:

(dollars in millions)	2017	2016
Long-term trade accounts receivable	**$ 973**	$ 926
Notes and leases receivable	**424**	430
Total long-term receivables	**$ 1,397**	$ 1,356

We determine a receivable is impaired when, based on current information and events, it is probable that we will be unable to collect amounts due according to the contractual terms of the receivable agreement. Factors considered in assessing collectability and risk include, but are not limited to, examination of credit quality indicators and other evaluation measures, underlying value of any collateral or security interests, significant past due balances, historical losses, and existing economic conditions.

We determine credit ratings for each customer in our portfolio based upon public information and information obtained directly from our customers. We conduct a review of customer credit ratings, published historical credit default rates for different rating categories, and multiple third-party aircraft value publications as a basis to validate the reasonableness of the allowance for losses on these balances quarterly or when events and circumstances warrant. Customer credit ratings range from customers with an extremely strong capacity to meet financial obligations, to customers whose uncollateralized receivable is in default. There can be no assurance that actual results will not differ from estimates or that consideration of these factors in the future will not result in an increase or decrease to the allowance for credit losses on long-term receivables. Based upon the customer credit ratings, approximately 11% and 13% of our long-term receivables were considered to bear high credit risk as of December 31, 2017 and 2016, respectively. See Note 5 for further discussion of commercial aerospace industry assets and commitments.

Reserves for credit losses on receivables relate to specifically identified receivables that are evaluated individually for impairment. For notes and leases receivable, we determine a specific reserve for exposure based on the difference between the carrying value of the receivable and the estimated fair value of the related collateral in connection with the evaluation of credit risk and collectability. For long-term trade accounts receivable, we evaluate credit risk and collectability individually to determine if an allowance is necessary. Our long-term receivables reflected in the table above, which include reserves of $17 million as of both December 31, 2017 and 2016, are individually evaluated for impairment. At both December 31, 2017 and 2016, we did not have any significant balances that are considered to be delinquent, on non-accrual status, past due 90 days or more, or considered to be impaired.

Income Taxes. In the ordinary course of business there is inherent uncertainty in quantifying our income tax positions. We assess our income tax positions and record tax benefits for all years subject to examination based upon management's evaluation of the facts, circumstances, and information available at the reporting date. For those tax positions where it is more-likely-than-not that a tax benefit will be sustained, we have recorded the largest amount of tax benefit with a greater than 50% likelihood of being realized upon ultimate settlement with a taxing authority that has full knowledge of all relevant information. For those income tax positions where it is not more-likely-than-not that a tax benefit will be sustained, no tax benefit has been recognized in the financial statements. Where applicable, associated interest expense has also been recognized. We recognize accrued interest related to unrecognized tax benefits in interest expense. Penalties, if incurred, would be recognized as a component of income tax expense.

On December 22, 2017 the TCJA was enacted. The TCJA contains a new law that may subject the Company to a tax on Global Intangible Low-Taxed Income (GILTI), beginning in 2018. GILTI is a tax on foreign income in excess of a deemed return on tangible assets of foreign corporations. The FASB has provided that companies subject to GILTI have the option to account for the GILTI tax as a period cost if and when incurred, or to recognize deferred taxes for temporary differences, including outside basis differences, expected to reverse as GILTI. We have elected to account for GILTI as a period cost, if incurred.

Revenue Recognition. As a result of our diverse product and service mix and customer base, we use multiple revenue recognition practices. We recognize sales for products and services in accordance with the provisions of Staff Accounting Bulletin (SAB) Topic 13, Revenue Recognition, as applicable. Products and services included within the scope of this SAB Topic include heating, ventilating, air-conditioning and refrigeration systems, certain alarm and fire detection and suppression systems, commercially funded research and development contracts and certain aerospace components. Sales within the scope of this SAB Topic are recognized when persuasive evidence of an arrangement exists, product delivery has occurred or services have been rendered, pricing is fixed or determinable and collectability is reasonably assured. Subsequent changes in service contracts are accounted for prospectively.

Contract Accounting and Separately Priced Maintenance and Extended Warranty Aftermarket Contracts: For our construction-type and certain production-type contracts, sales are recognized on a percentage-of-completion basis following contract accounting methods. Contracts consist of enforceable agreements which form the basis of our unit of accounting for

measuring sales, accumulating costs and recording loss provisions as necessary. Contract accounting requires estimates of award fees and other sources of variable consideration as well as future costs over the performance period of the contract. Cost estimates also include the estimated cost of satisfying our offset obligations required under certain contracts. Cost estimates are subject to change and result in adjustments to margins on contracts in progress. The extent of progress toward completion on our long-term commercial aerospace equipment is measured using units of delivery or other contractual milestones. The extent of progress towards completion on our development and other cost reimbursement contracts in our aerospace businesses and elevator and escalator sales, installation, modernization and other construction contracts in our commercial businesses is measured using cost-to-cost based input measures. Contract costs include estimated inventoriable manufacturing, engineering, product warranty and product performance guarantee costs, as appropriate.

For separately priced product maintenance and extended warranty aftermarket contracts, sales are recognized over the contract period. In the commercial businesses, sales are primarily recognized on a straight-line basis. In the aerospace businesses, sales are primarily recognized in proportion to cost as sufficient historical evidence indicates that costs of performing services under the contract are incurred on an other than straight-line basis.

Loss provisions on original equipment contracts are recognized to the extent that estimated contract costs exceed the estimated consideration from the products contemplated under the contractual arrangement. For new commitments, we generally record loss provisions at the earlier of contract announcement or contract signing except for certain requirements contracts under which losses are recorded upon receipt of the purchase order which obligates us to perform. For existing commitments, anticipated losses on contracts are recognized in the period in which losses become evident. Products contemplated under contractual arrangements include firm quantities of products sold under contract and, in the large commercial engine and wheels and brakes businesses, future highly probable sales of replacement parts required by regulation that are expected to be sold subsequently for incorporation into the original equipment. In the large commercial engine and wheels and brakes businesses, when the combined original equipment and aftermarket arrangements for each individual sales campaign are profitable, we record original equipment product losses, as applicable, at the time of delivery.

We review our cost estimates on significant contracts on a quarterly basis, and for others, no less frequently than annually or when circumstances change and warrant a modification to a previous estimate. We record changes in contract estimates using the cumulative catch-up method in accordance with the Revenue Recognition Topic of the FASB ASC. Operating profits included significant net unfavorable changes in aerospace contract estimates of approximately $110 million and $157 million in 2017 and 2016, respectively, primarily the result of unexpected increases in estimated costs related to Pratt & Whitney long term aftermarket contracts. Operating profits included significant net favorable changes in aerospace contract estimates of approximately $115 million in 2015, primarily representing favorable contract adjustments at Pratt & Whitney.

Collaborations: Sales generated from engine programs, spare parts sales, and aftermarket business under collaboration arrangements are recorded consistent with our revenue recognition policies in our consolidated financial statements. Amounts attributable to our collaborators for their share of sales are recorded as cost of sales in our financial statements based upon the terms and nature of the arrangement. Costs associated with engine programs under collaborative arrangements are expensed as incurred. Under these arrangements, collaborators contribute their program share of engine parts, incur their own production costs and make certain payments to Pratt & Whitney for shared or joint program costs. The reimbursement of a collaborator's share of program costs is recorded as a reduction of the related expense item at that time.

Cash Payments to Customers: UTC Climate, Controls & Security customarily offers its customers incentives to purchase products to ensure an adequate supply of its products in the distribution channels. The principal incentive program provides reimbursements to distributors for offering promotional pricing for our products. We account for incentive payments made as a reduction in sales. In our aerospace businesses, we may make participation payments to certain customers to secure certain contractual rights. To the extent these rights are incremental and are supported by the incremental cash flows obtained, they are capitalized as intangible assets. Otherwise, such payments are expensed. We classify the subsequent amortization of the capitalized acquired intangible assets from our customers as a reduction in sales. Contractually stated prices in arrangements with our customers that include the acquisition of intangible rights within the scope of the Intangibles - Goodwill and Other Topic of the FASB ASC and deliverables within the scope of the Revenue Recognition Topic of the FASB ASC are not presumed to be representative of fair value for determining the amounts to allocate to each element of an arrangement.

Accounting Standards Update (ASU) 2014-09, Revenue from Contracts with Customers: In May 2014, the FASB issued Accounting Standards Update (ASU) 2014-09, *Revenue from Contracts with Customers*. In 2015 and 2016, the FASB issued various updates to this ASU as follows:

- ASU 2015-14, *Revenue from Contracts with Customers (Topic 606): Deferral of the Effective Date* - delays the effective date of ASU 2014-09 by one year.
- ASU 2016-08, *Revenue from Contracts with Customers (Topic 606), Principal versus Agent Considerations (Reporting Revenue Gross versus Net)* - clarifies how an entity should identify the unit of accounting (i.e. the specified

good or service) for the principal versus agent evaluation and how it should apply the control principle to certain types of arrangements.

- ASU 2016-10, *Revenue from Contracts with Customers (Topic 606), Identifying Performance Obligations and Licensing* - clarifies the guidance surrounding licensing arrangements and the identification of performance obligations.
- ASU 2016-12, *Revenue from Contracts with Customers (Topic 606), Narrow-Scope Improvements and Practical Expedients* - addresses implementation issues raised by stakeholders concerning collectability, noncash consideration, presentation of sales tax, and transition.
- ASU 2016-20, *Revenue from Contracts with Customers (Topic 606), Technical Corrections and Improvements* - addresses loan guarantee fees, impairment testing of contract costs, provisions for losses on certain contracts, and various disclosures.

ASU 2014-09 and its related amendments (collectively, the New Revenue Standard) are effective for reporting periods beginning after December 15, 2017, and interim periods therein. In accordance with the standard, we have adopted the New Revenue Standard effective January 1, 2018 and elected the modified retrospective approach with the cumulative effect of adoption recognized through retained earnings at the date of adoption.

The New Revenue Standard will change the revenue recognition practices for a number of revenue streams across our businesses, although the most significant impacts will be concentrated within our aerospace units. Several businesses, which currently account for revenue on an output units of delivery basis will be required to use an input method of an “over time” model as they meet one or more of the mandatory criteria established in the New Revenue Standard. Revenue will now be recognized based on percentage-of-completion for repair contracts within Otis and UTC Climate, Controls & Security; certain U.S. Government aerospace contracts; and aerospace aftermarket service work. For these businesses, unrecognized sales and operating profits related to the satisfied portion of the performance obligations of contracts in process as of the date of adoption will be recorded through retained earnings. While we are still finalizing our retained earnings impact evaluation, the ongoing effect of recognizing revenue on an input method of an over time model within these businesses is not expected to be material.

In addition to the foregoing, our aerospace businesses will also incur changes related to the timing of manufacturing cost recognition and certain engineering and development costs. In most circumstances, our commercial aerospace businesses will identify the performance obligation, or the unit of accounting, as the individual original equipment (OEM) unit; revenues and costs to manufacture each unit will be recognized upon OEM unit delivery. Generally under current practice, the unit of accounting is the contract, and early-contract OEM unit costs in excess of the average expected over the contract are capitalized and amortized over lower-cost units later in the contract. With the adoption of the New Revenue Standard, deferred unit costs in excess of the contract average of $438 million as of December 31, 2017 will be eliminated through retained earnings and will not be amortized into future earnings.

With regard to costs incurred for the engineering and development of aerospace products under contract with customers, we generally expense as incurred unless there is a contractually guaranteed right of recovery. The New Revenue Standard requires product engineering and development costs to be capitalized as contract fulfillment costs, to the extent recoverable from the associated contract margin, and subsequently amortized as the OEM products are delivered to the customer. We are still finalizing the calculation of the impact of this change to our adoption-date retained earnings. The ongoing impact will not change the total amount of cost incurred, but will change the timing of recognition of that cost.

Prior to the New Revenue Standard, any customer funding received for such development efforts was recognized when earned, with the corresponding costs recognized as cost of sales. The New Revenue Standard requires customer funding of OEM product engineering and development to be deferred and recognized as revenue as the OEM products are delivered to the customer. For contracts that are open as of the adoption date, previously recognized customer funding will be established as a contract liability as deferred income. We are still finalizing the calculation of the impact of this change to our adoption-date retained earnings.

We expect the New Revenue Standard will have an immaterial impact on our 2018 net income. Adoption of the New Revenue Standard will result in income statement classification changes between Revenues, Cost of sales, Research & development, and Other income. The New Revenue Standard will also result in the establishment of Contract asset and Contract liability balance sheet accounts, and in the reclassification to these new accounts from Accounts receivable; Inventories and contracts in progress, net; and Accrued liabilities. The New Revenue Standard requires ongoing incremental disclosures including explanation of significant changes in the Contract asset and Contract liability balances, and disaggregation of revenue into categories that depict how the nature, amount, timing and uncertainty of revenue and cash flows are affected by economic factors.

The New Revenue Standard also requires disclosure of remaining performance obligations, which is a concept that is similar to that of backlog, which we report in Item I, Part I of our Form 10-K. Beginning in 2018, we will align our definition of

backlog with that of remaining performance obligations under the New Revenue Standard. We have historically included in backlog engine orders from airlines for which such purchase orders have not yet been received. Effective with the adoption of the New Revenue Standard, we will no longer include in backlog airline engine orders for which we have not yet received the associated firm manufacturing purchase order. Excluding these engine orders is expected to result in a significant decline in reported backlog in 2018.

Research and Development. Research and development costs not specifically covered by contracts and those related to the company sponsored share of research and development activity in connection with cost-sharing arrangements are charged to expense as incurred. Government research and development support, not associated with specific contracts, is recorded as a reduction to research and development expense in the period earned. See Note 8 for a discussion of amendments of certain government research and development support arrangements concluded in December 2015 between P&WC and the Canadian government.

Research and development costs incurred under contracts with customers are included as a contract cost and reported as a component of cost of products sold when revenue from such contracts is recognized. Research and development costs in excess of contractual consideration are expensed as incurred.

Foreign Exchange. We conduct business in many different currencies and, accordingly, are subject to the inherent risks associated with foreign exchange rate movements. The financial position and results of operations of substantially all of our foreign subsidiaries are measured using the local currency as the functional currency. Foreign currency denominated assets and liabilities are translated into U.S. Dollars at the exchange rates existing at the respective balance sheet dates, and income and expense items are translated at the average exchange rates during the respective periods. The aggregate effects of translating the balance sheets of these subsidiaries are deferred as a separate component of shareowners' equity.

Derivatives and Hedging Activity. We have used derivative instruments, including swaps, forward contracts and options, to help manage certain foreign currency, interest rate and commodity price exposures. Derivative instruments are viewed as risk management tools by us and are not used for trading or speculative purposes. By their nature, all financial instruments involve market and credit risks. We enter into derivative and other financial instruments with major investment grade financial institutions and have policies to monitor the credit risk of those counterparties. We limit counterparty exposure and concentration of risk by diversifying counterparties. While there can be no assurance, we do not anticipate any material non-performance by any of these counterparties. We enter into transactions that are subject to enforceable master netting arrangements or similar agreements with various counterparties. However, we have not elected to offset multiple contracts with a single counterparty and, as a result, the fair value of the derivative instruments in a loss position is not offset against the fair value of derivative instruments in a gain position.

Derivatives used for hedging purposes may be designated and effective as a hedge of the identified risk exposure at the inception of the contract. All derivative instruments are recorded on the balance sheet at fair value. Derivatives used to hedge foreign-currency denominated balance sheet items are reported directly in earnings along with offsetting transaction gains and losses on the items being hedged. Derivatives used to hedge forecasted cash flows associated with foreign currency commitments or forecasted commodity purchases may be accounted for as cash flow hedges, as deemed appropriate. Gains and losses on derivatives designated as cash flow hedges are recorded in other comprehensive income and reclassified to earnings as a component of product sales or expenses, as applicable, when the hedged transaction occurs. To the extent that a previously designated hedging transaction is no longer an effective hedge, any ineffectiveness measured in the hedging relationship is recorded currently in earnings in the period it occurs. As discussed in Note 14, at December 31, 2017 we have approximately €3.7 billion of Euro-denominated long-term debt, which qualify as a net investment hedge against our investments in European businesses. We had no Euro-denominated commercial paper borrowings outstanding at December 31, 2017.

To the extent the hedge accounting criteria are not met, the foreign currency forward contracts are utilized as economic hedges and changes in the fair value of these contracts are recorded currently in earnings in the period in which they occur. Additional information pertaining to foreign currency forward contracts and net investment hedging is included in Note 14.

Environmental. Environmental investigatory, remediation, operating and maintenance costs are accrued when it is probable that a liability has been incurred and the amount can be reasonably estimated. The most likely cost to be incurred is accrued based on an evaluation of currently available facts with respect to each individual site, including existing technology, current laws and regulations and prior remediation experience. Where no amount within a range of estimates is more likely, the minimum is accrued. For sites with multiple responsible parties, we consider our likely proportionate share of the anticipated remediation costs and the ability of the other parties to fulfill their obligations in establishing a provision for those costs. Liabilities with fixed or reliably determinable future cash payments are discounted. Accrued environmental liabilities are not reduced by potential insurance reimbursements. See Note 18 for additional details on the environmental remediation activities.

Pension and Postretirement Obligations. Guidance under the Compensation - Retirement Benefits Topic of the FASB ASC requires balance sheet recognition of the overfunded or underfunded status of pension and postretirement benefit plans. Under

this guidance, actuarial gains and losses, prior service costs or credits, and any remaining transition assets or obligations that have not been recognized under previous accounting standards must be recognized in other comprehensive income, net of tax effects, until they are amortized as a component of net periodic benefit cost.

In March 2017, the FASB issued ASU 2017-07, *Compensation—Retirement Benefits (Topic 715), Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost*. This ASU requires an employer to report the service cost component of net periodic pension benefit cost in the same line item or items as other compensation costs arising from services rendered by the pertinent employees during the period, with other cost components presented separately from the service cost component and outside of income from operations. This ASU also allows only the service cost component of net periodic pension benefit cost to be eligible for capitalization when applicable. The provisions of this ASU are effective for years beginning after December 15, 2017, and we adopted the new standard effective January 1, 2018. Provisions related to presentation of the service cost components versus other cost components must be applied retrospectively, while provisions related to service cost component eligibility for capitalization must be applied prospectively. This ASU primarily impacts the presentation of net periodic pension cost/benefit and therefore we do not expect this ASU to have a material impact on net income; however, it will result in changes to reported operating profit.

Product Performance Obligations. We extend performance and operating cost guarantees beyond our normal service and warranty policies for extended periods on some of our products, particularly commercial aircraft engines. Liability under such guarantees is based upon future product performance and durability. We accrue for such costs that are probable and can be reasonably estimated. In addition, we incur discretionary costs to service our products in connection with product performance issues. The costs associated with these product performance and operating cost guarantees require estimates over the full terms of the agreements, and require management to consider factors such as the extent of future maintenance requirements and the future cost of material and labor to perform the services. These cost estimates are largely based upon historical experience. See Note 17 for further discussion.

Collaborative Arrangements. In view of the risks and costs associated with developing new engines, Pratt & Whitney has entered into certain collaboration arrangements in which sales, costs and risks are shared. Sales generated from engine programs, spare parts, and aftermarket business under collaboration arrangements are recorded as earned in our financial statements. Amounts attributable to our collaborators for their share of sales are recorded as an expense in our financial statements based upon the terms and nature of the arrangement. Costs associated with engine programs under collaborative arrangements are expensed as incurred. Under these arrangements, collaborators contribute their program share of engine parts, incur their own production costs and make certain payments to Pratt & Whitney for shared or joint program costs. The reimbursement of the collaborators' share of program costs is recorded as a reduction of the related expense item at that time. As of December 31, 2017, the collaborators' interests in all commercial engine programs ranged from 14% to 50%, inclusive of a portion of Pratt & Whitney's interests held by other participants. Pratt & Whitney is the principal participant in all existing collaborative arrangements, with the exception of the Engine Alliance (EA), a joint venture with GE Aviation, which markets and manufactures the GP7000 engine for the Airbus A380 aircraft. There are no individually significant collaborative arrangements and none of the collaborators exceed a 31% share in an individual program. The following table illustrates the income statement classification and amounts attributable to transactions arising from the collaborative arrangements between participants for each period presented. Selling, general and administrative amounts for 2016 and 2015 have been revised to present these amounts on a basis consistent with 2017 presentation.

(dollars in millions)	**2017**	2016	2015
Collaborator share of sales:			
Cost of products sold	**$ 1,789**	$ 1,700	$ 1,547
Cost of services sold	**929**	675	652
Collaborator share of program costs (reimbursement of expenses incurred):			
Cost of products sold	**(143)**	(108)	(104)
Research and development	**(190)**	(184)	(248)
Selling, general and administrative	**(74)**	(57)	(53)

Accounting Pronouncements. In October 2016, the FASB issued ASU 2016-16, *Income Taxes (Topic 740): Intra-Entity Transfers of Assets Other Than Inventory*. This ASU requires the income tax consequences of an intra-entity transfer of an asset, other than inventory, to be recognized when the transfer occurs. Two common examples of assets included in the scope of this update are intellectual property and property, plant, and equipment. The provisions of this ASU are effective for years beginning after December 15, 2017, with early adoption permitted. We do not expect this ASU to have a significant impact on our financial statements or disclosures. We adopted the new standard effective January 1, 2018.

In February 2016, the FASB issued ASU 2016- 02, *Leases (Topic 842)*. The new standard establishes a right-of-use (ROU) model that requires a lessee to record a ROU asset and a lease liability on the balance sheet for all leases with terms longer than 12 months. Leases will be classified as either finance or operating, with classification affecting the pattern of expense recognition in the Consolidated Statement of Operations. In addition, this standard requires a lessor to classify leases as either sales-type, finance or operating. A lease will be treated as a sale if it transfers all of the risks and rewards, as well as control of the underlying asset, to the lessee. If risks and rewards are conveyed without the transfer of control, the lease is treated as financing. If the lessor doesn't convey risks and rewards or control, the lease is treated as operating.

