

TEXAS INSTRUMENTS INC
Form 10-K
February 22, 2019

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
for the fiscal year ended December 31, 2018

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF
1934
for the transition period from to

Commission File Number 1-3761

TEXAS INSTRUMENTS INCORPORATED

(Exact name of Registrant as specified in its charter)

Delaware 75-0289970
(State of Incorporation) (I.R.S. Employer Identification No.)

12500 TI Boulevard, Dallas, Texas 75243
(Address of Principal Executive Offices) (Zip Code)
Registrant's Telephone Number, Including Area Code: 214-479-3773

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

Title of each class	Name of each exchange on which registered
Common Stock, par value \$1.00	The Nasdaq Global Select Market

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Securities registered pursuant to Section 12(g) of the Act: None

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

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

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

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit such files). Yes No

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

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

Large accelerated filer Accelerated filer Non-accelerated filer Smaller reporting company
Emerging growth company

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

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

The aggregate market value of voting stock held by non-affiliates of the Registrant was approximately \$107,359,133,537 as of June 30, 2018.

938,484,603 (Number of shares of common stock outstanding as of February 18, 2019)

Part III hereof incorporates information by reference to the Registrant's proxy statement for the 2019 annual meeting of stockholders.

PART I

ITEM 1. Business.

We design and make semiconductors that we sell to electronics designers and manufacturers all over the world. We began operations in 1930. We are incorporated in Delaware, headquartered in Dallas, Texas, and have design, manufacturing or sales operations in more than 30 countries. We have two reportable segments: Analog and Embedded Processing. We report the results of our remaining business activities in Other. In 2018, we generated \$15.78 billion of revenue.

Our business model is designed around four sustainable competitive advantages that we believe, in combination, put us in a unique class of companies. These advantages include (1) a strong foundation of manufacturing and technology, (2) a broad portfolio of differentiated analog and embedded processing products, (3) the broadest reach of market channels and (4) diversity and longevity of our products, markets and customer positions. Our strategic focus, and where we invest the majority of our resources, is on Analog and Embedded Processing, with a particular emphasis on designing and selling those products into the industrial and automotive markets, which we believe represent the best growth opportunities. Analog and embedded processing products sold into industrial and automotive markets provide long product life cycles, intrinsic diversity and less capital-intensive manufacturing, which we believe offer stability, profitability and strong cash generation. This business model is the foundation of our capital management strategy, which is based on our belief that free cash flow growth, especially on a per-share basis, is important for maximizing shareholder value over the long term. We also believe that free cash flow will be valued only if it is productively invested in the business or returned to shareholders. Free cash flow is cash flow from operations less capital expenditures.

The combined effect of these sustainable competitive advantages is that over time we have gained market share in Analog and Embedded Processing and have grown and returned free cash flow. TI's business model puts us in a unique class of companies with the ability to grow, generate cash and return that cash to shareholders.

Product information

Semiconductors are electronic components that serve as the building blocks inside modern electronic systems and equipment. Semiconductors, generally known as "chips," combine multiple transistors to form a complete electronic circuit. We have tens of thousands of products that are used to accomplish many different things, such as converting and amplifying signals, interfacing with other devices, managing and distributing power, processing data, canceling noise and improving signal resolution. This broad portfolio includes products that are integral to almost all electronic equipment.

Our segments represent groups of similar products that are combined on the basis of similar design and development requirements, product characteristics, manufacturing processes and distribution channels. Our segments also reflect how management allocates resources and measures results.

Analog

Our Analog segment generated \$10.80 billion of revenue in 2018. Analog semiconductors change real-world signals, such as sound, temperature, pressure or images, by conditioning them, amplifying them and often converting them to a stream of digital data that can be processed by other semiconductors, such as embedded processors. Analog semiconductors also are used to manage power in all electronic equipment by converting, distributing, storing, discharging, isolating and measuring electrical energy, whether the equipment is plugged into a wall or running off a battery. Our Analog products are used in many markets, particularly industrial, automotive and personal electronics.

