FINANCIAL SECTION

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FINANCIAL OVERVIEW

GENERAL

The following discussion and analysis provides information that management believes to be relevant to understanding Canon's consolidated financial condition and results of operations. References in this discussion to the "Company" are to Canon Inc. and, unless otherwise indicated, references to the financial condition or operating results of "Canon" refer to Canon Inc. and its consolidated subsidiaries.

OVERVIEW

Canon is one of the world's leading manufacturers of office multifunction devices ("MFDs"), plain paper copying machines, laser printers, cameras, inkjet printers, medical equipment, semiconductor lithography equipment and flat-panel-display ("FPD") lithography equipment. Canon earns revenues primarily from the manufacture and sale of these products domestically and internationally. Canon's basic management policy is to contribute to the prosperity and well-being of the world while endeavoring to become a truly excellent global corporate group targeting continued growth and development.

Canon divides its businesses into four segments: the Office Business Unit, the Imaging System Business Unit, the Medical System Business Unit which was newly established in 2017, and the Industry and Others Business Unit.

Economic environment

Looking back at the global economy in 2018, the U.S. economy steadily recovered as corporate earnings and employment conditions improved. In Europe, while domestic demand remained firm, the rate of growth decelerated due to sluggish export growth. In China, the economy slowed down due to sluggish capital investments and a decline in consumer spending. The economies of other emerging markets also worsened, due to such factors as local currency depreciation. In Japan, the economy recovered moderately supported by continuing improvements in employment conditions. As a result, the global economy overall continued to realize a moderate recovery. However, the pace of economic growth slowed down from the latter half of the year as a result of trade friction.

Market environment

As for the markets in which Canon operates amid these conditions, office MFDs and laser printers enjoyed solid demand due to the shift from monochrome to color models and robust demand in emerging markets. The decline of the camera market continued and the market for inkjet printers was slightly below the level of the previous year. On the other hand, demand for medical equipment grew moderately. Within the Industry and Others sector, capital investment in semiconductor lithography equipment increased, while capital investment in organic light-emitting diode ("OLED") panel manufacturing equipment faced a temporary slowdown. Demand for network cameras enjoyed solid growth.

The average value of the yen during the year was ¥110.43 against the U.S. dollar, a year-on-year appreciation of approximately ¥2, and ¥130.29 against the euro, a year-on-year depreciation of approximately ¥4.

Summary of operations

During 2018, unit sales of office MFDs increased compared with the previous year due to the expanded sales of color models, mainly outside of Japan. Additionally, unit sales of both monochrome and color laser printers increased compared with the previous year, supported by the steady sales of newly launched models. Total sales volume of interchangeable-lens digital cameras decreased compared with the previous year due to contraction of the market mainly for entry-class models. However, sales of mirrorless cameras increased. Looking at inkjet printers, although sales unit of refillable ink tank models increased in emerging markets, unit sales overall decreased compared with the previous year, due to decreasing demand in developed economies. For medical equipment, newly launched diagnostic ultrasound systems and Magnetic resonance imaging ("MRI") systems experienced solid demand, mainly outside of Japan, achieving increased sales compared with the previous year. For industrial equipment, sales of semiconductor lithography equipment increased significantly compared with the previous year, thanks to favorable market conditions. However, manufacturing equipment for OLED panels decreased compared with the previous year mainly due to a slowdown in investment in OLED panels. Sales of network cameras increased steadily in response to the growing market. Under these conditions, net sales for the year decreased by 3.1% year on year to ¥3,951,937 million. In addition, the gross profit ratio dropped by 2.4 points to 46.4%. This was mainly due to the fact that certain costs that were recorded under operating expenses in the prior years have been reclassified to cost of sales in 2018, following the adoption of new accounting standards related to revenue recognitions as described in Note 15 of the Notes to Consolidated Financial Statements. The reclassified amount for the year ended December 31, 2018 was ¥115,700 million. Excluding the impact of this reclassification, the gross profit ratio increased by 0.6 points to 49.4%. Operating expenses decreased by 10.6% year on year to ¥1,492,602 million, thanks to Group-wide efforts to thoroughly manage expenses as well as impairment loss on goodwill of commercial printing business during the previous year in addition to the impact of the aforementioned reclassification of figures related to the adoption of new accounting standards. As a result, operating profit increased by 6.6% to ¥342,952 million. Other income (deductions) decreased by ¥12,339 million, mainly due to gain on securities contributed to the retirement benefit trust during the previous year, while income before income taxes increased by 2.5% year on year to ¥362,892 million and net income attributable to Canon Inc. increased by 4.5% to ¥252,755 million.

Total assets decreased by ¥298,826 million to ¥4,899,465 million at December 31, 2018, compared to the end of previous year, mainly due to the decrease of cash and cash equivalents. Total liabilities decreased by ¥220,564 million to ¥1,881,552 million at December 31, 2018, compared to the end of previous year, mainly due to the repayment of the long-term debt. Total equity decreased by ¥78,262 million to ¥3,017,913 million at December 31, 2018, compared to the end of previous year, mainly due to the increase of accumulated other comprehensive loss resulting from the appreciation of yen.

Key performance indicators

The following are the key performance indicators ("KPIs") that Canon uses in managing its business. The changes from year to year in these KPIs are set forth in the table below.

Net sales and profit ratio

As Canon pursues the goal to become a truly excellent global company, one indicator upon which Canon's management places strong emphasis is revenue. The following are some of the KPIs related to revenue that management considers to be important.

Net sales is one such KPI. Canon derives net sales primarily from the sale of products and, to a lesser extent, provision of services associated with its products. Sales vary depending on such factors as product demand, the number and size of transactions within the reporting period, market acceptance for new products, and changes in sales prices. Other factors involved are market share and market environment. In addition, management considers the evaluation of net sales by segment to be important for the purpose of assessing Canon's sales performance in various segments, taking into account recent market trends.

Gross profit ratio (ratio of gross profit to net sales) is another KPI for Canon. Through its reforms of product development, Canon has been striving to shorten product development lead times in order to launch new, competitively priced products at a faster pace. Furthermore, Canon has further achieved cost reductions through enhancement of efficiency in its production. Canon believes that these achievements have contributed to improving Canon's gross profit ratio, and will continue pursuing the curtailment of product development lead times and reductions of production costs.

Operating profit ratio (ratio of operating profit to net sales), income before income taxes ratio (ratio of income before income taxes to net sales), and R&D expense to net sales ratio are considered to be KPIs by Canon. Canon is focusing on two areas for improvement. Canon is striving to control and reduce its selling, general and administrative expenses as its first key point. Secondly, Canon's R&D policy is designed to maintain adequate spending in core technology to sustain Canon's leading position in its current business areas and to exploit opportunities in other markets. Canon believes such investments will create the basis for future success in its business and operations.

Cash flow management

Canon also places significant emphasis on cash flow management. The following are the KPIs relating to cash flow management that Canon's management believes to be important.

Inventory turnover measured in days is a KPI because it measures the efficiency of supply chain management. Inventories have inherent risks of becoming obsolete, physically damaged or otherwise decreasing significantly in value, which may adversely affect Canon's operating results. To mitigate these risks, management believes that it is crucial to continue reducing work-in-process inventories by decreasing production lead times in order to promptly recover related product expenses, while balancing risks of supply chain disruptions by optimizing finished goods inventories in order to avoid losing potential sales opportunities.

The debt to total assets ratio is also one of the KPIs. For a manufacturing company like Canon, it generally takes considerable time to realize profit from a business due to lead times required for R&D, manufacturing and sales has to be followed for success. Therefore, management believes that it is important to have sufficient financial strength. Canon will continue to reduce its dependency on external funds for capital investments in favor of generating the necessary funds from its own operations.

Canon Inc. shareholders' equity to total assets ratio is another KPI for Canon. Canon believes that its shareholders' equity to total assets ratio measures its long-term sustainability. Canon also believes that achieving a high or rising shareholders' equity ratio indicates that Canon has maintained a strong financial position or further improved its ability to fund debt obligations and other unexpected expenses. In the long-term, Canon's management believes a high shareholders' equity ratio will enable the company to maintain a high level of stable investments for its future operations and development. As Canon puts strong emphasis on its R&D activities, management believes that it is important to maintain a stable financial base and, accordingly, a high level of its shareholders' equity to total assets ratio.

KEY PERFORMANCE INDICATORS

	2018	2017	2016	2015	2014
Net sales (Millions of yen)	**3,951,937**	4,080,015	3,401,487	3,800,271	3,727,252
Gross profit to net sales ratio	**46.4%**	48.8%	49.2%	50.8%	49.9%
R&D expense to net sales ratio	**8.0%**	8.2%	9.0%	8.8%	8.4%
Operating profit to net sales ratio	**8.7%**	7.9%	6.4%	9.0%	9.3%
Income before income taxes to net sales ratio	**9.2%**	8.7%	7.2%	9.1%	10.3%
Inventory turnover measured in days	**56 days**	49 days	59 days	47 days	50 days
Debt to total assets ratio	**8.2%**	10.2%	11.9%	0.0%	0.0%
Canon Inc. shareholders' equity to total assets ratio	**57.7%**	55.2%	54.2%	67.0%	66.8%

Notes: 1. Inventory turnover measured in days is determined by: Inventory divided by net sales for the previous six months, multiplied by 182.5. The increase of inventory turnover in 2016 was primarily due to the acquisition of Canon Medical Systems Corporation ("CMSC") on December 19, 2016. If this factor were excluded, the inventory turnover would show 50 days.

2. Canon adopted ASU No. 2017-07 from the quarter beginning January 1, 2018. The adoption of the new presentation requirement of the service cost component and the other components of net benefit cost resulted in reclassification from cost of sales, and selling, general and administrative expenses, and research and development expenses into other income (deductions) for the years ended December 31, 2017, 2016, 2015, and 2014 respectively.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

The consolidated financial statements are prepared in accordance with U.S. generally accepted accounting principles ("U.S. GAAP") and based on the selection and application of significant accounting policies which require management to make significant estimates and assumptions. These estimates and assumptions include future market conditions, net sales growth rate, gross margin and discount rate. Though Canon believes that the estimates and assumptions are reasonable, actual future results may differ from these estimates and assumptions. Canon believes that the following are the more critical judgment areas in the application of its accounting policies that currently affect its financial condition and results of operations.

Revenue recognition

Canon generates revenue principally through the sale of office, imaging system and medical system products, industrial equipment, supplies and related services under separate contractual arrangements. Revenue is recognized when, or as, control of promised goods or services transfers to customers in an amount that reflects the consideration to which Canon expects to be entitled in exchange for transferring these goods or services.

Revenue from sales of office products, such as office MFDs and laser printers, and imaging system products, such as digital cameras and inkjet printers, is recognized upon shipment or delivery, depending upon when the customer obtains controls of these products.

Revenue from sales of equipment that are sold with customer acceptance provisions related to their functionality including optical equipment such as semiconductor lithography equipment and FPD lithography equipment, and certain medical equipment such as Computed tomography ("CT") systems and MRI systems, is recognized when the equipment is installed at the customer site and the agreed-upon specifications are objectively satisfied.

Most of Canon's service revenue is generated from office and medical system products which is recognized over time. For the service contracts of office products, the customer typically pays a variable amount based on usage, a stated fixed fee or a stated base fee plus a variable amount which frequently include the provision of consumables as well as break fix activities. The majority portion of service revenue from the office products is recognized as billed since invoiced amount directly correlates with the value to the customer of the underlying performance obligation to date. For the service contracts of medical system products, the customer typically pays a stated fixed fee for the stand ready maintenance service and revenue is recognized ratably over the contract period.

The majority of service arrangements for office products are executed in combination with related products. Transaction prices for products and services need to be allocated to each performance obligation on a relative standalone selling price basis where significant judgements are required. Canon estimates the standalone selling price using a range of prices that would meet the allocation objective based on all the information that is reasonably available including market conditions and other observable inputs. If transaction prices of the product or service contracts are not within the acceptable range then the revenue is subject to allocation based on the estimated standalone selling prices. Canon recognizes the incremental costs of obtaining a contract as an expense when related office products are sold.

Canon also provides leasing arrangement to the customers primarily for the sales of office products. Approximately 4% of total revenue is generated from these leasing arrangements for the year ended December 31, 2018. Revenue from the sale of these products under sales-type leases is recognized at the inception of the lease. Interest income on sales-type leases and direct-financing leases is recognized over the life of each respective lease using the interest method. Leases not qualifying as sales-type leases or direct-financing leases are accounted for as operating leases and related revenue is recognized ratably over the lease term. When product leases are bundled with maintenance contracts, revenue is allocated based upon the estimated standalone selling prices of the lease and non-lease components. Lease components generally include product, financing and executory costs, while non-lease components generally consist of maintenance contracts and supplies.

The transaction prices that Canon is entitled to receive in exchange for transferring goods or services to the customer include certain forms of variable consideration, including product discounts, customer promotions and volume-based rebates mainly for imaging system products, which are sold predominantly through distributors and retailers. Canon includes estimated amounts in the transaction price only to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. Variable considerations are estimated based upon historical trends and other known factors at the time of sale, and are subsequently adjusted in each period based on current information. In addition, Canon may provide a right of return on our products for a short time period after a sale. These rights are accounted for as variable consideration when determining the transaction price, and accordingly Canon recognizes revenue based on the estimated amount to which Canon expects to be entitled after considering expected returns.

Taxes collected from customers and remitted to governmental authorities are excluded from revenues in the consolidated statements of income.

Allowance for doubtful receivables

Allowance for doubtful receivables is determined using a combination of factors to ensure that Canon's trade and financing receivables are not overstated due to uncollectibility. These factors include the length of time receivables are past due, the credit quality of customers, macroeconomic conditions and historical experience. Also, Canon records specific reserves for individual accounts when Canon becomes aware of a customer's inability to meet its financial obligations to Canon, due for example to bankruptcy filings or deterioration in the customer's operating results or financial position. If circumstances related to customers change, estimates of the recoverability of receivables are further adjusted.

Valuation of inventories

Inventories are stated at the lower of cost or net realizable value. Cost is determined by the average method for domestic inventories and principally the first-in, first-out method for overseas inventories. Net realizable value is the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make a sale. Canon routinely reviews its inventories for their salability and for indications of obsolescence to determine if inventories should be written-down to market value. Judgments and estimates must be made and used in connection with establishing such allowances in any accounting period. In estimating the net realizable value of its inventories, Canon considers the age of the inventories and the likelihood of spoilage or changes in market demand for its inventories.

Impairment of long-lived assets

Long-lived assets, such as property, plant and equipment, and acquired intangibles subject to amortization, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. If the carrying amount of the asset exceeds its estimated undiscounted future cash flows, an impairment charge is recognized in the amount by which the carrying amount of the asset exceeds the fair value of the asset. Determining the fair value of the asset involves the use of estimates and assumptions.

Property, plant and equipment

Property, plant and equipment are stated at cost. Depreciation is calculated principally by the declining-balance method, except for certain assets which are depreciated by the straight-line method over the estimated useful lives of the assets.

Business combinations

The acquisition is accounted for using the acquisition method of accounting. The acquisition method of accounting requires the identification and measurement of all acquired tangible and intangible assets and assumed liabilities at their respective fair values, as of the acquisition date. The determination of the fair value of net assets acquired involves significant judgment and estimates, such as future cash flow projections, appropriate discount and capitalization rates and other estimates based on available market information. Estimates of future cash flows are based on a number of factors including operating results, known and anticipated trends, as well as market and economic conditions.

Goodwill and other intangible assets

Goodwill and other intangible assets with indefinite useful lives are not amortized, but are instead tested for impairment annually in the fourth quarter of each year, or more frequently if indicators of potential impairment exist. All goodwill is assigned to the reporting unit or units that benefit from the synergies arising from each business combination. If the carrying amount assigned to the reporting unit exceeds the fair value of the reporting unit, Canon recognizes an impairment charge in an amount equal to that excess, limited to the total amount of goodwill allocated to that reporting unit. Fair value of a reporting unit is determined primarily based on the discounted cash flow analysis which involves estimates of projected future cash flows and discount rates. Estimates of projected future cash flows are primarily based on Canon's forecast of future growth rates. Estimates of discount rates are determined based on the weighted average cost of capital, which considers primarily market and industry data as well as specific risk factors. Canon has completed its impairment test in the fourth quarter of 2018. The fair values of all reporting units exceeded its respective carrying amount, and thus no impairment charge was recognized as a result of 2018 impairment test. However, with regard to goodwill attributed to commercial printing business included in Office Business Unit for which the impairment charge of ¥33,912 million was recognized for the year ended December 31, 2017, and goodwill attributed to Medical System Business Unit and network camera business included in Industry and Others Business Unit were resulted from recent acquisitions, fair values in excess of reported carrying values as a percentage are lower than other reporting units. As a result, a future reduction in cash flows of the related business, could trigger an impairment. The goodwill related to these reporting units are ¥28,066 million, ¥500,896 million and ¥211,598 million, respectively. Intangible assets with finite useful lives consist primarily of software, trademarks, patents and developed technology, license fees and customer relationships, which are amortized using the straight-line method. The estimated useful lives of software are from 3 years to 7 years, trademarks are 15 years, patents and developed technology are from 7 years to 17 years, license fees are 7 years, and customer relationships are from 11 years to 15 years, respectively.

Income tax uncertainties

Canon considers many factors when evaluating and estimating income tax uncertainties. These factors include an evaluation of the technical merits of the tax positions as well as the amounts and probabilities of the outcomes that could be realized upon settlement. The actual resolutions of those uncertainties will inevitably differ from those estimates, and such differences may be material to the financial statements.

Valuation of deferred tax assets

Canon currently has significant deferred tax assets, which are subject to periodic recoverability assessments. Realization of Canon's deferred tax assets is principally dependent upon its achievement of projected future taxable income. Canon's judgments regarding future profitability may change due to future market conditions, its ability to continue to successfully execute its operating restructuring activities and other factors. Any changes in these factors may require possible recognition of significant valuation allowances to reduce the net carrying value of these deferred tax asset balances. When Canon determines that certain deferred tax assets may not be recoverable, the amounts, which may not be realized, are charged to income tax expense and will adversely affect net income.

Employee retirement and severance benefit plans

Canon has significant employee retirement and severance benefit obligations that are recognized based on actuarial valuations. Inherent in these valuations are key assumptions, including discount rates and expected return on plan assets. Management must consider current market conditions, including changes in interest rates, in selecting these assumptions. Other assumptions include assumed rate of increase in compensation levels, mortality rate, and withdrawal rate. Changes in assumptions inherent in the valuation are reasonably likely to occur from period to period. Actual results that differ from the assumptions are accumulated and amortized over future periods and, therefore, generally affect future pension expenses. While management believes that the assumptions used are appropriate, the differences may affect employee retirement and severance benefit costs in the future.

In preparing its financial statements for 2018, Canon estimated a weighted-average discount rate used to determine benefit obligations of 0.6% for Japanese plans and 2.4% for foreign plans and a weighted-average expected long-term rate of return on plan assets of 2.9% for Japanese plans and 4.4% for foreign plans. In estimating the discount rate, Canon uses available information about rates of return on high-quality fixed-income government and corporate bonds currently available and expected to be available during the period to the maturity of the pension benefits. Canon establishes the expected long-term rate of return on plan assets based on management's expectations of the long-term return of the various plan asset categories in which it invests. Management develops expectations with respect to each plan asset category based on actual historical returns and its current expectations for future returns.

Decreases in discount rates lead to increases in actuarial pension benefit obligations which, in turn, could lead to an increase in service cost and amortization cost through amortization of actuarial gain or loss, a decrease in interest cost, and vice versa. For 2018, a decrease of 50 basis points in the discount rate increases the projected benefit obligation by approximately ¥94,366 million. The net effect of changes in the discount rate, as well as the net effect of other changes in actuarial assumptions and experience, is deferred until subsequent periods.

Decreases in expected returns on plan assets may increase net periodic benefit cost by decreasing the expected return amounts, while differences between expected value and actual fair value of those assets could affect pension expense in the following years, and vice versa. For 2018, a change of 50 basis points in the expected long-term rate of return on plan assets would cause a change of approximately ¥4,657 million in net periodic benefit cost. Canon multiplies management's expected long-term rate of return on plan assets by the value of its plan assets to arrive at the expected return on plan assets that is included in pension expense. Canon defers recognition of the difference between this expected return on plan assets and the actual return on plan assets. The net deferral affects future pension expense.

Canon recognizes the funded status (i.e., the difference between the fair value of plan assets and the projected benefit obligations) of its pension plans in its consolidated balance sheets, with a corresponding adjustment to accumulated other comprehensive income (loss), net of tax.

Recently Issued Accounting Guidance

Please refer to Note 1 of the Notes to Consolidated Financial Statements.

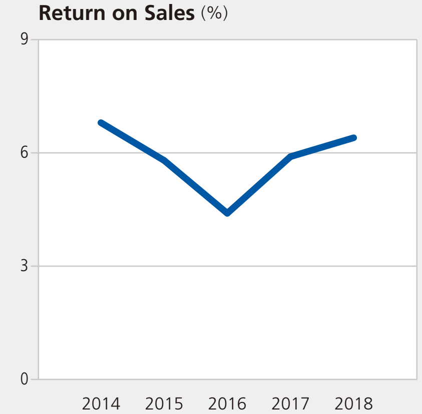
CONSOLIDATED RESULTS OF OPERATIONS

SUMMARY OF OPERATIONS

	Millions of yen				
	2018	change	2017	change	2016
Net sales	**3,951,937**	**-3.1%**	4,080,015	+19.9%	3,401,487
Products and Equipment	**3,194,724**	**-9.3%**	3,521,156	+17.9%	2,986,188
Services	**757,213**	**+35.5%**	558,859	+34.6%	415,299
Operating profit	**342,952**	**+6.6%**	321,605	+48.6%	216,425
Income before income taxes	**362,892**	**+2.5%**	353,884	+44.6%	244,651
Net income attributable to Canon Inc.	**252,755**	**+4.5%**	241,923	+60.6%	150,650

Note: See note to KEY PERFORMANCE INDICATORS

Return on Sales (%)



Sales

In the current business term, the world economy seemingly mounted a gradual recovery on the whole, yet decelerated in the latter half largely due to adverse effects of trade friction. In such an environment, although each of Canon Group's businesses endeavored to expand sales particularly with respect to new products, Canon's consolidated net sales in 2018 totaled ¥3,951,937 million, a decrease of 3.1% from the previous year largely due to adverse effect of a shrinking market. The adoption of the new revenue standard required the reconsideration of the scope of performance obligations related to service contracts, which has resulted in a change in classification of revenues between the products and service revenues. As a result, net sales of products and equipment totaled ¥3,194,724 million, a year-on-year decrease of 9.3%, while net sales of services totaled ¥757,213 million, a year-on-year increase of 35.5%. For further information, please refer to Note 15 of the Notes to Consolidated Financial Statements.