The new standard is effective for fiscal years beginning after December 15, 2018, including interim periods within those fiscal years. A modified retrospective transition approach is required for lessees for capital and operating leases and lessors for sales-type, direct financing, and operating leases existing at, or entered into after, the beginning of the earliest comparative period presented in the financial statements, with certain practical expedients available. In November 2017, the FASB announced a decision to offer an additional practical expedient related to the transition to the new lease accounting standard which allows for its prospective adoption. The FASB is expected to formally communicate this new practical expedient through an Accounting Standards Update to be released in early 2018. While we are still evaluating the impact of our pending adoption of the new standard on our consolidated financial statements, we expect that upon adoption we will recognize ROU assets and lease liabilities and that the amounts could be material. We do not expect the ASU to have a material impact on our cash flows or results of operations.

In January 2017, the FASB issued ASU 2017-01, *Business Combinations (Topic 805): Clarifying the Definition of a Business*. This ASU provides a new framework that will assist in the evaluation of whether business combination transactions should be accounted for as an acquisition of a business or as a group of assets, and specifies the minimum required inputs and processes necessary to be a business. The provisions of this ASU are effective for years beginning after December 15, 2017, with early adoption permitted. We adopted the new standard effective January 1, 2018.

In May 2017, the FASB issued ASU 2017-09, *Compensation—Stock Compensation (Topic 718): Scope of Modification Accounting*. This ASU provides that an entity should account for the effects of a modification unless the fair value, the vesting conditions of the modified award and the classification of the modified award (equity or liability instrument) are the same as the original award immediately before the modification. The provisions of this ASU are effective for years beginning after December 15, 2017, with early adoption permitted. We do not expect this ASU to have a significant impact on our financial statements or disclosures. We adopted the new standard effective January 1, 2018.

In August 2017, the FASB issued ASU 2017-12, *Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities*. This ASU will make more financial and nonfinancial hedging strategies eligible for hedge accounting. It also amends the presentation and disclosure requirements and changes how companies assess effectiveness. It is intended to more closely align hedge accounting with a company's risk management strategies, simplify the application of hedge accounting, and increase transparency as to the scope and results of hedging programs. The provisions of this ASU are effective for years beginning after December 15, 2018, with early adoption permitted for any interim period after issuance of the ASU. We do not expect this ASU to have a significant impact on our results of operations or financial position. We adopted the new standard effective January 1, 2018.

NOTE 2: BUSINESS ACQUISITIONS, DISPOSITIONS, GOODWILL AND INTANGIBLE ASSETS

Business Acquisitions and Dispositions. Our investments in businesses in 2017, 2016 and 2015 totaled $231 million, $712 million (including debt assumed of $2 million) and $556 million (including debt assumed of $18 million), respectively. Our investments in businesses in 2017 consisted of a number of small acquisitions, primarily in our commercial businesses. Our investments in businesses in 2016 consisted of the acquisition of a majority interest in an Italian heating products and services company by UTC Climate, Controls & Security, the acquisition of a Japanese services company by Otis and a number of small acquisitions, primarily in our commercial businesses. Our investments in businesses in 2015 consisted of the acquisition of the majority interest in a UTC Climate, Controls & Security business, the acquisition of an imaging technology company by UTC Aerospace Systems, and a number of small acquisitions, primarily in our commercial businesses.

On September 4, 2017, we announced that we had entered into a merger agreement with Rockwell Collins, Inc. (Rockwell Collins), under which we agreed to acquire Rockwell Collins. Under the terms of the merger agreement, each Rockwell Collins shareowner will receive $93.33 per share in cash and a fraction of a share of UTC common stock equal to the quotient obtained by dividing $46.67 by the average of the volume-weighted average prices per share of UTC common stock on the NYSE on each of the 20 consecutive trading days ending with the trading day immediately prior to the closing date, (the "UTC Stock Price"), subject to adjustment based on a two-way collar mechanism as described below (the "Stock Consideration"). The cash and UTC stock payable in exchange for each such share of Rockwell Collins common stock are collectively the "Merger Consideration." The fraction of a share of UTC common stock into which each such share of Rockwell

Collins common stock will be converted is the "Exchange Ratio." The Exchange Ratio will be determined based upon the UTC Stock Price. If the UTC Stock Price is greater than $107.01 but less than $124.37, the Exchange Ratio will be equal to the quotient of (i) $46.67 divided by (ii) the UTC Stock Price, which, in each case, will result in the Stock Consideration having a value equal to $46.67. If the UTC Stock Price is less than or equal to $107.01 or greater than or equal to $124.37, then a two-way collar mechanism will apply, pursuant to which, (x) if the UTC Stock Price is greater than or equal to $124.37, the Exchange Ratio will be fixed at 0.37525 and the value of the Stock Consideration will be greater than $46.67, and (y) if the UTC Stock Price is less than or equal to $107.01, the Exchange Ratio will be fixed at 0.43613 and the value of the Stock Consideration will be less than $46.67. On January 11, 2018, the merger was approved by Rockwell Collins' shareowners. We currently expect that the merger will be completed in the third quarter of 2018, subject to customary closing conditions, including the receipt of required regulatory approvals.

We anticipate that approximately $15 billion will be required to pay the aggregate cash portion of the Merger Consideration. We expect to fund the cash portion of the Merger Consideration through debt issuances and cash on hand. Additionally, we have entered into a $6.5 billion 364-day unsecured bridge loan credit agreement that would be funded only to the extent certain anticipated debt issuances are not completed prior to the completion of the merger. We expect to assume approximately $7 billion of Rockwell Collins' outstanding debt upon completion of the merger.

As discussed further in Note 3, on November 6, 2015, we completed the sale of Sikorsky to Lockheed Martin Corp. for approximately $9.1 billion in cash.

Goodwill. The changes in the carrying amount of goodwill, by segment, in 2017 are as follows:

(dollars in millions)	Balance as of January 1, 2017	Goodwill resulting from business combinations	Foreign currency translation and other	**Balance as of December 31, 2017**
Otis	$ 1,575	$ 28	$ 134	**$ 1,737**
UTC Climate, Controls & Security	9,487	130	392	**10,009**
Pratt & Whitney	1,511	—	—	**1,511**
UTC Aerospace Systems	14,483	—	167	**14,650**
Total Segments	27,056	158	693	**27,907**
Eliminations and other	3	—	—	**3**
Total	$ 27,059	$ 158	$ 693	**$ 27,910**

Intangible Assets. Identifiable intangible assets are comprised of the following:

	2017		2016	
(dollars in millions)	**Gross Amount**	**Accumulated Amortization**	Gross Amount	Accumulated Amortization
Amortized:				
Service portfolios	**$ 2,178**	**$ (1,534)**	$ 1,995	$ (1,344)
Patents and trademarks	**399**	**(233)**	378	(201)
Collaboration intangible assets	**4,109**	**(384)**	3,724	(211)
Customer relationships and other	**13,352**	**(4,100)**	12,798	(3,480)
	20,038	**(6,251)**	18,895	(5,236)
Unamortized:				
Trademarks and other	**2,096**	—	2,025	—
Total	**$ 22,134**	**$ (6,251)**	$ 20,920	$ (5,236)

Customer relationship intangible assets include payments made to our customers to secure certain contractual rights. Such payments are capitalized when distinct rights are obtained and sufficient incremental cash flows to support the recoverability of the assets have been established. Otherwise, the applicable portion of the payments is expensed. We amortize these intangible assets based on the underlying pattern of economic benefit, which may result in an amortization method other than straight-line. In the aerospace industry, amortization based on the pattern of economic benefit generally results in lower amortization expense during the development period with amortization expense increasing as programs enter full production and aftermarket cycles. If a pattern of economic benefit cannot be reliably determined, a straight-line amortization method is used. We classify amortization of such payments as a reduction of sales. Amortization of intangible assets was $834 million,

$778 million and $722 million in 2017, 2016 and 2015, respectively. The collaboration intangible assets are amortized based upon the pattern of economic benefits as represented by the underlying cash flows. The following is the expected amortization of intangible assets for 2018 through 2022, which reflects the pattern of expected economic benefit on certain aerospace intangible assets:

(dollars in millions)	2018	2019	2020	2021	2022
Amortization expense	$ 902	$ 869	$ 888	$ 902	$ 895

NOTE 3: DISCONTINUED OPERATIONS

On November 6, 2015, we completed the sale of Sikorsky to Lockheed Martin Corp. for $9.1 billion in cash. Accordingly, the results of operations and the cash flows related to Sikorsky have been classified in Discontinued Operations in our Consolidated Statements of Operations, Comprehensive Income and Cash Flows for all periods presented. In 2016, we recognized approximately $13 million of additional gain on the disposal, primarily resulting from the settlement of working capital adjustments. In 2016, we recognized approximately $24 million of income tax expense, including the impacts related to filing Sikorsky's 2015 tax returns. Net cash outflows from discontinued operations of approximately $2.5 billion for the year ended December 31, 2016 were primarily due to the payment of taxes related to the 2015 gain realized on the sale of Sikorsky.

UTC and its business segments have historically had sales to Sikorsky and purchases from Sikorsky, in the normal course of business, which were eliminated in consolidation. Net sales to Sikorsky were $138 million and net purchases from Sikorsky included in cost of products and services sold were $25 million for the year ended December 31, 2015.

NOTE 4: EARNINGS PER SHARE

(dollars in millions, except per share amounts; shares in millions)	**2017**	2016	2015
Net income attributable to common shareowners:			
Net income from continuing operations	**$ 4,552**	$ 5,065	$ 3,996
Net (loss) income from discontinued operations	**—**	(10)	3,612
Net income attributable to common shareowners	**$ 4,552**	$ 5,055	$ 7,608
Basic weighted average number of shares outstanding	**790.0**	818.2	872.7
Stock awards	**9.1**	7.9	10.5
Diluted weighted average number of shares outstanding	**799.1**	826.1	883.2
Earnings Per Share of Common Stock—Basic:			
Net income from continuing operations	**$ 5.76**	$ 6.19	$ 4.58
Net (loss) income from discontinued operations	**—**	(0.01)	4.14
Net income attributable to common shareowners	**5.76**	6.18	8.72
Earnings Per Share of Common Stock—Diluted:			
Net income from continuing operations	**$ 5.70**	$ 6.13	$ 4.53
Net (loss) income from discontinued operations	**—**	(0.01)	4.09
Net income attributable to common shareowners	**5.70**	6.12	8.61

The computation of diluted earnings per share excludes the effect of the potential exercise of stock awards, including stock appreciation rights and stock options, when the average market price of the common stock is lower than the exercise price of the related stock awards during the period. These outstanding stock awards are not included in the computation of diluted earnings per share because the effect would have been anti-dilutive. For 2017, 2016 and 2015, there were 5.9 million, 14.5 million and 9.7 million anti-dilutive stock awards excluded from the computation, respectively.

NOTE 5: COMMERCIAL AEROSPACE INDUSTRY ASSETS AND COMMITMENTS

We have receivables and other financing assets with commercial aerospace industry customers totaling $9,477 million and $7,222 million at December 31, 2017 and 2016, respectively. These include customer financing assets related to commercial aerospace industry customers, consisting of products under lease of $1,913 million and $939 million, and notes and leases receivable of $652 million and $497 million, at December 31, 2017 and 2016, respectively.

Aircraft financing commitments, in the form of debt or lease financing, are provided to commercial aerospace customers. The extent to which the financing commitments will be utilized is not currently known, since customers may be able to obtain more favorable terms from other financing sources. We may also arrange for third-party investors to assume a portion of these commitments. If financing commitments are exercised, debt financing is generally secured by assets with fair market values equal to or exceeding the financed amounts consistent with market terms and conditions. We may also lease aircraft and subsequently sublease the aircraft to customers under long-term non-cancelable operating leases. Our financing commitments with customers are contingent upon maintenance of certain levels of financial condition by the customers.

We have also made residual value and other guarantees related to various commercial aerospace customer financing arrangements. The estimated fair market values of the guaranteed assets equal or exceed the value of the related guarantees, net of existing reserves. We have residual value and other guarantees of $336 million as of December 31, 2017. Refer to Note 17 to the Consolidated Financial Statements for additional discussion on guarantees.

We also have other contractual commitments, including commitments to secure certain contractual rights to provide product on new aircraft platforms, which are included in "Other commercial aerospace commitments" in the table below. Payments made on these contractual commitments are included within other intangible assets and are to be amortized over the term of underlying economic benefit. Our commercial aerospace financing and other contractual commitments as of December 31, 2017 were approximately $15.3 billion. We have entered into certain collaboration arrangements, which may include participation by our collaboration partners in these commitments.

The following is the expected maturity of commercial aerospace industry assets and commitments as of December 31, 2017:

(dollars in millions)	Committed	2018	2019	2020	2021	2022	Thereafter
Notes and leases receivable	**$ 652**	$ 211	$ 56	$ 79	$ 38	$ 35	$ 233
Commercial aerospace financing commitments	**$ 4,012**	$ 371	$ 678	$ 636	$ 891	$ 783	$ 653
Other commercial aerospace commitments	**11,270**	910	840	684	735	645	7,456
Collaboration partners' share	**(5,109)**	(374)	(402)	(396)	(525)	(491)	(2,921)
Total commercial commitments	**$ 10,173**	$ 907	$ 1,116	$ 924	$ 1,101	$ 937	$ 5,188

In connection with our 2012 agreement to acquire Rolls-Royce's ownership and collaboration interests in IAE, additional payments are due to Rolls-Royce contingent upon each hour flown through June 2027 by the V2500-powered aircraft in service as of the acquisition date. These flight hour payments, included in "Other commercial aerospace commitments" in the table above, are being capitalized as collaboration intangible assets.

We have long-term aftermarket maintenance contracts with commercial aerospace industry customers for which revenue is recognized in proportion to actual costs incurred relative to total expected costs to be incurred over the respective contract periods. Billings, however, are typically based on factors such as engine flight hours. The timing differences between the billings and the maintenance costs incurred generates both unbilled receivables and deferred revenues. Unbilled receivables under these long-term aftermarket contracts totaled $1,109 million and $1,169 million at December 31, 2017 and 2016, respectively, and are included in "Accounts receivable" and "Other assets" in the accompanying Consolidated Balance Sheet. Deferred revenues generated totaled $5,048 million and $4,288 million at December 31, 2017 and 2016, respectively, and are included in "Accrued liabilities" and "Other long-term liabilities" in the accompanying Consolidated Balance Sheet.

Reserves related to aerospace receivables and financing assets were $175 million and $173 million at December 31, 2017 and 2016, respectively. Reserves related to financing commitments and guarantees were $23 million and $36 million at December 31, 2017 and 2016, respectively.

In addition, in connection with the 2012 Goodrich acquisition, we recorded assumed liabilities of approximately $2.2 billion related to customer contractual obligations on certain OEM development programs where the expected costs exceeded the expected revenue under contract. These liabilities are being liquidated in accordance with the underlying economic pattern of obligations, as reflected by the net cash outflows incurred on the OEM contracts. Total consumption of the contractual

obligations for the years ended December 31, 2017 and 2016 was approximately $217 million and $213 million, respectively. The balance of the contractual obligations at December 31, 2017 was $986 million, with future consumption expected to be as follows: $257 million in 2018, $229 million in 2019, $150 million in 2020, $84 million in 2021, $37 million in 2022 and $229 million thereafter.

NOTE 6: INVENTORIES & CONTRACTS IN PROGRESS

(dollars in millions)	2017	2016
Raw materials	**$ 2,038**	$ 2,040
Work-in-process	**3,366**	2,787
Finished goods	**3,845**	3,305
Contracts in progress	**10,205**	9,395
	19,454	17,527
Less:		
Progress payments, secured by lien, on U.S. Government contracts	**(236)**	(130)
Billings on contracts in progress	**(9,337)**	(8,693)
	$ 9,881	$ 8,704

Raw materials, work-in-process and finished goods are net of valuation reserves of $1,107 million and $877 million as of December 31, 2017 and 2016, respectively. Contracts in progress principally relate to elevator and escalator contracts and include costs of manufactured components, accumulated installation costs and estimated earnings on incomplete contracts.

Inventories also include capitalized contract development costs related to certain aerospace programs at UTC Aerospace Systems. As of December 31, 2017 and 2016, these capitalized costs were $127 million and $140 million, respectively, which will be liquidated as production units are delivered to customers. Within commercial aerospace, inventory costs attributable to new engine offerings are recognized based on the average cost per unit expected over the life of each contract using the units-of-delivery method of percentage of completion accounting. Under this method, costs of initial engine deliveries in excess of the projected contract per unit average cost are capitalized, and these capitalized amounts are subsequently expensed as additional engine deliveries occur for engines with costs below the projected contract per unit average cost over the life of the contract. As of December 31, 2017 and 2016, inventory included $438 million and $233 million, respectively, of such capitalized amounts. See Note 1 for further discussion regarding the impact from the adoption of the New Revenue Standard effective January 1, 2018.

Our sales contracts in many cases are long-term contracts expected to be performed over periods exceeding 12 months. At December 31, 2017 and 2016, approximately 63% and 68% respectively, of total inventories and contracts in progress have been acquired or manufactured under such long-term contracts, with approximately 38% and 41% scheduled for delivery within the succeeding 12 months for 2017 and 2016, respectively.

NOTE 7: FIXED ASSETS

(dollars in millions)	Estimated Useful Lives	2017	2016
Land		**$ 412**	$ 392
Buildings and improvements	12-40 years	**5,727**	5,180
Machinery, tools and equipment	3-20 years	**13,476**	12,471
Other, including assets under construction		**1,749**	1,426
		21,364	19,469
Accumulated depreciation		**(11,178)**	(10,311)
		$ 10,186	$ 9,158

Depreciation expense was $1,178 million in 2017, $1,105 million in 2016 and $1,068 million in 2015.

NOTE 8: ACCRUED LIABILITIES

(dollars in millions)	2017	2016
Advances on sales contracts and service billings	**$ 4,547**	$ 4,217
Accrued salaries, wages and employee benefits	**1,741**	1,608
Service and warranty accruals	**629**	555
Interest payable	**439**	395
Litigation and contract matters	**435**	488
Income taxes payable	**285**	382
Accrued property, sales and use taxes	**258**	289
Canadian government settlement - current portion	**217**	245
Accrued restructuring costs	**212**	210
Accrued workers compensation	**204**	208
Other	**3,349**	3,622
	$ 12,316	$ 12,219

On December 30, 2015, P&WC and federal and provincial Canadian government agencies entered into amendments of certain government research and development support arrangements. Under the amendments, P&WC agreed to make four annual payments of approximately $327 million Canadian (approximately $256 million at December 2017), commencing in the first quarter of 2016, to fully settle and terminate P&WC's future contractual obligations to pay royalties to these agencies that had previously been contingent upon future engine deliveries and P&WC sales; to maintain its commitments to perform certain assembly, test and manufacturing operations in Canada; and to provide support of innovation and research and development through initiatives with post-secondary institutions and key industry associations in Canada over a 14 year period. As a result of the amendments to these contractual arrangements, Pratt & Whitney recorded a charge and related discounted obligation of $867 million in the fourth quarter of 2015.

The Canadian government settlement included in the table above represents amounts expected to be paid under this agreement in 2018, with the remaining accrual of approximately $256 million and $477 million included in Other long-term liabilities in the accompanying Consolidated Balance Sheet as of December 31, 2017 and 2016, respectively.

NOTE 9: BORROWINGS AND LINES OF CREDIT

(dollars in millions)	2017	2016
Short-term borrowings:		
Commercial paper	**$ 300**	$ 522
Other borrowings	**92**	79
Total short-term borrowings	**$ 392**	$ 601

At December 31, 2017, we had revolving credit agreements with various banks permitting aggregate borrowings of up to $4.35 billion pursuant to a $2.20 billion revolving credit agreement and a $2.15 billion multicurrency revolving credit agreement, both of which expire in August 2021. As of December 31, 2017, there were no borrowings under either of these agreements. The undrawn portions of these revolving credit agreements are also available to serve as backup facilities for the issuance of commercial paper. As of December 31, 2017, our maximum commercial paper borrowing limit was $4.35 billion. We had no Euro-denominated commercial paper borrowings outstanding at December 31, 2017. We use our commercial paper borrowings for general corporate purposes, including the funding of potential acquisitions, discretionary pension contributions, debt refinancing, dividend payments and repurchases of our common stock. The need for commercial paper borrowings arises when the use of domestic cash for general corporate purposes exceeds the sum of domestic cash generation and foreign cash repatriated to the U.S.

At December 31, 2017, approximately $1.3 billion was available under short-term lines of credit with local banks at our various domestic and international subsidiaries. The weighted-average interest rates applicable to short-term borrowings and total debt were as follows:

	2017	2016
Average interest expense rate - average outstanding borrowings during the year:		
Short-term borrowings	**1.1%**	1.3%
Total debt	**3.5%**	4.1%
Average interest expense rate - outstanding borrowings as of December 31:		
Short-term borrowings	**2.3%**	0.6%
Total debt	**3.5%**	3.7%

Long-term debt consisted of the following as of December 31:

(dollars in millions)	2017	2016
1.800% notes due 2017 [1]	—	1,500
6.800% notes due 2018	**99**	99
EURIBOR plus 0.80% floating rate notes due 2018 (€750 million principal value) [2]	**890**	783
1.778% junior subordinated notes due 2018	**1,100**	1,100
LIBOR plus 0.350% floating rate notes due 2019 [3]	**350**	350
1.500% notes due 2019 [1]	**650**	650
EURIBOR plus 0.15% floating rate notes due 2019 (€750 million principal value) [2]	**890**	—
8.875% notes due 2019	**271**	271
4.875% notes due 2020 [1]	**171**	171
4.500% notes due 2020 [1]	**1,250**	1,250
1.900% notes due 2020 [1]	**1,000**	—
8.750% notes due 2021	**250**	250
1.950% notes due 2021 [1]	**750**	750
1.125% notes due 2021 (€950 million principal value) [1]	**1,127**	992
2.300% notes due 2022 [1]	**500**	—
3.100% notes due 2022 [1]	**2,300**	2,300
1.250% notes due 2023 (€750 million principal value) [1]	**890**	783
2.800% notes due 2024 [1]	**800**	—
1.875% notes due 2026 (€500 million principal value) [1]	**593**	522
2.650% notes due 2026 [1]	**1,150**	1,150
3.125% notes due 2027 [1]	**1,100**	—
7.100% notes due 2027	**141**	141
6.700% notes due 2028	**400**	400
7.500% notes due 2029 [1]	**550**	550
5.400% notes due 2035 [1]	**600**	600
6.050% notes due 2036 [1]	**600**	600
6.800% notes due 2036 [1]	**134**	134
7.000% notes due 2038	**159**	159
6.125% notes due 2038 [1]	**1,000**	1,000
5.700% notes due 2040 [1]	**1,000**	1,000
4.500% notes due 2042 [1]	**3,500**	3,500
4.150% notes due 2045 [1]	**850**	850
3.750% notes due 2046 [1]	**1,100**	1,100
4.050% notes due 2047 [1]	**600**	—
Project financing obligations	**158**	155
Other (including capitalized leases)	**195**	189
Total principal long-term debt	**27,118**	23,299
Other (fair market value adjustments, discounts and debt issuance costs)	**(25)**	1
Total long-term debt	**27,093**	23,300
Less: current portion	**2,104**	1,603
Long-term debt, net of current portion	**$ 24,989**	$ 21,697

1 We may redeem these notes at our option pursuant to their terms.

2 The three-month EURIBOR rate as of December 29, 2017 was approximately -0.329%. The notes may be redeemed at our option in whole, but not in part, at any time in the event of certain developments affecting U.S. taxation.