Sales of our Analog products generated about 68 percent of our revenue in 2018. According to external sources, the market for analog semiconductors was about \$59 billion in 2018. Our Analog segment's revenue in 2018 was about 18 percent of this fragmented market, the leading position. We believe we are well positioned to increase our market share over time.

Our Analog segment includes the following major product lines: Power, Signal Chain and High Volume.

Power

Power includes products that help customers manage power in electronic systems. Our broad portfolio is designed to manage power requirements across different voltage levels using battery management solutions, portable components, power supply controls, point-of-load products, switches and interfaces, integrated protection devices, high-voltage products, and mobile lighting and display products.

Signal Chain

Signal Chain includes products that sense, condition and measure real-world signals to allow information to be transferred or converted for further processing and control. Our Signal Chain products, which serve a variety of end markets, include amplifiers, data converters, interface products, motor drives, clocks and sensing products.

High Volume

High Volume includes integrated analog and standard products that are primarily sold into markets such as personal electronics, industrial and automotive. These products support applications like displays and automotive safety systems.

Embedded Processing

Our Embedded Processing segment generated \$3.55 billion of revenue in 2018. Embedded Processing products are the “brains” of many types of electronic equipment. Embedded processors are designed to handle specific tasks and can be optimized for various combinations of performance, power and cost, depending on the application. Our devices vary from simple, low-cost microcontrollers used in applications such as electric toothbrushes to highly specialized, complex devices used in automotive applications such as infotainment systems and advanced driver assistance systems (ADAS). Our Embedded Processing products are used in many markets, particularly industrial and automotive.

An important characteristic of our Embedded Processing products is that our customers often invest their own research and development (R&D) to write software that operates on our products. This investment tends to increase the length of our customer relationships because many customers prefer to re-use software from one product generation to the next.

Sales of Embedded Processing products generated about 23 percent of our revenue in 2018. According to external sources, the market for embedded processors was about \$21 billion in 2018. Our Embedded Processing segment’s revenue in 2018 was about 18 percent of this fragmented market, among the leaders. We believe we are well positioned to increase our market share over time.

Our Embedded Processing segment includes the following major product lines: Connected Microcontrollers and Processors.

Connected Microcontrollers

Connected Microcontrollers includes microcontrollers, microcontrollers with integrated wireless capabilities and stand-alone wireless connectivity solutions. Microcontrollers are self-contained systems with a processor core, memory and peripherals that are designed to control a set of specific tasks for electronic equipment. Microcontrollers tend to have minimal requirements for memory, program length and software complexity. Our products are used in a wide range of applications and incorporate both wired and wireless communication with integrated analog functions to enable electronic equipment to sense, connect, log and transfer data.

Processors

Processors includes digital signal processors (DSPs) and applications processors. DSPs perform mathematical computations almost instantaneously to process or improve digital data. Applications processors are designed for specific computing activity.

Other

We report the results of our remaining business activities in Other, which includes operating segments that do not meet the quantitative thresholds for individually reportable segments and cannot be aggregated with other operating segments. Other generated \$1.43 billion of revenue in 2018 and includes revenue from DLP® products (primarily used in projectors to create high-definition images), calculators and certain custom semiconductors known as application-specific integrated circuits (ASICs).

In Other, we also include items that are not used in evaluating the results of or in allocating resources to our segments. Examples of these items include acquisition charges; restructuring charges; and certain corporate-level items, such as litigation expenses, environmental costs, insurance settlements, and gains and losses from other activities, including asset dispositions.

Markets for our products

The table below lists the major markets for our products in 2018 and the estimated percentage of our 2018 revenue that the market represented. The chart also lists, in declining order of our revenue, the sectors within each market.