Overseas operations are significant to Canon's operating results and generated 78.0% of total net sales in 2018. Such sales are denominated in the applicable local currency and are subject to fluctuations in the value of the yen relative to those currencies. Despite efforts to reduce the impact of currency fluctuations on operating results, including localization of manufacturing in some regions along with procuring parts and materials from overseas suppliers, Canon believes such fluctuations have had and will continue to have a significant effect on its results of operations.

The average value of the yen during the year was ¥110.43 against the U.S. dollar, a year-on-year appreciation of approximately ¥2, and ¥130.29 against the euro, a year-on-year depreciation of approximately ¥4. The effects of foreign exchange rate fluctuations positively affected net sales by approximately ¥1,024 million in 2018. This favorable impact consisted of approximately ¥17,800 million of unfavorable impact for the U.S. dollar denominated sales and favorable impact of ¥22,534 million for the euro denominated sales, and unfavorable impact of ¥3,710 million for other foreign currency denominated sales.

Cost of sales

Cost of sales principally reflects the cost of raw materials, parts and labor used by Canon in the manufacture of its products. A portion of the raw materials used by Canon is imported or includes imported materials. Many of these raw materials are subject to fluctuations in world market prices accompanied by fluctuations in foreign exchange rates that may affect Canon's cost of sales. Other components of cost of sales include depreciation expenses, maintenance expenses, light and fuel expenses, and rent expenses. The ratios of cost of sales to net sales for 2018 and 2017 were 53.6% and 51.2%, respectively.

Gross profit

Canon's gross profit in 2018 decreased by 7.8% to ¥1,835,554 million from 2017. The gross profit ratio also dropped by 2.4 points to 46.4%. This was mainly due to the fact that certain costs that were under operating expenses have been reclassified under cost of sales following the adoption of new accounting standards related to revenue recognitions as described in Note 15 of the Notes to Consolidated Financial Statements. The reclassified amount for the year ended December 31, 2018 was ¥115,700 million. Excluding the impact of this reclassification, the gross profit ratio increased by 0.6 points to 49.4%.

Operating expenses

The major components of operating expenses are payroll, R&D, advertising expenses and other marketing expenses. Operating expenses decreased by 10.6% year on year to ¥1,492,602 million, thanks to Group-wide efforts to thoroughly manage expenses as well as impairment loss on goodwill of commercial printing business during the previous year in addition to the impact of the aforementioned reclassification of figures related to the adoption of new accounting standards.

Operating profit

Operating profit in 2018 increased by 6.6% from 2017 to a total of ¥342,952 million. The ratio of operating profit to net sales increased by 0.8 points to 8.7% from 2017.

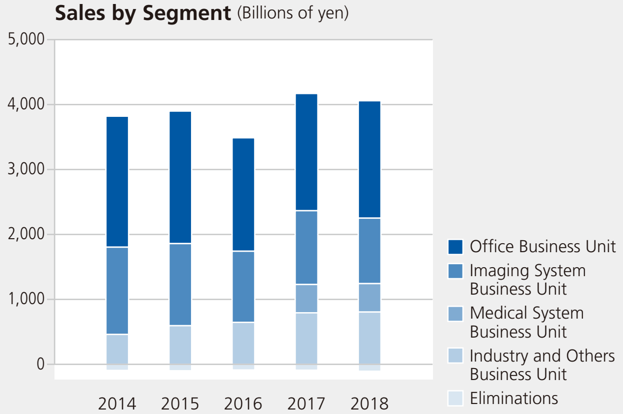
Other income (deductions)

Other income (deductions) for 2018 was ¥19,940 million, a decrease of ¥12,339 million from 2017 mainly due to gain on securities contributed to the retirement benefit trust during the previous year.

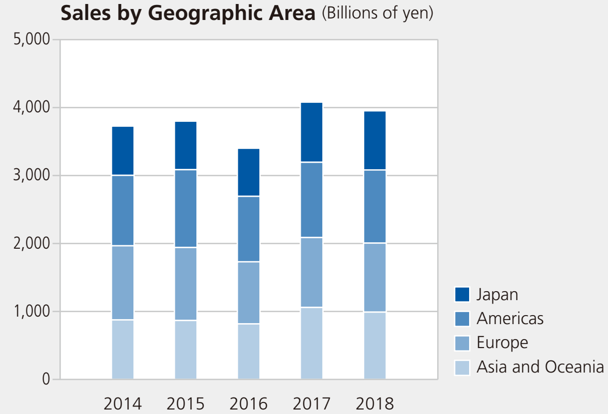
Income before income taxes

Income before income taxes in 2018 was ¥362,892 million, an increase of 2.5% from 2017, and constituted 9.2% of net sales.

Sales by Segment (Billions of yen)



Sales by Geographic Area (Billions of yen)



Income taxes

Income taxes in 2018 decreased by ¥1,874 million from 2017. The effective tax rate for 2018 was 26.5%, which was lower than the statutory tax rate in Japan. This was mainly due to the tax credit for R&D expenses.

Net income attributable to Canon Inc.

As a result, net income attributable to Canon Inc. in 2018 increased by 4.5% to ¥252,755 million, which represents 6.4% of net sales.

Segment information

Canon divides its businesses into four segments: the Office Business Unit, the Imaging System Business Unit, the Medical System Business Unit which was newly established in 2017, and the Industry and Others Business Unit.

The Office Business Unit mainly includes Office MFDs / Laser MFPs / Laser printers / Digital continuous feed presses / Digital sheet-fed presses / Wide-format printers / Document solutions

The Imaging System Business Unit mainly includes Interchangeable-lens digital cameras / Digital compact cameras / Digital camcorders / Digital cinema cameras / Interchangeable lenses / Compact photo printers / Inkjet printers / Large format inkjet printers / Commercial photo printers / Image scanners / Multimedia projectors / Broadcast equipment / Calculators

The Medical System Business Unit mainly includes Digital radiography systems / Diagnostic X-ray systems / CT systems / MRI systems / Diagnostic ultrasound systems / Clinical chemistry analyzers / Ophthalmic equipment

The Industry and Others Business Unit mainly includes Semiconductor lithography equipment / FPD (Flat panel display) lithography equipment / Vacuum thin-film deposition equipment / Organic LED (OLED) panel manufacturing equipment / Die bonders / Micromotors / Network cameras / Handy terminals / Document scanners

Sales by segment

Within the Office Business Unit, unit sales of office MFDs increased from the previous year, thanks to expanded sales of such color models as the imageRUNNER ADVANCE Gen3 2nd Edition series, which enhances convenience through compatibility with external cloud services, and the imageRUNNER C3020 series of strategic models for emerging markets. As for laser printers, sales of hardware increased from the previous year, supported by steady sales mainly of new models that achieve low power consumption, compact body designs and high productivity. Sales of consumables remained at the same level as the previous year. These factors resulted in total sales for the business unit of ¥1,807,301 million, a year-on-year increase of 0.1%, while income before income taxes increased by 17.3% year on year to ¥229,187 million partly due to impairment loss on goodwill during the previous year.

Within the Imaging System Business Unit, although unit sales of interchangeable-lens digital cameras decreased overall compared with the previous year due to shrinking market, Canon maintained the top share of the overall interchangeable-lens digital cameras market, mainly in key countries in Europe and the Americas as well as in Japan and China. In mirrorless cameras, sales were strong for such new models as the EOS R, Canon's first mirrorless camera equipped with a full-frame sensor, and the entry-class EOS Kiss M. As for digital compact cameras, although unit sales decreased compared with the previous year amid the shrinking market, sales of such high-value-added models as the PowerShot G-series enjoyed solid demand. For inkjet printers, unit sales of refillable ink tank models increased significantly in emerging markets. However, unit sales decreased overall compared with the previous year, mainly due to the shrinking market in developed economies. For large format inkjet printers, the imagePROGRAF TX series, which is suitable for outputting CAD drawings and poster designs, garnered high praise from the market and enjoyed solid sales. As a result, sales for the business unit decreased by 11.3% year on year to ¥1,008,165 million, while income before income taxes decreased by 31.1% year on year to ¥121,254 million.

Within the Medical System Business Unit, sales increased due to such newly launched products as the Alphenix-series of next-generation diagnostic X-ray systems and the Vantage Orian, a high-image-quality MRI system incorporating leading-edge technology. As a result, sales for the business unit increased by 0.3% year on year to ¥437,578 million, while income before income taxes increased by 31.0% year on year to ¥29,479 million.

In the Industry and Others Business Unit, unit sales of semiconductor lithography equipment increased from the previous year due to increasing demand for memory devices used in data centers. However, for FPD lithography equipment and OLED panel manufacturing equipment, sales decreased compared with the previous year mainly due to a temporary slowdown in investment in OLED panels. As for network cameras, Axis enjoyed solid sales amid increasing market demand. Consequently, sales for the business unit increased by 1.6% year on year to ¥805,211 million, while income before income taxes increased by 60.7% year on year to ¥67,607 million.

Intersegment sales of ¥106,318 million are eliminated from total sales for the four segments, and are described as "Eliminations".

SALES BY SEGMENT

	Millions of yen				
	2018	change	2017	change	2016
Office	**1,807,301**	**+0.1%**	1,804,782	+3.4%	1,745,996
Imaging System	**1,008,165**	**-11.3%**	1,136,188	+3.7%	1,095,289
Medical System	**437,578**	**+0.3%**	436,187	—	—
Industry and Others	**805,211**	**+1.6%**	792,850	+22.6%	646,483
Eliminations	**(106,318)**	**—**	(89,992)	—	(86,281)
Total	**3,951,937**	**-3.1%**	4,080,015	+19.9%	3,401,487

SALES BY GEOGRAPHIC AREA

	Millions of yen				
	2018	change	2017	change	2016
Japan	**869,577**	**-1.7%**	884,828	+25.2%	706,979
Americas	**1,076,402**	**-2.8%**	1,107,515	+14.9%	963,544
Europe	**1,015,428**	**-1.3%**	1,028,415	+12.6%	913,523
Asia and Oceania	**990,530**	**-6.5%**	1,059,257	+29.6%	817,441
Total	**3,951,937**	**-3.1%**	4,080,015	+19.9%	3,401,487

Note: This summary of net sales by geographic area is determined by the location where the product is shipped to the customers.

Sales by geographic area

Please refer to the table of sales by geographic area in Note 22 of the Notes to Consolidated Financial Statements.

In Japan, net sales decreased by 1.7% from the previous year mainly owing to the decline in sales of interchangeable-lens digital cameras and compact digital cameras.

In Americas, despite solid sales of network cameras, net sales decreased by 2.8% from the previous year mainly owing to the negative effect of the yen's appreciation and the decline in sales of interchangeable-lens digital cameras and compact digital cameras.

In Europe, net sales decreased by 1.3% from the previous year mainly owing to the decline in sales of interchangeable-lens digital cameras and compact digital cameras.

In Asia and Oceania, net sales decreased by 6.5% from the previous year mainly owing to the decline in sales of interchangeable-lens digital cameras, compact digital cameras, manufacturing equipment for OLED panels which is sold by Canon Tokki, and manufacturing equipment for FPD.

Income before income taxes by segment

Please refer to the table of segment information in Note 22 of the Notes to Consolidated Financial Statements.

Income before income taxes for the Office Business Unit in 2018 increased by 17.3% from the previous year to ¥229,187 million, as impairment loss on goodwill incurred during the previous year.

Income before income taxes for the Imaging System Business Unit in 2018 decreased by 31.1% from the previous year to ¥121,254 million, owing to shrinking market for interchangeable-lens digital cameras.

Income before income taxes for the Medical System Business Unit in 2018 increased by 31.0% from the previous year to ¥29,479 million, mainly due to cost reduction and favorable sales of diagnostic X-ray systems and MRI systems.

Income before income taxes for the Industry and Others Business Unit in 2018 increased by 60.7% from the previous year to ¥67,607 million, thanks to strong sales of semiconductor lithography equipment and network cameras.

FOREIGN OPERATIONS AND FOREIGN CURRENCY TRANSACTIONS

Canon's marketing activities are performed by subsidiaries in various regions in local currencies, while the cost of sales is generally in yen. Given Canon's current operating structure, appreciation of the yen has a negative impact on net sales and the gross profit ratio. To reduce the financial risks from changes in foreign exchange rates, Canon utilizes derivative financial instruments, which consist principally of forward currency exchange contracts.

The operating profit on foreign operation sales is usually lower than that from domestic operations because foreign operations consist mainly of marketing activities. Marketing activities are generally less profitable than production activities, which are mainly conducted by the Company and its domestic subsidiaries. Please refer to the table of geographic information in Note 22 of the Notes to Consolidated Financial Statements.

LIQUIDITY AND CAPITAL RESOURCES

Cash and cash equivalents decreased by ¥201,169 million to ¥520,645 million in fiscal 2018 compared to the previous year. Canon's cash and cash equivalents are primarily denominated in Japanese yen and in U.S. dollars, with the remainder denominated in other currencies.

Net cash provided by operating activities decreased by ¥225,264 million to ¥365,293 million in fiscal 2018 compared to the previous year due to increase of capital used for operations and income tax paid. The major component of Canon's cash inflow is cash received from customers, and the major components of Canon's cash outflow are payments for parts and materials, selling, general and administrative expenses, R&D expenses and income taxes.

For fiscal 2018, cash inflow from cash received from customers decreased due to sales deterioration. There were no significant changes in Canon's collection rates. Cash outflow for payments for parts and materials increased due to an increase of inventory level resulting from sales decline. Cash outflow for payments for income taxes increased due to an increase in taxable income in fiscal 2017.

Net cash used in investing activities increased by ¥30,605 million to ¥195,615 million in fiscal 2018 mainly due to an increase in payment for acquisitions of businesses.

Canon defines "free cash flow" as cash flows from operating activities less cash flows from investing activities. For fiscal 2018, free cash flow decreased by ¥255,869 million to ¥169,678 million as compared with ¥425,547 million for fiscal 2017.

Note: "Free cash flow" is non-GAAP measure. Refer to "Non-GAAP Financial Measures" section for the explanation and the reconciliation to the reported GAAP measure.

Canon's management places importance on cash flow management and frequently monitors this indicator. Furthermore, Canon's management believes that this indicator is significant in understanding Canon's current liquidity and the alternatives of use in financing activities because it takes into consideration its operating and investing activities and believes that such indicator is beneficial to an investor's understanding. Canon refers to this indicator together with relevant U.S. GAAP financial measures shown in its consolidated statements of cash flows and consolidated balance sheets for cash availability analysis.

Net cash used in financing activities totaled ¥354,830 million in fiscal 2018, mainly resulting from the dividend payout of ¥178,159 million, the repayment for long-term loans of ¥136,094 million. The Company paid dividends in fiscal 2018 of ¥160.00 per share.

To the extent Canon relies on external funding for its liquidity and capital requirements, it generally has access to various funding sources, including the issuance of additional share capital, issuance of corporate bond or loans. While Canon has been able to obtain funding from its traditional financing sources and from the capital markets, and believes it will continue to be able to do so in the future, there can be no assurance that adverse economic or other conditions will not affect Canon's liquidity or long-term funding in the future.

Short-term loans (including the current portion of long-term debt) decreased by ¥801 million to ¥38,527 million at December 31, 2018 compared with ¥39,328 million at December 31, 2017. Long-term debt (excluding the current portion) decreased by ¥131,276 million to ¥361,962 million at December 31, 2018 compared with ¥493,238 million at December 31, 2017 thanks to the repayment for long-term loans.

Canon's long-term debt mainly consists of bank borrowings and lease obligations.

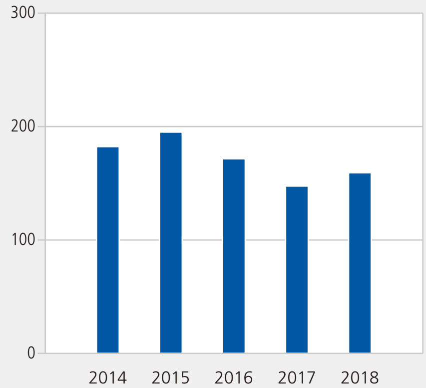
In order to facilitate access to global capital markets, Canon obtains credit ratings from two rating agencies: Moody's Investors Services, Inc. ("Moody's") and Standard and Poor's Ratings Services ("S&P"). In addition, Canon maintains a rating from Rating and Investment Information, Inc. ("R&I"), a rating agency in Japan, for access to the Japanese capital market.

As of February 28, 2019, Canon's debt ratings are: Moody's: Aa3 (long-term); S&P: AA- (long-term), A-1+ (short-term); and R&I: AA+ (long-term). Canon does not have any rating downgrade triggers that would accelerate the maturity of a material amount of its debt. A downgrade in Canon's credit ratings or outlook could, however, increase the cost of its borrowings.

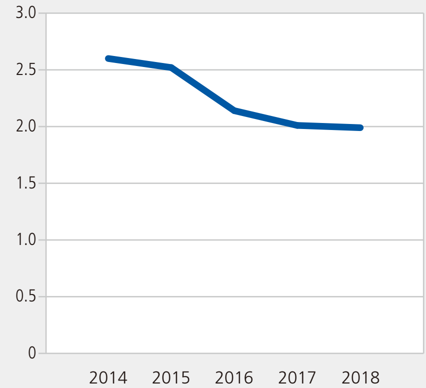
Canon's management policy in recent periods to optimize inventory levels is intended to maintain an appropriate balance among relevant imperatives, including minimizing working capital, avoiding undue exposure to the risk of inventory obsolescence, and maintaining the ability to sustain sales despite the occurrence of unexpected disasters.

Canon's total inventory turnover ratios were 56, 49, and 59 days at the end of the fiscal years 2018, 2017, and 2016,

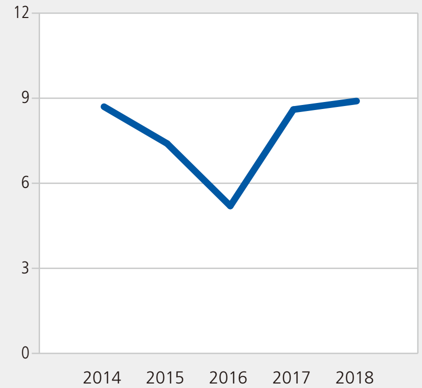
Increase in Property, Plant and Equipment (Billions of yen)



Working Capital Ratio



Return on Canon Inc. Shareholders' Equity (%)



respectively. The inventory turnover in 2018 was reflecting the foregoing circumstances. The inventory turnover in 2016 was primarily impacted by acquisition of CMSC on December 19, 2016. If this factor were excluded, the inventory turnover would show 50 days.

Increase in property, plant and equipment on an accrual basis in 2018 amounted to ¥159,316 million compared with ¥147,542 million in 2017 and ¥171,597 million in 2016. For 2019, Canon projects its increase in property, plant and equipment will be approximately ¥175,000 million.

Employer contributions to Canon's worldwide defined benefit pension plans were ¥35,044 million in 2018, ¥50,628 million in 2017 and ¥14,575 million in 2016. Employer contributions to Canon's worldwide defined contribution pension plans were ¥19,570 million in 2018, ¥18,979 million in 2017, and ¥17,603 million in 2016. In addition, employer contributions to the multiemployer pension plan of certain subsidiaries were ¥4,452 million in 2018, ¥4,165 million in 2017 and ¥3,482 million in 2016.
Working capital in 2018 decreased by ¥102,642 million to ¥1,020,527 million, compared with ¥1,123,169 million in 2017 and ¥1,116,379 million in 2016. Canon believes its working capital will be sufficient for its requirements for the foreseeable future. Canon's capital requirements are primarily dependent on management's business plans regarding the levels and timing of purchases of fixed assets and investments. The working capital ratio (ratio of current assets to current liabilities) for 2018 was 1.99 compared to 2.01 for 2017 and to 2.14 for 2016.

Return on assets (net income attributable to Canon Inc. divided by the average of total assets) was 5.0% in 2018, compared to 4.7% in 2017 and 3.1% in 2016.

Return on Canon Inc. shareholders' equity (net income attributable to Canon Inc. divided by the average of total Canon Inc. shareholders' equity) was 8.9% in 2018 compared with 8.6% in 2017 and 5.2% in 2016.

The debt to total assets ratios were 8.2%, 10.2% and 11.9% as of December 31, 2018, 2017 and 2016, respectively. Canon had short-term loans and long-term debt of ¥400,489 million as of December 31, 2018, ¥532,566 million as of December 31, 2017 and ¥613,139 million as of December 31, 2016.

Non-GAAP Financial Measures

We have reported our financial results in accordance with U.S. generally accepted accounting principles ("U.S. GAAP"). In addition, we have discussed our results using the combination of two GAAP cash flow measures, Net cash provided by operating activities and Net cash used for investing activities, which we refer to as "Free Cash Flow" which is non-GAAP measure. We believe this measure is beneficial to an investor's understanding on Canon's current liquidity and the alternatives of use in financing activities because it takes into consideration its operating and investing activities.

A reconciliation of these non-GAAP financial measures and the most directly comparable measures calculated and presented in accordance with GAAP are set forth on the following table.

FREE CASH FLOW

	Millions of yen	
	2018	2017
Net cash provided by operating activities	**365,293**	590,557
Net cash used in investing activities	**(195,615)**	(165,010)
Free cash flow	**169,678**	425,547

OFF-BALANCE SHEET ARRANGEMENTS

As part of its ongoing business, Canon does not participate in transactions that generate relationships with unconsolidated entities or financial partnerships, such as entities often referred to as structured finance or special purpose entities established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes.

Canon provides guarantees for its employees, affiliates and other companies. The guarantees for the employees are principally made for their housing loans. The guarantees for affiliates and other companies are made for their lease obligations and bank loans to ensure that those companies operate with less financial risk.

Canon would have to perform under a guarantee if the borrower defaults on a payment within the contract terms. The contract terms are 1 year to 30 years in case of employees with housing loans, and 1 year to 7 years in case of affiliates and other companies with lease obligations and bank loans. The maximum amount of undiscounted payments Canon would have had to make in the event of default is ¥4,458 million at December 31, 2018. The carrying amounts of the liabilities recognized for Canon's obligations as a guarantor under those guarantees at December 31, 2018 were not significant.

CONTRACTUAL OBLIGATIONS AND COMMERCIAL COMMITMENTS

The following summarizes Canon's contractual obligations at December 31, 2018.