3 The three-month LIBOR rate as of December 29, 2017 was approximately 1.694%.

In connection with the merger agreement with Rockwell Collins announced on September 4, 2017, we have entered into a $6.5 billion 364-day unsecured bridge loan credit agreement that would be funded only to the extent certain anticipated debt issuances are not completed prior to the completion of the merger. See Note 2 for additional discussion.

On November 13, 2017, we issued €750 million aggregate principal amount of floating rate notes due 2019. The interest rate is reset quarterly based upon the three-month EURIBOR rate plus 0.15%, with a minimum interest rate for any period of no less than 0.00%. The net proceeds from this debt issuance were used to fund the repayment of commercial paper and for other general corporate purposes.

On May 4, 2017, we issued $1.0 billion aggregate principal amount of 1.900% notes due 2020, $500 million aggregate principal amount of 2.300% notes due 2022, $800 million aggregate principal amount of 2.800% notes due 2024, $1.1 billion aggregate principal amount of 3.125% notes due 2027 and $600 million aggregate principal amount of 4.050% notes due 2047. The net proceeds received from these debt issuances were used to fund the repayment at maturity of our 1.800% notes due 2017, representing $1.5 billion in aggregate principal, and for other general corporate purposes.

On December 1, 2016, we redeemed all outstanding 5.375% notes due in 2017, representing $1.0 billion in aggregate principal, and all outstanding 6.125% notes due in 2019, representing $1.25 billion in aggregate principal, under our redemption notice issued on November 1, 2016. A combined net extinguishment loss of approximately $164 million was recognized within Interest expense, net in the accompanying Consolidated Statement of Operations.

On November 1, 2016, we issued $650 million aggregate principal amount of 1.500% notes due 2019, $750 million aggregate principal amount of 1.950% notes due 2021, $1,150 million aggregate principal amount of 2.650% notes due 2026, $1,100 million aggregate principal amount of 3.750% notes due 2046 and $350 million aggregate principal amount of floating rate notes due 2019. We used the net proceeds received from these issuances to fund the redemption price of the 5.375% notes due 2017 and the 6.125% notes due 2019, to fund the repayment of commercial paper, and for other general corporate purposes.

On February 22, 2016, we issued €950 million aggregate principal amount of 1.125% notes due 2021, €500 million aggregate principal amount of 1.875% notes due 2026 and €750 million aggregate principal amount of floating rate notes due 2018. The net proceeds from these debt issuances were used for general corporate purposes.

The project financing obligations included in the table above are associated with the sale of rights to unbilled revenues related to the ongoing activity of an entity owned by UTC Climate, Controls & Security. The percentage of total short-term borrowings and long-term debt at variable interest rates was 9% and 7% at December 31, 2017 and 2016, respectively. Interest rates on our commercial paper borrowings are considered variable due to their short-term duration and high-frequency of turnover.

The average maturity of our long-term debt at December 31, 2017 is approximately 11 years. The schedule of principal payments required on long-term debt for the next five years and thereafter is:

(dollars in millions)		
2018	$	2,104
2019		2,271
2020		2,479
2021		2,175
2022		2,804
Thereafter		15,285
Total	$	27,118

We have an existing universal shelf registration statement filed with the Securities and Exchange Commission (SEC) for an indeterminate amount of equity and debt securities for future issuance, subject to our internal limitations on the amount of equity and debt to be issued under this shelf registration statement.

NOTE 10: EQUITY

On November 11, 2015, we entered into ASR agreements to repurchase an aggregate of $6.0 billion of our common stock utilizing the net after-tax proceeds from the sale of Sikorsky. Under the terms of the ASR agreements, we made the aggregate payments and received an initial delivery of approximately 51.9 million shares of our common stock, representing approximately 85% of the shares expected to be repurchased. In 2016, the shares associated with the remaining portion of the aggregate purchase were settled upon final delivery to us of approximately 10.1 million additional shares of common stock. Including the remaining shares settled in 2016, the final price under the November 11, 2015 ASR was $96.74 per share.

On March 13, 2015, we entered into ASR agreements to repurchase an aggregate of $2.65 billion of our common stock. Under the terms of the ASR agreements, we made the aggregate payments and received an initial delivery of approximately 18.6 million shares of our common stock, representing approximately 85% of the shares expected to be repurchased. On July 31, 2015, the shares associated with the remaining portion of the aggregate purchase were settled upon final delivery of approximately 4.2 million additional shares of common stock. Including the remaining shares settled on July 31, 2015, the final price under the ASR was $116.11 per share.

On August 3, 2015, we received approximately $1.1 billion from the proceeds of the remarketing of our 1.550% junior subordinated notes, which were originally issued as part of our equity units on June 18, 2012, and issued approximately 11.3 million shares of common stock to settle the purchase obligation of the holders of the equity units under the purchase contract entered into at the time of the original issuance of the equity units.

A summary of the changes in each component of accumulated other comprehensive (loss) income, net of tax for the years ended December 31, 2017 and 2016 is provided below:

(dollars in millions)	Foreign Currency Translation	Defined Benefit Pension and Postretirement Plans	Unrealized Gains (Losses) on Available-for-Sale Securities	Unrealized Hedging (Losses) Gains	Accumulated Other Comprehensive (Loss) Income
Balance at December 31, 2015	$ (2,438)	$ (5,135)	$ 293	$ (339)	$ (7,619)
Other comprehensive (loss) income before reclassifications, net	(1,042)	(247)	119	54	(1,116)
Amounts reclassified, pre-tax	—	535	(94)	171	612
Tax (benefit) expense reclassified	—	(198)	35	(48)	(211)
Balance at December 31, 2016	$ (3,480)	$ (5,045)	$ 353	$ (162)	$ (8,334)
Other comprehensive income before reclassifications, net	**540**	**78**	**3**	**264**	**885**
Amounts reclassified, pre-tax	**(10)**	**529**	**(566)**	**(39)**	**(86)**
Tax (benefit) expense reclassified	**—**	**(214)**	**215**	**9**	**10**
Balance at December 31, 2017	**$ (2,950)**	**$ (4,652)**	**$ 5**	**$ 72**	**$ (7,525)**

Amounts reclassified related to our defined benefit pension and postretirement plans include amortization of prior service costs and actuarial net losses recognized during each period presented. These costs are recorded as components of net periodic pension cost for each period presented (see Note 12 for additional details).

Amounts reclassified that relate to unrealized gains (losses) on available-for-sale securities, pre-tax includes approximately $500 million of previously unrealized gains reclassified to other income as a result of sales of significant investments in available-for-sale securities in 2017, including UTC Climate, Controls & Security's sale of investments in Watsco, Inc.

All noncontrolling interests with redemption features, such as put options, that are not solely within our control (redeemable noncontrolling interests) are reported in the mezzanine section of the Consolidated Balance Sheet, between liabilities and equity, at the greater of redemption value or initial carrying value. The decrease in the value of redeemable noncontrolling interest in our Consolidated Balance Sheet as of December 31, 2017 is primarily attributable to the acquisition by UTC Climate, Controls & Security of the remaining interest in an Italian heating products and services company, initially acquired in 2016.

NOTE 11: INCOME TAXES

Income Before Income Taxes. The sources of income from continuing operations before income taxes are:

(dollars in millions)	**2017**	2016	2015
United States	**$ 2,990**	$ 2,534	$ 2,782
Foreign	**4,773**	4,599	3,685
	$ 7,763	$ 7,133	$ 6,467

On December 22, 2017 Public Law 115-97 *"An Act to Provide for Reconciliation Pursuant to Titles II and V of the Concurrent Resolution on the Budget for Fiscal Year 2018"* was enacted. This law is commonly referred to as the Tax Cuts and Jobs Act of 2017 (TCJA).

The Company recorded a tax charge of $690 million in connection with the passage of the TCJA. This amount relates to U.S. income tax attributable to previously undistributed earnings of UTC's international subsidiaries and equity investments, net of foreign tax credits, and the revaluation of U.S. deferred income taxes. In accordance with Staff Accounting Bulletin 118 (SAB 118) issued on December 22, 2017, the U.S. income tax attributable to the TCJA's deemed repatriation provision, the revaluation of U.S. deferred taxes and the tax consequences relating to states with current conformity to the Internal Revenue Code are provisional amounts. Due to the enactment date and tax complexities of the TCJA, the Company has not completed its accounting related to these items.

The Company operates in approximately 80 countries through numerous subsidiaries and joint venture arrangements. To complete the accounting associated with the TCJA, the Company will continue to review the technical interpretations of the underlying law, monitor state legislative changes, and review U.S. federal and state guidance as it is issued. For example, on January 19, 2018, the Department of the Treasury issued Notice 2018-13. We anticipate an additional tax cost of approximately $70 million related to this notice. This amount will be recorded in the first quarter 2018 together with other adjustments as appropriate. Further, the Company will continue to accumulate and refine the relevant data and computational elements needed to finalize its accounting for the effects of the TCJA by December 22, 2018.

Prior to enactment of the TCJA, with few exceptions, U.S. income taxes had not been provided on undistributed earnings of UTC's international subsidiaries as the Company had intended to reinvest such earnings permanently outside the U.S. or to repatriate such earnings only when it was tax effective to do so. As of December 31, 2017 such undistributed earnings were approximately $34 billion. The Company is evaluating the impact of the TCJA on its existing accounting position related to the undistributed earnings. Due to the inherent complexities in determining any incremental U.S. Federal and State taxes and the non-U.S. taxes that may be due if the earnings were remitted to the U.S. and in accordance with SAB 118 this evaluation has not been completed and no provisional amount has been recorded in regard to this amount.

Provision for Income Taxes. The income tax expense (benefit) for the years ended December 31, 2017, 2016 and 2015 consisted of the following components:

(dollars in millions)	**2017**	2016	2015
Current:			
United States:			
Federal	**$ 1,577**	$ 30	$ 328
State	**64**	(21)	(37)
Foreign	**1,140**	1,290	1,158
	2,781	1,299	1,449
Future:			
United States:			
Federal	**(27)**	318	712
State	**84**	134	109
Foreign	**5**	(54)	(159)
	62	398	662
Income tax expense	**$ 2,843**	$ 1,697	$ 2,111
Attributable to items credited (charged) to equity	**$ (128)**	$ (299)	$ (114)

Reconciliation of Effective Income Tax Rate. Differences between effective income tax rates and the statutory U.S. federal income tax rate are as follows:

	2017	2016	2015
Statutory U.S. federal income tax rate	**35.0 %**	35.0 %	35.0 %
Tax on international activities	**(6.4)%**	(8.1)%	(2.0)%
Tax audit settlements	**(0.7)%**	(2.9)%	—
U.S. tax reform	**8.9 %**	—	—
Other	**(0.2)%**	(0.2)%	(0.4)%
Effective income tax rate	**36.6 %**	23.8 %	32.6 %

The 2017 effective tax rate reflects a net tax charge of $690 million, as described above, attributable to the passage of the TCJA.

The decrease in the Tax audit settlement represents a $55 million favorable adjustment in 2017 related to the expiration of certain statute of limitations offset by the absence of the favorable audit settlements in 2016 described below.

The decrease in the benefit associated with international activities is related to international earnings taxed at lower statutory rates offset by the absence of certain credits included in 2016. On December 7, 2017, the province of Quebec enacted a retroactive tax law change resulting in a cost of $48 million offset by the 2016 French law changes described below.

The 2016 effective tax rate reflects $206 million of favorable adjustments related to the conclusion of the review by the Examination Division of the Internal Revenue Service of the UTC 2011 and 2012 tax years and the Goodrich Corporation 2011 and 2012 tax years through the date of its acquisition, as well as the absence of 2015 items described below. In addition, at the end of 2016, France enacted a tax law change reducing its corporate income tax rate, which resulted in a tax benefit of $25 million.

The 2015 effective tax rate reflects an unfavorable tax adjustment of $274 million related to the repatriation of certain foreign earnings, the majority of which were 2015 current year earnings, and a favorable adjustment of approximately $45 million related to a non-taxable gain recorded in the first quarter. France, the U.K. and certain U.S. states enacted tax law changes in the fourth quarter which resulted in a net incremental cost of approximately $68 million in 2015.

Deferred Tax Assets and Liabilities. Future income taxes represent the tax effects of transactions which are reported in different periods for tax and financial reporting purposes. These amounts consist of the tax effects of temporary differences between the tax and financial reporting balance sheets and tax carryforwards. Future income tax benefits and payables within the same tax paying component of a particular jurisdiction are offset for presentation in the Consolidated Balance Sheet. The amounts related to 2017 have been provisionally adjusted for the impact of the TCJA.

The tax effects of temporary differences and tax carryforwards which gave rise to future income tax benefits and payables at December 31, 2017 and 2016 are as follows:

(dollars in millions)	**2017**	2016
Future income tax benefits:		
Insurance and employee benefits	**$ 928**	$ 2,382
Other asset basis differences	**798**	1,098
Other liability basis differences	**1,158**	1,403
Tax loss carryforwards	**544**	494
Tax credit carryforwards	**948**	873
Valuation allowances	**(582)**	(545)
	$ 3,794	$ 5,705
Future income taxes payable:		
Other asset basis differences	**$ 3,415**	$ 5,376
Other items, net	**411**	364
	$ 3,826	$ 5,740

Valuation allowances have been established primarily for tax credit carryforwards, tax loss carryforwards, and certain foreign temporary differences to reduce the future income tax benefits to expected realizable amounts.

Tax Credit and Loss Carryforwards. At December 31, 2017, tax credit carryforwards, principally state and foreign, and tax loss carryforwards, principally state and foreign, were as follows:

(dollars in millions)	Tax Credit Carryforwards	Tax Loss Carryforwards
Expiration period:		
2018-2022	$ 22	$ 307
2023-2027	33	218
2028-2037	269	359
Indefinite	624	1,942
Total	$ 948	$ 2,826

Unrecognized Tax Benefits. At December 31, 2017, we had gross tax-effected unrecognized tax benefits of $1,189 million, all of which, if recognized, would impact the effective tax rate. A reconciliation of the beginning and ending amounts of unrecognized tax benefits and interest expense related to unrecognized tax benefits for the years ended December 31, 2017, 2016 and 2015 is as follows:

(dollars in millions)	**2017**	2016	2015
Balance at January 1	**$ 1,086**	$ 1,169	$ 1,089
Additions for tax positions related to the current year	**192**	69	206
Additions for tax positions of prior years	**73**	167	99
Reductions for tax positions of prior years	**(91)**	(61)	(101)
Settlements	**(71)**	(258)	(124)
Balance at December 31	**$ 1,189**	$ 1,086	$ 1,169
Gross interest expense related to unrecognized tax benefits	**$ 34**	$ 41	$ 39
Total accrued interest balance at December 31	**$ 215**	$ 185	$ 176

In accordance with SAB 118 described above, the portion of the balance of unrecognized tax benefits at December 31, 2017 related to the TCJA has been determined provisionally based on an analysis of currently available information.

We conduct business globally and, as a result, UTC or one or more of our subsidiaries files income tax returns in the U.S. federal jurisdiction and various state and foreign jurisdictions. In the normal course of business we are subject to examination by taxing authorities throughout the world, including such major jurisdictions as Australia, Belgium, Brazil, Canada, China, France, Germany, Hong Kong, India, Italy, Japan, Mexico, Netherlands, Poland, Singapore, South Korea, Spain, Switzerland, the United Kingdom and the United States. With few exceptions, we are no longer subject to U.S. federal, state and local, or non-U.S. income tax examinations for years before 2006.

During the quarter ended September 30, 2017, the Company recognized a noncash gain of approximately $64 million, including a pre-tax interest adjustment of $9 million, as a result of federal, state and non-U.S. tax year closures related to audit resolutions and the expiration of applicable statutes of limitation, including expiration of the U.S. federal income tax statute of limitations for UTC's 2013 tax year.

During the quarter ended December 31, 2016, the Company recognized a noncash gain of approximately $172 million, including a pre-tax interest adjustment of $22 million, as a result of the closure of the audit by the Examination Division of the Internal Revenue Service (IRS) of UTC tax years 2011 and 2012.

During the quarter ended September 30, 2016, the Company recognized a noncash gain of approximately $58 million, primarily tax, as a result of the closure of the audit by the Examination Division of the IRS of Goodrich Corporation tax years 2011 and 2012 through the date of acquisition by UTC.

It is reasonably possible that a net reduction within the range of $40 million to $435 million of unrecognized tax benefits may occur over the next 12 months as a result of additional worldwide uncertain tax positions, the revaluation of current uncertain tax positions arising from developments in examinations, in appeals, or in the courts, or the closure of tax statutes. The range of potential change does not include provisional amounts related to TCJA as sufficient information is not available to complete our analysis at this time.

As of December 31, 2017, UTC's tax years 2014 and 2015 were under audit by the Examination Division of the Internal Revenue Service. On January 9, 2018 UTC's 2016 tax year was added to the 2014 - 2015 audit. The combined audit of tax years 2014, 2015 and 2016 is expected to continue beyond the next twelve months.

See Note 18 "Contingent Liabilities" for discussion regarding uncertain tax positions, included in the above range, related to pending litigation with respect to certain deductions claimed in Germany.

NOTE 12: EMPLOYEE BENEFIT PLANS

We sponsor numerous domestic and foreign employee benefit plans, which are discussed below.

Employee Savings Plans. We sponsor various employee savings plans. Our contributions to employer sponsored defined contribution plans were $351 million, $318 million and $356 million for 2017, 2016 and 2015, respectively.

Our non-union domestic employee savings plan uses an Employee Stock Ownership Plan (ESOP) for employer matching contributions. External borrowings were used by the ESOP to fund a portion of its purchase of ESOP stock from us. The external borrowings have been extinguished and only re-amortized loans remain between UTC and the ESOP Trust. As ESOP debt service payments are made, common stock is released from an unreleased shares account. ESOP debt may be prepaid or re-amortized to either increase or decrease the number of shares released so that the value of released shares equals the value of plan benefit. We may also, at our option, contribute additional common stock or cash to the ESOP.

Shares of common stock are allocated to employees' ESOP accounts at fair value on the date earned. Cash dividends on common stock held by the ESOP are used for debt service payments. Participants may choose to have their ESOP dividends reinvested or distributed in cash. Common stock allocated to ESOP participants is included in the average number of common shares outstanding for both basic and diluted earnings per share. At December 31, 2017, 26.0 million common shares had been allocated to employees, leaving 10.5 million unallocated common shares in the ESOP Trust, with an approximate fair value of $1.3 billion.

Pension Plans. We sponsor both funded and unfunded domestic and foreign defined benefit pension plans that cover a large number of our employees. Our largest plans are generally closed to new participants. Our plans use a December 31 measurement date consistent with our fiscal year.

(dollars in millions)	2017	2016
Change in Benefit Obligation:		
Beginning balance	**$ 34,923**	$ 35,428
Service cost	**374**	383
Interest cost	**1,120**	1,183
Actuarial loss	**1,804**	1,831
Total benefits paid	**(1,782)**	(1,660)
Net settlement, curtailment and special termination benefits	**(49)**	(1,566)
Other	**609**	(676)
Ending balance	**$ 36,999**	$ 34,923
Change in Plan Assets:		
Beginning balance	**$ 30,555**	$ 31,011
Actual return on plan assets	**4,258**	3,202
Employer contributions	**2,188**	384
Benefits paid	**(1,782)**	(1,660)
Settlements	**(41)**	(1,632)
Other	**511**	(750)
Ending balance	**$ 35,689**	$ 30,555
Funded Status:		
Fair value of plan assets	**$ 35,689**	$ 30,555
Benefit obligations	**(36,999)**	(34,923)
Funded status of plan	**$ (1,310)**	$ (4,368)
Amounts Recognized in the Consolidated Balance Sheet Consist of:		
Noncurrent assets	**$ 957**	$ 451
Current liability	**(70)**	(72)
Noncurrent liability	**(2,197)**	(4,747)
Net amount recognized	**$ (1,310)**	$ (4,368)
Amounts Recognized in Accumulated Other Comprehensive Loss Consist of:		
Net actuarial loss	**$ 7,238**	$ 7,941
Prior service cost (credit)	**37**	(6)
Net amount recognized	**$ 7,275**	$ 7,935

At the end of fiscal 2015, we changed the approach we had used to estimate the service and interest components of net periodic pension cost for our significant pension plans. This change, compared to the previous approach, resulted in a net decrease in the service and interest components of our annual net periodic pension cost of approximately $215 million for 2016. Historically, we estimated the service and interest cost components utilizing a single-weighted average discount rate derived from the yield curve used to measure the benefit obligation at the beginning of the period. We have elected to utilize a full yield curve approach in the estimation of these components by applying the specific spot rates along the yield curve used in determination of the benefit obligation to the relevant projected cash flows. We made this change to provide a more precise measurement of service and interest costs by improving the correlation between projected benefit cash flows to the corresponding spot yield curve rates. This change does not materially affect the measurement of our total benefit obligations.