Market	Sector
Industrial (36% of TI revenue)	<ul style="list-style-type: none"> Factory automation & control Building automation Grid infrastructure Medical Test & measurement Aerospace & defense Appliances Motor drives Pro audio, video & signage Power delivery Electronic point of sale (EPOS) Industrial transport Lighting
Automotive (20% of TI revenue)	<ul style="list-style-type: none"> Infotainment & cluster Advanced driver assistance systems (ADAS) Passive safety Hybrid, electric & powertrain systems Body electronics & lighting
Personal electronics (23% of TI revenue)	<ul style="list-style-type: none"> Mobile phones PC & notebooks Portable electronics Connected peripherals & printers Tablets Data storage Home theatre & entertainment TV Wearables (non-medical) Gaming
Communications equipment (11% of TI revenue)	<ul style="list-style-type: none"> Wireless infrastructure Wired networking Broadband fixed line access Datacom module
Enterprise systems (7% of TI revenue)	<ul style="list-style-type: none"> Enterprise projectors Data center & enterprise computing Enterprise machine
Other (calculators and other)	

Market characteristics

Competitive landscape

Despite recent consolidation, the analog and embedded processing markets remain highly fragmented. As a result, we face significant global competition from dozens of large and small companies, including both broad-based suppliers and niche suppliers. Our competitors also include emerging companies, particularly in Asia, that sell products into the same markets in which we operate.

We believe that competitive performance in the semiconductor market generally depends on several factors, including the breadth of a company's product line, the strength and depth of its channels to market, technological innovation, product development execution, technical support, customer service, quality, reliability, capacity and price. In addition, manufacturing process and package technologies that provide differentiated levels of performance are a competitive factor for our Analog products and customers' prior investments in software development is a competitive factor for our Embedded Processing products.

Product cycle

The global semiconductor market is characterized by constant, though generally incremental, advances in product designs and manufacturing processes. Semiconductor prices and manufacturing costs tend to decline over time as manufacturing processes and product life cycles mature.

Market cycle

The "semiconductor cycle" refers to the ebb and flow of supply and demand and the building and depleting of inventories. The semiconductor market historically has been characterized by periods of tight supply caused by strengthening demand and/or insufficient manufacturing capacity, followed by periods of surplus inventory caused by weakening demand and/or excess manufacturing capacity. These are typically referred to as upturns and downturns in the semiconductor cycle. The semiconductor cycle could be affected by the significant time and money required to build and maintain semiconductor manufacturing facilities.

We employ several strategies to dampen the effect of the semiconductor cycle on TI. We plan manufacturing facility and equipment expansion ahead of demand. We focus our resources on our Analog and Embedded Processing segments, which serve diverse markets and diverse customers. This diversity reduces our dependence on the performance of a single market or small group of customers. Additionally, we utilize consignment inventory programs with our customers and distributors that give us improved insight into customer demand.

Seasonality

Our revenue is subject to some seasonal variation. Historically, our sequential revenue growth rate tends to be weaker in the first and fourth quarters when compared with the second and third quarters.

Customers, sales and distribution

We sell our products to about 100,000 customers. Our customer base is diverse, with more than one-third of our revenue derived from customers outside our largest 100.

We market and sell our products through direct sales channels, including our broad sales force and our website, and through distributors. About 65 percent of our sales are fulfilled through our distributors, and they maintain inventory of our products.

In order to provide high service levels for our customers, over the last several years we have been investing to have a closer direct relationship with a large, diverse customer base. Our investments in new and improved capabilities include website and e-commerce enhancements for demand creation as well as inventory consignment programs and order fulfillment services.

Manufacturing

Semiconductor manufacturing begins with a sequence of photolithographic and chemical processing steps that fabricate a number of semiconductor devices on a thin silicon wafer. Each device on the wafer is packaged and tested. The entire process takes place in highly specialized facilities, with most products requiring 6 to 14 weeks for completion.

We own and operate semiconductor manufacturing facilities in North America, Asia, Japan and Europe. These include both wafer fabrication and assembly/test facilities. Our facilities require substantial investment to construct and are largely fixed-cost assets once in operation.

We invest in manufacturing technologies and do most of our manufacturing in-house. This strategic decision to directly control our manufacturing helps ensure a consistent supply of products for our customers and also allows us to invest in technology that differentiates the features of our products. We have focused on creating a competitive manufacturing cost advantage by investing in our advanced analog 300-millimeter capacity, which has about a 40 percent cost advantage per unpackaged chip over 200-millimeter. To strengthen this advantage, we are planning our next phase of 300-millimeter capacity expansion as 300-millimeter wafers will continue to support the majority of our Analog growth.