		Payments due by period			
Millions of yen	**Total**	Less than 1 year	1-3 years	3-5 years	More than 5 years
Contractual obiligations:					
Long-term debt:					
Loan from the banks	**360,000**	—	360,000	—	—
Other debt	**4,602**	2,640	1,443	509	10
Operating lease obligations	**115,084**	29,817	41,239	23,730	20,298
Purchase commitments for:					
Property, plant and equipment	**54,905**	54,905	—	—	—
Parts and raw materials	**120,344**	120,344	—	—	—
Other long-term liabilities:					
Contribution to defined benefit pension plans	**32,400**	32,400	—	—	—
Total	**687,335**	240,106	402,682	24,239	20,308

Note: The table does not include provisions for uncertain tax positions and related accrued interest and penalties, as the specific timing of future payments related to these obligations cannot be projected with reasonable certainty. See Note 12, Income Taxes in the Notes to Consolidated Financial Statements for further details. Contribution to defined benefit pension plans reflects the expected amount only for the next fiscal year, since contributions beyond the next fiscal year are not currently determinable due to uncertainties related to changes in actuarial assumptions, returns on plan assets and changes to plan membership.

Canon provides warranties of generally less than one year against defects in materials and workmanship on most of its consumer products. Estimated product warranty related costs are established at the time revenue are recognized and are included in selling, general and administrative expenses. Estimates for accrued product warranty costs are primarily based on historical experience, and are affected by ongoing product failure rates, specific product class failures outside of the baseline experience, material usage and service delivery costs incurred in correcting a product failure. As of December 31, 2018 accrued product warranty costs amounted to ¥17,318 million.

At December 31, 2018, commitments outstanding for the purchase of property, plant and equipment were approximately ¥54,905 million, and commitments outstanding for the purchase of parts and raw materials were approximately ¥120,344 million, both for use in the ordinary course of its business. Canon anticipates that funds needed to fulfill these commitments will be generated internally through operations.

During 2019, Canon expects to contribute ¥13,089 million to its Japanese defined benefit pension plans and ¥19,311 million to its foreign defined benefit pension plans.

Canon's management believes that current financial resources, cash generated from operations and Canon's potential capacity for additional debt and/or equity financing will be sufficient to fund current and future capital requirements.

RESEARCH AND DEVELOPMENT, PATENTS AND LICENSES

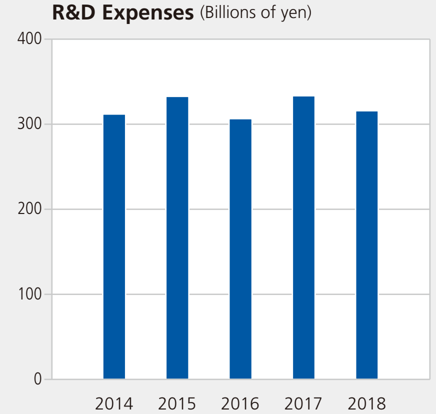
Canon has started its 5-year management plan, the Excellent Global Corporation Plan Phase V ("Phase V") from the year 2016. In Phase V, our slogan is "Embrace the challenge of new growth through a grand strategic transformation" and there are three key strategies related to R&D:

- Establish a new production system to achieve a cost-of-sales ratio of 45%;
- Reinforce and expand new businesses while creating future businesses; and
- Enhance R&D capabilities through open innovation.

Canon has been striving to implement the three R&D related strategies as follows:

- Establish a new production system to achieve a cost-of-sales ratio of 45%: Strengthen domestic mother factories by integrating design, procurement, production engineering and manufacturing technology operations while pursuing total cost reduction by advancing production

R&D Expenses (Billions of yen)



engineering capabilities with more sophisticated robots and next-generation technologies such as the IoT, big data and artificial intelligence.

- Reinforce and expand new businesses while creating future businesses: Create and expand new businesses by accelerating the horizontal expansion of existing business with the exploration of new application possibility of Canon's technologies into new fields. Also, invest intensively on the R&D of promising businesses areas such as commercial printing, network cameras and life sciences while actively taking advantage of M&A to accelerate the early expansion of these businesses.
- Enhance R&D capabilities through open innovation: Construct a more open R&D system that proactively leverages external technologies and knowledge to accelerate and improve efficiency of the R&D. Especially in our fundamental research and development, Canon is promoting joint and contract research with various partners including universities, research institutes, and startups around the world.

Canon is currently working on collaborative research with Massachusetts General Hospital and Brigham and Women's Hospital to develop medical robotics and ultra-miniature endoscope at the Healthcare Optics Research Laboratory in Boston. Also, CMSC has started collaborative research on Deep Learning Reconstruction in MRI systems, together with Kumamoto University and the University of Bordeaux.

Canon has developed simulation systems covering comprehensive image processing including optical design, mechanical noise analysis, and thermal air flow analysis. With these simulation systems, Canon has succeeded in further reducing the need for prototypes, lowering costs and shortening product development lead times.

Canon believes that new products protected by the robust patent portfolio will not easily allow competitors to compete with them, and will give them an advantage in establishing standards in the market and industry.

Canon obtained the third greatest number of patents in the United States in 2018, according to the annual ranking list, released by IFI CLAIMS® Patent Services.

MARKET RISK EXPOSURES

Canon is exposed to market risks, including changes in foreign currency exchange rates, interest rates and prices of marketable securities and investments. In order to hedge the risks of changes in foreign currency exchange rates, Canon uses derivative financial instruments.

Equity price risk

Canon holds marketable securities included in current assets, which consist generally of highly-liquid and low-risk instruments. Investments included in noncurrent assets are held as long-term investments. Canon does not hold marketable securities and investments for trading purposes.

Maturities and fair values of such marketable securities and investments with original maturities of more than three months were as follows at December 31, 2018.

	Millions of yen
	Fair value
Debt securities	
Due within one year	630
Fund trusts and others	1,038
Equity securities	13,787
	15,455

Foreign currency exchange rate and interest rate risk

Canon operates internationally, exposing it to the risk of changes in foreign currency exchange rates. Derivative financial instruments are comprised principally of foreign currency exchange contracts utilized by the Company and certain of its subsidiaries to reduce the risk. Canon assesses foreign currency exchange rate risk by continually monitoring changes in the exposures and by evaluating hedging opportunities. Canon does not hold or issue derivative financial instruments for trading purposes. Canon is also exposed to credit-related losses in the event of non-performance by counterparties to derivative financial instruments, but it is not expected that any counterparties will fail to meet their obligations. Most of the counterparties are internationally recognized financial institutions and selected by Canon taking into account their financial condition, and contracts are diversified across a number of major financial institutions.

Canon's international operations expose Canon to the risk of changes in foreign currency exchange rates. Canon uses foreign exchange contracts to manage certain foreign currency exchange exposures principally from the exchange of U.S. dollars and euros into Japanese yen. These contracts are primarily used to hedge the foreign currency exposure of forecasted intercompany sales and intercompany trade receivables which are denominated in foreign currencies. In accordance with Canon's policy, a specific portion of foreign currency exposure resulting from forecasted intercompany sales are hedged using foreign exchange contracts which principally mature within three months.

The following table provides information about Canon's major derivative financial instruments related to foreign currency exchange transactions existing at December 31, 2018. All of the foreign exchange contracts described in the following table have a contractual maturity date in 2019.

Millions of yen	U.S.$	Euro	Others	Total
Forwards to sell foreign currencies:				
Contract amounts	108,126	101,356	21,023	230,505
Estimated fair value	857	1,235	513	2,605
Forwards to buy foreign currencies:				
Contract amounts	24,025	2,807	3,984	30,816
Estimated fair value	(158)	(11)	(59)	(228)

Canon expects that fair value changes and cash flows resulting from reasonable near-term changes in interest rates will be immaterial. Accordingly, Canon believes interest rate risk is insignificant. See also Note 9 of the Notes to Consolidated Financial Statements.

Changes in the fair value of derivative financial instruments designated as cash flow hedges, including foreign currency exchange contracts associated with forecasted intercompany sales, are reported in accumulated other comprehensive income (loss). These amounts are subsequently reclassified into earnings through other income (deductions) in the same period as the hedged items affect earnings. Substantially all such amounts recorded in accumulated other comprehensive income (loss) at year-end are expected to be recognized in earnings over the next twelve months. Canon excludes the time value component from the assessment of hedge effectiveness. Changes in the fair value of a foreign currency exchange contract for the period between the date that the forecasted intercompany sales occur and its maturity date are recognized in earnings and not considered hedge ineffectiveness. From the quarter beginning January 1, 2019, Canon will adopt ASU No. 2017-12, Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities. After the adoption of this guidance, gains and losses resulting from derivative financial instruments designated as cash flow hedges associated with forecasted intercompany sales, which are currently included in other income (deductions) in the consolidated statements of income, will be included in net sales.

The amount of the hedging ineffectiveness was not material for the years ended December 31, 2018, 2017 and 2016. The amounts of net losses excluded from the assessment of hedge effectiveness (time value component) which was recorded in other income (deductions) were ¥682 million, ¥332 million and ¥311 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Canon has entered into certain foreign currency exchange contracts to manage its foreign currency exposures. These foreign currency exchange contracts have not been designated as hedges. Accordingly, the changes in fair values of these contracts are recorded in earnings immediately.

LOOKING FORWARD

Under the corporate philosophy of *kyosei*—living and working together for the common good—Canon's basic management policy is to contribute to the prosperity and well-being of the world while endeavoring to become a truly excellent global corporation targeting continued growth and development.

Based on this basic management policy, Canon launched the Excellent Global Corporation Plan in 1996 and, from Phase I through to Phase IV, has worked to strengthen its management base and improve corporate value. In 2016, under the slogan "Embracing the challenge of new growth through a grand strategic transformation," Canon embarked on a new five-year initiative: Phase V of the Excellent Global Corporation Plan. Under this plan, Canon aims to facilitate growth through structural transformation by reinforcing existing businesses and taking steps to cultivate and strengthen new businesses.

The global economy is expected to continue to slow down from the latter half of 2018 and overall, there are concerns of further economic slowdown occurring as a result of intensifying trade friction.

In the businesses in which Canon is involved, for office MFDs, color models are expected to grow steadily. Overall demand for laser printers is expected to remain at the same level as that of the previous year, supported by the trend of shifting from monochrome to color models and increasing demand in emerging markets. For interchangeable-lens digital cameras, while demand for interchangeable-lens digital cameras equipped with full-frame sensors is expected to grow steadily, overall demand is expected to decrease. Projections for digital compact cameras indicate continued market contraction, centered mainly on low-priced models. With regard to inkjet printers, demand is expected to continue to decrease slightly from the previous year.

As for the medical equipment market, demand is expected to remain firm, mainly outside of Japan, with increasing demand in emerging markets and increased demand for advanced medical care in the United States and Europe. Looking at industrial equipment, as for the semiconductor lithography equipment, while demand for automotive devices is expected to increase, capital investment is expected to slow down for memory devices. For FPD lithography equipment and OLED panel manufacturing equipment, capital investment in small- and medium-size display panels is expected to continue to slow down. As for network cameras, demand is expected to continue expanding for high-spec models and image analysis software due to the growing use of network cameras for a widening range of applications.

The Canon Group recognizes the Business Term in 2019 as a year for achieving transformation into an enterprise wielding high productivity on par with other excellent global corporations in every field of business ranging from R&D to production, sales and service, underpinned by a new business portfolio containing four additional new business areas (commercial printing, network cameras, medical system, and industrial equipment). Accordingly, we will work to address the following key challenges under the theme, “Accelerate Grand Strategic Transformation to achieve fundamental improvements in productivity.”

(1)Revitalizing existing businesses

- We promote efforts to strengthen development of DANTOTSU products that overwhelm competitors, making extensive use of cloud, AI and IoT technologies.
- We will enhance assembly automation by turning out product designs suitable to automation, and promote in-house production of equipment and key parts throughout the Group.
- We will make quality and cost improvements by strengthening procurement functions and collaborating with suppliers, and promote in-house production and standardization of parts.

(2)Bolstering and expanding new businesses

- In commercial printing, our aims involve drawing up comprehensive strategy for all printing-related businesses, building platforms for the commercial printing business centered on Océ, and establishing product structures geared to high-resolution and high-mix, small-lot printing.
- With network cameras, we will enhance and upgrade related software, and promote expansion into a wide range of fields beyond crime prevention and disaster monitoring applications.
- In the medical field, we will enhance our product strengths and sales capabilities with respect to diagnostic equipment, and will explore possibilities for expanding our business into areas besides diagnostic equipment.
- With industrial equipment, we will accelerate development of next-generation OLED panel manufacturing equipment and promote development of new industrial equipment.

(3)Reforming R&D operation in anticipation of industrial and social changes

- We will take an approach to the theme of development, grouped into the three areas of: 1. initiatives related to enhancing existing businesses, 2. initiatives aiming to commercialize opportunities in the near future, and 3. initiatives over the medium to long term. Accordingly, we will strive to improve development productivity by forming a development framework that is tailored to those three areas of focus.
- We will expand and enhance our worldwide research into start-up companies that have substantial potential for growth drawing on their cutting-edge technologies and new business models.

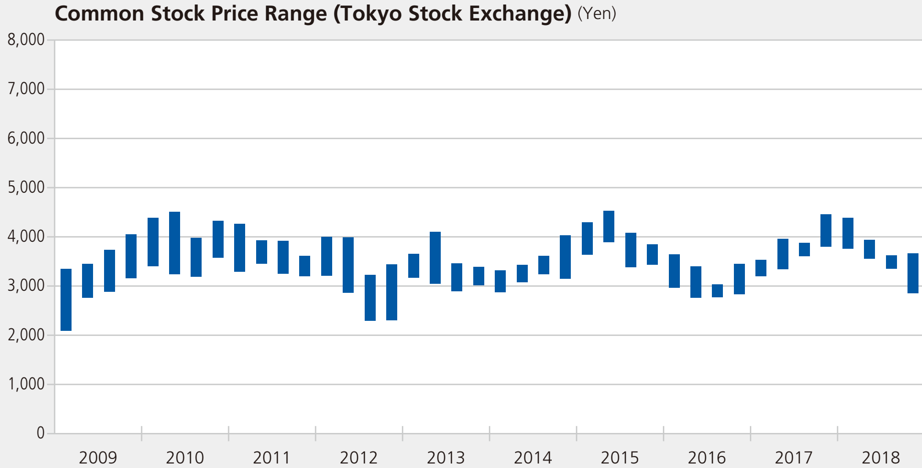
Forward looking statements

The foregoing discussion and other disclosure in this report contains forward-looking statements that reflect management’s current views with respect to certain future events and financial performance. Actual results may differ materially from those projected or implied in the forward-looking statements. Further, certain forward-looking statements are based upon assumptions of future events that may not prove to be accurate. The following important factors could cause actual results to differ materially from those projected or implied in any forward-looking statements: foreign currency exchange rate fluctuations; the uncertainty of Canon’s ability to implement its plans to localize production and other measures to reduce the impact of foreign currency exchange rate fluctuations; uncertainty as to economic conditions in Canon’s major markets; uncertainty of continued demand for Canon’s high-value-added products; Canon’s ability to continue to develop products and to market products that incorporate new technology on a timely basis, are competitively priced, and achieve market acceptance; the possibility of losses resulting from foreign currency transactions designed to reduce financial risks from changes in foreign currency exchange rates; and inventory risk due to shifts in market demand.

TEN-YEAR FINANCIAL SUMMARY

	Millions of yen (except per share amounts)			
	2018	2017	2016	2015
Net sales:				
Domestic	**869,577**	884,828	706,979	714,280
Overseas	**3,082,360**	3,195,187	2,694,508	3,085,991
Total	**3,951,937**	4,080,015	3,401,487	3,800,271
Percentage of previous year	**96.9%**	119.9%	89.5%	102.0%
Net income attributable to Canon Inc.	**252,755**	241,923	150,650	220,209
Percentage of sales	**6.4%**	5.9%	4.4%	5.8%
Advertising	**58,729**	61,207	58,707	80,907
Research and development expenses	**315,842**	333,371	306,537	332,678
Depreciation of property, plant and equipment	**175,771**	189,712	199,133	223,759
Increase in property, plant and equipment	**159,316**	147,542	171,597	195,120
Long-term debt, excluding current installments	**361,962**	493,238	611,289	881
Canon Inc. shareholders' equity	**2,827,602**	2,870,630	2,783,129	2,966,415
Total assets	**4,899,465**	5,198,291	5,138,529	4,427,773
Per share data:				
Net income attributable to Canon Inc. shareholders per share:				
Basic	**234.09**	222.88	137.95	201.65
Diluted	**234.08**	222.88	137.95	201.65
Dividend per share	**160.00**	160.00	150.00	150.00
Stock price:				
High	**4,395**	4,472	3,656	4,539
Low	**2,877**	3,218	2,780	3,402
Average number of common shares in thousands	**1,079,753**	1,085,439	1,092,071	1,092,018
Number of employees	**195,056**	197,776	197,673	189,571

Common Stock Price Range (Tokyo Stock Exchange) (Yen)



2014	2013	2012	2011	2010	2009	Thousands of U.S. dollars (except per share amounts) 2018
724,317	715,863	720,286	694,450	695,749	702,344	**$ 7,834,027**
3,002,935	3,015,517	2,759,502	2,862,983	3,011,152	2,506,857	**27,769,009**
3,727,252	3,731,380	3,479,788	3,557,433	3,706,901	3,209,201	**35,603,036**
99.9%	107.2%	97.8%	96.0%	115.5%	78.4%	**96.9%**
254,797	230,483	224,564	248,630	246,603	131,647	**2,277,072**
6.8%	6.2%	6.5%	7.0%	6.7%	4.1%	**6.4%**
79,765	86,398	83,134	81,232	94,794	78,009	**529,090**
311,896	307,500	296,281	308,900	317,286	306,128	**2,845,423**
213,739	223,158	211,973	210,179	232,327	277,399	**1,583,523**
182,343	188,826	270,457	226,869	158,976	216,128	**1,435,279**
1,148	1,448	2,117	3,368	4,131	4,912	**$ 3,260,919**
2,978,184	2,910,262	2,598,026	2,551,132	2,645,782	2,688,109	**25,473,892**
4,460,618	4,242,710	3,955,503	3,930,727	3,983,820	3,847,557	**44,139,324**
229.03	200.78	191.34	204.49	199.71	106.64	**$ 2.11**
229.03	200.78	191.34	204.48	199.70	106.64	**2.11**
150.00	130.00	130.00	120.00	120.00	110.00	**1.44**
4,045	4,115	4,015	4,280	4,520	4,070	**39.59**
2,889	2,913	2,308	3,220	3,205	2,115	**25.92**
1,112,510	1,147,934	1,173,648	1,215,832	1,234,817	1,234,482	
191,889	194,151	196,968	198,307	197,386	168,879	

Notes: 1. U.S. dollar amounts are translated from yen at the rate of U.S.$1 = JPY111, the approximate exchange rate on the Tokyo Foreign Exchange Market as of December 28, 2018.

2. Canon adopted ASU No. 2017-07 from the quarter beginning January 1, 2018. The adoption of the new presentation requirement of the service cost component and the other components of net benefit cost resulted in reclassification from cost of sales, and selling, general and administrative expenses, and research and development expenses into other income (deductions) for the years ended December 31 from 2017 to 2009 respectively.

CONSOLIDATED BALANCE SHEETS

Canon Inc. and Subsidiaries
December 31, 2018 and 2017

	Millions of yen	
ASSETS	**2018**	2017
Current assets:		
Cash and cash equivalents (Note 1)	**520,645**	721,814
Short-term investments (Note 2)	**956**	1,965
Trade receivables, net (Notes 3 and 15)	**612,953**	650,872
Inventories (Notes 4 and 15)	**611,281**	570,033
Prepaid expenses and other current assets (Notes 6, 15 and 18)	**304,346**	287,965
Total current assets	**2,050,181**	2,232,649
Noncurrent receivables (Note 19)	**18,230**	35,444
Investments (Note 2)	**42,556**	48,320
Property, plant and equipment, net (Notes 5 and 6)	**1,090,992**	1,126,620
Intangible assets, net (Notes 7 and 8)	**391,021**	420,972
Goodwill (Notes 7 and 8)	**908,511**	936,722
Other assets (Notes 6, 11 and 12)	**397,974**	397,564
Total assets	**4,899,465**	5,198,291

LIABILITIES AND EQUITY		
Current liabilities:		
Short-term loans and current portion of long-term debt (Note 9)	**38,527**	39,328
Trade payables (Note 10)	**352,489**	380,654
Accrued income taxes (Note 12)	**41,264**	77,501
Accrued expenses (Notes 11, 15 and 19)	**321,137**	330,188
Other current liabilities (Notes 5, 15 and 18)	**276,237**	281,809
Total current liabilities	**1,029,654**	1,109,480
Long-term debt, excluding current installments (Notes 9 and 20)	**361,962**	493,238
Accrued pension and severance cost (Note 11)	**382,789**	365,582
Other noncurrent liabilities (Note 12)	**107,147**	133,816
Total liabilities	**1,881,552**	2,102,116
Commitments and contingent liabilities (Note 19)		
Equity:		
Canon Inc. shareholders' equity:		
Common stock		
Authorized 3,000,000,000 shares; issued 1,333,763,464 shares in 2018 and 2017	**174,762**	174,762
Additional paid-in capital	**404,389**	401,386
Legal reserve (Note 13)	**67,116**	66,879
Retained earnings (Note 13)	**3,508,908**	3,429,312
Accumulated other comprehensive income (loss) (Note 14)	**(269,071)**	(143,228)
Treasury stock, at cost; 254,013,641shares in 2018 and 254,007,681shares in 2017	**(1,058,502)**	(1,058,481)
Total Canon Inc. shareholders' equity	**2,827,602**	2,870,630
Noncontrolling interests	**190,311**	225,545
Total equity	**3,017,913**	3,096,175
Total liabilities and equity	**4,899,465**	5,198,291

See accompanying Notes to Consolidated Financial Statements.