As part of our long-term strategy to de-risk our defined benefit pension plans, we made discretionary contributions of approximately $1.9 billion to our domestic defined benefit pension plans in the quarter ended September 30, 2017. In 2016, we entered into an agreement to purchase a group annuity contract to transfer approximately $768 million of our outstanding pension benefit obligations related to certain U.S. retirees or beneficiaries, which was finalized on October 12, 2016. We also offered certain former U.S. employees or beneficiaries (generally all former U.S. participants not yet in receipt of their vested pension benefits) an option to take a one-time lump-sum distribution in lieu of future monthly pension payments, which reduced our pension benefit obligations by approximately $935 million. These transactions reduced the assets of our defined

benefit pension plans by approximately $1.5 billion. As a result of these 2016 transactions, we recognized a one-time pre-tax pension settlement charge of approximately $423 million in the fourth quarter of 2016.

The amounts included in "Other" in the above table primarily reflect the impact of foreign exchange translation, primarily for plans in the U.K. and Canada.

As approved in 2016, effective January 1, 2017, a voluntary lump-sum option is available for the frozen final average earnings benefits of certain U.S. salaried employees upon termination of employment after 2016. This option provides participants with the choice of electing to receive a lump-sum payment in lieu of receiving a future monthly pension benefit. This plan change reduced the projected benefit obligation by $170 million.

Qualified domestic pension plan benefits comprise approximately 74% of the projected benefit obligation. Benefits for union employees are generally based on a stated amount for each year of service. For non-union employees, benefits for service up to December 31, 2014 are generally based on an employee's years of service and compensation through December 31, 2014. Benefits for service after December 31, 2014 are based on the existing cash balance formula that was adopted in 2003 for newly hired non-union employees and for other non-union employees who made a one-time voluntary election to have future benefit accruals determined under this formula. Certain foreign plans, which comprise approximately 25% of the projected benefit obligation, are considered defined benefit plans for accounting purposes. Nonqualified domestic pension plans provide supplementary retirement benefits to certain employees and are not a material component of the projected benefit obligation.

We made $1.9 billion of cash contributions to our domestic defined benefit pension plans and made $212 million of cash contributions to our foreign defined benefit pension plans in 2017. In 2016, we made $100 million of cash contributions to our domestic defined benefit pension plans and made $203 million of cash contributions to our foreign defined benefit pension plans.

Information for pension plans with accumulated benefit obligations in excess of plan assets:

(dollars in millions)	**2017**	2016
Projected benefit obligation	**$ 22,360**	$ 32,732
Accumulated benefit obligation	**22,159**	32,095
Fair value of plan assets	**20,438**	27,943

The accumulated benefit obligation for all defined benefit pension plans was $36.2 billion and $34.2 billion at December 31, 2017 and 2016, respectively.

The components of the net periodic pension (benefit) cost are as follows:

(dollars in millions)	**2017**	2016	2015
Pension Benefits:			
Service cost	**$ 374**	$ 383	$ 493
Interest cost	**1,120**	1,183	1,399
Expected return on plan assets	**(2,215)**	(2,202)	(2,264)
Amortization of prior service credit	**(36)**	(33)	(11)
Recognized actuarial net loss	**575**	572	882
Net settlement, curtailment and special termination benefits loss	**3**	498	150
Net periodic pension (benefit) cost - employer	**$ (179)**	$ 401	$ 649

Net settlement and curtailment losses for pension benefits includes curtailment losses of approximately $109 million related to, and recorded in, discontinued operations for the year ended December 31, 2015. In addition, total net periodic pension cost includes approximately $98 million related to, and recorded in, discontinued operations for the year ended December 31, 2015.

Other changes in plan assets and benefit obligations recognized in other comprehensive loss in 2017 are as follows:

(dollars in millions)		
Current year actuarial gain	**$**	**(239)**
Amortization of actuarial loss		**(575)**
Current year prior service cost		**4**
Amortization of prior service credit		**36**
Net settlement and curtailment loss		**(11)**
Other		**125**
Total recognized in other comprehensive loss	**$**	**(660)**
Net recognized in net periodic pension (benefit) cost and other comprehensive loss	**$**	**(839)**

The amount included in "Other" in the above table primarily reflects the impact of foreign exchange translation, primarily for plans in the U.K. and Canada.

The estimated amount that will be amortized from accumulated other comprehensive loss into net periodic pension (benefit) cost in 2018 is as follows:

(dollars in millions)		
Net actuarial loss	$	402
Prior service credit		(41)
	$	361

Major assumptions used in determining the benefit obligation and net cost for pension plans are presented in the following table as weighted-averages:

	Benefit Obligation		Net Cost		
	2017	2016	**2017**	2016	2015
Discount rate					
PBO	**3.4%**	3.8%	**3.8%**	4.1%	3.8%
Interest cost[1]	**—**	—	**3.3%**	3.4%	—
Service cost[1]	**—**	—	**3.6%**	3.8%	—
Salary scale	**4.2%**	4.1%	**4.1%**	4.2%	4.2%
Expected return on plan assets	**—**	—	**7.3%**	7.3%	7.6%

Note 1 The 2017 and 2016 discount rates used to measure the service cost and interest cost applies to our significant plans. The PBO discount rate is used for the service cost and interest cost measurements for non-significant plans.

In determining the expected return on plan assets, we consider the relative weighting of plan assets, the historical performance of total plan assets and individual asset classes, and economic and other indicators of future performance. In addition, we may consult with and consider the opinions of financial and other professionals in developing appropriate capital market assumptions. Return projections are also validated using a simulation model that incorporates yield curves, credit spreads and risk premiums to project long-term prospective returns.

The plans' investment management objectives include providing the liquidity and asset levels needed to meet current and future benefit payments, while maintaining a prudent degree of portfolio diversification considering interest rate risk and market volatility. Globally, investment strategies target a mix of 50% to 55% of growth seeking assets and 45% to 50% of income generating and hedging assets using a wide diversification of asset types, fund strategies and investment managers. The growth seeking allocation consists of global public equities in developed and emerging countries, private equity, real estate and multi-asset class strategies. Growth assets include an enhanced alpha strategy that invests in publicly traded equity and fixed income securities, derivatives and foreign currency. Investments in private equity are primarily via limited partnership interests in buy-out strategies with smaller allocations to distressed debt funds. The real estate strategy is principally concentrated in directly held U.S. core investments with some smaller investments in international, value-added and opportunistic strategies. Within the income generating assets, the fixed income portfolio consists of mainly government and broadly diversified high quality corporate bonds.

The plans have continued their pension risk management techniques designed to reduce the plans' interest rate risk. More specifically, the plans have incorporated liability hedging programs that include the adoption of a risk reduction objective as part of the long-term investment strategy. Under this objective the interest rate hedge is dynamically increased as

funded status improves. The hedging programs incorporate a range of assets and investment tools, each with ranging interest rate sensitivity. As result of the improved funded status of the plans due to favorable asset returns and funding of the plans, the interest rate hedge increased significantly during 2017. The investment portfolios are currently hedging approximately 55% to 60% of the interest rate sensitivity of the pension plan liabilities.

As a result of the shift in the target asset mix to higher income generating and hedging assets and lower growth seeking assets, we will reduce the expected return on plan assets assumption for 2018 including the assumption of a 7% return on plan assets for our qualified domestic pension plans.

The fair values of pension plan assets at December 31, 2017 and 2016 by asset category are as follows:

(dollars in millions)	Quoted Prices in Active Markets For Identical Assets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Not Subject to Leveling	Total
Asset Category:					
Public Equities					
Global Equities	**$ 3,129**	**$ 3**	**$ —**	**$ —**	**$ 3,132**
Global Equity Commingled Funds[1]	**—**	**1,084**	**—**	**—**	**1,084**
Enhanced Global Equities [2]	**213**	**819**	**—**	**—**	**1,032**
Global Equity Funds at net asset value[8]	**—**	**—**	**—**	**7,599**	**7,599**
Private Equities [3,8]	**—**	**—**	**46**	**1,170**	**1,216**
Fixed Income Securities					
Governments	**1,445**	**69**	**—**	**—**	**1,514**
Corporate Bonds	**—**	**10,929**	**—**	**—**	**10,929**
Fixed Income Securities[8]	**—**	**—**	**—**	**3,519**	**3,519**
Real Estate [4,8]	**—**	**15**	**1,446**	**396**	**1,857**
Other [5,8]	**—**	**287**	**—**	**2,509**	**2,796**
Cash & Cash Equivalents [6,8]	**—**	**79**	**—**	**498**	**577**
Subtotal	**$ 4,787**	**$ 13,285**	**$ 1,492**	**$ 15,691**	**35,255**
Other Assets & Liabilities[7]					**434**
Total at December 31, 2017					**$ 35,689**
Public Equities					
Global Equities	$ 4,682	$ 3	$ —	$ —	$ 4,685
Global Equity Commingled Funds[1]	—	367	—	—	367
Enhanced Global Equities [2]	168	1,494	—	—	1,662
Global Equity Funds at net asset value [8]	—	—	—	7,090	7,090
Private Equities [3,8]	—	—	122	1,239	1,361
Fixed Income Securities					
Governments	260	54	—	—	314
Corporate Bonds	—	7,637	—	—	7,637
Fixed Income Securities[8]	—	—	—	2,788	2,788
Real Estate [4,8]	—	17	1,285	513	1,815
Other [5,8]	—	289	—	1,819	2,108
Cash & Cash Equivalents [6,8]	100	75	—	121	296
Subtotal	$ 5,210	$ 9,936	$ 1,407	$ 13,570	30,123
Other Assets & Liabilities[7]					432
Total at December 31, 2016					$ 30,555

Note 1 Represents commingled funds that invest primarily in common stocks.

Note 2 Represents enhanced equity separate account and commingled fund portfolios. A portion of the portfolio may include long-short market neutral and relative value strategies that invest in publicly traded, equity and fixed income securities, as well as derivatives of equity and fixed income securities and foreign currency.

Note 3 Represents limited partner investments with general partners that primarily invest in debt and equity.

Note 4 Represents investments in real estate including commingled funds and directly held properties.

Note 5 Represents insurance contracts and global balanced risk commingled funds consisting mainly of equity, bonds and some commodities.

Note 6 Represents short-term commercial paper, bonds and other cash or cash-like instruments.

Note 7 Represents trust receivables and payables that are not leveled.

Note 8 In accordance with ASU 2015-07, *Fair Value Measurement (Topic 820)*, certain investments that are measured at fair value using the net asset value per share (or its equivalent) practical expedient have not been classified in the fair value hierarchy. The fair value amounts presented in this table are intended to permit reconciliation of the fair value hierarchy to the amounts presented for the total pension benefits plan assets.

Derivatives in the plan are primarily used to manage risk and gain asset class exposure while still maintaining liquidity. Derivative instruments mainly consist of equity futures, interest rate futures, interest rate swaps and currency forward contracts.

Our common stock represents approximately 1% of total plan assets at both December 31, 2017 and 2016. We review our assets at least quarterly to ensure we are within the targeted asset allocation ranges and, if necessary, asset balances are adjusted back within target allocations. We employ a broadly diversified investment manager structure that includes diversification by active and passive management, style, capitalization, country, sector, industry and number of investment managers.

The fair value measurement of plan assets using significant unobservable inputs (Level 3) changed due to the following:

(dollars in millions)	Private Equities	Real Estate	Total
Balance, December 31, 2015	$ 182	$ 1,165	$ 1,347
Realized gains	46	19	65
Unrealized gains relating to instruments still held in the reporting period	5	18	23
Purchases, sales, and settlements, net	(111)	83	(28)
Balance, December 31, 2016	122	1,285	1,407
Realized gains	**61**	**31**	**92**
Unrealized (losses) gains relating to instruments still held in the reporting period	**(47)**	**17**	**(30)**
Purchases, sales, and settlements, net	**(90)**	**113**	**23**
Balance, December 31, 2017	**$ 46**	**$ 1,446**	**$ 1,492**

Quoted market prices are used to value investments when available. Investments in securities traded on exchanges, including listed futures and options, are valued at the last reported sale prices on the last business day of the year or, if not available, the last reported bid prices. Fixed income securities are primarily measured using a market approach pricing methodology, where observable prices are obtained by market transactions involving identical or comparable securities of issuers with similar credit ratings. Mortgages have been valued on the basis of their future principal and interest payments discounted at prevailing interest rates for similar investments. Investment contracts are valued at fair value by discounting the related cash flows based on current yields of similar instruments with comparable durations. Real estate investments are valued on a quarterly basis using discounted cash flow models which consider long-term lease estimates, future rental receipts and estimated residual values. Valuation estimates are supplemented by third-party appraisals on an annual basis.

Private equity limited partnerships are valued quarterly using discounted cash flows, earnings multiples and market multiples. Valuation adjustments reflect changes in operating results, financial condition, or prospects of the applicable portfolio company. Over-the-counter securities and government obligations are valued at the bid prices or the average of the bid and ask prices on the last business day of the year from published sources or, if not available, from other sources considered reliable, generally broker quotes. Temporary cash investments are stated at cost, which approximates fair value.

As a result of the $1.9 billion contribution, we are not required to make additional contributions to our domestic defined benefit pension plans through the end of 2028. We expect to make total contributions of approximately $100 million to our global defined benefit pension plans in 2018. Contributions do not reflect benefits to be paid directly from corporate assets.

Benefit payments, including amounts to be paid from corporate assets, and reflecting expected future service, as appropriate, are expected to be paid as follows: $2,044 million in 2018, $1,903 million in 2019, $1,952 million in 2020, $2,004 million in 2021, $2,054 million in 2022, and $10,710 million from 2023 through 2027.

Postretirement Benefit Plans. We sponsor a number of postretirement benefit plans that provide health and life benefits to eligible retirees. Such benefits are provided primarily from domestic plans, which comprise approximately 85% of the benefit obligation. The postretirement plans are unfunded.

(dollars in millions)	2017	2016
Change in Benefit Obligation:		
Beginning balance	**$ 805**	$ 890
Service cost	**2**	3
Interest cost	**29**	34
Actuarial gain	**(4)**	(48)
Total benefits paid	**(87)**	(97)
Other	**22**	23
Ending balance	**$ 767**	$ 805
Change in Plan Assets:		
Beginning balance	**$ —**	$ —
Employer contributions	**71**	80
Benefits paid	**(87)**	(97)
Other	**16**	17
Ending balance	**$ —**	$ —
Funded Status:		
Fair value of plan assets	**$ —**	$ —
Benefit obligations	**(767)**	(805)
Funded status of plan	**$ (767)**	$ (805)
Amounts Recognized in the Consolidated Balance Sheet Consist of:		
Current liability	**$ (72)**	$ (78)
Noncurrent liability	**(695)**	(727)
Net amount recognized	**$ (767)**	$ (805)
Amounts Recognized in Accumulated Other Comprehensive Loss Consist of:		
Net actuarial gain	**$ (143)**	$ (152)
Prior service credit	**(10)**	(5)
Net amount recognized	**$ (153)**	$ (157)

The components of net periodic benefit cost are as follows:

(dollars in millions)	2017	2016	2015
Other Postretirement Benefits:			
Service cost	**$ 2**	$ 3	$ 3
Interest cost	**29**	34	34
Amortization of prior service credit	**(1)**	—	—
Recognized actuarial net gain	**(9)**	(4)	(4)
Net settlement and curtailment gain	**—**	—	(1)
Net periodic other postretirement benefit cost	**$ 21**	$ 33	$ 32

Other changes in plan assets and benefit obligations recognized in other comprehensive loss in 2017 are as follows:

(dollars in millions)	
Current year actuarial gain	$ (2)
Current year prior service credit	(6)
Amortization of prior service credit	1
Amortization of actuarial net gain	9
Other	2
Total recognized in other comprehensive loss	$ 4
Net recognized in net periodic other postretirement benefit cost and other comprehensive loss	$ 25

The estimated amounts that will be amortized from accumulated other comprehensive loss into net periodic benefit cost in 2018 include actuarial net gains of $10 million and prior service credits of $3 million.

Major assumptions used in determining the benefit obligation and net cost for postretirement plans are presented in the following table as weighted-averages:

	Benefit Obligation		Net Cost		
	2017	2016	**2017**	2016	2015
Discount rate	**3.4%**	3.8%	**3.8%**	4.0%	3.8%

Assumed health care cost trend rates are as follows:

	2017	2016
Health care cost trend rate assumed for next year	**7.0%**	6.5%
Rate that the cost trend rate gradually declines to	**5.0%**	5.0%
Year that the rate reaches the rate it is assumed to remain at	**2026**	2022

Assumed health care cost trend rates have a significant effect on the amounts reported for the health care plans. A one-percentage-point change in assumed health care cost trend rates would have the following effects:

	2017 One-Percentage-Point	
(dollars in millions)	Increase	Decrease
Effect on total service and interest cost	$ 2	$ (2)
Effect on postretirement benefit obligation	40	(35)

Benefit payments, including net amounts to be paid from corporate assets and reflecting expected future service, as appropriate, are expected to be paid as follows: $72 million in 2018, $67 million in 2019, $64 million in 2020, $59 million in 2021, $54 million in 2022, and $225 million from 2023 through 2027.

Multiemployer Benefit Plans. We contribute to various domestic and foreign multiemployer defined benefit pension plans. The risks of participating in these multiemployer plans are different from single-employer plans in that assets contributed are pooled and may be used to provide benefits to employees of other participating employers. If a participating employer stops contributing to the plan, the unfunded obligations of the plan may be borne by the remaining participating employers. Lastly, if we choose to stop participating in some of our multiemployer plans, we may be required to pay those plans a withdrawal liability based on the underfunded status of the plan.

Our participation in these plans for the annual periods ended December 31 is outlined in the table below. Unless otherwise noted, the most recent Pension Protection Act (PPA) zone status available in 2017 and 2016 is for the plan's year-end at June 30, 2016, and June 30, 2015, respectively. The zone status is based on information that we received from the plan and is certified by the plan's actuary. Our significant plan is in the green zone which represents a plan that is at least 80% funded and does not require a financial improvement plan (FIP) or a rehabilitation plan (RP). An extended amortization provision of ten years is utilized to recognize investment gains or losses for our significant plan.

(dollars in millions)		Pension Protection Act Zone Status		FIP/ RP Status	Contributions				
Pension Fund	EIN/Pension Plan Number	**2017**	2016	Pending/ Implemented	**2017**	2016	2015	Surcharge Imposed	Expiration Date of Collective-Bargaining Agreement
National Elevator Industry Pension Plan	23-2694291	**Green**	Green	No	**$ 114**	$ 100	$ 88	No	July 8, 2022
Other funds					**31**	31	32		
					$ 145	$ 131	$ 120		

For the plan years ended June 30, 2016 and 2015, respectively, we were listed in the National Elevator Industry Pension Plan's Forms 5500 as providing more than 5% of the total contributions for the plan. At the date these financial statements were issued, Forms 5500 were not available for the plan year ending June 30, 2017.

In addition, we participate in several multiemployer arrangements that provide postretirement benefits other than pensions, with the National Elevator Industry Health Benefit Plan being the most significant. These arrangements generally provide medical and life benefits for eligible active employees and retirees and their dependents. Contributions to multiemployer plans that provide postretirement benefits other than pensions were $19 million, $17 million and $15 million for 2017, 2016 and 2015, respectively.

Stock-based Compensation. UTC's long-term incentive plan authorizes various types of market and performance based incentive awards that may be granted to officers and employees. Our Long-Term Incentive Plan (LTIP) was last amended on February 5, 2016. Since the LTIP's inception in 2005, a total of 149 million shares have been authorized for issuance pursuant to awards under the LTIP. All equity-based compensation awards are made exclusively through the LTIP. As of December 31, 2017, approximately 29 million shares remain available for awards under the LTIP. The LTIP does not contain an aggregate annual award limit. We expect that the shares awarded on an annual basis will range from 1.0% to 1.5% of shares outstanding. The LTIP will expire after all authorized shares have been awarded or April 30, 2020, whichever is sooner.

Under the LTIP and predecessor long-term incentive plans, the exercise price of awards is set on the grant date and may not be less than the fair market value per share on that date. Generally, stock appreciation rights and stock options have a term of ten years and a minimum three-year vesting period. In the event of retirement, awards held for more than one year may become vested and exercisable subject to certain terms and conditions. LTIP awards with performance-based vesting generally have a minimum three-year vesting period and vest based on performance against pre-established metrics. In the event of retirement, vesting for awards held more than one year does not accelerate but may vest as scheduled based on actual performance relative to target metrics. We have historically repurchased shares of our common stock in an amount at least equal to the number of shares issued under our equity compensation arrangements and will continue to evaluate this policy in conjunction with our overall share repurchase program.

We measure the cost of all share-based payments, including stock options, at fair value on the grant date and recognize this cost in the Consolidated Statement of Operations as follows:

(dollars in millions)	**2017**	2016	2015
Continuing operations	**$ 192**	$ 152	$ 158
Discontinued operations	**—**	1	17
Total compensation cost recognized	**$ 192**	$ 153	$ 175

The associated future income tax benefit recognized was $38 million, $49 million and $57 million for the years ended December 31, 2017, 2016 and 2015, respectively. The amounts related to 2017 have been provisionally adjusted for the impact of the TCJA. Please refer to Note 11 for additional detail.

For the years ended December 31, 2017, 2016 and 2015, the amount of cash received from the exercise of stock options was $29 million, $17 million and $41 million, respectively, with an associated tax benefit realized of $100 million, $69 million and $89 million, respectively. In addition, for the years ended December 31, 2017, 2016 and 2015, the associated tax benefit realized from the vesting of performance share units and other restricted awards was $12 million, $17 million and $48 million, respectively. In 2016, we adopted the provisions of ASU 2016-09, "Compensation - Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting." As part of that adoption, we elected to apply the prospective transition method and therefore, did not revise prior years' disclosures. As such, for the year ended December 31, 2015, based on existing guidance prior to the issuance of ASU 2016-09, $64 million of certain tax benefits have been reported as operating cash outflows with corresponding cash inflows from financing activities.