We expect to continue to maintain sufficient internal manufacturing capacity to meet the vast majority of our production needs, and to obtain manufacturing equipment to support new technology developments and revenue growth. To supplement our manufacturing capacity and maximize our responsiveness to customer demand, we use the capacity of outside suppliers, commonly known as foundries, and subcontractors. In 2018, we sourced about 20 percent of our total wafers from external foundries and about 40 percent of our assembly/test services from subcontractors.

Inventory

Our long-term inventory strategy is to maintain high levels of customer service and stable lead times, minimize inventory obsolescence and improve manufacturing asset utilization. To capitalize on manufacturing efficiencies, we build in advance of demand low-volume, long-lived devices with a broad customer base and a low risk of obsolescence. Additionally, we sometimes maintain product inventory in unfinished wafer form to allow greater flexibility in periods of high demand. Further, we have improved insight into demand and are better able to manage our factory loadings because over time we have increased consignment inventory programs with our customers and distributors. About 65 percent of TI revenue is fulfilled from consignment programs. Our strategy and expected customer demand will cause our inventory levels to fluctuate over time.

Longer term, we expect to carry more inventory than we have in the past as we move towards higher consignment levels and more long-lived, low-volume devices to serve industrial customers, a growing portion of our business.

Backlog

We define backlog as of a particular date as purchase orders with a customer-requested delivery date within a specified length of time. Our backlog at any particular date may not be indicative of revenue for any future period. As customer requirements and industry conditions change, orders may be subject to cancellation or modification of terms such as pricing, quantity or delivery date. Customer order placement practices continually evolve based on customers' individual business needs and capabilities, as well as industry supply and capacity considerations. Further, our consignment programs do not result in backlog because the order occurs at the same time as delivery, i.e., when the customer pulls the product from consigned inventory. Our backlog of orders was \$1.45 billion at December 31, 2018, and \$1.32 billion at December 31, 2017.

Raw materials

We purchase materials, parts and supplies from a number of suppliers. In some cases we purchase such items from sole-source suppliers. The materials, parts and supplies essential to our business are generally available at present, and we believe that such materials, parts and supplies will be available in the foreseeable future.

Intellectual property

We own many patents, and have many patent applications pending, in the United States and other countries in fields relating to our business. We have developed a strong, broad-based patent portfolio and continually add patents to that portfolio. We also have license agreements, which vary in duration, involving rights to our portfolio or those of other companies. We do not consider our business materially dependent upon any one patent or patent license.

We often participate in industry initiatives to set technical standards. Our competitors may participate in the same initiatives. Participation in these initiatives may require us to license certain of our patents to other companies on reasonable and non-discriminatory terms.

We own trademarks that are used in the conduct of our business. These trademarks are valuable assets, the most important of which are “Texas Instruments” and our corporate monogram.

Executive officers of the Registrant

The following is an alphabetical list of the names and ages of the executive officers of the company and the positions or offices with the company held by each person named:

Name	Age	Position
Niels Anderskov	49	Senior Vice President
Ahmad S. Bahai	56	Senior Vice President
Ellen L. Barker	56	Senior Vice President and Chief Information Officer
R. Gregory Delagi	56	Senior Vice President
Kyle M. Flessner	48	Senior Vice President
Haviv Ilan	50	Senior Vice President
Hagop H. Kozanian	36	Senior Vice President
Rafael R. Lizardi	46	Senior Vice President, Chief Financial Officer and Chief Accounting Officer
Richard K. Templeton	60	Director, Chairman of the Board, President and Chief Executive Officer
Cynthia Hoff Trochu	55	Senior Vice President, Secretary and General Counsel
Julie M. Van Haren	50	Senior Vice President
Darla H. Whitaker	53	Senior Vice President
Bing Xie	51	Senior Vice President

The term of office of these officers is from the date of their election until their successor shall have been elected and qualified. All have been employees of the company for more than five years. Messrs. Delagi and Templeton and Ms. Whitaker have served as executive officers of the company for more than five years. Ms. Trochu and Mr. Xie became executive officers of the company in 2015. Messrs. Anderskov, Ilan and Lizardi and Ms. Barker and Van Haren became executive officers of the company in 2017. Messrs. Bahai, Flessner and Kozanian became executive officers of the company in 2018. Mr. Anderskov was previously an executive officer of the company from 2012 to 2014.