CONSOLIDATED STATEMENTS OF INCOME

Canon Inc. and Subsidiaries
Years ended December 31, 2018, 2017 and 2016

	Millions of yen		
	2018	2017	2016
Net sales (Note 15)			
Products and Equipment	**3,194,724**	3,521,156	2,986,188
Services	**757,213**	558,859	415,299
	3,951,937	4,080,015	3,401,487
Cost of sales (Notes 5, 8, 11, 15 and 19)			
Products and Equipment	**1,762,171**	1,875,581	1,574,679
Services	**354,212**	213,880	154,810
	2,116,383	2,089,461	1,729,489
Gross profit	**1,835,554**	1,990,554	1,671,998
Operating expenses (Notes 1, 5, 8, 11, 15, 16, 19 and 21):			
Selling, general and administrative expenses	**1,176,760**	1,301,666	1,149,036
Research and development expenses	**315,842**	333,371	306,537
Impairment losses on goodwill	**—**	33,912	—
	1,492,602	1,668,949	1,455,573
Operating profit	**342,952**	321,605	216,425
Other income (deductions):			
Interest and dividend income	**6,604**	6,012	4,762
Interest expense	**(797)**	(818)	(1,061)
Other, net (Notes 1, 2, 11, 14 and 18)	**14,133**	27,085	24,525
	19,940	32,279	28,226
Income before income taxes	**362,892**	353,884	244,651
Income taxes (Note 12)	**96,150**	98,024	82,681
Consolidated net income	**266,742**	255,860	161,970
Less: Net income attributable to noncontrolling interests	**13,987**	13,937	11,320
Net income attributable to Canon Inc.	**252,755**	241,923	150,650
	Yen		
Net income attributable to Canon Inc. shareholders per share (Note 17):			
Basic	**234.09**	222.88	137.95
Diluted	**234.08**	222.88	137.95
Cash dividends per share	**160.00**	160.00	150.00

See accompanying Notes to Consolidated Financial Statements.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

Canon Inc. and Subsidiaries
Years ended December 31, 2018, 2017 and 2016

	Millions of yen		
	2018	2017	2016
Consolidated net income	**266,742**	255,860	161,970
Other comprehensive income (loss), net of tax (Note 14):			
Foreign currency translation adjustments	**(93,146)**	47,090	(107,666)
Net unrealized gains and losses on securities	**(141)**	(9,362)	997
Net gains and losses on derivative instruments	**488**	2,588	(2,948)
Pension liability adjustments	**(30,570)**	21,207	(70,355)
	(123,369)	61,523	(179,972)
Comprehensive income (loss)	**143,373**	317,383	(18,002)
Less: Comprehensive income attributable to noncontrolling interests	**6,918**	18,807	1,745
Comprehensive income (loss) attributable to Canon Inc.	**136,455**	298,576	(19,747)

See accompanying Notes to Consolidated Financial Statements.

CONSOLIDATED STATEMENTS OF EQUITY

Canon Inc. and Subsidiaries
Years ended December 31, 2018, 2017 and 2016

	Millions of yen								
	Common stock	Additional paid-in capital	Legal reserve	Retained earnings	Accumulated other comprehensive income (loss)	Treasury stock	Total Canon Inc. shareholders' equity	Non-controlling interests	Total equity
Balance at December 31, 2015	174,762	401,358	65,289	3,365,158	(29,742)	(1,010,410)	2,966,415	218,048	3,184,463
Equity transactions with noncontrolling interests and other		27			258		285	(5,270)	(4,985)
Dividends to Canon Inc. shareholders				(163,810)			(163,810)		(163,810)
Dividends to noncontrolling interests								(4,077)	(4,077)
Acquisition of subsidiaries								1,047	1,047
Transfer to legal reserve			1,269	(1,269)			—		—
Comprehensive income:									
Net income				150,650			150,650	11,320	161,970
Other comprehensive income (loss), net of tax (Note 14):									
Foreign currency translation adjustments					(101,257)		(101,257)	(6,409)	(107,666)
Net unrealized gains and losses on securities					1,196		1,196	(199)	997
Net gains and losses on derivative instruments					(2,924)		(2,924)	(24)	(2,948)
Pension liability adjustments					(67,412)		(67,412)	(2,943)	(70,355)
Total comprehensive income (loss)							(19,747)	1,745	(18,002)
Repurchases and reissuance of treasury stock				(1)		(13)	(14)		(14)
Balance at December 31, 2016	174,762	401,385	66,558	3,350,728	(199,881)	(1,010,423)	2,783,129	211,493	2,994,622
Equity transactions with noncontrolling interests and other		1					1	(1)	—
Dividends to Canon Inc. shareholders				(162,887)			(162,887)		(162,887)
Dividends to noncontrolling interests								(4,814)	(4,814)
Acquisition of subsidiaries								60	60
Transfer to legal reserve			321	(321)			—		—
Comprehensive income:									
Net income				241,923			241,923	13,937	255,860
Other comprehensive income (loss), net of tax (Note 14):									
Foreign currency translation adjustments					44,168		44,168	2,922	47,090
Net unrealized gains and losses on securities					(9,767)		(9,767)	405	(9,362)
Net gains and losses on derivative instruments					2,562		2,562	26	2,588
Pension liability adjustments					19,690		19,690	1,517	21,207
Total comprehensive income (loss)							298,576	18,807	317,383
Repurchases of treasury stock						(50,036)	(50,036)		(50,036)
Reissuance of treasury stock				(131)		1,978	1,847		1,847
Balance at December 31, 2017	174,762	401,386	66,879	3,429,312	(143,228)	(1,058,481)	2,870,630	225,545	3,096,175
Cumulative effects of accounting standard update—adoption of ASU No.2014-09				(106)			(106)	(76)	(182)
Cumulative effects of accounting standard update—adoption of ASU No. 2016-01				5,343	(5,343)		—	—	—
Equity transactions with noncontrolling interests and other		3,003			(4,200)		(1,197)	(36,518)	(37,715)
Dividends to Canon Inc. shareholders				(178,159)			(178,159)		(178,159)
Dividends to noncontrolling interests								(5,558)	(5,558)
Transfers to legal reserve			237	(237)			—		—
Comprehensive income:									
Net income				252,755			252,755	13,987	266,742
Other comprehensive income (loss), net of tax (Note 14):									
Foreign currency translation adjustments					(89,823)		(89,823)	(3,323)	(93,146)
Net unrealized gains and losses on securities					(141)		(141)	—	(141)
Net gains and losses on derivative instruments					488		488	—	488
Pension liability adjustments					(26,824)		(26,824)	(3,746)	(30,570)
Total comprehensive income (loss)							136,455	6,918	143,373
Repurchases of treasury stock						(25)	(25)		(25)
Reissuance of treasury stock				0		4	4		4
Balance at December 31, 2018	174,762	404,389	67,116	3,508,908	(269,071)	(1,058,502)	2,827,602	190,311	3,017,913

See accompanying Notes to Consolidated Financial Statements.

CONSOLIDATED STATEMENTS OF CASH FLOWS

Canon Inc. and Subsidiaries
Years ended December 31, 2018, 2017 and 2016

	Millions of yen		
	2018	2017	2016
Cash flows from operating activities:			
Consolidated net income	**266,742**	255,860	161,970
Adjustments to reconcile consolidated net income to net cash provided by operating activities:			
Depreciation and amortization	**251,554**	261,881	250,096
Loss on disposal of fixed assets	**5,726**	6,935	5,203
Equity in earnings of affiliated companies	**(1,414)**	(1,196)	(890)
Impairment losses on goodwill (Notes 8 and 21)	**—**	33,912	—
Gain on securities contributed to retirement benefit trust (Note 2)	**—**	(17,836)	—
Deferred income taxes	**(11,849)**	(17,603)	7,188
(Increase) decrease in trade receivables	**(17,724)**	3,563	(4,155)
(Increase) decrease in inventories	**(61,755)**	2,967	6,156
Increase (decrease) in trade payables	**(31,212)**	4,951	56,844
Increase (decrease) in accrued income taxes	**(35,284)**	46,296	(16,456)
Increase (decrease) in accrued expenses	**2,541**	18,503	(5,256)
Increase (decrease) in accrued (prepaid) pension and severance cost	**(17,738)**	522	5,489
Other, net (Note 6)	**15,706**	(8,198)	34,094
Net cash provided by operating activities	**365,293**	590,557	500,283
Cash flows from investing activities:			
Purchases of fixed assets (Note 5)	**(191,399)**	(189,484)	(206,971)
Proceeds from sale of fixed assets (Note 5)	**9,634**	26,444	6,177
Purchases of securities	**(2,311)**	(2,220)	(84)
Proceeds from sale and maturity of securities	**1,615**	970	1,181
Decrease in time deposits, net	**401**	3,373	15,414
Acquisitions of businesses, net of cash acquired (Note 7)	**(13,346)**	(6,557)	(649,570)
Other, net	**(209)**	2,464	(3,272)
Net cash used in investing activities	**(195,615)**	(165,010)	(837,125)
Cash flows from financing activities:			
Proceeds from issuance of long-term debt (Note 9)	**439**	1,570	610,552
Repayments of long-term debt (Note 9)	**(136,094)**	(126,578)	(856)
Increase (decrease) in short-term loans, net (Note 9)	**2,501**	5,628	(80,580)
Transactions with noncontrolling interests	**(37,942)**	—	(4,993)
Dividends paid	**(178,159)**	(162,887)	(163,810)
Repurchases and reissuance of treasury stock	**(21)**	(50,034)	(14)
Other, net	**(5,554)**	(8,163)	(4,607)
Net cash provided by (used in) financing activities	**(354,830)**	(340,464)	355,692
Effect of exchange rate changes on cash and cash equivalents	**(16,017)**	6,538	(22,270)
Net change in cash and cash equivalents	**(201,169)**	91,621	(3,420)
Cash and cash equivalents at beginning of year	**721,814**	630,193	633,613
Cash and cash equivalents at end of year	**520,645**	721,814	630,193
Supplemental disclosure for cash flow information:			
Cash paid during the year for:			
Interest	**749**	1,026	738
Income taxes	**131,616**	71,473	76,714

See accompanying Notes to Consolidated Financial Statements.

1. BASIS OF PRESENTATION AND SIGNIFICANT ACCOUNTING POLICIES

(a) Description of Business

Canon Inc. (the "Company") and subsidiaries (collectively "Canon") is one of the world's leading manufacturers in such fields as office products, imaging system products, medical system products and industry and other products. Office products consist mainly of office multifunction devices ("MFDs"), laser multifunction printers ("MFPs"), laser printers, digital continuous feed presses, digital sheet-fed presses, wide-format printers and document solutions. Imaging system products consist mainly of interchangeable-lens digital cameras, digital compact cameras, digital camcorders, digital cinema cameras, interchangeable lenses, compact photo printers, inkjet printers, large format inkjet printers, commercial photo printers, image scanners, multimedia projectors, broadcast equipment and calculators. Medical system products consist mainly of digital radiography systems, diagnostic X-ray systems, computed tomography ("CT") systems, magnetic resonance imaging ("MRI") systems, diagnostic ultrasound systems, clinical chemistry analyzers and ophthalmic equipment. Industry and other products consist mainly of semiconductor lithography equipment, FPD (Flat panel display) lithography equipment, vacuum thin-film deposition equipment, organic LED ("OLED") panel manufacturing equipment, die bonders, micromotors, network cameras, handy terminals and document scanners. Sales are made principally under the Canon brand name, almost entirely through sales subsidiaries. These subsidiaries are responsible for marketing and distribution, and primarily sell to retail dealers in their geographic area. Further segment information is described in Note 22.

Canon sells laser printers on an OEM basis to HP Inc.; such sales constituted 13.6%, 13.1% and 14.8% of consolidated net sales for the years ended December 31, 2018, 2017 and 2016, respectively, and are included in the Office Business Unit.

Canon's manufacturing operations are conducted primarily at 30 plants in Japan and 18 overseas plants which are located in countries or regions such as the United States, Germany, France, the Netherlands, Taiwan, China, Malaysia, Thailand, Vietnam and Philippines.

(b) Basis of Presentation

The Company and its domestic subsidiaries maintain their books of account in conformity with financial accounting standards of Japan. Foreign subsidiaries maintain their books of account in conformity with financial accounting standards of the countries of their domicile.

Certain adjustments and reclassifications have been incorporated in the accompanying consolidated financial statements to conform with U.S. generally accepted accounting principles ("U.S. GAAP"). These adjustments were not recorded in the statutory books of account.

(c) Principles of Consolidation

The consolidated financial statements include the accounts of the Company, its majority owned subsidiaries and those variable interest entities where the Company or its consolidated subsidiaries are the primary beneficiaries. All significant intercompany balances and transactions have been eliminated.

(d) Use of Estimates

The preparation of the consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the period. Significant estimates and assumptions are reflected in valuation and disclosure of accounts including: revenue recognition, allowance for doubtful receivables, inventories, long-lived assets, goodwill and other intangible assets with indefinite useful lives, environmental liabilities, deferred tax assets, uncertain tax positions and employee retirement and severance benefit obligations. Actual results could differ materially from those estimates.

(e) Translation of Foreign Currencies

Assets and liabilities of the Company's subsidiaries located outside Japan with functional currencies other than Japanese yen are translated into Japanese yen at the rates of exchange in effect at the balance sheet date. Income and expense items are translated at the average exchange rates prevailing during the year. Gains and losses resulting from translation of financial statements are excluded from earnings and are reported in other comprehensive income (loss).

Gains and losses resulting from foreign currency transactions, including foreign exchange contracts, and translation of assets and liabilities denominated in foreign currencies are included in other income (deductions) in the consolidated statements of income. Foreign currency exchange gains and losses were net losses of ¥6,044 million, ¥9,775 million and ¥2 million for the years ended December 31, 2018, 2017 and 2016, respectively.

(f) Cash Equivalents

All highly liquid investments acquired with original maturities of three months or less are considered to be cash equivalents. Certain debt securities with original maturities of less than three months, classified as available-for-sale securities of ¥70,500 million at December 31, 2018 and 2017, respectively, are included in cash and cash equivalents in the consolidated balance sheets.

(g) Investments

Investments consist primarily of time deposits with original maturities of more than three months, debt and equity securities and investments in affiliated companies.

Canon classifies investments in debt securities as available-for-sale securities. Canon does not hold any trading securities which are bought and held primarily for the purpose of sale in the near term, or any held-to-maturity securities. Canon reports investments with maturities of less than one year as short-term investments.

Available-for-sales debt securities and equity securities with readily determinable fair value that are not accounted for under the equity method are recorded at fair value which is determined based on quoted market prices, projected discounted cash flows or other valuation techniques as appropriate. The changes in fair value are recognized in net income for equity securities and in other comprehensive income for available-for-sales debt securities.

Available-for-sale debt securities are regularly reviewed for other-than-temporary declines in the carrying amount based on criteria that include the length of time and the extent to which the market value has been less than cost, the financial condition and near-term prospects of the issuer and Canon's intent and ability to retain the investment for a period of time sufficient to allow for any anticipated recovery in market value. For available-for-sale securities for which the declines are deemed to be other-than-temporary and there is no intent to sell, the impairment are separated into the amount related to credit loss, which is recognized in earnings and the amount related to all other factors is recognized in other comprehensive income (loss). For available-for-sale securities for which the declines are deemed to be other-than-temporary and there is an intent to sell, the impairments in their entirety are recognized in earnings. Canon recognizes an impairment loss to the extent by which the cost basis of the investment exceeds the fair value of the investment.

Canon measures non-marketable equity securities without readily determinable fair value at cost, minus impairment, if any, plus or minus changes resulting from observables price changes in orderly transactions for the identical or a similar investment of the same issuer.

Realized gains and losses are determined by the average cost method and reflected in earnings.

Investments in affiliated companies over which Canon has the ability to exercise significant influence, but does not hold a controlling financial interest, are accounted for by the equity method.

(h) Allowance for Doubtful Receivables

Allowance for doubtful trade and finance receivables is maintained for all customers based on a combination of factors, including aging analysis, macroeconomic conditions and historical experience. An additional reserve for individual accounts is recorded when Canon becomes aware of a customer's inability to meet its financial obligations, such as in the case of bankruptcy filings. If circumstances related to customers change, estimates of the recoverability of receivables would be further adjusted. When all collection options are exhausted including legal recourse, the accounts or portions thereof are deemed to be uncollectable and charged against the allowance.

(i) Inventories

Inventories are stated at the lower of cost or net realizable value. Cost is determined by the average method for domestic inventories and principally by the first-in, first-out method for overseas inventories.

(j) Impairment of Long-Lived Assets

Long-lived assets, such as property, plant and equipment, and acquired intangible assets subject to amortization, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability of assets to be held and used is measured by a comparison of the carrying amount of the asset and the estimated undiscounted future cash flows expected to be generated by the asset. If the carrying amount of the asset exceeds its estimated undiscounted future cash flows, an impairment charge is recognized in the amount by which the carrying amount of the asset exceeds the fair value of the asset. Assets to be disposed of by sale are reported at the lower of the carrying amount or fair value less costs to sell, and are no longer depreciated.

(k) Property, Plant and Equipment

Property, plant and equipment are stated at cost. Depreciation is calculated principally by the declining-balance method, except for certain assets which are depreciated by the straight-line method over the estimated useful lives of the assets.

The depreciation period ranges from 3 years to 60 years for buildings and 1 year to 20 years for machinery and equipment.

Assets leased to others under operating leases are stated at cost and depreciated to the estimated residual value of the assets by the straight-line method over the lease term, generally from 2 years to 5 years.

(l) Goodwill and Other Intangible Assets

Goodwill and other intangible assets with indefinite useful lives are not amortized, but are instead tested for impairment annually in the fourth quarter of each year, or more frequently if indicators of potential impairment exist. All goodwill is assigned to the reporting unit or units that benefit from the synergies arising from each business combination. If the carrying amount assigned to the reporting unit exceeds the fair value of the reporting unit, Canon recognizes an impairment charge in an amount equal to that excess, limited to the total amount of goodwill allocated to that reporting unit.

Intangible assets with finite useful lives consist primarily of software, trademarks, patents and developed technology, license fees and customer relationships, which are amortized using the straight-line method. The estimated useful lives of software are from 3 years to 7 years, trademarks are 15 years, patents and developed technology are from 7 years to 17 years, license fees are 7 years, and customer relationships are from 11 years to 15 years, respectively. Certain costs incurred in connection with developing or obtaining internal-use software are capitalized. These costs consist primarily of payments made to third parties and the salaries of employees working on such software development. Costs incurred in connection with developing internal-use software are capitalized at the application development stage. In addition, Canon develops or obtains certain software to be sold where related costs are capitalized after establishment of technological feasibility.

(m) Environmental Liabilities

Liabilities for environmental remediation and other environmental costs are accrued when environmental assessments or remedial efforts are probable and the costs can be reasonably estimated. Such liabilities are adjusted as further information develops or circumstances change. Costs of future obligations are not discounted to their present values.

(n) Income Taxes

Deferred tax assets and liabilities are recognized for the estimated future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date. Canon records a valuation allowance to reduce the deferred tax assets to the amount that is more likely than not realizable.

Canon recognizes the financial statement effects of tax positions when it is more likely than not, based on the technical merits, that the tax positions will be sustained upon examination by the tax authorities. Benefits from tax positions that meet the more-likely-than-not recognition threshold are measured at the largest amount of benefit that is greater than 50% likely of being realized upon settlement. Interest and penalties accrued related to unrecognized tax benefits are included in income taxes in the consolidated statements of income.

(o) Stock-Based Compensation

Canon measures stock-based compensation cost at the grant date, based on the fair value of the award, and recognizes the cost on a straight-line basis over the requisite service period, which is the vesting period.

(p) Net Income Attributable to Canon Inc. Shareholders per Share

Basic net income attributable to Canon Inc. shareholders per share is computed by dividing net income attributable to Canon Inc. by the weighted-average number of common shares outstanding during each year. Diluted net income attributable to Canon Inc. shareholders per share includes the effect from potential issuances of common stock based on the assumptions that all stock options were exercised.

(q) Revenue Recognition

Canon generates revenue principally through the sale of office, imaging system and medical system products, industrial equipment, supplies and related services under separate contractual arrangements. Revenue is recognized when, or as, control of promised goods or services transfers to customers in an amount that reflects the consideration to which Canon expects to be entitled in exchange for transferring these goods or services. For further information, please refer to Note 15.

(r) Research and Development Costs

Research and development costs are expensed as incurred.

(s) Advertising Costs

Advertising costs are expensed as incurred. Advertising expenses were ¥58,729 million, ¥61,207 million and ¥58,707 million for the years ended December 31, 2018, 2017 and 2016, respectively.

(t) Shipping and Handling Costs

Shipping and handling costs totaled ¥54,844 million, ¥52,953 million and ¥44,296 million for the years ended December 31, 2018, 2017 and 2016, respectively, and are included in selling, general and administrative expenses in the consolidated statements of income.

(u) Derivative Financial Instruments

All derivatives are recognized at fair value and are included in prepaid expenses and other current assets, or other current liabilities in the consolidated balance sheets.

Canon uses and designates certain derivatives as a hedge of a forecasted transaction or the variability of cash flows to be received or paid related to a recognized asset or liability ("cash flow" hedge). Canon formally documents all relationships between hedging instruments and hedged items, as well as its risk-management objective and strategy for undertaking various hedge transactions. Canon also formally assesses, both at the hedge's inception and on an ongoing basis, whether the derivatives that are used in hedging transactions are highly effective in offsetting changes in cash flows of hedged items. When it is determined that a derivative is not highly effective as a hedge or that it has ceased to be a highly effective hedge, Canon discontinues hedge accounting prospectively. Changes in the fair value of a derivative that is designated and qualifies as a cash flow hedge are recorded in other comprehensive income (loss), until earnings are affected by the variability in cash flows of the hedged item. Gains and losses from hedging ineffectiveness are included in other income (deductions). Gains and losses related to the components of hedging instruments excluded from the assessment of hedge effectiveness are included in other income (deductions).

Canon also uses certain derivative financial instruments which are not designated as hedges. The changes in fair values of these derivative financial instruments are immediately recorded in earnings.

Canon classifies cash flows from derivatives as cash flows from operating activities in the consolidated statements of cash flows.

(v) Guarantees

Canon recognizes, at the inception of a guarantee, a liability for the fair value of the obligation it has undertaken in issuing guarantees.

(w) Recent Accounting Guidance

Recently adopted accounting guidance

In May 2014, the Financial Accounting Standards Board (“FASB”) issued Accounting Standards Update (“ASU”) No. 2014-09, Revenue from Contracts with Customers (Topic 606) Section C – Background Information and Basis for Conclusions, which is a new accounting standard related to revenue from contracts with customers, as amended. (Accounting Standards Codification (“ASC”) 606) This standard requires an entity to recognize revenue when promised goods or services are transferred to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. Canon adopted this standard from the quarter beginning January 1, 2018 with modified retrospective method of adoption to contracts that were not completed as of the adoption. The cumulative-effects to the retained earnings and the impact on the consolidated result of operations for the year ended December 31, 2018 from the adoption of this standard were not material. For further information, please refer to Note 15.