At December 31, 2017, there was $175 million of total unrecognized compensation cost related to non-vested equity awards granted under long-term incentive plans. This cost is expected to be recognized ratably over a weighted-average period of 3.3 years.

A summary of the transactions under all long-term incentive plans for the year ended December 31, 2017 follows:

	Stock Options		Stock Appreciation Rights		Performance Share Units		Other
(shares and units in thousands)	Shares	Average Price*	Shares	Average Price*	Units	Average Price**	Incentive Shares/Units
Outstanding at:							
December 31, 2016	2,023	$ 89.72	36,413	$ 87.18	1,967	$ 107.05	2,033
Granted	**231**	**110.81**	**3,464**	**110.91**	**614**	**110.83**	**1,006**
Exercised / earned	**(369)**	**77.17**	**(6,770)**	**72.86**	**(2)**	**107.78**	**(441)**
Cancelled	**(103)**	**102.00**	**(720)**	**95.23**	**(699)**	**112.16**	**(123)**
Other	**(37)**	**$ 94.30**	**335**	**$ 92.54**	**(4)**	**$ 106.38**	**(293)**
December 31, 2017	**1,745**	**$ 94.35**	**32,722**	**$ 92.54**	**1,876**	**$ 106.38**	**2,182**

* weighted-average exercise price

** weighted-average grant stock price

The weighted-average grant date fair value of stock options and stock appreciation rights granted during 2017, 2016 and 2015 was $17.22, $14.02 and $18.69, respectively. The weighted-average grant date fair value of performance share units, which vest upon achieving certain performance metrics, granted during 2017, 2016 and 2015 was $111.00, $91.63 and $120.36, respectively. The total fair value of awards vested during the years ended December 31, 2017, 2016 and 2015 was $138 million, $165 million and $247 million, respectively. The total intrinsic value (which is the amount by which the stock price exceeded the exercise price on the date of exercise) of stock options and stock appreciation rights exercised during the years ended December 31, 2017, 2016 and 2015 was $320 million, $214 million and $281 million, respectively. The total intrinsic value (which is the stock price at vesting) of performance share units and other restricted awards vested was $49 million, $61 million and $151 million during the years ended December 31, 2017, 2016 and 2015, respectively.

The following table summarizes information about equity awards outstanding that are vested and expected to vest and equity awards outstanding that are exercisable at December 31, 2017:

	Equity Awards Vested and Expected to Vest				Equity Awards That Are Exercisable			
(shares in thousands; aggregate intrinsic value in millions)	Awards	Average Price*	Aggregate Intrinsic Value	Remaining Term**	Awards	Average Price*	Aggregate Intrinsic Value	Remaining Term**
Stock Options/Stock Appreciation Rights	34,183	$ 91.85	$ 1,221	5.5 years	21,990	$ 84.34	$ 951	4.2 years
Performance Share Units/Restricted Stock	3,462	—	442	2.1 years				

* weighted-average exercise price per share

** weighted-average contractual remaining term in years

The fair value of each option award is estimated on the date of grant using a binomial lattice model. The following table indicates the assumptions used in estimating fair value for the years ended December 31, 2017, 2016 and 2015. Lattice-based option models incorporate ranges of assumptions for inputs; those ranges are as follows:

	2017	2016	2015
Expected volatility	**19%**	20%	20% - 23%
Weighted-average volatility	**19%**	20%	21%
Expected term (in years)	**6.5**	6.5	6.0 - 6.8
Expected dividend yield	**2.4%**	2.7%	2.2%
Risk-free rate	**0.5% - 2.5%**	0.2% - 2.6%	0.0% - 2.2%

Expected volatilities are based on the returns of our stock, including implied volatilities from traded options on our stock for the binomial lattice model. We use historical data to estimate equity award exercise and employee termination behavior within the valuation model. Prior to 2016, separate employee groups and equity award characteristics were considered

separately for valuation purposes. The expected term represents an estimate of the period of time equity awards are expected to remain outstanding. The risk-free rate is based on the term structure of interest rates at the time of equity award grant.

NOTE 13: RESTRUCTURING COSTS

During 2017, we recorded net pre-tax restructuring costs totaling $253 million for new and ongoing restructuring actions. We recorded charges in the segments as follows:

(dollars in millions)	
Otis	$ 50
UTC Climate, Controls & Security	111
Pratt & Whitney	5
UTC Aerospace Systems	80
Eliminations and other	7
Total	$ 253

Restructuring charges incurred in 2017 primarily relate to actions initiated during 2017 and 2016, and were recorded as follows:

(dollars in millions)	
Cost of sales	$ 119
Selling, general & administrative	134
Total	$ 253

2017 Actions. During 2017, we recorded net pre-tax restructuring costs totaling $176 million for restructuring actions initiated in 2017, consisting of $70 million in cost of sales and $106 million in selling, general and administrative expenses. The 2017 actions relate to ongoing cost reduction efforts, including workforce reductions and consolidation of field operations.

We are targeting to complete in 2018 and 2019 the majority of the remaining workforce and all facility related cost reduction actions initiated in 2017. No specific plans for significant other actions have been finalized at this time. The following table summarizes the accrual balances and utilization by cost type for the 2017 restructuring actions:

(dollars in millions)	Severance	Facility Exit, Lease Termination & Other Costs	Total
Net pre-tax restructuring costs	$ 160	$ 16	$ 176
Utilization and foreign exchange	(76)	(15)	(91)
Balance at December 31, 2017	**$ 84**	**$ 1**	**$ 85**

The following table summarizes expected, incurred and remaining costs for the 2017 restructuring actions by segment:

(dollars in millions)	Expected Costs	**Cost Incurred During 2017**	**Remaining Costs at December 31, 2017**
Otis	$ 79	**$ (43)**	**$ 36**
UTC Climate, Controls & Security	87	**(76)**	**11**
Pratt & Whitney	7	**(7)**	**—**
UTC Aerospace Systems	118	**(43)**	**75**
Eliminations and other	7	**(7)**	**—**
Total	$ 298	**$ (176)**	**$ 122**

2016 Actions. During 2017, we recorded net pre-tax restructuring costs totaling $57 million for restructuring actions initiated in 2016, consisting of $22 million in cost of sales and $35 million in selling, general and administrative expenses. The 2016 actions relate to ongoing cost reduction efforts, including workforce reductions and the consolidation of field operations. The following table summarizes the accrual balances and utilization by cost type for the 2016 restructuring actions:

(dollars in millions)	Severance	Facility Exit, Lease Termination and Other Costs	Total
Restructuring accruals at January 1, 2017	$ 63	$ 46	$ 109
Net pre-tax restructuring costs	34	23	57
Utilization and foreign exchange	(65)	(17)	(82)
Balance at December 31, 2017	**$ 32**	**$ 52**	**$ 84**

The following table summarizes expected, incurred and remaining costs for the 2016 programs by segment:

(dollars in millions)	Expected Costs	Costs Incurred During 2016	**Costs Incurred During 2017**	**Remaining Costs at December 31, 2017**
Otis	$ 57	$ (48)	**$ (5)**	**$ 4**
UTC Climate, Controls & Security	79	(45)	**(21)**	**13**
Pratt & Whitney	118	(118)	**—**	**—**
UTC Aerospace Systems	79	(31)	**(31)**	**17**
Total	$ 333	$ (242)	**$ (57)**	**$ 34**

2015 and Prior Actions. During 2017, we recorded net pre-tax restructuring costs totaling $20 million for restructuring actions initiated in 2015 and prior. As of December 31, 2017, we have approximately $43 million of accrual balances remaining related to 2015 and prior actions.

NOTE 14: FINANCIAL INSTRUMENTS

We enter into derivative instruments for risk management purposes only, including derivatives designated as hedging instruments under the Derivatives and Hedging Topic of the FASB ASC and those utilized as economic hedges. We operate internationally and, in the ordinary course of business, we are exposed to fluctuations in interest rates, foreign exchange rates and commodity prices. These fluctuations can increase the costs of financing, investing and operating the business. We have used derivative instruments, including swaps, forward contracts and options to manage certain foreign currency, interest rate and commodity price exposures.

The four quarter rolling average of the notional amount of foreign exchange contracts hedging foreign currency transactions was $19.1 billion and $18.3 billion at December 31, 2017 and 2016, respectively. Additional information pertaining to foreign exchange and hedging activities is included in Note 1.

The following table summarizes the fair value of derivative instruments as of December 31, 2017 and 2016, which consist solely of foreign exchange contracts:

	Asset Derivatives		**Liability Derivatives**	
(dollars in millions)	**2017**	2016	**2017**	2016
Derivatives designated as hedging instruments	**$ 178**	$ 15	**$ 18**	$ 196
Derivatives not designated as hedging instruments	**75**	155	**60**	158

As discussed in Note 9, at December 31, 2017 we have issued approximately €3.7 billion of euro-denominated long-term debt, which qualifies as a net investment hedge against our investments in European businesses. As of December 31, 2017, the net investment hedge is deemed to be effective.

The impact from foreign exchange derivative instruments that qualified as cash flow hedges was as follows:

	Year Ended December 31,	
(dollars in millions)	**2017**	2016
Gain recorded in Accumulated other comprehensive loss	**$ 347**	$ 75
(Gain) loss reclassified from Accumulated other comprehensive loss into Product sales (effective portion)	**$ (39)**	$ 171

Assuming current market conditions continue, a $66 million pre-tax loss is expected to be reclassified from Accumulated other comprehensive loss into Product sales to reflect the fixed prices obtained from foreign exchange hedging within the next 12 months. At December 31, 2017, all derivative contracts accounted for as cash flow hedges mature by December 2021.

The effect on the Consolidated Statement of Operations of foreign exchange contracts not designated as hedging instruments was as follows:

	Year Ended December 31,	
(dollars in millions)	**2017**	2016
Gain recognized in Other income, net	**$ 77**	$ 56

During the year ended December 31, 2017, we had net cash payments of approximately $317 million for the settlement of derivative contracts. During the years ended December 31, 2016 and 2015, we had net cash receipts of approximately $249 million and $160 million, respectively, from the settlement of derivative contracts.

NOTE 15: FAIR VALUE MEASUREMENTS

In accordance with the provisions of ASC 820, the following tables provide the valuation hierarchy classification of assets and liabilities that are carried at fair value and measured on a recurring and nonrecurring basis in our Consolidated Balance Sheet as of December 31, 2017 and 2016:

2017 *(dollars in millions)*	**Total**	**Level 1**	**Level 2**	**Level 3**
Recurring fair value measurements:				
Available-for-sale securities	**$ 64**	**$ 64**	**$ —**	**$ —**
Derivative assets	**253**	**—**	**253**	**—**
Derivative liabilities	**(78)**	**—**	**(78)**	**—**

2016 *(dollars in millions)*	Total	Level 1	Level 2	Level 3
Recurring fair value measurements:				
Available-for-sale securities	$ 987	$ 987	$ —	$ —
Derivative assets	170	—	170	—
Derivative liabilities	(354)	—	(354)	—

The reduction in value of available-for-sale securities as of December 31, 2017, as compared to December 31, 2016, is primarily the result of sales of these securities in 2017, including UTC Climate, Controls & Security's sale of investments in Watsco, Inc. during 2017.

Valuation Techniques. Our available-for-sale securities include equity investments that are traded in active markets, either domestically or internationally, and are measured at fair value using closing stock prices from active markets. Our derivative assets and liabilities include foreign exchange contracts and commodity derivatives that are measured at fair value using internal models based on observable market inputs such as forward rates, interest rates, our own credit risk and our counterparties' credit risks. As of December 31, 2017, there were no significant transfers in or out of Level 1 and Level 2.

As of December 31, 2017, there has not been any significant impact to the fair value of our derivative liabilities due to our own credit risk. Similarly, there has not been any significant adverse impact to our derivative assets based on our evaluation of our counterparties' credit risks.

The following table provides carrying amounts and fair values of financial instruments that are not carried at fair value at December 31, 2017 and 2016:

	December 31, 2017		December 31, 2016	
(dollars in millions)	Carrying Amount	Fair Value	Carrying Amount	Fair Value
Long-term receivables	**$ 127**	**$ 121**	$ 127	$ 121
Customer financing notes receivable	**609**	**596**	437	420
Short-term borrowings	**(392)**	**(392)**	(600)	(600)
Long-term debt (excluding capitalized leases)	**(27,067)**	**(29,180)**	(23,280)	(25,110)
Long-term liabilities	**(362)**	**(330)**	(457)	(427)

The following table provides the valuation hierarchy classification of assets and liabilities that are not carried at fair value in our Consolidated Balance Sheet as of December 31, 2017:

(dollars in millions)	Total	Level 1	Level 2	Level 3
Long-term receivables	**$ 121**	**$ —**	**$ 121**	**$ —**
Customer financing notes receivable	**596**	**—**	**596**	**—**
Short-term borrowings	**(392)**	**—**	**(300)**	**(92)**
Long-term debt (excluding capitalized leases)	**(29,180)**	**—**	**(28,970)**	**(210)**
Long-term liabilities	**(330)**	**—**	**(330)**	**—**

NOTE 16: VARIABLE INTEREST ENTITIES

Pratt & Whitney holds a 61% interest in the IAE International Aero Engines AG (IAE) collaboration with MTU Aero Engines AG (MTU) and Japanese Aero Engines Corporation (JAEC) and a 49.5% ownership interest in IAE. IAE's business purpose is to coordinate the design, development, manufacturing and product support of the V2500 program through involvement with the collaborators. Additionally, Pratt & Whitney, JAEC and MTU are participants in International Aero Engines, LLC (IAE LLC), whose business purpose is to coordinate the design, development, manufacturing and product support for the PW1100G-JM engine for the Airbus A320neo aircraft and the PW1400G-JM engine for the Irkut MC21 aircraft. Pratt & Whitney holds a 59% net interest and a 59% ownership interest in IAE LLC. IAE and IAE LLC retain limited equity with the primary economics of the programs passed to the participants. As such, we have determined that IAE and IAE LLC are variable interest entities with Pratt & Whitney the primary beneficiary. IAE and IAE LLC have, therefore, been consolidated. The carrying amounts and classification of assets and liabilities for variable interest entities in our Consolidated Balance Sheet as of December 31, 2017 and 2016 are as follows:

(dollars in millions)	2017	2016
Current assets	**$ 3,976**	$ 2,722
Noncurrent assets	**1,534**	1,334
Total assets	**$ 5,510**	$ 4,056
Current liabilities	**$ 3,601**	$ 2,422
Noncurrent liabilities	**2,086**	1,636
Total liabilities	**$ 5,687**	$ 4,058

NOTE 17: GUARANTEES

We extend a variety of financial, market value and product performance guarantees to third parties. As of December 31, 2017 and 2016, the following financial guarantees were outstanding:

	December 31, 2017		December 31, 2016	
(dollars in millions)	**Maximum Potential Payment**	**Carrying Amount of Liability**	Maximum Potential Payment	Carrying Amount of Liability
Commercial aerospace financing arrangements (see Note 5)	**$ 336**	**$ 8**	$ 348	$ 14
Credit facilities and debt obligations (expire 2018 to 2028)	**256**	**15**	270	15
Performance guarantees	**56**	**2**	55	4

We also have obligations arising from sales of certain businesses and assets, including those from representations and warranties and related indemnities for environmental, health and safety, tax and employment matters. The maximum potential payment related to these obligations is not a specified amount as a number of the obligations do not contain financial caps. The carrying amount of liabilities related to these obligations was $179 million and $171 million at December 31, 2017 and December 31, 2016, respectively. For additional information regarding the environmental indemnifications, see Note 18.

We accrue for costs associated with guarantees when it is probable that a liability has been incurred and the amount can be reasonably estimated. The most likely cost to be incurred is accrued based on an evaluation of currently available facts, and where no amount within a range of estimates is more likely, the minimum is accrued. In accordance with the Guarantees Topic of the FASB ASC, we record these liabilities at fair value.

We provide service and warranty policies on our products and extend performance and operating cost guarantees beyond our normal service and warranty policies on some of our products, particularly commercial aircraft engines. In addition, we incur discretionary costs to service our products in connection with specific product performance issues. Liabilities for performance and operating cost guarantees are based upon future product performance and durability, and are largely estimated based upon historical experience. Adjustments are made to accruals as claim data and historical experience warrant. The changes in the carrying amount of service and product warranties and product performance guarantees for the years ended December 31, 2017 and 2016 are as follows:

(dollars in millions)	**2017**	2016
Balance as of January 1	**$ 1,199**	$ 1,212
Warranties and performance guarantees issued	**323**	246
Settlements made	**(207)**	(240)
Other	**9**	(19)
Balance as of December 31	**$ 1,324**	$ 1,199

NOTE 18: CONTINGENT LIABILITIES

Except as otherwise noted, while we are unable to predict the final outcome, based on information currently available, we do not believe that resolution of any of the following matters will have a material adverse effect upon our competitive position, results of operations, cash flows or financial condition.

Leases. We occupy space and use certain equipment under lease arrangements. Rental commitments of approximately $2.3 billion at December 31, 2017 under long-term non-cancelable operating leases are payable as follows: $498 million in 2018, $430 million in 2019, $325 million in 2020, $221 million in 2021, $143 million in 2022 and $635 million thereafter. Rent expense was $411 million in 2017 and $386 million in 2016 and 2015.

Additional information pertaining to commercial aerospace rental commitments is included in Note 5 to the Consolidated Financial Statements.

Environmental. Our operations are subject to environmental regulation by federal, state and local authorities in the United States and regulatory authorities with jurisdiction over our foreign operations. As described in Note 1 to the Consolidated Financial Statements, we have accrued for the costs of environmental remediation activities, including but not limited to investigatory, remediation, operating and maintenance costs and performance guarantees, and periodically reassess these amounts. We believe that the likelihood of incurring losses materially in excess of amounts accrued is remote. As of December 31, 2017 and 2016, we had $830 million and $829 million reserved for environmental remediation, respectively. Additional information pertaining to environmental matters is included in Note 1 to the Consolidated Financial Statements.

Government. In the ordinary course of business, the Company and its subsidiaries and our properties are subject to regulatory and governmental examinations, information gathering requests, inquiries, investigations and threatened legal actions and proceedings. For example, we are now, and believe that, in light of the current U.S. Government contracting environment, we will continue to be the subject of one or more U.S. Government investigations. Such U.S. Government investigations often take years to complete and could result in administrative, civil or criminal liabilities, including repayments, fines, treble and other damages, forfeitures, restitution or penalties, or could lead to suspension or debarment of U.S. Government contracting privileges. For instance, if we or one of our business units were charged with wrongdoing as a result of any of these investigations or other government investigations (including violations of certain environmental or export laws) the U.S. Government could suspend us from bidding on or receiving awards of new U.S. Government contracts pending the completion of legal proceedings. If convicted or found liable, the U.S. Government could fine and debar us from new U.S. Government contracting for a period generally not to exceed three years. The U.S. Government also reserves the right to debar a contractor from receiving new government contracts for fraudulent, criminal or other seriously improper conduct. The U.S. Government could void any contracts found to be tainted by fraud.

Our contracts with the U.S. Government are also subject to audits. Like many defense contractors, we have received audit reports, which recommend that certain contract prices should be reduced to comply with various government regulations, including because cost or pricing data we submitted in negotiation of the contract prices or cost accounting practices may not have conformed to government regulations, or that certain payments be delayed or withheld. Some of these audit reports involved substantial amounts. We have made voluntary refunds in those cases we believe appropriate, have settled some allegations and, in some cases, continue to negotiate and/or litigate. In addition, we accrue for liabilities associated with those matters that are probable and can be reasonably estimated. The most likely settlement amount to be incurred is accrued based upon a range of estimates. Where no amount within a range of estimates is more likely, then we accrued the minimum amount.

Legal Proceedings.

Cost Accounting Standards Claim

As previously disclosed, in December 2013, a Divisional Administrative Contracting Officer of the United States Defense Contract Management Agency asserted a claim against Pratt & Whitney to recover overpayments of approximately $177 million plus interest (approximately $72.4 million through December 31, 2017). The claim is based on Pratt & Whitney's alleged noncompliance with cost accounting standards from January 1, 2005 to December 31, 2012, due to its method of determining the cost of collaborator parts used in the calculation of material overhead costs for government contracts. On March 18, 2014, Pratt & Whitney filed an appeal to the Armed Services Board of Contract Appeals. Pratt & Whitney’s appeal is still pending and we continue to believe the government’s claim is without merit.

German Tax Litigation

As previously disclosed, UTC has been involved in administrative review proceedings with the German Tax Office, which concern approximately €215 million (approximately $256 million) of tax benefits that we have claimed related to a 1998 reorganization of the corporate structure of Otis operations in Germany. Upon audit, these tax benefits were disallowed by the German Tax Office. UTC estimates interest associated with the aforementioned tax benefits is an additional approximately €118 million (approximately $140 million). On August 3, 2012, we filed suit in the local German Tax Court (Berlin-Brandenburg). In March 2016, the local German Tax Court dismissed our suit, and we have appealed this decision to the German Federal Tax Court (FTC). In 2015, UTC made tax and interest payments to German tax authorities of €275 million (approximately $300 million) in order to avoid additional interest accruals pending final resolution of this matter. In the meantime, we continue vigorously to litigate this matter.

Asbestos Matters

As previously disclosed, like many other industrial companies, we and our subsidiaries have been named as defendants in lawsuits alleging personal injury as a result of exposure to asbestos integrated into certain of our products or business premises. While we have never manufactured asbestos and no longer incorporate it in any currently-manufactured products, certain of our historical products, like those of many other manufacturers, have contained components incorporating asbestos. A substantial majority of these asbestos-related claims have been dismissed without payment or were covered in full or in part by insurance or other forms of indemnity. Additional cases were litigated and settled without any insurance reimbursement. The amounts involved in asbestos related claims were not material individually or in the aggregate in any year.

Our estimated total liability to resolve all pending and unasserted potential future asbestos claims through 2059 is approximately $344 million and is principally recorded in Other long-term liabilities on our Consolidated Balance Sheet as of December 31, 2017. This amount is on a pre-tax basis, not discounted, and excludes the Company’s legal fees to defend the asbestos claims (which will continue to be expensed by the Company as they are incurred). In addition, the Company has an insurance recovery receivable for probable asbestos related recoveries of approximately $120 million, which is included primarily in Other assets on our Consolidated Balance Sheet as of December 31, 2017.