Employees

At December 31, 2018, we had 29,888 employees.

Available information

Our internet address is www.ti.com. Information on our website is not part of this report. We make available free of charge through our Investor Relations website our reports on Forms 10-K, 10-Q and 8-K, and amendments to those reports, as soon as reasonably practicable after they are filed with the SEC. Also available through the TI Investor Relations website are reports filed by our directors and executive officers on Forms 3, 4 and 5, and amendments to those reports.

Available on our website at www.ti.com/corporategovernance are: (i) our Corporate Governance Guidelines; (ii) charters for the Audit, Compensation, and Governance and Stockholder Relations Committees of our board of directors; (iii) our Code of Conduct; and (iv) our Code of Ethics for TI Chief Executive Officer and Senior Finance Officers. Stockholders may request copies of these documents free of charge by writing to Texas Instruments Incorporated, P.O. Box 660199, MS 8657, Dallas, Texas, 75266-0199, Attention: Investor Relations.

ITEM 1A. Risk Factors.

~~You should read the following risk factors in conjunction with the factors discussed elsewhere in this and other of our filings with the Securities and Exchange Commission (SEC) and in materials incorporated by reference into these filings. These risk factors are intended to highlight certain factors that may affect our financial condition and results of operations and are not meant to be an exhaustive discussion of risks that apply to TI, a company with broad international operations. Like other companies, we are susceptible to any potential downturn associated with increasing protectionism, trade tensions and macroeconomic weakness, including any potential downturn associated with the pending withdrawal of the United Kingdom from the European Union. These may affect the general economic climate and our performance and the performance of our customers. Similarly, the price of our securities is subject to volatility due to fluctuations in general market conditions, actual financial results that do not meet our and/or the investment community's expectations, changes in our and/or the investment community's expectations for our future results, dividends or share repurchases, and other factors, many of which are beyond our control.~~

We face substantial competition that requires us to respond rapidly to product development and pricing pressures.

We face intense technological and pricing competition in the markets in which we operate. We expect this competition will continue to increase from large competitors and from small competitors serving niche markets, and also from emerging companies, particularly in Asia, that sell products into the same markets in which we operate. For example, we may face increased ~~competition~~ as a result of China actively promoting and reshaping its domestic semiconductor industry through policy changes and investment. These actions may restrict us from participating in the China market or may prevent us from competing effectively with Chinese companies. Certain competitors possess sufficient financial, technical and management resources to develop and market products that may compete favorably against our products, and consolidation among our competitors may allow them to compete more effectively. Additionally, traditional intellectual property licensors are increasingly providing functionality, designs and complete hardware or software solutions that compete with our products. The price and product development pressures that result from competition may lead to reduced profit margins and lost business opportunities in the event that we are unable to match the price declines or cost efficiencies, or meet the technological, product, support, software or manufacturing advancements of our competitors.

Changes in expected demand for our products could have a material adverse effect on our results of operations.

Our customers include companies in a wide range of end markets and sectors within those markets. If demand in one or more sectors within our end markets declines or the rate of growth slows, our results of operations may be adversely affected. The cyclical nature of the semiconductor market may lead to significant and rapid increases and decreases in product demand. Additionally, the loss or significant curtailment of purchases by one or more of our large customers, including curtailments due to a change in the design or manufacturing sourcing policies or practices of these customers, or the timing of customer or distributor inventory adjustments, may adversely affect our results of operations and financial condition.

Our results of operations also might suffer because of a general decline in customer demand resulting from, for example: uncertainty regarding the stability of global credit and financial markets; natural events or domestic or international political, social, economic or other conditions; breaches of customer information technology systems that disrupt customer operations; or a customer's inability to access credit markets and other sources of needed liquidity.