In January 2016, the FASB issued ASU No. 2016-01, Financial Instruments – Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities, which addresses certain aspects of recognition, measurement, presentation, and disclosure of financial instruments. This guidance includes the requirement that equity investments that do not result in consolidation and are not accounted for under the equity method be measured at fair value with changes in the fair value recognized in net income. Canon adopted this standard from the quarter beginning January 1, 2018, and Canon recognized a cumulative-effect adjustment to retained earnings of ¥5,343 million as of January 1, 2018 for the unrealized gains, net of tax, on available-for-sale equity securities previously recognized in accumulated other comprehensive income.

In October 2016, the FASB issued ASU No. 2016-16, Income Taxes (Topic 740): Intra-entity Transfers of Assets other than Inventory, which requires an entity to recognize the income tax consequences of an intra-entity transfer of an asset other than inventory when the transfer occurs. Consequently, the amendments in this guidance eliminate the exception for an intra-entity transfer of an asset other than inventory. Two common examples of assets included in the scope of this guidance are intellectual property and property, plant, and equipment. The amendments in this guidance should be applied on a modified retrospective basis through a cumulative effect adjustment directly to retained earnings as of the beginning of the period of adoption. Canon adopted this standard from the quarter beginning January 1, 2018. The adoption of this guidance did not have a material impact on its consolidated results of operation and financial condition.

In March 2017, the FASB issued ASU No. 2017-07, Compensation – Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost, which requires an entity to disaggregate the service cost component from the other components of net benefit cost and present it in the same line item or items as other compensation costs arising from services rendered by the pertinent employees during the period. The other components of net benefit cost are required to be presented separately from the service cost component, such as in other income (deductions) in the income statement. The amendments also allow only the service cost component to be eligible for capitalization (for example, as a cost of internally manufactured inventory). The amendments were to be applied retrospectively for the presentation of the service cost component and the other components of net benefit cost, and prospectively for the capitalization of the service cost component of net benefit cost. Canon adopted this guidance from the quarter beginning January 1, 2018. The adoption of the new presentation requirement of the service cost component and the other components of net benefit cost resulted in reclassification of ¥2,137 million and ¥1,835 million from cost of sales, ¥4,419 million and ¥4,161 million from selling, general and administrative expenses and ¥3,318 million and ¥6,445 million from research and development expenses into other income (deductions) for the years ended December 31, 2017 and 2016, respectively. Please refer to Note 11 for additional information. The adoption of the capitalization of the service cost component of net benefit cost did not have a material impact on its consolidated results of operations and financial condition.

Recently issued accounting guidance not yet adopted

In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842) Section A – Leases: Amendments to the FASB Accounting Standards Codification, which requires lessees to recognize most leases on their balance sheets but recognize expenses on their income statements in a manner similar to the current guidance. For lessors, the standard modifies the classification criteria and the accounting for sales-type and direct financing leases. FASB also modified the definition of lease. Additionally, the guidance expands qualitative and quantitative disclosures related to lease. The guidance is effective for annual reporting periods beginning after December 15, 2018. Canon applies the guidance from the quarter beginning after January 1, 2019. Canon applies the package of practical expedients that allows us not to reassess whichever any existing contracts at or expired contracts prior to the adoption date are or contain leases, lease classification and whichever initial direct costs qualify for capitalization, in addition to short term lease exception. Canon also adopts the transition method which no restatement of comparative periods and no reassessment of land easements not previously accounted for as a lease that exist at or expired prior to the adoption date are required. The right of use assets for operating leases recognized at January 1, 2019 is ¥125,649 million almost same as the lease obligations and are included in noncurrent assets and liabilities in the accompanying consolidated balance sheets. Canon does not expect the adoption of this guidance such as the modification the definition of lease and the changes in lessor accounting to have material impact on its consolidated results of operation.

In August 2017, the FASB issued ASU No. 2017-12, Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities, which amends existing guidance to simplify the application of the hedge accounting in certain situations and enable an entity to better portray the economic results of an entity's risk management activities in its financial statements. This guidance eliminates the requirement to separately measure and report hedge ineffectiveness, and requires an entity to present the earnings effect of the hedging instrument in the same income statement line item which the earnings effect of the hedged item is reported. The amendments in this guidance should be applied on a modified retrospective basis through a cumulative effect adjustment directly to retained earnings as of the beginning of the period of adoption. This guidance is effective for Canon from the quarter beginning January 1, 2019. Gains and losses resulting from derivative financial instruments designated as cash flow hedges associated with forecasted intercompany sales, which are currently included in other income (deductions) in the consolidated statements of income, will be included in net sales after the adoption of this guidance. Canon does not expect other material impacts from the adoption on its consolidated results of operation and financial condition.

2. INVESTMENTS

The cost, gross unrealized holding gains, gross unrealized holding losses and fair value for available-for-sale debt securities and equity securities included in short-term investments and investments by major security type at December 31, 2018 and 2017 are as follows:

December 31 Millions of yen	Cost	Gross unrealized holding gains	Gross unrealized holding losses	Fair value
2018: Current:				
Corporate bonds	**630**	**—**	**—**	**630**
	630	**—**	**—**	**630**

Millions of yen	Cost	Gross unrealized holding gains	Gross unrealized holding losses	Fair value
2017: Current:				
Corporate bonds	1,222	—	—	1,222
	1,222	—	—	1,222
Noncurrent:				
Government bonds	305	—	16	289
Corporate bonds	640	182	—	822
Fund trusts*	122	2	—	124
Equity securities*	10,965	11,612	1,676	20,901
	12,032	11,796	1,692	22,136

* After the adoption of ASU No. 2016-01, equity investments are measured at fair value with changes in the fair value recognized in net income from the quarter beginning January 1, 2018.

Maturities of available-for-sale debt securities included in short-term investments in the accompanying consolidated balance sheet are as follows at December 31, 2018:

	Millions of yen	
	Cost	Fair value
Due within one year	**630**	**630**
	630	**630**

The unrealized and realized gains and losses related to debt securities were not significant for the years ended December 31, 2018, 2017 and 2016, respectively.

The unrealized and realized gains and losses related to equity securities for the year ended December 31, 2018 are as follows:

Years ended December 31, 2018	Millions of yen
Net gains and (losses) recognized during the period on equity securities	**(6,092)**
Less: Net gains and (losses) recognized during the period on equity securities sold during the period	**675**
Unrealized gains and (losses) recognized during the period on equity securities still held at December 31	**(6,767)**

Gross realized gains related to equity securities were ¥18,514 million and ¥750 million for the years ended December 31, 2017 and 2016, respectively. Gross realized losses, including write-downs for impairments that were other-than-temporary, were ¥42 million and ¥1,032 million for the years ended December 31, 2017, 2016, respectively.

During the year ended December 31, 2017, Canon contributed certain marketable equity securities, not including those of its subsidiaries and affiliated companies, to an established employee retirement benefit trust, with no cash proceeds there on. The fair value of those securities at the time of contribution was ¥30,473 million. Upon contribution of those available-for-sale securities, the unrealized gains amounting to ¥17,836 million were realized and were included in "Other, net" in the consolidated statements of income.

The carrying amount of non-marketable equity securities without readily determinable fair value totaled ¥4,629 million at December 31, 2018. Aggregate cost of non-marketable equity securities accounted for under the cost method totaled ¥3,760 million at December 31, 2017. The impairment or other adjustments resulting from observable price changes recorded during the year ended December 31, 2018 and 2017 were not significant.

Time deposits with original maturities of more than three months are ¥326 million and ¥743 million at December 31, 2018 and 2017, respectively, and are included in short-term investments in the accompanying consolidated balance sheets.

Investments in affiliated companies accounted for by the equity method amounted to ¥21,312 million and ¥20,496 million at December 31, 2018 and 2017, respectively. Canon's share of the net earnings in affiliated companies accounted for by the equity method, included in other income (deductions), were earnings of ¥1,414 million, ¥1,196 million and ¥890 million for the years ended December 31, 2018, 2017 and 2016 respectively.

3. TRADE RECEIVABLES

Trade receivables are summarized as follows:

December 31	Millions of yen	
	2018	2017
Notes	**29,878**	37,077
Accounts	**594,552**	627,173
	624,430	664,250
Less allowance for doubtful receivables	**(11,477)**	(13,378)
	612,953	650,872

4. INVENTORIES

Inventories are summarized as follows:

December 31	Millions of yen	
	2018	2017
Finished goods	**393,820**	377,632
Work in process	**165,003**	144,251
Raw materials	**52,458**	48,150
	611,281	570,033

5. PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment are stated at cost less accumulated depreciation and are summarized as follows:

December 31	Millions of yen	
	2018	2017
Land	**272,443**	274,551
Buildings	**1,629,927**	1,638,202
Machinery and equipment	**1,793,499**	1,804,982
Construction in progress	**67,045**	46,940
	3,762,914	3,764,675
Less accumulated depreciation	**(2,671,922)**	(2,638,055)
	1,090,992	1,126,620

Depreciation expenses for the years ended December 31, 2018, 2017 and 2016 were ¥175,771 million, ¥189,712 million and ¥199,133 million, respectively.

Amounts due for purchases of property, plant and equipment were ¥32,433 million and ¥23,432 million at December 31, 2018 and 2017, respectively, and are included in other current liabilities in the accompanying consolidated balance sheets. Fixed assets presented in the consolidated statements of cash flows include property, plant and equipment and intangible assets.

6. FINANCE RECEIVABLES AND OPERATING LEASES

Finance receivables represent financing leases which consist of sales-type leases and direct-financing leases resulting from the sales of Canon's and complementary third-party products. These receivables typically have terms ranging from 1 year to 7 years. The components of the finance receivables, which are included in prepaid expenses and other current assets, and other assets in the accompanying consolidated balance sheets, are as follows:

December 31	Millions of yen	
	2018	2017
Total minimum lease payments receivable	**351,198**	361,686
Unguaranteed residual values	**12,661**	15,055
Executory costs	**(2,112)**	(2,216)
Unearned income	**(31,007)**	(32,286)
	330,740	342,239
Less allowance for credit losses	**(2,675)**	(2,681)
	328,065	339,558
Less current portion	**(111,629)**	(120,186)
	216,436	219,372

The activity in the allowance for credit losses is as follows:

Years ended December 31	Millions of yen	
	2018	2017
Balance at beginning of year	**2,681**	2,325
Charge-offs	**(1,284)**	(1,523)
Provision	**938**	1,436
Translation adjustments and other	**340**	443
Balance at end of year	**2,675**	2,681

Canon has policies in place to ensure that its products are sold to customers with an appropriate credit history, and continuously monitors its customers' credit quality based on information including length of period in arrears, macroeconomic conditions, initiation of legal proceedings against customers and bankruptcy filings. The allowance for credit losses of finance receivables are evaluated collectively based on historical experience of credit losses. An additional reserve for individual accounts is recorded when Canon becomes aware of a customer's inability to meet its financial obligations, such as in the case of bankruptcy filings. Finance receivables which are past due or individually evaluated for impairment at December 31, 2018 and 2017 are not significant.

The cost of equipment leased to customers under operating leases included in property, plant and equipment, net at December 31, 2018 and 2017 was ¥120,457 million and ¥103,078 million, respectively. Accumulated depreciation on equipment under operating leases at December 31, 2018 and 2017 was ¥82,698 million and ¥78,307 million, respectively.

The following is a schedule by year of the future minimum lease payments to be received under financing leases and noncancelable operating leases at December 31, 2018.

Year ending December 31:	Millions of yen	
	Financing leases	Operating leases
2019	127,068	9,207
2020	98,772	6,409
2021	66,719	2,917
2022	37,181	1,202
2023	14,792	317
Thereafter	6,666	60
	351,198	20,112

Canon has a syndication arrangement to sell its entire interests in finance receivables to a third-party financial institution. The transactions under the arrangement are accounted for as sales in accordance with ASC 860 "Transfers and Servicing." The finance receivables sold and derecognized from its consolidated balance sheet was ¥21,909 million during the year ended December 31, 2018 and the amount remained uncollected was ¥22,956 million as of December 31, 2018. This amount includes uncollected finance receivables which were sold before 2018. Cash proceeds from the transaction are included in other, net under the cash flow from operating activities in the consolidated statement of cash flows. Canon continues to provide collection and administrative services for the financial institution. The amount associated with the servicing liability measured at fair value was not material as of December 31, 2018. Canon also retains limited recourse obligations which cover credit defaults. The recourse obligation was not material as of December 31, 2018.

There were no significant transfers of finance receivables for the years ended December 31, 2017 and 2016.

7. ACQUISITIONS

On March 17, 2016, Canon entered into a Shares and Other Securities Transfer Agreement with Toshiba Corporation and acquired the share options for consideration of cash to acquire all the ordinary shares of Toshiba Medical Systems Corporation which was renamed as Canon Medical Systems Corporation ("CMSC"), as of January 4, 2018, which was exercisable upon the clearances of necessary competition regulatory authorities. As such clearances were obtained, Canon exercised the share options and acquired all the ordinary shares of CMSC on December 19, 2016. The acquisition date was December 19, 2016 and the purchase price was ¥665,498 million, which approximates the fair value at that date.

The acquisition was accounted for using the acquisition method of accounting. Acquisition-related costs were expensed as incurred and were not material.

Under Phase V of the Excellent Global Corporation Plan, a five-year initiative that Canon has been implementing since 2016, "embracing the challenge of new growth through a grand strategic transformation" has been set as a basic policy. With regard to "strengthening and growing new businesses, and creating future businesses," a particularly important strategy, Canon intends to develop medical system business within the realm of "safety and security," as a next-generation pillar of growth.

CMSC is one of the leading global companies in the medical equipment industry. Within the field of medical X-ray computed tomography systems in particular, CMSC is the overwhelming market share leader in Japan and has been steadily increasing its global market share. By maximizing the combination of both companies' management resources, Canon aims to solidify its business foundation for medical system that can contribute to the world.

The purchase price allocation was based on estimated fair values of the assets acquired and liabilities assumed at acquisition date. Since the acquisition date of CMSC was near the balance sheet date in 2016, and CMSC is composed of various entities located around the world, the purchase price allocation was preliminary at December 31, 2016. The purchase price allocation was finalized in the fourth quarter of 2017. The certain underlying inputs for inventories and intangible assets have been updated during the measurement period.

The following table summarizes the estimated fair values of the assets acquired and liabilities assumed at acquisition date.

Millions of yen	Preliminary	Measurement Period Adjustment	Final
Cash and cash equivalents	25,301	—	25,301
Other current assets	169,545	(1,962)	167,583
Intangible assets	227,500	627	228,127
Other noncurrent assets	42,975	—	42,975
Total assets acquired	465,321	(1,335)	463,986
Current liabilities	199,223	(877)	198,346
Noncurrent liabilities	92,231	(1,049)	91,182
Total liabilities assumed	291,454	(1,926)	289,528
Noncontrolling interest	1,047	—	1,047
Net identifiable assets acquired	172,820	591	173,411
Goodwill	492,678	(591)	492,087
Net assets acquired	665,498	—	665,498

Intangible assets acquired, which are subject to amortization, mainly consist of customer relationships of ¥143,600 million, and patents and developed technology of ¥73,000 million. Canon has estimated the amortization period for the customer relationships, and patents and developed technology to be 15 years and 10 years, respectively. The weighted average amortization period for all intangible assets is approximately 13 years.

Goodwill recorded is attributable primarily to expected synergies from combining operations of CMSC and Canon, such as accelerating entry into new fields, further improvement in quality through shared production technology and expanding business domains through the enhancement of R&D capabilities. None of the goodwill is expected to be deductible for tax purposes.

Canon acquired businesses other than that described above during the years ended December 31, 2018 and 2017 that were not material to its consolidated financial statements.

8. GOODWILL AND OTHER INTANGIBLE ASSETS

Intangible assets subject to amortization acquired during the year ended December 31, 2018, including those recorded from businesses acquired, totaled ¥48,004 million, which primarily consist of software of ¥36,859 million, and patent and developed technology of ¥6,109 million. The weighted average amortization periods for intangible assets in total acquired during the year ended December 31, 2018 are approximately 6 years. The weighted average amortization periods for software, and patent and developed technology acquired during the year ended December 31, 2018 are approximately 5 years and 11 years, respectively.

Intangible assets subject to amortization acquired during the year ended December 31, 2017, including those recorded from businesses acquired, totaled ¥35,112 million, which primarily consist of software of ¥33,437 million and customer relationships of ¥1,203 million. The weighted average amortization periods for intangible assets in total acquired during the year ended December 31, 2017 are approximately 5 years. The weighted average amortization periods for software and customer relationships acquired during the year ended December 31, 2017 are approximately 5 years and 8 years, respectively.

The components of intangible assets subject to amortization at December 31, 2018 and 2017 were as follows:

December 31 Millions of yen	2018 Gross carrying amount	2018 Accumulated amortization	2017 Gross carrying amount	2017 Accumulated amortization
Software	**362,130**	**244,188**	342,322	217,654
Customer relationships	**156,679**	**27,263**	162,832	22,463
Patents and developed technology	**123,831**	**36,029**	121,886	27,085
Trademarks	**44,449**	**12,062**	48,823	9,890
License fees	**16,071**	**6,461**	13,565	6,375
Other	**19,319**	**9,859**	18,592	8,136
	722,479	**335,862**	708,020	291,603

Aggregate amortization expense for the years ended December 31, 2018, 2017 and 2016 was ¥75,783 million, ¥72,169 million and ¥50,963 million, respectively. Estimated amortization expense for intangible assets currently held for the next five years ending December 31 is ¥68,730 million in 2019, ¥54,115 million in 2020, ¥46,067 million in 2021, ¥37,158 million in 2022, and ¥31,202 million in 2023.

Intangible assets not subject to amortization other than goodwill at December 31, 2018 and 2017 were not significant.

For management reporting purposes, goodwill is not allocated to the segments. Goodwill has been allocated to its respective segment for impairment testing.

The changes in the carrying amount of goodwill by segment for the years ended December 31, 2018 and 2017 were as follows:

Years ended December 31 Millions of yen	Office	Imaging System	Medical System	Industry and Others	Unallocated	Total
2018: Goodwill -gross	**135,125**	**52,561**	**499,915**	**283,577**	**—**	**971,178**
Accumulated impairment losses	**(22,069)**	**—**	**—**	**(12,387)**	**—**	**(34,456)**
Balance at beginning of year	**113,056**	**52,561**	**499,915**	**271,190**	**—**	**936,722**
Goodwill acquired during the year	**—**	**—**	**1,521**	**6,106**	**—**	**7,627**
Translation adjustments and other	**(5,966)**	**(3,891)**	**(540)**	**(25,441)**	**—**	**(35,838)**
Goodwill -gross	**127,860**	**48,670**	**500,896**	**263,513**	**—**	**940,939**
Accumulated impairment losses	**(20,770)**	**—**	**—**	**(11,658)**	**—**	**(32,428)**
Balance at end of year	**107,090**	**48,670**	**500,896**	**251,855**	**—**	**908,511**

Years ended December 31 Millions of yen	Office	Imaging System	Medical System	Industry and Others	Unallocated*1	Total
2017: Balance at beginning of year*3	124,993	49,034	—	269,719	492,678	936,424
Goodwill acquired during the year	857	236	—	2,394	—	3,487
Transfer*1	—	—	499,855	(7,177)	(492,678)	—
Impairment loss*2,3	(21,721)	—	—	(12,191)	—	(33,912)
Translation adjustments and other*3	8,927	3,291	60	18,445	—	30,723
Balance at end of year	113,056	52,561	499,915	271,190	—	936,722

*1 Canon did not complete the allocation of goodwill to the segments for impairment testing which was attributable to the acquisition of CMSC as of December 31, 2016. Based on the realignment of Canon's internal reporting and management structure, Canon newly established Medical System Business Unit effective at the beginning of the second quarter of 2017. Goodwill related to CMSC as well as goodwill related to certain medical business which was previously included in Industry and Others Business Unit have been transferred to Medical System Business Unit.

*2 After entering the commercial printing business through the acquisition of Océ N.V. in 2010, the market environment surrounding this business has become significantly competitive and rapid technological changes have required increasing investments into R&D. These factors resulted in lower operating margin than expected, which led to the decline in the estimated fair value of this business which was determined based on the income approach. As the result of the annual goodwill impairment test as of October 1, 2017, it was determined that the estimated fair value of commercial printing business was less than its carrying value of the reporting unit. Based on the accounting policy described in Note 1, Canon recognized an impairment charge of ¥33,912 million representing the excess of the carrying amount over the reporting unit's fair value.

*3 Based on the realignment of Canon's internal reporting and management structure, from the beginning of the third quarter of 2018, Canon has reclassified certain businesses from Office Business Unit to Industry and Others Business Unit. The goodwill balance at the beginning of the year ended December 31, 2017 has been restated to reflect the transfer of ¥11,263 million in goodwill between the segments. Impairment loss of ¥12,191 million and translation adjustments and other of ¥928 million for the year ended December 31, 2017 related to the reclassified business were restated from Office Business Unit to Industry and Others Business Unit, accordingly.

9. SHORT-TERM LOANS AND LONG-TERM DEBT

Short-term loans consisting of bank borrowings at December 31, 2018 and 2017 were ¥35,887 million and ¥33,398 million, respectively. The weighted average interest rate on short-term borrowings outstanding at December 31, 2018 and 2017 were 0.43% and 0.52%, respectively.

Long-term debt consisted of the following:

December 31	Millions of yen	
	2018	2017
Loan from the banks; bearing interest of 0.07% at December 31, 2018 and 0.06% at December 31, 2017*1	**360,000**	490,000
Other debt*2	**4,602**	9,168
	364,602	499,168
Less current portion	**(2,640)**	(5,930)
	361,962	493,238

*1 Canon entered into the unsecured revolving credit facility contracts expiring in December 2021. Canon prepaid ¥130,000 million of the loan with cash flows generated during the year ended December 31, 2018. The outstanding loans under the credit facilities are ¥360,000 million at a floating interest of 0.07% and Canon has no unused credit facilities as of December 31, 2018.
*2 The other debt consisted of term-loans and capital lease obligations as of December 31, 2018 and 2017.

The aggregate annual maturities of long-term debt outstanding at December 31, 2018 were as follows:

Year ending December 31:	Millions of yen
2019	2,640
2020	638
2021	360,805
2022	427
2023	82
Thereafter	10
	364,602

Both short-term and long-term bank loans are primarily made under general agreements which provide that security and guarantees for present and future indebtedness will be given upon request of the bank, and that the bank shall have the right to offset cash deposits against obligations that have become due or, in the event of default, against all obligations due to the bank.