The amounts recorded by UTC for asbestos-related liabilities and insurance recoveries are based on currently available information and assumptions that we believe are reasonable. Our actual liabilities or insurance recoveries could be higher or lower than those recorded if actual results vary significantly from the assumptions. Key variables in these assumptions include the number and type of new claims to be filed each year, the outcomes or resolution of such claims, the average cost of resolution of each new claim, the amount of insurance available, allocation methodologies, the contractual terms with each insurer with whom we have reached settlements, the resolution of coverage issues with other excess insurance carriers with whom we have not yet achieved settlements, and the solvency risk with respect to our insurance carriers. Other factors that may affect our future liability include uncertainties surrounding the litigation process from jurisdiction to jurisdiction and from case to case, legal rulings that may be made by state and federal courts, and the passage of state or federal legislation. At the end of each year, the Company will evaluate all of these factors and, with input from an outside actuarial expert, make any necessary adjustments to both our estimated asbestos liabilities and insurance recoveries.

Other.

As described in Note 17 to the Consolidated Financial Statements, we extend performance and operating cost guarantees beyond our normal warranty and service policies for extended periods on some of our products. We have accrued our estimate of the liability that may result under these guarantees and for service costs that are probable and can be reasonably estimated.

We also have other commitments and contingent liabilities related to legal proceedings, self-insurance programs and matters arising out of the normal course of business. We accrue contingencies based upon a range of possible outcomes. If no amount within this range is a better estimate than any other, then we accrue the minimum amount. Of note, the design, development, production and support of new aerospace technologies is inherently complex and subject to risk. Since the PurePower PW1000G Geared TurboFan engine entered into service in 2016, technical issues have been identified and experienced with the engine, which is usual for new engines and new aerospace technologies. Pratt & Whitney has addressed these issues through various improvements and modifications. These issues have resulted in financial impacts, including increased warranty provisions, customer contract settlements, and reductions in contract performance estimates. Additional technical issues have been identified, for which a reasonable estimate of the impact cannot currently be made, and such issues may also arise in the normal course, which may result in financial impacts that could be material to the Company's financial position, results of operations and cash flows.

In the ordinary course of business, the Company and its subsidiaries are also routinely defendants in, parties to or otherwise subject to many pending and threatened legal actions, claims, disputes and proceedings. These matters are often based on alleged violations of contract, product liability, warranty, regulatory, environmental, health and safety, employment, intellectual property, tax and other laws. In some of these proceedings, claims for substantial monetary damages are asserted against the Company and its subsidiaries and could result in fines, penalties, compensatory or treble damages or non-monetary relief. We do not believe that these matters will have a material adverse effect upon our competitive position, results of operations, cash flows or financial condition.

NOTE 19: SEGMENT FINANCIAL DATA

Our operations for the periods presented herein are classified into four principal segments. The segments are generally determined based on the management structure of the businesses and the grouping of similar operating companies, where each management organization has general operating autonomy over diversified products and services.

As discussed in Note 3, on November 6, 2015, we completed the sale of Sikorsky to Lockheed Martin Corp. The tables below exclude amounts attributable to Sikorsky, which have been reclassified to Discontinued Operations in the accompanying Consolidated Statement of Operations.

Otis products include elevators, escalators, moving walkways and service sold to customers in the commercial and residential property industries around the world.

UTC Climate, Controls & Security products and related services include HVAC and refrigeration systems, building controls and automation, fire and special hazard suppression systems and equipment, security monitoring and rapid response systems, provided to a diversified international customer base principally in the industrial, commercial and residential property and commercial transportation sectors.

Pratt & Whitney products include commercial, military, business jet and general aviation aircraft engines, parts and services sold to a diversified customer base, including international and domestic commercial airlines and aircraft leasing companies, aircraft manufacturers, and U.S. and foreign governments. Pratt & Whitney also provides product support and a full range of overhaul, repair and fleet management services.

UTC Aerospace Systems provides aerospace products and aftermarket services for commercial, military, business jet and general aviation customers worldwide. Products include electric power generation, power management and distribution

systems, air data and flight sensing and management systems, engine control systems, electric systems, intelligence, surveillance and reconnaissance systems, engine components, environmental control systems, fire and ice detection and protection systems, propeller systems, aircraft aerostructures including engine nacelles, thrust reversers, and mounting pylons, interior and exterior aircraft lighting, aircraft seating and cargo systems, actuation systems, landing systems, including landing gears, wheels and brakes, and space products and subsystems. Aftermarket services include spare parts, overhaul and repair, engineering and technical support and fleet management solutions.

We have reported our financial and operational results for the periods presented herein under the four principal segments noted above, consistent with how we have reviewed our business operations for decision-making purposes, resource allocation and performance assessment during 2017.

Segment Information. Total sales by segment include intersegment sales, which are generally made at prices approximating those that the selling entity is able to obtain on external sales. Segment information for the years ended December 31 is as follows:

	Net Sales			Operating Profits		
(dollars in millions)	**2017**	2016	2015	**2017**	2016	2015
Otis	**$ 12,341**	$ 11,893	$ 11,980	**$ 2,021**	$ 2,147	$ 2,338
UTC Climate, Controls & Security	**17,812**	16,851	16,707	**3,300**	2,956	2,936
Pratt & Whitney	**16,160**	14,894	14,082	**1,460**	1,545	861
UTC Aerospace Systems	**14,691**	14,465	14,094	**2,370**	2,298	1,888
Total segment	**61,004**	58,103	56,863	**9,151**	8,946	8,023
Eliminations and other	**(1,167)**	(859)	(765)	**(38)**	(368)	(268)
General corporate expenses	**—**	—	—	**(441)**	(406)	(464)
Consolidated	**$ 59,837**	$ 57,244	$ 56,098	**$ 8,672**	$ 8,172	$ 7,291

	Total Assets			Capital Expenditures			Depreciation & Amortization		
(dollars in millions)	**2017**	2016	2015	**2017**	2016	2015	**2017**	2016	2015
Otis	**$ 9,421**	$ 8,867	$ 8,846	**$ 133**	$ 94	$ 83	**$ 177**	$ 171	$ 176
UTC Climate, Controls & Security	**22,657**	21,787	21,287	**326**	340	261	**372**	354	337
Pratt & Whitney	**26,768**	22,971	20,336	**923**	725	692	**672**	550	476
UTC Aerospace Systems	**34,567**	34,093	34,736	**527**	452	537	**823**	807	796
Total segment	**93,413**	87,718	85,205	**1,909**	1,611	1,573	**2,044**	1,882	1,785
Eliminations and other	**3,507**	1,988	2,279	**105**	88	79	**96**	80	78
Consolidated	**$ 96,920**	$ 89,706	$ 87,484	**$ 2,014**	$ 1,699	$ 1,652	**$ 2,140**	$ 1,962	$ 1,863

Geographic External Sales and Operating Profit. Geographic external sales and operating profits are attributed to the geographic regions based on their location of origin. U.S. external sales include export sales to commercial customers outside the U.S. and sales to the U.S. Government, commercial and affiliated customers, which are known to be for resale to customers outside the U.S. Long-lived assets are net fixed assets attributed to the specific geographic regions.

	External Net Sales			Operating Profits			Long-Lived Assets		
(dollars in millions)	**2017**	2016	2015	**2017**	2016	2015	**2017**	2016	2015
United States Operations	**$ 33,912**	$ 32,335	$ 30,989	**$ 4,528**	$ 4,566	$ 4,391	**$ 5,323**	$ 4,822	$ 4,517
International Operations									
Europe	**11,879**	11,151	10,945	**2,058**	1,933	1,882	**1,817**	1,538	1,525
Asia Pacific	**8,770**	8,260	8,425	**1,488**	1,484	1,641	**1,113**	999	994
Other	**5,262**	5,479	5,584	**1,077**	963	109	**1,389**	1,325	1,273
Eliminations and other	**14**	19	155	**(479)**	(774)	(732)	**544**	474	423
Consolidated	**$ 59,837**	$ 57,244	$ 56,098	**$ 8,672**	$ 8,172	$ 7,291	**$ 10,186**	$ 9,158	$ 8,732

Sales from U.S. operations include export sales as follows:

(dollars in millions)	**2017**	2016	2015
Europe	**$ 5,273**	$ 5,065	$ 4,366
Asia Pacific	**3,634**	3,449	2,902
Other	**2,217**	2,313	2,473
	$ 11,124	$ 10,827	$ 9,741

Major Customers. Net Sales include sales under prime contracts and subcontracts to the U.S. Government, primarily related to Pratt & Whitney and UTC Aerospace Systems products, as follows:

(dollars in millions)	**2017**	2016	2015
Pratt & Whitney	**$ 3,347**	$ 3,187	$ 2,945
UTC Aerospace Systems	**2,299**	2,301	2,409
Other	**152**	138	276
	$ 5,798	$ 5,626	$ 5,630

Net sales by Sikorsky under prime contracts and subcontracts to the U.S. Government of approximately $3.1 billion have been reclassified to Discontinued Operations in our Consolidated Statement of Operations for the year ended December 31, 2015.

Net sales to Airbus, primarily related to Pratt & Whitney and UTC Aerospace Systems products, were approximately $8,908 million, $7,688 million and $7,624 million for the years ended December 31, 2017, 2016 and 2015, respectively.

SELECTED QUARTERLY FINANCIAL DATA (UNAUDITED)

(dollars in millions, except per share amounts)	2017 Quarters				2016 Quarters			
	First	**Second**	**Third**	**Fourth**	First	Second	Third	Fourth
Net Sales	**$ 13,815**	**$ 15,280**	**$ 15,062**	**$ 15,680**	$ 13,357	$ 14,874	$ 14,354	$ 14,659
Gross margin	**3,738**	**4,180**	**4,019**	**3,947**	3,703	4,133	4,012	3,936
Net income attributable to common shareowners	**1,386**	**1,439**	**1,330**	**397**	1,183	1,379	1,480	1,013
Earnings per share of Common Stock:								
Basic - net income	**$ 1.75**	**$ 1.83**	**$ 1.69**	**$ 0.50**	$ 1.43	$ 1.67	$ 1.80	$ 1.26
Diluted - net income	**$ 1.73**	**$ 1.80**	**$ 1.67**	**$ 0.50**	$ 1.42	$ 1.65	$ 1.78	$ 1.25

COMPARATIVE STOCK DATA (UNAUDITED)

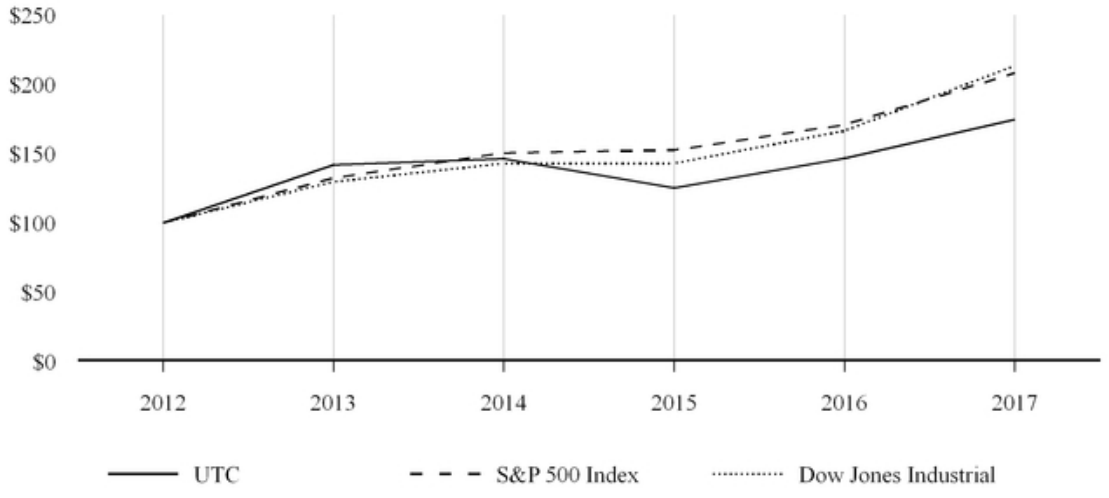
(common stock)	2017			2016		
	High	**Low**	**Dividend**	High	Low	Dividend
First quarter	**$ 113.68**	**$ 108.18**	**$ 0.66**	$ 100.25	$ 84.66	$ 0.64
Second quarter	**$ 122.50**	**$ 111.93**	**$ 0.66**	$ 105.89	$ 97.21	$ 0.66
Third quarter	**$ 123.71**	**$ 109.55**	**$ 0.70**	$ 109.69	$ 100.10	$ 0.66
Fourth quarter	**$ 128.12**	**$ 116.38**	**$ 0.70**	$ 110.98	$ 98.67	$ 0.66

Our common stock is listed on the New York Stock Exchange. The high and low prices are based on the Composite Tape of the New York Stock Exchange. There were approximately 18,393 registered shareholders at January 31, 2018.

PERFORMANCE GRAPH (UNAUDITED)

The following graph presents the cumulative total shareholder return for the five years ending December 31, 2017 for our common stock, as compared to the Standard & Poor's 500 Stock Index and to the Dow Jones 30 Industrial Average. Our common stock price is a component of both indices. These figures assume that all dividends paid over the five-year period were reinvested, and that the starting value of each index and the investment in common stock was $100.00 on December 31, 2012.

COMPARISON OF CUMULATIVE FIVE YEAR TOTAL RETURN



	December					
	2012	2013	2014	2015	2016	**2017**
United Technologies Corporation	$ 100.00	$ 141.87	$ 146.39	$ 125.30	$ 146.66	**$ 174.62**
S&P 500 Index	$ 100.00	$ 132.39	$ 150.51	$ 152.59	$ 170.84	**$ 208.14**
Dow Jones Industrial Average	$ 100.00	$ 129.65	$ 142.67	$ 142.98	$ 166.56	**$ 213.38**

EX-21 5 a2017-12x3110xkexhibit21.htm SUBSIDIARIES OF THE REGISTRANT

United Technologies Corporation **Exhibit 21**
Subsidiary and Affiliate Listing
December 31, 2017

Entity Name	Place of Incorporation
Allyn Holdings, Inc.	Delaware
AMI Industries, Inc.	Colorado
Arabian Air Conditioning Company	Saudi Arabia
Augusta (Gibraltar) Holdings I Limited	Gibraltar
Augusta (Gibraltar) Holdings II S.C.S.	Grand-Duchy of Luxembourg
Automated Logic Corporation	Georgia
Bedford Holdings B.V.	Netherlands
Beesail Limited	England
Belgium Parkview BVBA	Belgium
Berkeley Luxembourg S.à r.l.	Grand-Duchy of Luxembourg
BET Security and Communications Limited	United Kingdom
Blades Technology International, Inc.	Delaware
Blades Technology Ltd.	Israel
Bridgecam (Ireland) Limited	Ireland
Cambridge Luxembourg S.à r.l.	Grand-Duchy of Luxembourg
Caricor Ltd.	Delaware
Carrier Asia Limited	Hong Kong
Carrier Commercial Refrigeration, Inc.	Delaware
Carrier Corporation	Delaware
Carrier Enterprise, LLC	Delaware
Carrier HVACR Investments B.V.	Netherlands
Carrier Mexico, S.A. de C.V.	Mexico
Carrier Technologies ULC	Alberta
CEAM Costruzioni Elettromeccaniche Ascensori e Montacarichi Srl	Italy
Ceesail Limited	England
Chubb Fire & Security Limited	England
Chubb Fire & Security Pty Ltd	Australia
Chubb Fire Limited	England
Chubb Group Limited	England
Chubb Group Security Limited	England
Chubb International (Netherlands) BV	Netherlands
Chubb International Holdings Limited	England
Chubb Limited	England
Chubb Nederland B.V.	Netherlands
Commonwealth Luxembourg Holdings S.à r.l.	Grand-Duchy of Luxembourg
Concord Luxembourg S.à r.l.	Grand-Duchy of Luxembourg
Delancey Holdings B.V.	Netherlands
Delavan Inc.	Delaware
Detector Electronics Corporation	Minnesota
Devonshire Switzerland Holdings GmbH	Switzerland
Elevadores Otis Ltda.	Brazil

United Technologies Corporation
Subsidiary and Affiliate Listing
December 31, 2017

Entity Name	Place of Incorporation
Elmwood Holdings LLC	Delaware
Empresas Carrier, S. De R.L. De C.V.	Mexico
Fernwood Holdings S.C.S	Luxembourg
Fyrnetics (Hong Kong) Limited	Hong Kong
Goodrich Aerospace Canada Ltd	Ontario
Goodrich Aftermarket Services Limited	United Kingdom
Goodrich Control Systems	United Kingdom
Goodrich Corporation	New York
Goodrich Inertial Limited	United Kingdom
Goodrich Limited	United Kingdom
Goodrich Luxembourg S.A.R.L.	Grand-Duchy of Luxembourg
Goodrich Systems Limited	United Kingdom
Goodrich XCH Luxembourg B.V./S.a.r.l. (Dual Dutch/Lux Citizenship)	Netherlands
Gulf Security Technology Company Limited	China
Hamilton Sundstrand Aviation Services, Inc.	Delaware
Hamilton Sundstrand Corporation	Delaware
Hamilton Sundstrand Holdings, Inc.	Delaware
Hamilton Sundstrand International Holdings (Luxembourg) S.à r.l.	Grand-Duchy of Luxembourg
HEJ Holding, Inc.	Delaware
IAE International Aero Engines AG	Switzerland
International Aero Engines, LLC	Delaware
JMS I Corporation	Delaware
Kidde Fire Protection Inc.	Delaware
Kidde International Limited	England
Kidde Products Limited	England
Kidde Technologies Inc.*	Delaware
Kidde UK	England
Kidde US Holdings Inc.	Delaware
Latin American Holding, Inc.	Delaware
Menasco Aerosystems Inc.	Delaware
Mulberry Holdings LLC	Delaware
Netherlands Parkview Coöperatief U.A.	Netherlands
Nippon Otis Elevator Company	Japan
Noresco, LLC	Delaware
Otis Electric Elevator Company Limited	China
Otis Elevator (China) Company Limited	China
Otis Elevator (China) Investment Company Limited	China
Otis Elevator Company	New Jersey
Otis Elevator Korea	Korea, Republic of
Otis Far East Holdings Limited	Hong Kong
Otis Holdings GmbH & Co. OHG	Germany

United Technologies Corporation
Subsidiary and Affiliate Listing
December 31, 2017

Entity Name	Place of Incorporation
Otis International Holdings GmbH	Germany
Otis Investments Limited	England
Otis Limited	England
Otis Pacific Holdings B.V.	Netherlands
Otis S.C.S.	France
Parkview Treasury Services (UK) Limited	United Kingdom
Pratt & Whitney Aero Engines International Gmbh	Switzerland
Pratt & Whitney Canada Corp.	Nova Scotia
Pratt & Whitney Canada Holdings Corp.	Nova Scotia
Pratt & Whitney Canada Leasing, Limited Partnership	Québec
Pratt & Whitney Component Solutions, Inc.	Michigan
Pratt & Whitney Compressor Airfoil Holdings, Inc.	Delaware
Pratt & Whitney Engine Leasing, LLC	Delaware
Pratt & Whitney Holdings LLC	Cayman Islands
Pratt & Whitney Rzeszow S.A.	Poland
Pratt Aero Limited Partnership	Nova Scotia
Riello Group S.P.A	Italy
Riello S.P.A.	Italy
Rohr, Inc.	Delaware
Rosemount Aerospace Inc.	Delaware
Sensitech Inc.	Delaware
SICLI Holding SAS	France
Silver Lake Holdings S.à r.l.	Grand-Duchy of Luxembourg
Simmonds Precision Products, Inc.	New York
Sirius (Korea) Limited	England
South American Coöperatief U.A.	Netherlands
Trenton Luxembourg S.à r.l.	Grand-Duchy of Luxembourg
Trumbull Holdings SCS	France
United Technologies Corporation [DE]	Delaware
United Technologies Electronic Controls, Inc.	Delaware
United Technologies Far East Limited	Hong Kong
United Technologies Finance (U.K.) Limited	England
United Technologies France SAS	France
United Technologies Holding GmbH	Germany
United Technologies Holdings Italy Srl	Italy
United Technologies Holdings Limited	England
United Technologies Holdings SAS	France
United Technologies Intercompany Lending Ireland Designated Activity Company	Ireland
United Technologies International Corporation	Delaware
United Technologies International Corporation-Asia Private Limited	Singapore
United Technologies International SAS	France

United Technologies Corporation
Subsidiary and Affiliate Listing
December 31, 2017

Entity Name	Place of Incorporation
United Technologies Luxembourg S.à r.l.	Grand-Duchy of Luxembourg
United Technologies Paris S.A.S.	France
United Technologies South Asia Pacific Pte. Ltd	Singapore
United Technologies Treasury Center, Inc.	Delaware
UT Finance Corporation	Delaware
UT Luxembourg Holding II S.à r.l.	Grand-Duchy of Luxembourg
UT Park View, Inc.	Delaware
UTC (US) LLC	Delaware
UTC Australia Commercial Holdings Pty Ltd	Australia
UTC Canada Corporation	New Brunswick
UTC Corporation	Delaware
UTC Fire & Security Americas Corporation, Inc.	Delaware
UTC Fire & Security Canada Inc.	Nova Scotia
UTC Fire & Security Corporation	Delaware
UTC Fire & Security Luxembourg S.a r.l.	Grand-Duchy of Luxembourg
UTC Investments Australia Pty Limited	Australia
UTCL Corp.	Nova Scotia
UTCL Holdings, Limited	New Brunswick
UTCL Investments B.V.	Netherlands
UTX Holdings S.C.S.	France
Walter Kidde Portable Equipment Inc.	Delaware
Zardoya Otis, S.A.	Spain

* Kidde Technologies Inc. also conducts business as Kidde Aerospace & Defense, Fenwal Safety Systems and Kidde Dual Spectrum.

Other subsidiaries of the Registrant have been omitted from this listing since, considered in the aggregate as a single subsidiary, they would not constitute a significant subsidiary, as defined by Rule 1-02 of Regulation S-K.

racts, Grants & Agreements FY 98

Protex

1070252 - R8 SDMS

McALLISTER & MURPHY, P.C.