10. TRADE PAYABLES

Trade payables are summarized as follows:

December 31	Millions of yen	
	2018	2017
Notes	**68,140**	81,002
Accounts	**284,349**	299,652
	352,489	380,654

11. EMPLOYEE RETIREMENT AND SEVERANCE BENEFITS

The Company and certain of its subsidiaries have contributory and noncontributory defined benefit pension plans covering substantially all of their employees. Benefits payable under the plans are based on employee earnings and years of service. The Company and certain of its subsidiaries also have defined contribution pension plans covering substantially all of their employees. CMSC temporarily participated in Toshiba Corporate Pension Funds (“Toshiba Funds”) after CMSC was acquired by Canon in 2016. In April 2018, CMSC established a new pension provision which provides participants an equivalent level of benefits as compared to the Toshiba Funds. As of December 31, 2018, a majority of plan participants have been transferred from the Toshiba Funds into the new pension provision. Participants who have not transferred are still part of Toshiba Funds as of December 31, 2018. Canon calculated the projected benefit obligations for the participants with Toshiba Funds based on the benefit level of Toshiba Funds and included the proportional share of the plan assets of CMSC to which they have legal right in the following tables.

Obligations and funded status

Reconciliations of beginning and ending balances of the projected benefit obligations and the fair value of the plan assets are as follows:

December 31	Japanese plans		Foreign plans	
	Millions of yen		Millions of yen	
	2018	2017	**2018**	2017
Change in benefit obligations:				
Projected benefit obligations at beginning of year	**929,630**	906,007	**423,579**	392,086
Service cost	**31,241**	30,889	**7,982**	6,962
Interest cost	**5,419**	5,689	**8,691**	8,691
Plan participants’ contributions	**—**	—	**1,535**	1,644
Actuarial (gain) loss	**(1,844)**	11,112	**(24,297)**	(1,760)
Benefits paid	**(33,477)**	(29,020)	**(10,135)**	(7,884)
Acquisition	**—**	4,239	**—**	—
Plan amendments	**(3,963)**	1,149	**3,257**	(1,069)
Curtailments and settlements	**—**	(435)	**(1,149)**	—
Foreign currency exchange rate changes	**—**	—	**(23,514)**	24,909
Projected benefit obligations at end of year	**927,006**	929,630	**385,949**	423,579
Change in plan assets:				
Fair value of plan assets at beginning of year	**735,513**	667,436	**254,020**	224,939
Actual return on plan assets	**(38,010)**	47,376	**(6,042)**	14,262
Employer contributions	**12,651**	43,468	**22,393**	7,160
Plan participants’ contributions	**—**	—	**1,535**	1,644
Benefits paid	**(27,459)**	(23,967)	**(10,135)**	(7,884)
Acquisition	**—**	1,223	**—**	—
Settlements	**—**	(23)	**(1,150)**	—
Foreign currency exchange rate changes	**—**	—	**(11,979)**	13,899
Fair value of plan assets at end of year	**682,695**	735,513	**248,642**	254,020
Funded status at end of year	**(244,311)**	(194,117)	**(137,307)**	(169,559)

Employer contributions for the year ended December 31, 2017 include contribution of equity securities to a retirement benefit trust. The fair value of those securities at the time of contribution was ¥30,473 million.

Amounts recognized in the consolidated balance sheets at December 31, 2018 and 2017 are as follows:

December 31	Japanese plans		Foreign plans	
	Millions of yen		Millions of yen	
	2018	2017	**2018**	2017
Other assets	**1,536**	1,695	**1,306**	1,215
Accrued expenses	**(679)**	—	**(992)**	(1,004)
Accrued pension and severance cost	**(245,168)**	(195,812)	**(137,621)**	(169,770)
	(244,311)	(194,117)	**(137,307)**	(169,559)

Amounts recognized in accumulated other comprehensive income (loss) at December 31, 2018 and 2017 before the effect of income taxes are as follows:

December 31	Japanese plans		Foreign plans	
	Millions of yen		Millions of yen	
	2018	2017	**2018**	2017
Actuarial loss	**267,355**	221,106	**95,121**	105,883
Prior service credit	**(48,392)**	(57,430)	**(227)**	(3,638)
	218,963	163,676	**94,894**	102,245

The accumulated benefit obligation for all defined benefit plans was as follows:

December 31	Japanese plans		Foreign plans	
	Millions of yen		Millions of yen	
	2018	2017	**2018**	2017
Accumulated benefit obligation	**893,154**	894,329	**371,653**	402,390

The projected benefit obligations and the fair value of plan assets for the pension plans with projected benefit obligations in excess of plan assets, and the accumulated benefit obligations and the fair value of plan assets for the pension plans with accumulated benefit obligations in excess of plan assets are as follows:

December 31	Japanese plans		Foreign plans	
	Millions of yen		Millions of yen	
	2018	2017	**2018**	2017
Plans with projected benefit obligations in excess of plan assets:				
Projected benefit obligations	**918,736**	924,536	**384,167**	420,383
Fair value of plan assets	**672,889**	728,724	**245,554**	249,609
Plans with accumulated benefit obligations in excess of plan assets:				
Accumulated benefit obligations	**891,204**	889,652	**369,215**	394,840
Fair value of plan assets	**670,826**	728,724	**244,826**	245,247

Components of net periodic benefit cost and other amounts recognized in other comprehensive income (loss)

Net periodic benefit cost for Canon's employee retirement and severance defined benefit plans for the years ended December 31, 2018, 2017 and 2016 consisted of the following components:

Years ended December 31	Japanese plans			Foreign plans		
	Millions of yen			Millions of yen		
	2018	2017	2016	**2018**	2017	2016
Service cost	**31,241**	30,889	29,367	**7,982**	6,962	6,816
Interest cost	**5,419**	5,689	8,238	**8,691**	8,691	8,792
Expected return on plan assets	**(21,983)**	(20,493)	(19,443)	**(12,601)**	(10,722)	(10,012)
Amortization of prior service credit	**(13,001)**	(12,860)	(13,230)	**(217)**	(83)	85
Amortization of actuarial loss	**11,900**	14,220	10,944	**5,108**	5,747	2,185
(Gain) loss on curtailments and settlements	**—**	(63)	—	**—**	—	—
	13,576	17,382	15,876	**8,963**	10,595	7,866

Service cost component of net periodic benefit cost for Canon's employee retirement and severance defined benefit plans is included in cost of sales and operating expenses in the consolidated statements of income. The components other than the service cost component are included in other, net of other income (deductions) in the consolidated statements of income.

Other changes in plan assets and benefit obligations recognized in other comprehensive income (loss) for the years ended December 31, 2018, 2017 and 2016 are summarized as follows:

Years ended December 31	Japanese plans			Foreign plans		
	Millions of yen			Millions of yen		
	2018	2017	2016	**2018**	2017	2016
Current year actuarial (gain) loss	**58,149**	(15,771)	53,076	**(5,654)**	(5,300)	47,365
Current year prior service credit	**(3,963)**	1,149	(4,734)	**3,257**	(1,069)	—
Amortization of actuarial loss	**(11,900)**	(14,220)	(10,944)	**(5,108)**	(5,747)	(2,185)
Amortization of prior service credit	**13,001**	12,860	13,230	**217**	83	(85)
Curtailments and settlements	**—**	19	—	**(63)**	—	—
	55,287	(15,963)	50,628	**(7,351)**	(12,033)	45,095

The estimated prior service credit and actuarial loss for the defined benefit pension plans that will be amortized from accumulated other comprehensive income (loss) into net periodic benefit cost over the next year are summarized as follows:

	Japanese plans	Foreign plans
	Millions of yen	Millions of yen
Prior service credit	(11,887)	(57)
Actuarial loss	15,230	4,852

Assumptions

Weighted-average assumptions used to determine benefit obligations are as follows:

December 31	Japanese plans		Foreign plans	
	2018	2017	**2018**	2017
Discount rate	**0.6%**	0.6%	**2.4%**	2.2%
Assumed rate of increase in future compensation levels	**2.6%**	2.6%	**1.9%**	1.8%

Weighted-average assumptions used to determine net periodic benefit cost are as follows:

Years ended December 31	Japanese plans			Foreign plans		
	2018	2017	2016	**2018**	2017	2016
Discount rate	**0.6%**	0.7%	1.1%	**2.2%**	2.2%	3.0%
Assumed rate of increase in future compensation levels	**2.6%**	2.6%	3.0%	**1.8%**	2.1%	2.0%
Expected long-term rate of return on plan assets	**2.9%**	3.1%	3.1%	**4.4%**	4.2%	4.4%

Canon determines the expected long-term rate of return based on the expected long-term return of the various asset categories in which it invests. Canon considers the current expectations for future returns and the actual historical returns of each plan asset category.

Plan assets

Canon's investment policies are designed to ensure adequate plan assets are available to provide future payments of pension benefits to eligible participants. Taking into account the expected long-term rate of return on plan assets, Canon formulates a "model" portfolio comprised of the optimal combination of equity securities and debt securities. Plan assets are invested in individual equity and debt securities using the guidelines of the "model" portfolio in order to produce a total return that will match the expected return on a mid-term to long-term basis. Canon evaluates the gap between expected return and actual return of invested plan assets on an annual basis to determine if such differences necessitate a revision in the formulation of the "model" portfolio. Canon revises the "model" portfolio when and to the extent considered necessary to achieve the expected long-term rate of return on plan assets.

Canon's model portfolio for Japanese plans consists of three major components: approximately 25% is invested in equity securities, approximately 50% is invested in debt securities, and approximately 25% is invested in other investment vehicles, primarily consisting of investments in life insurance company general accounts.

Outside Japan, investment policies vary by country, but the long-term investment objectives and strategies remain consistent. Canon's model portfolio for foreign plans has been developed as follows: approximately 35% is invested in equity securities, approximately 25% is invested in debt securities, and approximately 40% is invested in other investment vehicles, primarily consisting of investments in real estate assets.

The equity securities are selected primarily from stocks that are listed on the securities exchanges. Prior to investing, Canon has investigated the business condition of the investee companies, and appropriately diversified investments by type of industry and other relevant factors. The debt securities are selected primarily from government bonds, public debt instruments, and corporate bonds. Prior to investing, Canon has investigated the quality of the issue, including rating, interest rate, and repayment dates, and has appropriately diversified the investments. Pooled funds are selected using strategies consistent with the equity and debt securities described above. As for investments in life insurance company general accounts, the contracts with the insurance companies include a guaranteed interest rate and return of capital. With respect to investments in foreign investment vehicles, Canon has investigated the stability of the underlying governments and economies, the market characteristics such as settlement systems and the taxation systems. For each such investment, Canon has selected the appropriate investment country and currency.

The three levels of input used to measure fair value are more fully described in Note 21. The fair values of Canon's pension plan assets at December 31, 2018 and 2017, by asset category, are as follows:

December 31, 2018	Millions of yen							
	Japanese plans				Foreign plans			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Equity securities:								
Japanese companies (a)	**67,283**	**—**	**—**	**67,283**	**—**	**—**	**—**	**—**
Foreign companies	**5,451**	**—**	**—**	**5,451**	**8,567**	**—**	**—**	**8,567**
Pooled funds (b)	**—**	**137,712**	**—**	**137,712**	**—**	**49,312**	**—**	**49,312**
Debt securities:								
Government bonds (c)	**137,858**	**—**	**—**	**137,858**	**—**	**—**	**—**	**—**
Municipal bonds	**—**	**1,483**	**—**	**1,483**	**—**	**2,642**	**—**	**2,642**
Corporate bonds	**—**	**12,595**	**—**	**12,595**	**—**	**6,318**	**—**	**6,318**
Pooled funds (d)	**—**	**140,712**	**—**	**140,712**	**—**	**59,419**	**—**	**59,419**
Mortgage backed securities (and other asset backed securities)	**—**	**8,489**	**—**	**8,489**	**—**	**—**	**—**	**—**
Life insurance company general accounts	**—**	**123,747**	**—**	**123,747**	**—**	**9,019**	**—**	**9,019**
Other assets	**—**	**30,009**	**1,451**	**31,460**	**—**	**95,844**	**—**	**95,844**
Investment measured at net asset value	**—**	**—**	**—**	**15,905**	**—**	**—**	**—**	**17,521**
	210,592	**454,747**	**1,451**	**682,695**	**8,567**	**222,554**	**—**	**248,642**

December 31, 2017	Millions of yen							
	Japanese plans				Foreign plans			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Equity securities:								
Japanese companies (e)	83,765	—	—	83,765	—	—	—	—
Foreign companies	8,261	—	—	8,261	32,240	—	—	32,240
Pooled funds (f)	—	164,946	—	164,946	—	73,968	—	73,968
Debt securities:								
Government bonds (g)	138,092	—	—	138,092	9,343	—	—	9,343
Municipal bonds	—	1,166	—	1,166	—	2,901	—	2,901
Corporate bonds	—	15,246	—	15,246	—	22,045	—	22,045
Pooled funds (h)	—	130,507	—	130,507	—	25,821	—	25,821
Mortgage backed securities (and other asset backed securities)	—	8,076	—	8,076	—	3	—	3
Life insurance company general accounts	—	126,985	—	126,985	—	8,683	—	8,683
Other assets	—	43,070	—	43,070	—	73,320	—	73,320
Investment measured at net asset value	—	—	—	15,399	—	—	—	5,696
	230,118	489,996	—	735,513	41,583	206,741	—	254,020

(a) The plan's equity securities include common stock of the Company and certain of its subsidiaries in the amounts of ¥147 million.
(b) These funds invest in listed equity securities consisting of approximately 30% Japanese companies and 70% foreign companies for Japanese plans, and mainly foreign companies for foreign plans.
(c) This class includes approximately 90% Japanese government bonds and 10% foreign government bonds for Japanese plans, and mainly foreign government bonds for foreign plans.
(d) These funds invest in approximately 30% Japanese government bonds, 50% foreign government bonds, 5% Japanese municipal bonds, and 15% corporate bonds for Japanese plans. These funds invest in approximately 35% foreign government bonds and 65% corporate bonds for foreign plans.
(e) The plan's equity securities include common stock of the Company and certain of its subsidiaries in the amounts of ¥381 million.
(f) These funds invest in listed equity securities consisting of approximately 30% Japanese companies and 70% foreign companies for Japanese plans, and mainly foreign companies for foreign plans.
(g) This class includes approximately 90% Japanese government bonds and 10% foreign government bonds for Japanese plans, and mainly foreign government bonds for foreign plans.
(h) These funds invest in approximately 30% Japanese government bonds, 45% foreign government bonds, 5% Japanese municipal bonds, and 20% corporate bonds for Japanese plans. These funds invest in approximately 70% foreign government bonds and 30% corporate bonds for foreign plans.

Each level into which assets are categorized is based on inputs used to measure the fair value of the assets, and does not necessarily indicate the risks or ratings of the assets.

Level 1 assets are comprised principally of equity securities and government bonds, which are valued using unadjusted quoted market prices in active markets with sufficient volume and frequency of transactions. Level 2 assets are comprised principally of pooled funds that invest in equity and debt securities, corporate bonds, investments in life insurance company general accounts and other assets. Pooled funds are valued at their net asset values that are calculated by the sponsor of the fund and have daily liquidity. Corporate bonds are valued using quoted prices for identical assets in markets that are not active. Investments in life insurance company general accounts are valued at conversion value. Other assets are comprised principally of interest bearing cash and hedge funds.

The fair value of Level 3 asset, consisting of hedge funds, was ¥1,451 million at December 31, 2018. Amounts of actual returns on, purchases and sales of these assets during the year ended December 31, 2018 were not significant.

The fair values of plan assets for the participants with Toshiba Funds by each asset category are calculated based on a pro-rata basis of total plan assets of Toshiba Funds.

Contributions

Canon expects to contribute ¥13,089 million to its Japanese defined benefit pension plans and ¥19,311 million to its foreign defined benefit pension plans for the year ending December 31, 2019.

Estimated future benefit payments

The following benefit payments, which reflect expected future service, as appropriate, are expected to be paid:

Year ending December 31:	Japanese plans	Foreign plans
	Millions of yen	Millions of yen
2019	35,604	12,077
2020	36,896	12,214
2021	38,524	13,221
2022	41,775	13,927
2023	43,119	14,562
2024 – 2028	226,704	87,006

Multiemployer pension plans

The amounts of cost recognized for the multiemployer pension plans primarily in the Netherlands for the years ended December 31, 2018, 2017 and 2016 were ¥4,452 million, ¥4,165 million and ¥3,482 million, respectively. The multiemployer pension plan in which the subsidiaries in the Netherlands participated was 102% funded as of December 31, 2017. The collective bargaining agreements have no expiration date. Canon is not liable for other participating employers' obligations under the terms and conditions of the agreements.

Defined contribution plans

The amounts of cost recognized for the defined contribution pension plans of the Company and certain of its subsidiaries for the years ended December 31, 2018, 2017 and 2016 were ¥19,570 million, ¥18,979 million and ¥17,603 million, respectively.

12. INCOME TAXES

Domestic and foreign components of income before income taxes and the current and deferred income tax expense attributable to such income are summarized as follows:

Years ended December 31	Millions of yen		
	Japanese	Foreign	Total
2018: Income before income taxes	**241,474**	**121,418**	**362,892**
Income taxes:			
Current	**75,556**	**32,443**	**107,999**
Deferred	**(6,552)**	**(5,297)**	**(11,849)**
	69,004	**27,146**	**96,150**
2017: Income before income taxes	276,149	77,735	353,884
Income taxes:			
Current	80,225	35,402	115,627
Deferred	(7,453)	(10,150)	(17,603)
	72,772	25,252	98,024
2016: Income before income taxes	135,131	109,520	244,651
Income taxes:			
Current	47,687	27,806	75,493
Deferred	4,126	3,062	7,188
	51,813	30,868	82,681

The Company and its domestic subsidiaries are subject to a number of income taxes, which, in the aggregate, represent a statutory income tax rate of approximately 31%, 31% and 33% for the years ended December 31, 2018, 2017 and 2016, respectively.

The statutory income tax rate utilized for deferred tax assets and liabilities which are expected to be settled or realized in the future period is approximately 31%. The adjustments of deferred tax assets and liabilities for amendments to the Japanese tax regulations enacted on March 29, 2016 which have been reflected in income taxes in the consolidated statements of income for the years ended December 31, 2016 were ¥3,498 million.

The United States enacted tax reform legislation (the "Tax Reform Legislation") on December 22, 2017. Due to the Tax Reform Legislation, the federal corporate income tax rate in the U.S. is reduced from 35% to 21% from the fiscal year commencing on January 1, 2018. The adjustment to deferred tax assets and liabilities for the tax rate change was tax benefit of ¥14,563 million for the year ended December 31, 2017. The impacts related to other changes from the Tax Reform Legislation are not material.

A reconciliation of the Japanese statutory income tax rate and the effective income tax rate as a percentage of income before income taxes is as follows:

Years ended December 31	**2018**	2017	2016
Japanese statutory income tax rate	**31.0%**	31.0%	33.0%
Increase (reduction) in income taxes resulting from:			
Expenses not deductible for tax purposes*	**0.7**	3.7	0.8
Income of foreign subsidiaries taxed at lower than Japanese statutory tax rate	**(3.0)**	(2.1)	(3.0)
Tax credit for research and development expenses	**(3.4)**	(4.8)	(3.0)
Change in valuation allowance	**0.4**	1.7	(0.8)
Effect of enacted changes in tax laws and rates on Japanese tax	**—**	—	1.4
Effect of enacted changes in U.S. tax laws	**—**	(3.6)	—
Other	**0.8**	1.8	5.4
Effective income tax rate	**26.5%**	27.7%	33.8%

* Expenses not deductible for tax purposes for the year ended December 31, 2017 primarily consist of impairment losses on goodwill.

Net deferred income tax assets and liabilities are included in the accompanying consolidated balance sheets under the following captions:

December 31	Millions of yen	
	2018	2017
Other assets	**160,541**	150,854
Other noncurrent liabilities	**(70,336)**	(90,010)
	90,205	60,844

The tax effects of temporary differences that give rise to the deferred tax assets and deferred tax liabilities at December 31, 2018 and 2017 are presented below:

December 31	Millions of yen	
	2018	2017
Deferred tax assets:		
Inventories	**10,739**	11,921
Accrued business tax	**2,361**	4,705
Accrued pension and severance cost	**105,933**	98,114
Research and development – costs capitalized for tax purposes	**4,690**	5,383
Property, plant and equipment	**33,738**	33,488
Accrued expenses	**28,015**	30,126
Net operating losses carried forward	**28,549**	29,006
Other	**38,683**	38,526
	252,708	251,269
Less valuation allowance	**(30,734)**	(30,783)
Total deferred tax assets	**221,974**	220,486
Deferred tax liabilities:		
Undistributed earnings of foreign subsidiaries	**(7,615)**	(9,859)
Tax deductible reserve	**(4,050)**	(4,396)
Financing lease revenue	**(26,441)**	(38,287)
Intangible assets	**(66,189)**	(74,377)
Other	**(27,474)**	(32,723)
Total deferred tax liabilities	**(131,769)**	(159,642)
Net deferred tax assets	**90,205**	60,844

The net changes in the total valuation allowance were a decrease of ¥49 million, an increase of ¥4,096 million and a decrease of ¥6,244 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Based on the level of historical taxable income and projections for future taxable income over the periods which the net deductible temporary differences are expected to reverse, management believes it is more likely than not that Canon will realize the benefits of these deferred tax assets, net of the valuation allowance, at December 31, 2018.

At December 31, 2018, Canon had net operating losses which can be carried forward for income tax purposes of ¥186,114 million to reduce future taxable income. Periods available to reduce future taxable income vary in each tax jurisdiction and generally range from one year to an indefinite period as follows:

	Millions of yen
Within one year	5,854
After one year through five years	26,802
After five years through ten years	38,687
After ten years through twenty years	48,642
Indefinite period	66,129
Total	186,114

Income taxes have not been accrued on undistributed earnings of domestic subsidiaries as the tax law provides a means by which the dividends from a domestic subsidiary can be received tax free.

Canon has not recognized deferred tax liabilities of ¥27,278 million for a portion of undistributed earnings of foreign subsidiaries of ¥1,001,310 million as of December 31, 2018 because Canon currently does not expect to have such amounts distributed or paid as dividends to the Company in the foreseeable future. Deferred tax liabilities will be recognized when Canon expects that it will realize those undistributed earnings in a taxable manner, such as through receipt of dividends or sale of the investments.

A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows:

Years ended December 31	Millions of yen		
	2018	2017	2016
Balance at beginning of year	**10,282**	7,318	6,056
Additions for tax positions of the current year	**45**	2,956	2,741
Additions for tax positions of prior years	**178**	250	—
Reductions for tax positions of prior years	**(17)**	(915)	(665)
Settlements with tax authorities	**(1,286)**	—	(370)
Other	**(553)**	673	(444)
Balance at end of year*	**8,649**	10,282	7,318

* The total amounts of unrecognized tax benefits presented in other noncurrent liabilities in the consolidated balance sheets were offset by deferred tax assets in the amount of ¥2,043 million, ¥124 million and ¥32 million as of December 31, 2018, 2017 and 2016.

The total amounts of unrecognized tax benefits that would reduce the effective tax rate, if recognized, were ¥8,649 million and ¥10,282 million at December 31, 2018 and 2017, respectively.

Although Canon believes its estimates and assumptions of unrecognized tax benefits are reasonable, uncertainty regarding the final determination of tax examination settlements and any related litigation could affect the effective tax rate in a future period. Based on each of the items of which Canon is aware at December 31, 2018, no significant changes to the unrecognized tax benefits are expected within the next twelve months.

Canon recognizes interest and penalties accrued related to unrecognized tax benefits in income taxes. Both interest and penalties accrued at December 31, 2018 and 2017, and interest and penalties included in income taxes for the years ended December 31, 2018, 2017 and 2016 were not significant.

Canon files income tax returns in Japan and various foreign tax jurisdictions. In Japan, Canon is no longer subject to regular income tax examinations by the tax authority for years before 2017 with few exceptions. Canon is also no longer subject to a transfer pricing examination by the tax authority for years before 2017 with few exceptions. In other major foreign tax jurisdictions, including the United States and the Netherlands, Canon is no longer subject to income tax examinations by tax authorities for years before 2009 with few exceptions. The tax authorities are currently conducting income tax examinations of Canon's income tax returns for years after 2008 in some foreign tax jurisdictions.

13. LEGAL RESERVE AND RETAINED EARNINGS

The Corporation Law of Japan provides that an amount equal to 10% of distributions from retained earnings paid by the Company and its Japanese subsidiaries be appropriated as a legal reserve. No further appropriations are required when the total amount of the additional paid-in capital and the legal reserve equals 25% of their respective stated capital. The Corporation Law of Japan also provides that additional paid-in capital and legal reserve are available for appropriations by resolution of the shareholders. Certain foreign subsidiaries are also required to appropriate their earnings to legal reserves under the laws of their respective countries.

Cash dividends and appropriations to the legal reserve charged to retained earnings for the years ended December 31, 2018, 2017 and 2016 represent dividends paid out during those years and the related appropriations to the legal reserve. Retained earnings at December 31, 2018 did not reflect current year-end dividends in the amount of ¥86,380 million which were approved by the shareholders in March 2019.

The amount available for dividends under the Corporation Law of Japan is based on the amount recorded in the Company's nonconsolidated books of account in accordance with financial accounting standards of Japan. Such amount was ¥984,692 million at December 31, 2018.

Retained earnings at December 31, 2018 included Canon's equity in undistributed earnings of affiliated companies accounted for by the equity method in the amount of ¥18,265 million.

14. OTHER COMPREHENSIVE INCOME (LOSS)

Changes in accumulated other comprehensive income (loss) for the years ended December 31, 2018, 2017 and 2016 are as follows:

Millions of yen	Foreign currency translation adjustments	Unrealized gains and losses on securities	Gains and losses on derivative instruments	Pension liability adjustments	Total
Balance at December 31, 2015	87,038	14,055	182	(131,017)	(29,742)
Equity transactions with noncontrolling interests and other	259	—	—	(1)	258
Other comprehensive income (loss) before reclassifications	(101,350)	814	938	(67,511)	(167,109)
Amounts reclassified from accumulated other comprehensive income (loss)	93	382	(3,862)	99	(3,288)
Net change during the year	(100,998)	1,196	(2,924)	(67,413)	(170,139)
Balance at December 31, 2016	(13,960)	15,251	(2,742)	(198,430)	(199,881)
Equity transactions with noncontrolling interests and other	—	—	—	—	—
Other comprehensive income (loss) before reclassifications	44,184	2,813	(1,452)	14,785	60,330
Amounts reclassified from accumulated other comprehensive income (loss)	(16)	(12,580)	4,014	4,905	(3,677)
Net change during the year	44,168	(9,767)	2,562	19,690	56,653
Balance at December 31, 2017	**30,208**	**5,484**	**(180)**	**(178,740)**	**(143,228)**
Cumulative effects of accounting standard update—adoption of ASU No. 2016-01*	**—**	**(5,343)**	**—**	**—**	**(5,343)**
Equity transactions with noncontrolling interests and other	**(4,200)**	**—**	**—**	**—**	**(4,200)**
Other comprehensive income (loss) before reclassifications	**(89,823)**	**—**	**(457)**	**(29,909)**	**(120,189)**
Amounts reclassified from accumulated other comprehensive income (loss)	**—**	**(141)**	**945**	**3,085**	**3,889**
Net change during the year	**(94,023)**	**(5,484)**	**488**	**(26,824)**	**(125,843)**
Balance at December 31, 2018	**(63,815)**	**—**	**308**	**(205,564)**	**(269,071)**

* Represents the impact of adopting the new accounting standard related to financial instruments. Please refer to Note 1(w) for more detailed information.

Reclassifications out of accumulated other comprehensive income (loss) for the years ended December 31, 2018, 2017 and 2016 are as follows:

Years ended December 31	Amount reclassified from accumulated other comprehensive income (loss) *1			Affected line items in consolidated statements of income
	Millions of yen			
	2018	2017	2016	
Foreign currency translation adjustments	**—**	(39)	139	Other, net
	—	12	(46)	Income taxes
	—	(27)	93	Consolidated net income
	—	11	—	Net income attributable to noncontrolling interests
	—	(16)	93	Net income attributable to Canon Inc.
Unrealized gains and losses on securities	**(178)**	(18,472)	282	Other, net
	37	5,727	(94)	Income taxes
	(141)	(12,745)	188	Consolidated net income
	—	165	194	Net income attributable to noncontrolling interests
	(141)	(12,580)	382	Net income attributable to Canon Inc.
Gains and losses on derivative instruments	**1,341**	5,772	(5,890)	Other, net
	(392)	(1,732)	2,049	Income taxes
	949	4,040	(3,841)	Consolidated net income
	(4)	(26)	(21)	Net income attributable to noncontrolling interests
	945	4,014	(3,862)	Net income attributable to Canon Inc.
Pension liability adjustments	**3,853**	7,005	(16)	Other, net
	(699)	(1,832)	164	Income taxes
	3,154	5,173	148	Consolidated net income
	(69)	(268)	(49)	Net income attributable to noncontrolling interests
	3,085	4,905	99	Net income attributable to Canon Inc.
Total amount reclassified, net of tax and noncontrolling interests	**3,889**	(3,677)	(3,288)	

*1 Amounts in parentheses indicate gains in consolidated statements of income.

Tax effects allocated to each component of other comprehensive income (loss) and reclassification adjustments, including amounts attributable to noncontrolling interests, are as follows:

Years ended December 31	Millions of yen		
	Before-tax amount	Tax (expense) or benefit	Net-of-tax amount
2018:			
Foreign currency translation adjustments:			
Amount arising during the year	**(93,955)**	**809**	**(93,146)**
Reclassification adjustments for gains and losses realized in net income	**—**	**—**	**—**
Net change during the year	**(93,955)**	**809**	**(93,146)**
Net unrealized gains and losses on securities:			
Amount arising during the year	**—**	**—**	**—**
Reclassification adjustments for gains and losses realized in net income	**(178)**	**37**	**(141)**
Net change during the year	**(178)**	**37**	**(141)**
Net gains and losses on derivative instruments:			
Amount arising during the year	**(586)**	**125**	**(461)**
Reclassification adjustments for gains and losses realized in net income	**1,341**	**(392)**	**949**
Net change during the year	**755**	**(267)**	**488**
Pension liability adjustments:			
Amount arising during the year	**(51,789)**	**18,065**	**(33,724)**
Reclassification adjustments for gains and losses realized in net income	**3,853**	**(699)**	**3,154**
Net change during the year	**(47,936)**	**17,366**	**(30,570)**
Other comprehensive income (loss)	**(141,314)**	**17,945**	**(123,369)**
2017:			
Foreign currency translation adjustments:			
Amount arising during the year	47,825	(708)	47,117
Reclassification adjustments for gains and losses realized in net income	(39)	12	(27)
Net change during the year	47,786	(696)	47,090
Net unrealized gains and losses on securities:			
Amount arising during the year	5,100	(1,717)	3,383
Reclassification adjustments for gains and losses realized in net income	(18,472)	5,727	(12,745)
Net change during the year	(13,372)	4,010	(9,362)
Net gains and losses on derivative instruments:			
Amount arising during the year	(2,080)	628	(1,452)
Reclassification adjustments for gains and losses realized in net income	5,772	(1,732)	4,040
Net change during the year	3,692	(1,104)	2,588
Pension liability adjustments:			
Amount arising during the year	20,991	(4,957)	16,034
Reclassification adjustments for gains and losses realized in net income	7,005	(1,832)	5,173
Net change during the year	27,996	(6,789)	21,207
Other comprehensive income (loss)	66,102	(4,579)	61,523
2016:			
Foreign currency translation adjustments:			
Amount arising during the year	(108,280)	521	(107,759)
Reclassification adjustments for gains and losses realized in net income	139	(46)	93
Net change during the year	(108,141)	475	(107,666)
Net unrealized gains and losses on securities:			
Amount arising during the year	1,184	(375)	809
Reclassification adjustments for gains and losses realized in net income	282	(94)	188
Net change during the year	1,466	(469)	997
Net gains and losses on derivative instruments:			
Amount arising during the year	1,619	(726)	893
Reclassification adjustments for gains and losses realized in net income	(5,890)	2,049	(3,841)
Net change during the year	(4,271)	1,323	(2,948)
Pension liability adjustments:			
Amount arising during the year	(95,707)	25,204	(70,503)
Reclassification adjustments for gains and losses realized in net income	(16)	164	148
Net change during the year	(95,723)	25,368	(70,355)
Other comprehensive income (loss)	(206,669)	26,697	(179,972)

15. REVENUE

Revenue from sales of office products, such as office MFDs and laser printers, and imaging system products, such as digital cameras and inkjet printers, is recognized upon shipment or delivery, depending upon when the customer obtains controls of these products.

Revenue from sales of equipment that are sold with customer acceptance provisions related to their functionality including optical equipment such as semiconductor lithography equipment and FPD lithography equipment, and certain medical equipment such as CT systems and MRI systems, is recognized when the equipment is installed at the customer site and the agreed-upon specifications are objectively satisfied.

Most of Canon's service revenue is generated from office and medical system products which is recognized over time. For the service contracts of office products, the customer typically pays a variable amount based on usage, a stated fixed fee or a stated base fee plus a variable amount which frequently include the provision of consumables as well as break fix activities. The majority portion of service revenue from the office products is recognized as billed since invoiced amount directly correlates with the value to the customer of the underlying performance obligation to date. For the service contracts of medical system products, the customer typically pays a stated fixed fee for the stand ready maintenance service and revenue is recognized ratably over the contract period.

The majority of service arrangements for office products are executed in combination with related products. Transaction prices for products and services need to be allocated to each performance obligation on a relative standalone selling price basis where significant judgements are required. Canon estimates the standalone selling price using a range of prices that would meet the allocation objective based on all the information that is reasonably available including market conditions and other observable inputs. If transaction prices of the product or service contracts are not within the acceptable range then the revenue is subject to allocation based on the estimated standalone selling prices. Canon recognizes the incremental costs of obtaining a contract as an expense when related office products are sold.

Canon also provides leasing arrangement to the customers primarily for the sales of office products. Approximately 4% of total revenue is generated from these leasing arrangements for the year ended December 31, 2018. Revenue from the sale of these products under sales-type leases is recognized at the inception of the lease. Interest income on sales-type leases and direct-financing leases is recognized over the life of each respective lease using the interest method. Leases not qualifying as sales-type leases or direct-financing leases are accounted for as operating leases and related revenue is recognized ratably over the lease term. When product leases are bundled with maintenance contracts, revenue is allocated based upon the estimated standalone selling prices of the lease and non-lease components. Lease components generally include product, financing and executory costs, while non-lease components generally consist of maintenance contracts and supplies.

The transaction prices that Canon is entitled to receive in exchange for transferring goods or services to the customer include certain forms of variable consideration, including product discounts, customer promotions and volume-based rebates mainly for imaging system products, which are sold predominantly through distributors and retailers. Canon includes estimated amounts in the transaction price only to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. Variable considerations are estimated based upon historical trends and other known factors at the time of sale, and are subsequently adjusted in each period based on current information. In addition, Canon may provide a right of return on our products for a short time period after a sale. These rights are accounted for as variable consideration when determining the transaction price, and accordingly Canon recognizes revenue based on the estimated amount to which Canon expects to be entitled after considering expected returns.

Disaggregated revenue by timing is as follows. Disaggregated revenue by business unit, product and geographic area are described in Note 22.

	Millions of yen					
	Office	Imaging System	Medical System	Industry and Others	Corporate and eliminations	Consolidated
2018:						
Revenue recognized at a point in time	**1,286,100**	**993,658**	**305,457**	**599,766**	**(106,318)**	**3,078,663**
Revenue recognized over time	**521,201**	**14,507**	**132,121**	**205,445**	**—**	**873,274**
Total	**1,807,301**	**1,008,165**	**437,578**	**805,211**	**(106,318)**	**3,951,937**

Revenue recognized over time includes primarily revenue from maintenance service in the office and medical system products and sales of certain industrial equipment which do not have alternative use and for which Canon has enforceable right to payment to the customers for the performance completed to date.

The adoption of the new revenue standard required the reconsideration of the scope of performance obligations related to service contracts, which has resulted in a change in classification of revenues between the products and service revenues. Specifically, certain revenue historically classified within products revenues, including consumables provided under the service contracts and certain outsourcing business, is currently classified within service revenues and cost of sales in the consolidated statement of income under the new revenue standard. Canon has started separating revenues and cost of sales into products and services in the consolidated statements of income starting from the quarter beginning January 1, 2018, including prior period's presentation. However, prior period's presentation is not retrospectively adjusted and is presented in accordance with the historical accounting policy. In addition, in conjunction with the application of the new standard, Canon has reclassified certain expenses related to service revenues from operating expenses to cost of sales in the accompanying consolidated statement of income. The amount reclassified for the year ended December 31, 2018 was ¥115,700 million. The reconsideration of the scope of performance obligations did not materially affect the timing of revenue recognition. The impacts of adoption of new revenue standard on Canon's consolidated balance sheet as of December 31, 2018 and the consolidated statement of income for the year ended December 31, 2018 were as follows.

Consolidated Balance Sheet

December 31	Millions of yen		
	2018		
ASSETS	As reported	Balance under historical accounting policy	Effect of change
Trade receivables, net	612,953	657,419	(44,466)
Inventories	611,281	614,243	(2,962)
Prepaid expenses and other current assets	304,346	253,547	50,799
Other assets	397,974	397,949	25
Total assets	4,899,465	4,896,069	3,396
LIABILITIES AND EQUITY			
Accrued expenses	321,137	319,416	1,721
Other current liabilities	276,237	274,741	1,496
Total liabilities	1,881,552	1,878,335	3,217
Retained earnings	3,508,908	3,508,704	204
Noncontrolling interests	190,311	190,336	(25)
Total equity	3,017,913	3,017,734	179

Consolidated Statement of Income

For the year ended December 31	Millions of yen		
	2018		
	As reported	Amount under historical accounting policy	Effect of change
Net sales			
Products and Equipment	3,194,724	3,383,566	(188,842)
Services	757,213	567,582	189,631
	3,951,937	3,951,148	789
Cost of sales			
Products and Equipment	1,762,171	1,783,798	(21,627)
Services	354,212	216,513	137,699
	2,116,383	2,000,311	116,072
Gross profit	1,835,554	1,950,837	(115,283)
Selling, general and administrative expenses	1,176,760	1,292,460	(115,700)
Operating profit	342,952	342,535	417
Income before income taxes	362,892	362,475	417
Income taxes	96,150	96,094	56
Consolidated net income	266,742	266,381	361
Less: Net income attributable to noncontrolling interests	13,987	13,936	51
Net income attributable to Canon Inc.	252,755	252,445	310

Canon recognized contract assets primarily for unbilled receivables mainly arising from services contracts for office products totaled to ¥42,915 million at the adoption date and included in prepaid expenses and other current assets in the consolidated balance sheet with an offsetting impact to trade receivables. Contract assets at December 31, 2018 were ¥50,799 million.

Canon typically bills to the customer when performance obligation is satisfied and collects the payment in relatively short term except for certain maintenance service of office and medical products and certain industrial equipment for which Canon occasionally receives the payment in advance from customers. The amount received in excess of revenue recognized is recognized as deferred revenue until the performance obligation for distinct goods or services are satisfied. Deferred revenue at December 31, 2018 and 2017 were ¥123,686 million and ¥125,965 million, respectively, and are included in other current liabilities in the accompanying consolidated balance sheets. Revenue recognized for the year ended December 31, 2018, which had been included in the deferred revenue balance at December 31, 2017, was ¥104,678 million.

Remaining performance obligations for products and equipment at December 31, 2018 primarily arise from the sales of certain industrial equipment, amounting to ¥72,708 million, 75% of which is expected to be recognized as revenue within one year and remaining 25% is within two years. Disclosure of remaining performance obligations is not required for the majority of service since the revenue is recognized as billed basis applying the right to invoice practical expedient or is generated from the contracts with original expected duration of less than one year. The portion of fixed maintenance service contract for office and medical products with original expected duration of more than one year is approximately 11% of total service revenue and the average remaining period for these fixed contracts as of December 31, 2018 is about 2 years.

Taxes collected from customers and remitted to governmental authorities are excluded from revenues in the consolidated statements of income.

16. STOCK-BASED COMPENSATION

On May 2, 2018, based on the approval of the shareholders, the Company granted stock options to its directors and executive officers to acquire 74,000 shares of common stock. Those to whom stock acquisition rights are granted (the "Holder(s)") shall be entitled to exercise all the stock acquisition rights together within 10 days (in case the last day is not a business day, the following business day) from after the date when they cease to hold any position as a director or an executive officer of the Company. These option awards have a 30 year exercisable period. The grant-date fair value per share of the stock options granted during the year ended December 31, 2018 was ¥2,948.

On May 1, 2011, based on the approval of the shareholders, the Company granted stock options to its directors, executive officers and certain employees to acquire 912,000 shares of common stock. These option awards vest after two years of continued service beginning on the grant date and have a four year exercisable period. The grant-date fair value per share of the stock options granted during the year ended December 31, 2011 was ¥772.

On May 1, 2010, based on the approval of the shareholders, the Company granted stock options to its directors, executive officers and certain employees to acquire 890,000 shares of common stock. These option awards vest after two years of continued service beginning on the grant date and have a four year exercisable period. The grant-date fair value per share of the stock options granted during the year ended December 31, 2010 was ¥988.

The compensation cost recognized for these stock options for the years ended December 31, 2018 was ¥218 million and 2017 and 2016 was nil, and it is included in selling, general and administrative expenses in the consolidated statements of income.

The fair value of the option award was estimated on the date of grant using the Black-Sholes option pricing model that incorporates the assumptions presented below:

Year ended December 31	**2018**
Expected term of option (in years)	**6.0**
Expected volatility	**23.02%**
Dividend yield	**4.14%**
Risk-free interest rate	**(0.07%)**

A summary of option activity under the stock option plans as of and for the years ended December 31, 2018, 2017 and 2016 is presented below:

	Shares	Weighted-average exercise price	Weighted-average remaining contractual term	Aggregate intrinsic value
		Yen	Year	Millions of yen
Outstanding at January 1, 2016	1,296,000	4,263	0.4	—
Exercised	—	—		
Forfeited/Expired	(693,000)	4,500		
Outstanding at December 31, 2016	603,000	3,990	0.2	—
Exercised	—	—		
Forfeited/Expired	(603,000)	3,990		
Outstanding at December 31, 2017	—	—		—
Granted	**74,000**	**1**		
Exercised	**—**	**—**		
Forfeited/Expired	**—**	**—**		
Outstanding at December 31, 2018	**74,000**	**1**	**29.3**	**222**
Exercisable at December 31, 2018	**74,000**	**1**	**29.3**	**222**

The total fair value of shares vested during the years ended December 31, 2018 was ¥218 million and 2017 and 2016 was nil. Cash received from the exercise of stock options for the years ended December 31, 2018, 2017 and 2016 was nil.

17. NET INCOME ATTRIBUTABLE TO CANON INC. SHAREHOLDERS PER SHARE

A reconciliation of the numerators and denominators of basic and diluted net income attributable to Canon Inc. shareholders per share computations is as follows:

Years ended December 31	Millions of yen		
	2018	2017	2016
Net income attributable to Canon Inc.	**252,755**	241,923	150,650
	Number of shares		
Average common shares outstanding	**1,079,753,008**	1,085,439,370	1,092,070,680
Effect of dilutive securities:			
Stock options	**49,319**	—	—
Diluted common shares outstanding	**1,079,802,327**	1,085,439,370	1,092,070,680
	Yen		
Net income attributable to Canon Inc. shareholders per share:			
Basic	**234.09**	222.88	137.95
Diluted	**234.08**	222.88	137.95

The computation of diluted net income attributable to Canon Inc. shareholders per share for the years ended December 31, 2017 and 2016 excludes outstanding stock options because the effect would be anti-dilutive.

18. DERIVATIVES AND HEDGING ACTIVITIES

Risk management policy

Canon operates internationally, exposing it to the risk of changes in foreign currency exchange rates. Derivative financial instruments are comprised principally of foreign exchange contracts utilized by the Company and certain of its subsidiaries to reduce the risk. Canon assesses foreign currency exchange rate risk by continually monitoring changes in the exposures and by evaluating hedging opportunities. Canon does not hold or issue derivative financial instruments for trading purposes. Canon is also exposed to credit-related losses in the event of non-performance by counterparties to derivative financial instruments, but it is not expected that any counterparties will fail to meet their obligations. Most of the counterparties are internationally recognized financial institutions and selected by Canon taking into account their financial condition, and contracts are diversified across a number of major financial institutions.