ATTORNEYS AT LAW

1120 Lincoln Street, Suite 1600
Denver, Colorado 80203-2141
Telephone (303) 830-0566
Telecopier (303) 839-8424

Robert T. McAllister
Patrick T. Murphy
Barry Boughman
Kathryn Haight
Bradly J. Holmes

COPY

August 2, 1999

Received
Office of Enforcement

AUG 03 1999

Compliance & Env. Justice

Carol J. Pokorny, 8ENF-T
U.S. Environmental Protection Agency
Technical Enforcement Program
999 18th Street, Suite 500
Denver, Colorado 80202-2466

Re: Protex Industries, Inc., First Request for Information Regarding the Weld County Waste Disposal, Inc. Facility Located at 4982 County Road #35 in Weld County, CO

Dear Ms. Pokorny:

Pursuant to correspondence dated June 23, 1999, enclosed is the Information Request regarding the above-captioned matter.

Yours truly,

McALLISTER & MURPHY, P.C.

Robert T. McAllister

Robert T. McAllister

RTM/sk
enclosure
cc: client

FIRST REQUEST FOR INFORMATION

Weld County Waste Disposal Site
4982 County Road #35
Weld County, Colorado

Received
Office of Enforcement

AUG 03 1999

Compliance & Env. Justice

INFORMATION REQUEST

From the mid-1970s until 1980, Transporters may have picked up waste materials from business in Colorado and transported them to Weld County Disposal, Inc. near Ft. Lupton, in Weld County, CO. (Please refer to the Site map in Enclosure 1.) EPA is seeking information relating to the quantity and type of wastes that were sent to the Facility by your company, either by using a Transporter or by use of company vehicles. We ask that you research your files for all information that may be relevant to this request and respond to the following questions.

1. Provide the name, address, and phone number of the person who is responding to this request for information. if you are an attorney responding on behalf of a client, provide this information for yourself and your client.

ANSWER: **Robert T. McAllister, McAllister & Murphy, P.C., 1120 Lincoln Street, Suite 1600, Denver, Colorado 80203, 303-830-0566.**

2. Provide the name, current address, and phone number of all persons consulted in the preparation of the answers to these questions.

ANSWER: **Kristi Westfall, P.O. Box 212, Ouray, Colorado 81427, 970-325-4911.**

3. Provide the name, title, address, telephone number, and FAX number of the person to whom future correspondence regarding this matter should be directed, if other than the person identified in question #1.

ANSWER: **Robert T. McAllister, Attorney, McAllister & Murphy, 1120 Lincoln, Suite 1600, Denver, Colorado 80203, 303-830-0566, (fax) 303-839-8424.**

4. For each and every question contained herein, identify and provide accurate copies of all documents you used to prepare your responses to these questions or any other documents which are relevant to the questions.

ANSWER: **None.**

5. Identify all persons, including yourself, as well as current and past employees,

who have knowledge, information, or documents concerning:

a. Respondent's business operations during the period 1976-1979;

ANSWER: Don Wilson.

b. Respondent's transactions, if any, with any Transporter (refer to definition section); and

ANSWER: None.

c. Any disposal of wastes from Respondent's operations at the Site.

ANSWER: None known.

6. Describe all arrangements Respondent may have had with each of the following persons or businesses between 1976 and 1979.

Waste Transport Co.	James I. Martin
Waste Transport Company	Guy Harvey
Milt Adams a/k/a Milton A. Adams	Les Phillips
Richard Ackerman	Billy Watts
Jay Knutson	Kenneth Kyle
Weld County (Waste) Disposal	Billy Cannon
John T. Martin	

ANSWER: None known.

7. Did Respondent make any arrangement with a Transporter to treat, store, dispose of or transport for disposal of any materials, hazardous materials, or byproducts resulting from Respondent's operations?

ANSWER: No.

If the answer to this question is affirmative:

a. Identify the Transporter;

b. Please describe the nature of the arrangement and the specific materials provided (including, but not limited to type of material, quantity by volume and weight, chemical content, physical state, and other physical characteristics relevant to whether the material is hazardous).

c. Please indicate whether the choice of disposal location was made by Respondent or by the Transporter.

d. Please describe your intended purpose for transferring the materials to the Transporter?

ANSWER: **Not Applicable.**

8. If the answer to question 7 above is affirmative, but Respondent asserts that none of the materials provided to the Transporter were hazardous, please provide a detailed description of Respondent's operations, including, but not limited to, types of ingredients, lubricants, solvents, cleaning agents, products, byproducts and waste materials. Contemporaneous business documents would provide the best evidence supporting such a description.

ANSWER: **Not Applicable.**

9. Did Respondent dispose of any materials, hazardous materials, or byproducts at the Site between 1976 and 1979?

If the answer to this question is affirmative:

a. Please describe specifically the materials disposed of by Respondent, including, but not limited to type of material, quantity by volume and weight, chemical content, physical state, and other physical characteristics relevant to whether the material is hazardous; and

ANSWER: **None known.**

b. Please describe your intended purpose for bringing these materials to the Site.

ANSWER: **None known.**

10. If the answer to question 9 is affirmative and Respondent observed the operations at the Site during the relevant time period or has any other information pertaining to the Site, please recount those observations and/or provide such information in a detailed narrative account.

ANSWER: **Not Applicable.**

11. If you or your company is a corporation, identify the parent corporation and all

subsidiaries of Respondent.

ANSWER: Protex Industries, Inc. was a corporation in 1976-1979 but has since been dissolved and is no longer in existence.

12. State each and every name under which you or your business may have conducted business between 1976 and 1979.

ANSWER: Protex Industries, Inc.

13. If you have reason to believe that there may be persons able to provide a more detailed or complete response to any question contained herein or who may be able to provide additional responsive documents, identify such persons and the additional information or documents that they may have.

ANSWER: Unknown.

14. For each and every question contained herein, if information or documents responsive to this Information Request are not in your possession, custody or control, then identify the persons from whom such information or documents may be obtained.

ANSWER: Unknown.

ENCLOSURE 3

NOTARIZED CERTIFICATE

I, Kristi R. Westfall, having been duly sworn and being of legal age, hereby state:

1. I am the person authorized by Protex Industries Inc. to respond to the Environmental Protection Agency's (EPA's) First Request for Information concerning the Weld County Waste Disposal Site in Weld County, CO.

2. I have made a complete and thorough review of all documents, information, and sources relevant to the First Request for Information.

3. I hereby certify that the attached response to EPA's First Request for Information is complete and contains all information and documents responsive to the request.

Kristi R. Westfall
(Signature)

Kristi R. Westfall
(Print Name)

Secretary
(Title)

Subscribed and sworn to me this 23rd day of July, 1999.

NOTARY PUBLIC [SEAL] JEANNE M. BOOTS STATE OF COLORADO

Jeanne M. Boots
Notary Public

My Commission Expires 5/24/2001

My address is Ouray, Co 81427

You searched for: PROTEX INDUSTRIES, IN
Entity Search by Name Results (Alpha)

Found 165 matching records.

[<Prev 25] 1 2 3 4 5 6 7

#	Filing ID	Corporation Name	Status	Type	Cl
151	19971057871	PROTERM INTERNATIONAL LTD.	EXST	DLP	n/a
152	19971057869	PROTERM MANAGEMENT, INC.	DISS	DPC	n/a
153	19871155571	PROTESTANT EPISCOPAL CHURCH HOMES, INC.	n/a	NAMCHG	n/a
154	19871155571	PROTESTANT EPISCOPAL CHURCH HOMES, INC. - S	n/a	TRDNAM	n/a
155	19971151939	PROTESTANT EPISCOPAL CHURCH IN THE UNITED STATES OF AMERICA, INC. (THE)	REV	FNC	n/a
156	19991074629	PROTESTANT REFORMED CHURCHES IN AMERICA	GOOD	FNC	n/a
157	19871682719	PROTEUS CORPORATION	GOOD	DPC	n/a
158	19941142054	PROTEUS ENGINEERING	GOOD	TMSM	00
159	19871708693	PROTEUS ENGINEERING, INC.	n/a	NAMCHG	n/a
160	19951027207	PROTEUS HOMES CORPORATION	GOOD	DPC	n/a
161	19901048284	PROTEUS INTERNATIONAL, INC.	GOOD	DPC	n/a
162	19991024161	PROTEUS REFINISHING ORGANIZATION LLC	DISS	DLLC	n/a
163	19981040357	PROTEUS RETAIL COMPANY LLC	SUSP	DLLC	n/a
164	19871157890	PROTEX INDUSTRIES INC.	DISS	DPC	n/a
		PROTEX SPECIAL			

165	19871050862	SYSTEMS, INC. (NONSURV)	n/a	MRGDOF	n/a

[<Prev 25] 1 2 3 4 5 6 7

Entity Detail

View History and Documents.

Name:	**PROTEX INDUSTRIES INC.**
Entity ID:	**19871157890**
Entity Type:	**DOMESTIC PROFIT CORPORATION**
Filing Date:	**05/08/1928**
Status:	**DISSOLVED**
State of Incorporation:	**CO**
Term:	**PERPETUAL**
Inactive Date:	**09/01/2001**
Last Report:	**Report not filed**
Last Report Filing ID:	**none**
Name Reservation Expires:	**N/A**

Registered Agent

Name:

WESTFALL DAVID S

Physical Address:

316 6TH AVE

OURAY **Colorado** **81427**

PO Box:

None

Principal Address:

PO BOX 212

PO BOX 212

OURAY CO 81427

Secondary Address:

View History and Documents.

File Key: 19871157890 Start Date: 05/08/1928 Type: For Profit
Source: Secretary of State
Purge: 09/01/2001

PROTEX INDUSTRIES INC.
PO BOX 212
OURAY, CO 81427

Agent: WESTFALL DAVID S
316 6TH AVE

OURAY, CO 81427

Home State: CO

Status: DIS*

Term: Perpetual

Officers:
WESTFALL DAVID S ,Pres
BOX 212

OURAY, CO 81427

HORN BRIAN ,VP
8797 W CORNELL #3

LAKEWOOD, CO 80227

WESTFALL KRISTI R ,Sec
BOX 212

OURAY, CO 81427

Directors/Owners(Dept of Revenue):
WESTFALL DAVID S
BOX 212

OURAY, CO 81427

HORN BRIAN
8797 W CORNELL #3

LAKEWOOD, CO 80227

WESTFALL KRISTI R
BOX 212

OURAY, CO 81427

History:

Date	Type	Name
05/08/1928	ARTINC	AUTOLENE LUBRICANTS COMPANY
01/02/1962	NAMCHG	AUTOLENE LUBRICANTS COMPANY
11/27/1970	TRDNAM	UNIVERSAL ADMIXTURES, INC.
09/30/1988	SUSP	
12/18/1989	REINS	
12/15/1989	AMEND	DF1
02/09/1990	AMEND	
12/14/1991	REPORT	CR86 - 03/10/86 - 8607340
04/21/1992	REPORT	CR - 05/01/92 - 07/31/92
12/13/1993	REPORT	CR88 - 12/18/89 - 891112698
04/14/1994	REPORT	CR - 05/01/94 - 07/31/94
12/13/1995	REPORT	CR90 - 05/01/90 - 901050410
04/17/1996	REPORT	CR - 05/01/96 - 07/31/96
12/14/1997	REPORT	CR1992 - 05/26/1992 - 19921053111
04/21/1998	REPORT	CR - 05/01/1998 - 07/31/1998
08/25/1998	REPORT	CR - 08/31/1998 - DA 10/31/1998
05/09/1994	REPORT	CORP REPORT
04/21/2000	REPORT	CR - 05/01/2000 - 07/31/2000
08/25/2000	REPORT	PR - 08/31/2000 - DA 10/31/2000
08/24/2000	DISS	ART OF DISS--NAME NOW INCLUDES--A DISSOLVED COLORADO CORPORA TION, 2000

File Key: 19871157890 Start Date: 05/08/1928 Type: For Profit
Source: Secretary of State
Purge: 09/01/2001

PROTEX INDUSTRIES INC.
PO BOX 212
OURAY, CO 81427

Agent: WESTFALL DAVID S
316 6TH AVE

OURAY, CO 81427

Home State: CO

Status: DIS*

Term: Perpetual

Officers:
WESTFALL DAVID S ,Pres
BOX 212

OURAY, CO 81427

HORN BRIAN ,VP
8797 W CORNELL #3

LAKEWOOD, CO 80227

WESTFALL KRISTI R ,Sec
BOX 212

OURAY, CO 81427

Directors/Owners(Dept of Revenue):
WESTFALL DAVID S
BOX 212

OURAY, CO 81427

Supporting Docs From Research

Add waste stream - oil + other constituents

History:

Date	Type	Name
05/08/1928	ARTINC	AUTOLENE LUBRICANTS
01/02/1962	NAMCHG	AUTOLENE LUBRICANTS
11/27/1970	TRDNAM	UNIVERSAL ADMIXTURE
09/30/1988	SUSP	
12/18/1989	REINS	
12/15/1989	AMEND	DF1
02/09/1990	AMEND	
12/14/1991	REPORT	CR86 - 03/10/86 - 8607340
04/21/1992	REPORT	CR - 05/01/92 - 07/31/92
12/13/1993	REPORT	CR88 - 12/18/89 - 891112698
04/14/1994	REPORT	CR - 05/01/94 - 07/31/94
12/13/1995	REPORT	CR90 - 05/01/90 - 901050410
04/17/1996	REPORT	CR - 05/01/96 - 07/31/96
12/14/1997	REPORT	CR1992 - 05/26/1992 - 19921053111
04/21/1998	REPORT	CR - 05/01/1998 - 07/31/1998
08/25/1998	REPORT	CR - 08/31/1998 - DA 10/31/1998
05/09/1994	REPORT	CORP REPORT
04/21/2000	REPORT	CR - 05/01/2000 - 07/31/2000
08/25/2000	REPORT	PR - 08/31/2000 - DA 10/31/2000
08/24/2000	DISS	ART OF DISS--NAME NOW INCLUDES--A DISSOLVED COLORADO CORPORA TION, 2000

Fax Request Cover Sheet

1-900-555-1717

Colorado Corporation Information

Wednesday, November 01, 2000

Number of Pages (including cover page) 2

Job Number: 10

Date/Time of Request
11/1/2000 1:42:34 PM

Caller Name/Firm Name
Ann

Originating Fax number
(303) 420-7658

Form Name
Printouts (Reference Corporate ID# on the Additional Form line)

Additional Form
19871157890 PROTEX INDUSTRIES INC.

Agent
Allen

OFFICE USE ONLY

Thank you for using Colorado Corporation Information. Faxed is the information or forms that you requested from our service. Whether it be Filing Information, Corporation Printouts, Fees, Name Availability, or other needs, CCI is there for you. We look forward to serving you again in the future.

NOTICE: We are not a filing agency, please be sure to file your documents with the appropriate governement offices.

SS-4 EIN (in Colorado) File With:
Internal Revenue Service
ATTN: Entity Control
Mail Stop 6271
P.O. Box: 9941
Ogden, UT 84201
(801) 620-7645

Any filing with Secretary Of State:
Secretary of State
Corporations Section
1560 Broadway, Suite 200
Denver, CO 80202

Tuesday, March 28, 2

KnowX.com®

Donna Toeroek
Client ID: weld

Detail Record

Detail Record No. 1	
Information America Database:	CORPORATE
Information Current:	through 03-03-2000
Last Updated:	03-19-2000 (Updated on a WEEKLY basis)
Filed:	DEPARTMENT OF STATE

State ID Number:	19871157890
Status:	ACTIVE
Date of Filing:	05-08-1928
	Home State COLORADO
Name:	PROTEX INDUSTRIES INC.
Address:	5555 W JEWELL AVE
	LAKEWOOD, CO 80226
Title:	PRESIDENT
Name:	WESTFALL DAVID S
Address:	BOX 212
	OURAY
	CO
	81427
Title:	EXECUTIVE VICE PRESIDENT
Name:	HORN BRIAN
Address:	8797 W CORNELL #3
	LAKEWOOD
	CO
	80227
Title:	SECRETARY
Name:	WESTFALL KRISTI R
Address:	BOX 212
	OURAY
	CO
	81427
Name:	WESTFALL DAVID S
Address:	BOX 212
	OURAY
	CO

Tuesday, March 28, 2

ROC
10/1/00
COSOS
Articles of Dissolution
Protex Industries →
Dissolved status
Name protection
Status - 120 days
8/24/00

KnowX.com®

Donna Toeroek
Client ID: weld

Detail Record No. 1
Information America Database:
Information Current:
Last Updated: 03-19-2000 (Updated on a WEEKLY basis)
Filed: DEPARTMENT OF STATE

State ID Number:	19871157890
Status:	ACTIVE
Date of Filing:	05-08-1928
	Home State COLORADO
Name:	PROTEX INDUSTRIES INC.
Address:	5555 W JEWELL AVE
	LAKEWOOD, CO 80226
Title:	PRESIDENT
Name:	WESTFALL DAVID S
Address:	BOX 212
	OURAY
	CO
	81427
Title:	EXECUTIVE VICE PRESIDENT
Name:	HORN BRIAN
Address:	8797 W CORNELL #3
	LAKEWOOD
	CO
	80227
Title:	SECRETARY
Name:	WESTFALL KRISTI R
Address:	BOX 212
	OURAY
	CO
	81427
Name:	WESTFALL DAVID S
Address:	BOX 212
	OURAY
	CO

	81427
Name:	HORN BRIAN
Address:	8797 W CORNELL #3
	LAKEWOOD
	CO
	80227
Name:	WESTFALL KRISTI R
Address:	BOX 212
	OURAY
	CO
	81427
Title:	REGISTERED AGENT
Agent Name:	WESTFALL, DAVID S
Address:	316 6TH AVE
	81427
	OURAY
Date of Appointment:	12-15-1989
Transaction:	ARTINC
Date:	05-08-1928
Comments:	AUTOLENE LUBRICANTS COMPANY
Transaction:	NAMCHG
Date:	01-02-1962
Comments:	AUTOLENE LUBRICANTS COMPANY
Transaction:	TRDNAM
Date:	11-27-1970
Comments:	UNIVERSAL ADMIXTURES, INC.
Transaction:	SUSP
Date:	09-30-1988
Transaction:	REINS
Date:	12-18-1989
Transaction:	AMEND
Date:	12-15-1989
Comments:	DF1
Transaction:	AMEND
Date:	02-09-1990
Transaction:	REPORT
Date:	12-14-1991
Comments:	CR86 - 03/10/86 - 8607340
Transaction:	REPORT
Date:	04-21-1992
Comments:	CR - 05/01/92 - 07/31/92
Transaction:	REPORT
Date:	12-13-1993
Comments:	CR88 - 12/18/89 - 891112698
Transaction:	REPORT
Date:	04-14-1994

Comments:	CR - 05/01/94 - 07/31/94
Transaction:	REPORT
Date:	12-13-1995
Comments:	CR90 - 05/01/90 - 901050410
Transaction:	REPORT
Date:	04-17-1996
Comments:	CR - 05/01/96 - 07/31/96
Transaction:	REPORT
Date:	12-14-1997
Comments:	CR1992 - 05/26/1992 - 19921053111
Transaction:	REPORT
Date:	04-21-1998
Comments:	CR - 05/01/1998 - 07/31/1998
Transaction:	REPORT
Date:	08-25-1998
Comments:	CR - 08/31/1998 - DA 10/31/1998
Transaction:	REPORT
Date:	05-09-1994
Comments:	CORP REPORT

KnowX.com can help you. Try our other searches!

Home | All Searches | Your Account | Help & FAQ's | Site Map

KnowX.com® -- The Most Comprehensive Source of Public Records on the Web.
Click Here to Learn More About KnowX.com®.
Click here for Customer Support.
Click here for the KnowX.com® Site Map.

PROTEX

Protex Industries Inc

Waste information found in:
104(e) Response to Lowry Investigation - Document Number: C05-00683

Product/Service/Operation: Admixtures, Cures & sealers, and Epoxies for concrete

RAW MATERIAL	WASTE MATERIAL	DATE	DISPOSAL DECISION	COMMENTS
No information provided	Washout water from raw material or finished product tanks and containers; Waste from cleaning of mixing equipment; Residue from empty drums	7/15/78 through 7/14/80	7/15/78 through 11/26/79 Waste Transport. 4/11/80 through 7/14/80 Pumping Technology Ent. Ltd.	7/15/78 through 11/26/79 disposed by Waste Transport Disposal location unknown. 4/11/80 through 7/14/80 disposed by Pumping Technology Ent. Ltd Disposal location Lowry.

418-3-0015

173475

PART A - COMPANY INFORMATION

Part A must be completed by each recipient of this Request

1. Company Name: Protex Industries Inc.

   Mailing Address: 1331 West Evans Avenue, Denver, CO 80223

   Telephone Number: (303) 935-3566

ADMINISTRATIVE RECORD FILE NUMBER 29.03.918

2. Name and Title of Person Completing Request: Charles V. Hyatt, Controller

   Mailing Address: 1331 West Evans Avenue, Denver, CO 80223

   Telephone Number: (303) 935-3566

   Note: Mr. Hyatt was not employed by Protex during the time period at issue in this request for information. This response has been compiled based upon a review of documents known and available to Mr. Hyatt and discussions with current employees employed during a portion of the relevant time period.

3. Name and Title of Contact for Further Information: Charles V. Hyatt, Controller

   Mailing Address: 1331 West Evans Avenue, Denver, CO 80223

   Telephone Number: (303) 935-3566

4. Colorado Authorized Agent for Service of Process: Lucas Wilson

   Mailing Address: 1331 West Evans Avenue, Denver, CO 80223

   Telephone Number: (303) 935-3566

5. List for the period 1965 to the present, all names under which you operated, including the names of any predecessor or successor in interest, describe the form of business organization of each name listed (e.g., corporation, partnership, joint venture, sole proprietorship, etc.), and identify the same in which each was/is organized.