Foreign currency exchange rate risk management

Canon's international operations expose Canon to the risk of changes in foreign currency exchange rates. Canon uses foreign exchange contracts to manage certain foreign currency exchange exposures principally from the exchange of U.S. dollars and euros into Japanese yen. These contracts are primarily used to hedge the foreign currency exposure of forecasted intercompany sales and intercompany trade receivables that are denominated in foreign currencies. In accordance with Canon's policy, a specific portion of foreign currency exposure resulting from forecasted intercompany sales are hedged using foreign exchange contracts which principally mature within three months.

Cash flow hedge

Changes in the fair value of derivative financial instruments designated as cash flow hedges, including foreign exchange contracts associated with forecasted intercompany sales, are reported in accumulated other comprehensive income (loss). These amounts are subsequently reclassified into earnings through other income (deductions) in the same period as the hedged items affect earnings. Substantially all amounts recorded in accumulated other comprehensive income (loss) at year-end are expected to be recognized in earnings over the next twelve months. Canon excludes the time value component from the assessment of hedge effectiveness. Changes in the fair value of a foreign exchange contract for the period between the date that the forecasted intercompany sales occur and its maturity date are recognized in earnings and not considered hedge ineffectiveness.

Derivatives not designated as hedges

Canon has entered into certain foreign exchange contracts to primarily offset the earnings impact related to fluctuations in foreign currency exchange rates associated with certain assets denominated in foreign currencies. Although these foreign exchange contracts have not been designated as hedges as required in order to apply hedge accounting, the contracts are effective from an economic perspective. The changes in the fair value of these contracts are recorded in earnings immediately.

Contract amounts of foreign exchange contracts at December 31, 2018 and 2017 are set forth below:

December 31	Millions of yen	
	2018	2017
To sell foreign currencies	**230,505**	272,563
To buy foreign currencies	**30,816**	46,168

Fair value of derivative instruments in the consolidated balance sheets

The following tables present Canon's derivative instruments measured at gross fair value as reflected in the consolidated balance sheets at December 31, 2018 and 2017.

Derivatives designated as hedging instruments

December 31		Fair value	
		Millions of yen	
	Balance sheet location	**2018**	2017
Assets:			
Foreign exchange contracts	Prepaid expenses and other current assets	**521**	255
Liabilities:			
Foreign exchange contracts	Other current liabilities	**323**	367

Derivatives not designated as hedging instruments

December 31		Fair value	
		Millions of yen	
	Balance sheet location	**2018**	2017
Assets:			
Foreign exchange contracts	Prepaid expenses and other current assets	**2,622**	289
Liabilities:			
Foreign exchange contracts	Other current liabilities	**443**	2,892

Effect of derivative instruments in the consolidated statements of income

The following tables present the effect of Canon's derivative instruments in the consolidated statements of income for the years ended December 31, 2018, 2017 and 2016.

Derivatives in cash flow hedging relationships

Years ended December 31	Gain (loss) recognized in OCI (effective portion)	Gain (loss) reclassified from accumulated OCI into income (effective portion)		Gain (loss) recognized in income (ineffective portion and amount excluded from effectiveness testing)	
Millions of yen	Amount	Location	Amount	Location	Amount
2018: Foreign exchange contracts	**(586)**	Other, net	**(1,341)**	Other, net	**(682)**
2017: Foreign exchange contracts	(2,080)	Other, net	(5,772)	Other, net	(332)
2016: Foreign exchange contracts	1,619	Other, net	5,890	Other, net	(311)

Derivatives not designated as hedging instruments

Years ended December 31		Gain (loss) recognized in income on derivative		
		Millions of yen		
	Location	**2018**	2017	2016
Foreign exchange contracts	Other, net	**5,284**	(7,932)	7,018

19. COMMITMENTS AND CONTINGENT LIABILITIES

Commitments

At December 31, 2018, commitments outstanding for the purchase of property, plant and equipment approximated ¥54,905 million, and commitments outstanding for the purchase of parts and raw materials approximated ¥120,344 million.

Canon occupies sales offices and other facilities under lease arrangements accounted for as operating leases. Deposits made under such arrangements aggregated ¥12,728 million and ¥13,740 million at December 31, 2018 and 2017, respectively, and are included in noncurrent receivables in the accompanying consolidated balance sheets. Rental expenses of cancelable and noncancelable operating leases amounted to ¥49,394 million, ¥47,619 million and ¥42,714 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Future minimum lease payments required under noncancelable operating leases that have initial or remaining lease terms in excess of one year at December 31, 2018 are as follows:

Year ending December 31:	Millions of yen
2019	29,817
2020	23,402
2021	17,837
2022	13,565
2023	10,165
Thereafter	20,298
Total future minimum lease payments	115,084

Guarantees

Canon provides guarantees for its employees, affiliates and other companies. The guarantees for the employees are principally made for their housing loans. The guarantees for affiliates and other companies are made for their lease obligations and bank loans to ensure that those companies operate with less financial risk.

Canon would have to perform under a guarantee if the borrower defaults on a payment within the contract terms. The contract terms are 1 year to 30 years in case of employees with housing loans, and 1 year to 7 years in case of affiliates and other companies with lease obligations and bank loans. The maximum amount of undiscounted payments Canon would have had to make in the event of default is ¥4,458 million at December 31, 2018. The carrying amounts of the liabilities recognized for Canon's obligations as a guarantor under those guarantees at December 31, 2018 were not significant.

Canon also issues contractual product warranties under which it generally guarantees the performance of products delivered and services rendered for a certain period or term. Changes in accrued product warranty costs for the years ended December 31, 2018 and 2017 are summarized as follows:

Years ended December 31	Millions of yen	
	2018	2017
Balance at beginning of year	**17,452**	13,168
Additions	**18,870**	18,893
Utilization	**(14,707)**	(12,957)
Other	**(4,297)**	(1,652)
Balance at end of year	**17,318**	17,452

Legal proceedings

Canon is involved in various claims and legal actions arising in the ordinary course of business. Canon has recorded provisions for liabilities when it is probable that liabilities have been incurred and the amount of loss can be reasonably estimated. Canon reviews these provisions at least quarterly and adjusts these provisions to reflect the impact of the negotiations, settlements, rulings, advice of legal counsel and other information and events pertaining to a particular case. Based on its experience, although litigation is inherently unpredictable, Canon believes that any damage amounts claimed in outstanding matters are not a meaningful indicator of Canon's potential liability. In the opinion of management, any reasonably possible range of losses from outstanding matters would not have a material adverse effect on Canon's consolidated financial position, results of operations, or cash flows.

20. DISCLOSURES ABOUT THE FAIR VALUE OF FINANCIAL INSTRUMENTS AND CONCENTRATIONS OF CREDIT RISK

Fair value of financial instruments

The estimated fair values of Canon's financial instruments at December 31, 2018 and 2017 are set forth below. The following summary excludes cash and cash equivalents, trade receivables, finance receivables, noncurrent receivables, short-term loans, trade payables and accrued expenses for which fair values approximate their carrying amounts. The summary also excludes investments and derivative instruments which are disclosed in Note 2 and Note 21, and Note 18, respectively.

December 31	Millions of yen			
	2018		2017	
	Carrying amount	Estimated fair value	Carrying amount	Estimated fair value
Long-term debt, including current installments	**(364,602)**	**(364,570)**	(499,168)	(499,126)

The following methods and assumptions are used to estimate the fair value in the above table.

Long-term debt

Canon's long-term debt instruments are classified as Level 2 instruments and valued based on the present value of future cash flows associated with each instrument discounted using current market borrowing rates for similar debt instruments of comparable maturity. The levels are more fully described in Note 21.

Limitations of fair value estimates

Fair value estimates are made at a specific point in time, based on relevant market information and information about the financial instruments. These estimates are subjective in nature and involve uncertainties and matters of significant judgment and therefore cannot be determined with precision. Changes in assumptions could significantly affect the estimates.

Concentrations of credit risk

At December 31, 2018 and 2017, one customer accounted for approximately 12% and 8% of consolidated trade receivables, respectively. Although Canon does not expect that the customer will fail to meet its obligations, Canon is potentially exposed to concentrations of credit risk if the customer failed to perform according to the terms of the contracts.

21. FAIR VALUE MEASUREMENTS

Fair value is the price that would be received to sell an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants at the measurement date. A three-level fair value hierarchy that prioritizes the inputs used to measure fair value is as follows:

Level 1— Inputs are quoted prices in active markets for identical assets or liabilities.

Level 2— Inputs are quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, inputs other than quoted prices that are observable, and inputs that are derived principally from or corroborated by observable market data by correlation or other means.

Level 3— Inputs are derived from valuation techniques in which one or more significant inputs or value drivers are unobservable, which reflect the reporting entity's own assumptions about the assumptions that market participants would use in establishing a price.

Assets and liabilities measured at fair value on a recurring basis

The following tables present Canon's assets and liabilities that are measured at fair value on a recurring basis consistent with the fair value hierarchy at December 31, 2018 and 2017.

December 31 Millions of yen	Level 1	Level 2	Level 3	Total
2018: Assets:				
Cash and cash equivalents	**—**	**70,500**	**—**	**70,500**
Short-term investments:				
Available-for-sale:				
Corporate bonds	**630**	**—**	**—**	**630**
Investments:				
Available-for-sale:				
Government bonds	**—**	**—**	**—**	**—**
Corporate bonds	**—**	**—**	**—**	**—**
Fund trusts and others	**630**	**408**	**—**	**1,038**
Equity securities	**13,787**	**—**	**—**	**13,787**
Prepaid expenses and other current assets:				
Derivatives	**—**	**3,143**	**—**	**3,143**
Total assets	**15,047**	**74,051**	**—**	**89,098**
Liabilities:				
Other current liabilities:				
Derivatives	**—**	**766**	**—**	**766**
Total liabilities	**—**	**766**	**—**	**766**

Millions of yen	Level 1	Level 2	Level 3	Total
2017: Assets:				
Cash and cash equivalents	—	70,500	—	70,500
Short-term investments:				
Available-for-sale:				
Corporate bonds	1,222	—	—	1,222
Investments:				
Available-for-sale:				
Government bonds	289	—	—	289
Corporate bonds	605	217	—	822
Fund trusts	13	111	—	124
Equity securities	20,901	—	—	20,901
Prepaid expenses and other current assets:				
Derivatives	—	544	—	544
Total assets	23,030	71,372	—	94,402
Liabilities:				
Other current liabilities:				
Derivatives	—	3,259	—	3,259
Total liabilities	—	3,259	—	3,259

Level 1 investments are comprised principally of Japanese equity securities, which are valued using an unadjusted quoted market price in active markets with sufficient volume and frequency of transactions. Level 2 cash and cash equivalents are valued based on market approach, using quoted prices for identical assets in markets that are not active.

Derivative financial instruments are comprised of foreign exchange contracts. Level 2 derivatives are valued using quotes obtained from counterparties or third parties, which are periodically validated by pricing models using observable market inputs, such as foreign currency exchange rates and interest rates, based on market approach.

Assets and liabilities measured at fair value on a nonrecurring basis

There were no assets or liabilities to be measured at fair value on a nonrecurring basis during the year ended December 31, 2018. The following table presents the Canon's asset that was measured at fair value on a nonrecurring basis consistent with the fair value hierarchy and related impairment charge recognized during the year ended December 31, 2017.

Year ended December 31 Millions of yen	Total loss	Level 1	Level 2	Level 3	Total
2017: Asset:					
Goodwill	(33,912)	—	—	29,370	29,370

Goodwill was classified as Level 3 items and valued based on an income approach using unobservable inputs. Canon performed the annual goodwill impairment test as of October 1, 2017, which indicated that the fair value of the reporting unit was less than its carrying value. Canon recognized the impairment charge for the amount representing the excess of the carrying amount over the reporting unit's fair value. The fair value for the reporting unit was measured based on the discounted cash flow method with 6.0% of weighted average cost of capital and estimated future cash flows. Future cash flows are based on management's estimates of projected revenues, gross profits, operating expenses, a long-term growth rate, taking into consideration industry trends and market conditions.

22. SEGMENT INFORMATION

Canon operates its business in four segments: the Office Business Unit, the Imaging System Business Unit, the Medical System Business Unit, and the Industry and Others Business Unit, which are based on the organizational structure and information reviewed by Canon's management to evaluate results and allocate resources.

Based on the realignment of Canon's internal reporting and management structure, from the beginning of the third quarter of 2018, Canon has reclassified certain businesses from Office Business Unit to Industry and Others Business Unit. Segment information for the year ended December 31, 2018 have reflected this change. Prior period amounts also have been restated. Canon newly established Medical System Business Unit effective at the beginning of the second quarter of 2017, and certain businesses included in Industry and Others Business Unit have been reclassified. Operating results for the year ended December 31, 2017 have been reclassified and for the year ended December 31, 2016 have not been restated since they have not been material. Total assets as of December 31, 2016 have been restated.

The primary products included in each segment are as follows:

Office Business Unit:
Office multifunction devices (MFDs) / Laser multifunction printers (MFPs) / Laser printers / Digital continuous feed presses / Digital sheet-fed presses / Wide-format printers / Document solutions

Imaging System Business Unit:
Interchangeable-lens digital cameras / Digital compact cameras / Digital camcorders / Digital cinema cameras / Interchangeable lenses / Compact photo printers /Inkjet printers / Large format inkjet printers / Commercial photo printers / Image scanners / Multimedia projectors / Broadcast equipment / Calculators

Medical System Business Unit:
Digital radiography systems / Diagnostic X-ray systems / Computed tomography (CT) systems / Magnetic resonance imaging (MRI) systems / Diagnostic ultrasound systems / Clinical chemistry analyzers / Ophthalmic equipment

Industry and Others Business Unit:
Semiconductor lithography equipment / FPD (Flat panel display) lithography equipment / Vacuum thin-film deposition equipment / Organic LED (OLED) panel manufacturing equipment / Die bonders / Micromotors / Network cameras / Handy terminals / Document scanners

The accounting policies of the segments are substantially the same as those described in the significant accounting policies in Note 1. While Canon previously disclosed operating profit as segment profit, Canon has newly adopted income before income taxes as segment profit for the year ended December 31, 2018. Due to the increase of other income (deductions) from the adoption of ASU No. 2017-07, Compensation – Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost, Canon has changed its business performance measure. Please refer to Note 1 (w) for more detailed information about the change in the accounting standard.

Information about operating results and assets for each segment as of and for the years ended December 31, 2018, 2017 and 2016 is as follows:

Millions of yen	Office	Imaging System	Medical System	Industry and Others	Corporate and eliminations	Consolidated
2018: Net sales:						
External customers	**1,804,002**	**1,007,365**	**437,305**	**703,265**	**—**	**3,951,937**
Intersegment	**3,299**	**800**	**273**	**101,946**	**(106,318)**	**—**
Total	**1,807,301**	**1,008,165**	**437,578**	**805,211**	**(106,318)**	**3,951,937**
Operating cost and expenses	**1,586,497**	**891,210**	**408,739**	**739,665**	**(17,126)**	**3,608,985**
Operating profit	**220,804**	**116,955**	**28,839**	**65,546**	**(89,192)**	**342,952**
Other income (deductions)	**8,383**	**4,299**	**640**	**2,061**	**4,557**	**19,940**
Income before income taxes	**229,187**	**121,254**	**29,479**	**67,607**	**(84,635)**	**362,892**
Total assets	**923,261**	**393,004**	**247,282**	**383,568**	**2,952,350**	**4,899,465**
Depreciation and amortization	**64,964**	**40,541**	**9,365**	**38,582**	**98,102**	**251,554**
Capital expenditures	**48,127**	**25,796**	**7,454**	**24,091**	**95,036**	**200,504**
2017: Net sales:						
External customers	1,802,542	1,135,584	434,985	706,904	—	4,080,015
Intersegment	2,240	604	1,202	85,946	(89,992)	—
Total	1,804,782	1,136,188	436,187	792,850	(89,992)	4,080,015
Operating cost and expenses	1,615,521	962,663	414,246	752,122	13,858	3,758,410
Operating profit	189,261	173,525	21,941	40,728	(103,850)	321,605
Other income (deductions)	6,108	2,388	564	1,339	21,880	32,279
Income before income taxes	195,369	175,913	22,505	42,067	(81,970)	353,884
Total assets	946,213	387,088	238,824	376,064	3,250,102	5,198,291
Depreciation and amortization	72,346	41,695	5,212	39,736	102,892	261,881
Impairment losses on goodwill	21,721	—	—	12,191	—	33,912
Capital expenditures	46,769	28,508	8,963	16,620	80,529	181,389
2016: Net sales:						
External customers	1,743,039	1,094,291	—	564,157	—	3,401,487
Intersegment	2,957	998	—	82,326	(86,281)	—
Total	1,745,996	1,095,289	—	646,483	(86,281)	3,401,487
Operating cost and expenses	1,583,588	953,567	—	641,082	6,825	3,185,062
Operating profit	162,408	141,722	—	5,401	(93,106)	216,425
Other income (deductions)	7,467	2,691	—	1,658	16,410	28,226
Income before income taxes	169,875	144,413	—	7,059	(76,696)	244,651
Total assets	947,602	391,661	204,755	354,602	3,239,909	5,138,529
Depreciation and amortization	76,500	47,386	—	42,872	83,338	250,096
Capital expenditures	71,841	25,564	—	29,694	81,280	208,379

Intersegment sales are recorded at the same prices used in transactions with third parties. Expenses not directly associated with specific segments are allocated based on the most reasonable measures applicable. Corporate expenses include certain corporate research and development expenses. Amortization costs of identified intangible assets resulting from the purchase price allocation of CMSC are also included in corporate expenses. Segment assets are based on those directly associated with each segment. Corporate assets primarily consist of cash and cash equivalents, investments, deferred tax assets, goodwill, identified intangible assets from acquisitions and corporate properties. Capital expenditures represent the additions to property, plant and equipment and intangible assets measured on an accrual basis.

Information about sales by product to external customers for each segment for the years ended December 31, 2018, 2017 and 2016 is as follows:

Years ended December 31	Millions of yen		
	2018	2017	2016
Office			
Monochrome copiers	**280,035**	287,823	289,532
Color copiers	**403,522**	405,576	386,193
Printers	**702,378**	702,491	664,846
Others	**418,067**	406,652	402,468
Total	**1,804,002**	1,802,542	1,743,039
Imaging System			
Cameras	**599,578**	702,598	666,868
Inkjet printers	**318,382**	333,721	329,066
Others	**89,405**	99,265	98,357
Total	**1,007,365**	1,135,584	1,094,291
Medical System			
Diagnostic equipment	**437,305**	434,985	—
Industry and Others			
Lithography equipment	**199,722**	193,113	121,090
Others	**503,543**	513,791	443,067
Total	**703,265**	706,904	564,157
Consolidated	**3,951,937**	4,080,015	3,401,487

Information by major geographic area as of and for the years ended December 31, 2018, 2017 and 2016 is as follows:

	Millions of yen		
	2018	2017	2016
Net sales:			
Japan	**869,577**	884,828	706,979
Americas	**1,076,402**	1,107,515	963,544
Europe	**1,015,428**	1,028,415	913,523
Asia and Oceania	**990,530**	1,059,257	817,441
Total	**3,951,937**	4,080,015	3,401,487
Long-lived assets:			
Japan	**1,046,065**	1,081,522	1,163,374
Americas	**129,989**	141,937	147,129
Europe	**169,357**	174,889	166,734
Asia and Oceania	**136,602**	149,244	164,007
Total	**1,482,013**	1,547,592	1,641,244

Net sales are attributed to areas based on the location where the product is shipped and the service is performed to the customers. Other than in Japan and the United States, Canon does not conduct business in any individual country in which its sales in that country exceed 10% of consolidated net sales. Net sales in the United States were ¥995,245 million, ¥1,022,305 million and ¥884,083 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Long-lived assets represent property, plant and equipment and intangible assets for each geographic area.

SCHEDULE II VALUATION AND QUALIFYING ACCOUNTS

Years ended December 31 Millions of yen	Balance at beginning of period	Addition-charged to income	Deduction bad debts written off	Translation adjustments and other	Balance at end of period
2018: Allowance for doubtful receivables					
Trade receivables	**13,378**	**1,347**	**(2,789)**	**(459)**	**11,477**
Finance receivables	**2,681**	**938**	**(1,284)**	**340**	**2,675**
2017: Allowance for doubtful receivables					
Trade receivables	11,075	3,574	(1,787)	516	13,378
Finance receivables	2,325	1,436	(1,523)	443	2,681
2016: Allowance for doubtful receivables					
Trade receivables	12,077	1,460	(1,824)	(638)	11,075
Finance receivables	2,878	398	(978)	27	2,325

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

The management of Canon is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is defined in Rule 13a-15(f) promulgated under the Securities Exchange Act of 1934, as amended, as a process designed by, or under the supervision of, the company's principal executive and principal financial officers and effected by the company's board of directors, management and other personnel, 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 and includes those policies and procedures that (1) pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) 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 (3) 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.

Canon's management assessed the effectiveness of internal control over financial reporting as of December 31, 2018. In making this assessment, management used the criteria established in internal Control –Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the "COSO criteria").

Based on its assessment, management concluded that, as of December 31, 2018, Canon's internal control over financial reporting was effective based on the COSO criteria.

Canon's independent registered public accounting firm, Ernst & Young ShinNihon LLC, has issued an audit report on the effectiveness of Canon's internal control over financial reporting. This report appears in Item 18 of FORM 20-F.

Fujio Mitarai
Chairman & CEO

Toshizo Tanaka
Executive Vice President & CFO

March 28, 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

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To the Shareholders and the Board of Directors of
Canon Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Canon Inc. and subsidiaries (the Company) as of December 31, 2018 and 2017, the related consolidated statements of income, comprehensive income, equity and cash flows for each of the three years in the period ended December 31, 2018, and the related notes and schedule of valuation and qualifying accounts (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated March 28, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the 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 audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the 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 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

Ernst & Young ShinNihon LLC

We have served as the Company's auditor for SEC reporting purposes since 2004, and as its Japanese statutory auditor since 1978.

March 28, 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

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To the Shareholders and the Board of Directors of
Canon Inc.

Opinion on Internal Control over Financial Reporting

We have audited Canon Inc. and subsidiaries' internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, Canon Inc. and subsidiaries (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2018 and 2017, the related consolidated statements of income, comprehensive income, equity and cash flows for each of the three years in the period ended December 31, 2018, and the related notes and schedule of valuation and qualifying accounts and our report dated March 28, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible 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 an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the 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 audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

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 (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) 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 (3) 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.

Ernst & Young ShinNihon LLC

March 28, 2019