BUSINESS NAME	TIME PERIOD	FORM OF BUSINESS	STATE OF ORGANIZATION
Protex Industries Inc.	1965-Present	Corporation	Colorado

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173475

LWR128

C05-00683

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173475

LWR128

418-3-0015

6. List each insurance company or other person that provided casualty or pollution liability insurance coverage, including but not limited to any Comprehensive General Liability coverage, Environmental Impairment coverage, Insurance Services Office coverage, Umbrella coverage, or any other indemnification or defense agreement, that provides to you or any other person or entity identified in response to question 5 a right of indemnification or defense in any action involving hazardous substances. This question applies only to policies or agreements that are or were in effect at any time during the period 1965 to the present. Submit copies of all insurance policies or agreements identified.

INSURANCE COMPANY	POLICY NUMBER	TIME PERIOD OF COVERAGE
Comprehensive General Liability Coverage		
American Employers - Boston	?	?
Hartford Insurance Company	34IC720946	6/1974 - 75
Hartford Insurance Company	34C691422	6/1975 - 76
Hartford Insurance Company	34C697025	6/1976 - 77
New Hampshire Insurance Company	POP93-27-81 SMP53-27-38	6/1977 - 9/1981
Aetna Fire Underwriters Ins. Co.	CCP358307	9/1981 - 83
Aetna Fire Underwriters Ins. Co.	MFC D1 0213484	9/1983 - 6/1984
Aetna Fire Underwriters Ins. Co.	MFC D1 1912540	6/1984 - 7/1985
Columbia Casualty Co.	CCP3654507	7/1985 - 86
Umbrella Coverage		
Republic Insurance Company	CDU 5366	6/1981 - 82
Republic Insurance Company	CDU 5366	6/1982 - 83
Republic Insurance Company	CDU 14146	6/1983 - 84
Mission National Insurance Co.	MN 037885	6/1984 - 85

Protex does not have copies of all the policies listed above. Policies which have been located will be made available for inspection upon request.

7. Identify all person(s) employed by you either currently or previously who have personal knowledge of your waste disposal practices during the pariod 1965 through 1980.

NAME	TITLE	EMPLOYMENT DATES	ADDRESS	TELEPHONE NUMBER
Craig Wilson	Assistant General Manager	12/2/74 - 4/30/83	7291 Piute Dr. Sedalia, CO 80135	688-3793
Floyd Whitson	Plant Manager	7/6/65 - 7/26/68 & 1/23/69 - Present	1331 W. Evans Ave. Denver, CO 80223	935-3566

418-3-0015

LOWRY LANDFILL INFORMATION REQUEST
PART A - Page 3 of 4

Gary Gregory	Warehouse Manager	6/26/75 - Present	1331 W. Evans Ave. Denver, CO 80223	935-3566
Donald Wilson	General Manager	6/1/41 - Present	1331 W. Evans Ave. Denver, CO 80223	935-3566
Terry Baumgartner	Barrel Department Supervisor	7/23/74 - Present	1331 W. Evans Ave. Denver, CO 80223	935-3566
Gary Blankenship	Plant Manager	4/8/76 - Present	323 Como Avenue St. Paul, MN 55103	(800)328-9649
George Dietrich	Controller	6/7/63 - 12/2/79	Deceased	

8. Identify all persons interviewed by you or from whom statements were taken at any time for any purpose concerning their personal knowledge of your waste disposal practices during the period 1965 through 1980, list the date on which the interview or statement was made, and for each person identified summarize the substance of the interview or statement.

NAME	TITLE	ADDRESS	TELEPHONE NUMBER	DATE
Craig Wilson	Assistant General Manager	7291 Piute Dr. Sedalia, CO 80135	688-3793	2/11/87
Floyd Whitson	Plant Manager	1331 W. Evans Ave. Denver, CO 80223	935-3566	2/11/87
Gary Gregory	Warehouse Manager	1331 W. Evans Ave. Denver, CO 80223	935-3566	2/10/87
Gary Blankenship	Plant Manager	323 Como Avenue St. Paul, MN 55103	(800)328-9649	2/20/87
Terry Baumgartner	Barrel Department Supervisor	1331 W. Evans Ave. Denver, CO 80223	935-3566	3/25/87

Relevant information from interviews of these employees is incorporated in this response. Follow-up questions may have been asked of employees on dates subsequent to those set forth above.

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173475

LWR128

0926

418-3-0015

9. Describe the types of documents generated or maintained by you concerning your waste generation, storage, treatment, disposal, recycling, or transportation operations during the period 1965 to the present, including a description of the information included in each type of document and the identity of the person who was the custodian of the documents. If documents relevant to this Request are no longer available, state the reason the documents are unavailable.

   Invoices from Waste Transporters

   General Ledger

   Documents before 1975 are not available due to a fire that destroyed the office building and records.

10. List separately by street address each facility you or any predecessor in interest owned or operated during the period 1965 through 1980.

ADDRESS	TIME PERIOD
1331 West Evans Avenue, Denver, CO 80223	1965-1980

COMPLETE PART B FOR EACH FACILITY IDENTIFIED ABOVE

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173475

LWR128

DOCUMENT

418-3-0016

LOWRY LANDFILL INFORMATION REQUEST
PART B - Page 1 of 1

ADMINISTRATIVE RECORD FILE NUMBER 29.03.418

173476

PART B - FACILITY INFORMATION

Part B must be completed for each facility identified in Part A, question 10. Submit all documents upon which your responses are based.

COMPANY NAME: Protex Industries Inc.

FACILITY ADDRESS: 1331 West Evans Ave., Denver, CO 80223

1. List the name of the products manufactured, processed, treated, recycled, or handled at this facility for the period 1965 through 1980, the Standard Industrial Classification ("SIC Code") of each product, if known, and the time periods during which each product was manufactured, processed, treated, recycled, or handled.

PRODUCT	TIME PERIOD	SIC CODE
Admixtures for Concrete	1965 - 1980	-
Cures & Sealers for Concrete	1965 - 1980	-
Epoxies for Concrete	1965 - 1980	-

2. List the operations and/or services performed at or by this facility for the period 1965 through 1980, the SIC Code of the operation and/or service, if known, and the time period during which operation and/or service was performed.

SERVICE/OPERATION	TIME PERIOD	SIC CODE
Recondition drums	1965 - 1980	-
Product dispenser assembly	1965 - 1980	-

COMPLETE PART C FOR EACH PRODUCT OR SERVICE IDENTIFIED ABOVE

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173476

LWR128

DEBFL

418-3-0017

ADMINISTRATIVE REC
FILE NUMBER
29.03.418

173477

Part C
is CBI claim

See files
behind "Ye Olde Stripper Shop"

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173477

LWR128

0929 FL

418-3-0018

173478

PART D(1) - WASTE MATERIALS

Part D must be completed for each waste material identified in Part C, question 5. Submit all documents upon which your responses are based.

COMPANY NAME: Protex Industries Inc.

FACILITY ADDRESS: 1331 West Evans Avenue, Denver, CO 80223

ADMINISTRATIVE RECORD FILE NUMBER 29.103.48

PRODUCT/OPERATION/SERVICE: Admixtures for Concrete

WASTE MATERIALS: Washout Water from Raw Material or Finished Product Tanks and Containers

1. Identify the physical nature of this waste material as follows:
   liquid X semisolid____ solid____ other (describe)____

   If liquid or semisolid, state % of solids 2 - 3% (estimate)

2. Describe the chemical nature of this waste material by listing the name of each chemical constituent, the average concentration, and the concentration range. State the units of measurement for the concentrations listed.

   No analysis of this waste stream during the time period at issue is available. Because the waste was generated in cleaning tanks and containers, it is estimated that the waste was in excess of 90% water with the remainder comprised principally of lignin sulfonate with trace amounts of the substances listed in response to Part C(1), Question 3.

3. Describe the normal method of shipment of this waste material for recycling, treatment, processing, or disposal as follows:

   drums X tanks X bulk____ other (describe)____

4. Shipment for Recycling, Treatment or Processing. State in chronological order by date of shipment from 1965 through 1980 the quantity of this waste material that was shipped from your facility for recycling, treatment, processing, or handling, and identify the person or entity that received the waste for recycling, treatment, processing, or handling.

SHIPMENT DATE	QUANTITY/UNITS	PERSON RECEIVING
None		

NOTICE: if the film image is less clear than this notice, it is due to the quality of the document being filmed

173478

LWR128

DEEDE

418-3-0018

5. State the name and address of each person identified in question 4.

NAME	ADDRESS
N/A	

6. Shipment for Disposal.

The waste streams described in Parts D(1), D(2) and D(3) were comingled prior to shipment for off-site disposal. No specific information is available regarding the quantity of each of the three waste streams although the washout water (D(1)) represented by far the largest volume of waste, with the wastes described in Parts D(2) and D(3) contributing only a very small amount to the total volume of waste disposed off-site. (See responses to Part C(3) and C(4), Question 5.)

The following information describes the waste disposed off-site by Protex during the relevant time period.

a. State in chronological order by date of shipment from 1965 through 1980 the quantity of this waste material that was disposed by you in Section 6.

Below is a listing of the waste material disposed of by Protex Industries Inc. in drums at Lowry Landfill from July 1976 through 1980. See attached invoices, Exhibits 1-22. Prior to July 1976, it is believed that Protex disposed of waste materials on occasion at the Lowry Landfill and other disposal sites; however, no information is available regarding specific shipments.

SHIPMENT DATE	QUANTITY/UNITS
07/02/76	1,780 lbs.
07/15/76	5,080 lbs.
07/15/76	1,880 lbs.
08/25/76	9,280 lbs.
09/30/76	16,180 lbs.
10/04/76	18,280 lbs.
10/05/76	17,680 lbs.
10/14/76	2,770 lbs.
10/21/76	6,330 lbs.
11/17/76	9,530 lbs.
11/24/76	630 lbs.
12/15/76	7,650 lbs.
12/16/76	3,600 lbs.
12/17/76	8,050 lbs.
12/17/76	2,700 lbs.
12/18/76	9,300 lbs.
12/27/76	12,800 lbs.
01/07/77	12,830 lbs.
01/27/77	2,820 lbs.

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173478

LWR128

DOE 1

418-3-0018

01/27/77	3,610 lbs.
01/27/77	3,810 lbs.
01/28/77	2,620 lbs.
01/28/77	8,250 lbs.
01/28/77	8,410 lbs.
02/02/77	3,960 lbs.
02/03/77	30,550 lbs.
02/22/77	3,360 lbs.
02/24/77	9,170 lbs.
02/25/77	7,960 lbs.
05/03/77	9,820 lbs.
05/04/77	3,990 lbs.
05/06/77	15,770 lbs.
05/11/77	13,170 lbs.
06/11/77	11,130 lbs.
06/14/77	10,830 lbs.
06/21/77	13,070 lbs.
06/25/77	8,110 lbs.
06/25/77	8,230 lbs.
07/15/77	11,840 lbs.
08/02/77	10,300 lbs.
08/03/77	9,580 lbs.
12/00/78	30,000 lbs.
01/11/79	12,350 lbs.
01/12/79	10,590 lbs.
02/06/79	9,630 lbs.
03/01/79	31,700 lbs.
03/02/79	32,600 lbs.
03/06/79	30,590 lbs.
03/08/79	26,410 lbs.
03/13/79	27,660 lbs.
04/21/79	29,030 lbs.
05/16/79	25,170 lbs.
06/20/79	4,910 lbs.
09/08/79	34,640 lbs.
09/10/79	31,550 lbs.
09/12/79	28,770 lbs.
10/18/79	6,530 lbs.
10/19/79	7,310 lbs.
10/26/79	12,730 lbs.
10/27/79	5,840 lbs.
11/19/79	7,560 lbs.

b. State in chronological order by date of shipment form 1965 through 1980 the quantity of this waste material that was received by a person <u>other than yourself</u> for transportation or other handling for disposal at Section 6 or an unknown location, state the identity of the disposal location, if known, and indicate whether the decision regarding the disposal location for this waste material was determined by you or the identified person. In responding to this question, you may only exclude those shipments that you can demonstrate were disposed of at locations other than Section 6.

NOTICE: if the film image is less clear than this notice, it is due to the quality of the document being filmed

173478

LWR128

0065

418-3-C018

LOWRY LANDFILL INFORMATION REQUEST
PART D(1) - Page 4 of 5

Below is a listing of shipments of waste material disposed of by a person other than Protex Industries Inc. at Lowry Landfill or an unknown location. See attached invoices, Exhibits 23-47. Note that large quantities of precipitation were mixed with these waste materials which were stored in an underground storage tank whose surface inlet was not sealed during the period of its use July 1978-1980.

SHIPMENT DATE	QUANTITY	PERSON RECEIVING	DISPOSAL LOCATION	DISPOSAL DECISION
07/15/78	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
07/28/78	3,500 gl	Waste Transport Co.	Unknown	Waste Transport Co.
08/11/78	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
09/05/78	3,200 gl	Waste Transport Co.	Unknown	Waste Transport Co.
12/01/78	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
12/15/78	2,900 gl	Waste Transport Co.	Unknown	Waste Transport Co.
01/04/79	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
01/18/79	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
01/19/79	2,850 gl	Waste Transport Co.	Unknown	Waste Transport Co.
02/09/79	3,500 gl	Waste Transport Co.	Unknown	Waste Transport Co.
02/21/79	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
02/24/79	2,700 gl	Waste Transport Co.	Unknown	Waste Transport Co.
03/08/79	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
03/13/79	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
03/14/79	2,200 gl	Waste Transport Co.	Unknown	Waste Transport Co.
04/19/79	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
05/21/79	1,500 gl	Waste Transport Co.	Unknown	Waste Transport Co.
05/22/79	2,500 gl	Waste Transport Co.	Unknown	Waste Transport Co.
06/07/79	3,500 gl	Waste Transport Co.	Unknown	Waste Transport Co.
06/15/79	3,500 gl	Waste Transport Co.	Unknown	Waste Transport Co.
06/20/79	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
06/27/79	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
07/25/79	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
08/08/79	1,600 gl	Waste Transport Co.	Unknown	Waste Transport Co.
08/10/79	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
08/13/79	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
09/13/79	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
10/08/79	2,500 gl	Waste Transport Co.	Unknown	Waste Transport Co.
10/11/79	1,200 gl	Waste Transport Co.	Unknown	Waste Transport Co.
10/11/79	3,500 gl	Waste Transport Co.	Unknown	Waste Transport Co.
10/26/79	2,500 gl	Waste Transport Co.	Unknown	Waste Transport Co.
11/09/79	3,500 gl	Waste Transport Co.	Unknown	Waste Transport Co.
11/26/79	3,000 gl	Waste Transport Co.	Unknown	Waste Transport Co.
04/11/80	15,120 lb	Pumping Technology Ent. Ltd.	Lowry Landfill	Pumping Technology Ent. Ltd.
04/29/80	13,940 lb	Pumping Technology Ent. Ltd.	Lowry Landfill	Pumping Technology Ent. Ltd.
05/05/80	15,430 lb	Pumping Technology Ent. Ltd.	Lowry Landfill	Pumping Technology Ent. Ltd.

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173478

LWR128

0933

418-3-0018

LOWRY LANDFILL INFORMATION REQUEST
PART D(1) - Page 5 of 5

05/14/80	14,870 lb	Pumping Technology Ent. Ltd.	Lowry Landfill	Pumping Technology Ent. Ltd.
05/27/80	15,450 lb	Pumping Technology Ent. Ltd.	Lowry Landfill	Pumping Technology Ent. Ltd.
06/19/80	14,600 lb	Pumping Technology Ent. Ltd.	Lowry Landfill	Pumping Technology Ent. Ltd.
06/30/80	13,840 lb	Pumping Technology Ent. Ltd.	Lowry Landfill	Pumping Technology Ent. Ltd.
07/14/80	13,450 lb	Pumping Technology Ent. Ltd.	Lowry Landfill	Pumping Technology Ent. Ltd.

7. State the name and address of each person identified in question 6(b).

NAME	ADDRESS
Waste Transport Co.	5390 East 72nd Ave. Adams City, CO 80022
Pumping Technology Ent. Ltd. (formerly Rocky Mountain Pumping)	7145 Ingalls Ct. Arvada, CO 80003

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173478

LWR128

09347

418-3-0019

LOWRY LANDFILL INFORMATION REQUEST
PART D(2) - Page 1 of 2

173479

PART D(2) - WASTE MATERIALS

Part D must be completed for each waste material identified in Part C, question 5. Submit all documents upon which your responses are based.

COMPANY NAME: Protex Industries Inc.

FACILITY ADDRESS: 1331 West Evans Avenue, Denver, CO 80223

ADMINISTRATIVE RECORD FILE NUMBER 29.03.418

PRODUCT/OPERATION/SERVICE: Epoxies for Concrete

WASTE MATERIALS: Waste from Cleaning of Mixing Equipment

1. Identify the physical nature of this waste material as follows:
   liquid X semisolid____ solid____ other (describe)____

   If liquid or semisolid, state % of solids 50-85% (estimate)

2. Describe the chemical nature of this waste material by listing the name of each chemical constituent, the average concentration, and the concentration range. State the units of measurement for the concentrations listed.

   No analysis of this waste stream during the time period at issue is available. This waste was generated when it was necessary to clean the epoxy mixing equipment. Xylene was used to remove residues from the equipment and it is estimated that this waste stream was approximately 85% epoxy and 15% xylene. As stated in response to Part C(3), Question 5, this cleaning process generated a small amount of waste during the relevant time period 1965-1980.

3. Describe the normal method of shipment of this waste material for recycling, treatment, processing, or disposal as follows:

   drums X tanks____ bulk____ other (describe)____

4. Shipment for Recycling, Treatment or Processing. State in chronological order by date of shipment from 1965 through 1980 the quantity of this waste material that was shipped from your facility for recycling, treatment, processing, or handling, and identify the person or entity that received the waste for recycling, treatment, processing, or handling.

SHIPMENT DATE	QUANTITY/UNITS	PERSON RECEIVING
None		

1/2

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173479

LWR128

0935 F

418-3-0019

LOWRY LANDFILL INFORMATION REQUEST
PART D(2) - Page 2 of 2

5. State the name and address of each person identified in question 4.

NAME	ADDRESS
N/A	

6. Shipment for Disposal.

   a. State in chronological order by date of shipment from 1965 through 1980 the quantity of this waste material that was disposed by you in Section 6.

      See response to Part D(1), Question 6.

   b. State in chronological order by date of shipment form 1965 through 1980 the quantity of this waste material that was received by a person other than yourself for transportation or other handling for disposal at Section 6 or an unknown location, state the identity of the disposal location, if known, and indicate whether the decision regarding the disposal location for this waste material was determined by you or the identified person. In responding to this question, you may only exclude those shipments that you can demonstrate were disposed of at locations other than Section 6.

      See response to Part D(1), Question 6.

7. State the name and address of each person identified in question 6(b).

   See response to Part D(1), Question 7.

2/2

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173479

LWR128

0936

418-3-0020

PART D(3) - WASTE MATERIALS

Part D must be completed for each waste material identified in Part C, question 5. Submit all documents upon which your responses are based.

COMPANY NAME: Protex Industries Inc.

FACILITY ADDRESS: 1331 West Evans Avenue, Denver, CO 80223

PRODUCT/OPERATION/SERVICE: Recondition Drums

WASTE MATERIALS: Residue from Empty Drums

173480

ADMINISTRATIVE RECORD FILE NUMBER 29.03.418

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173460

LWR128

DELETE

1. Identify the physical nature of this waste material as follows:
   liquid X semisolid____ solid____ other (describe)____

   If liquid or semisolid, state % of solids 10-50% (estimate)

2. Describe the chemical nature of this waste material by listing the name of each chemical constituent, the average concentration, and the concentration range. State the units of measurement for the concentrations listed.

CHEMICAL CONSTITUENTS	AVERAGE CONCENTRATION	CONCENTRATION RANGE
Oil	Unknown	Unknown
Unknown Constituents	Unknown	Unknown

   No analysis of this waste stream for the relevant time period is available. As stated in response to Part C(4), Question 5, this waste represented a small portion of the waste disposed off-site by Protex.

3. Describe the normal method of shipment of this waste material for recycling, treatment, processing, or disposal as follows:

   drums X tanks X bulk____ other (describe)____

4. Shipment for Recycling, Treatment or Processing. State in chronological order by date of shipment from 1965 through 1980 the quantity of this waste material that was shipped from your facility for recycling, treatment, processing, or handling, and identify the person or entity that received the waste for recycling, treatment, processing, or handling.

SHIPMENT DATE	QUANTITY/UNITS	PERSON RECEIVING
None		

418-3-0020

LOWRY LANDFILL INFORMATION REQUEST
PART D(3) - Page 2 of 2

5. State the name and address of each person identified in question 4.

NAME	ADDRESS
N/A	

6. Shipment for Disposal.

a. State in chronological order by date of shipment from 1965 through 1980 the quantity of this waste material that was disposed by you in Section 6.

See response to Part D(1), Question 6.

b. State in chronological order by date of shipment form 1965 through 1980 the quantity of this waste material that was received by a person other than yourself for transportation or other handling for disposal at Section 6 or an unknown location, state the identity of the disposal location, if known, and indicate whether the decision regarding the disposal location for this waste material was determined by you or the identified person. In responding to this question, you may only exclude those shipments that you can demonstrate were disposed of at locations other than Section 6.

See response to Part D(1), Question 6.

7. State the name and address of each person identified in question 6(b).

See response to Part D(1), Question 7.

2/2

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173480

LWR128

0938L

418-3-0021

173481

PART E - TRANSPORTER INFORMATION

Part E must be completed by each person whose business activities included the transportation of wastes for another. Submit all documents upon which your responses are based.

ADMINISTRATIVE RECORD
FILE NUMBER 29.03.418

COMPANY NAME: N/A

1. Please state in chronological order by date of shipment from 1965 through 1980, the identity and quantity of the waste materials transported to Section 6, the identity of the facility from which the waste material was received, and state whether the decision to dispose of the waste material at Section 6 was made by you or the facility from which the material was received.

SHIPMENT WASTE MATERIAL	QUANTITY	FACILITY	DISPOSAL DECISION	DATE
N/A				

2. Please state the name and address of each facility identified in response to question 1.

NAME	ADDRESS
N/A	

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed

173481

LWR128

0939 FL