Our ability to match inventory and production with the product mix needed to fill orders may affect our ability to meet a quarter's revenue forecast. In addition, when responding to customers' requests for shorter shipment lead times, we manufacture products based on forecasts of customers' demands. These forecasts are based on multiple assumptions. If we inaccurately forecast customer demand, we may hold inadequate, excess or obsolete inventory that would reduce our profit margins and adversely affect our results of operations and financial condition.

Our global operations subject us to risks associated with domestic or international political, social, economic or other conditions.

We have facilities in more than 30 countries. About 85 percent of our revenue comes from shipments to locations outside the United States; in particular, shipments of products into China typically represent a large portion of our revenue. We are exposed to political, social and economic conditions, security risks, terrorism or other hostile acts, health conditions, labor conditions, and possible disruptions in transportation, communications and information technology networks of the various countries in which we operate. Additionally, certain countries where we operate have experienced, and other countries may experience, increasing protectionism that may impact global trade, including tariffs, import or export restrictions, trade embargoes and sanctions, restrictions on cross-border investment and other trade barriers. This could result in an adverse effect on our operations and our financial results. In addition, our global operations expose us to periods when the U.S. dollar significantly fluctuates in relation to the non-U.S. currencies in which we transact business. The remeasurement of non-U.S. dollar transactions can have an adverse effect on our results of operations and financial condition.

Our operating results and our reputation could be adversely affected by breaches or disruptions of information technology systems.

Breaches or disruptions of our information technology systems or the systems of our customers, vendors and other third parties could be caused by factors such as computer viruses, system failures, restricted network access, unauthorized access, terrorism, employee malfeasance, or human error. These events could, among other things, compromise our information technology networks; result in corrupt or lost data or the unauthorized release of our, our customers' or our suppliers' confidential or proprietary information; cause a disruption to our manufacturing and other operations; result in the release of personal data; or cause us to incur costs associated with increased protection, remediation, regulatory inquiries or penalties, any of which could adversely affect our operating results and our reputation. Cybersecurity threats are frequent and constantly evolving, thereby increasing the difficulty of defending against them.

Our results of operations could be affected by natural events in the locations in which we operate.

We have manufacturing, data and design facilities and other operations in locations subject to natural occurrences such as severe weather, geological events or health epidemics that could disrupt operations. A natural disaster that results in a prolonged disruption to our operations may adversely affect our results and financial condition.

Rapid technological change in markets we serve requires us to develop new technologies and products.

Rapid technological change in markets we serve could contribute to shortened product life cycles and a decline in average selling prices of our products. Our results of operations depend in part upon our ability to successfully develop, manufacture and market innovative products in a timely manner. We make significant investments in research and development to improve existing technology and products, develop new products to meet changing customer demands, and improve our production processes. In some cases, we might not realize a return or the expected return on our investments because they are generally made before commercial viability can be assured. Further, projects that are commercially viable may not contribute to our operating results until at least a few years after they are completed.

We face supply chain and manufacturing risks.

We rely on third parties to supply us with goods and services in a cost-effective and timely manner. Our access to needed goods and services may be adversely affected by potential disputes with suppliers or disruptions in our suppliers' operations as a result of, for example: quality excursions; uncertainty regarding the stability of global credit and financial markets; domestic or international political, social, economic and other conditions; natural events in the

locations in which our suppliers operate; or limited or delayed access to key raw materials, natural resources and utilities. Additionally, a breach of our suppliers' information technology systems could result in a release of our confidential or proprietary information. If our suppliers are unable to access credit markets and other sources of needed liquidity, we may be unable to obtain needed supplies, collect accounts receivable or access needed technology.

In particular, our manufacturing processes and critical manufacturing equipment require that certain key raw materials, natural resources and utilities be available. Limited or delayed access to and high costs of these items could adversely affect our results of operations. Our products contain materials that are subject to conflict minerals reporting requirements. Our relationships with customers and suppliers may be adversely affected if we are unable to describe our products as conflict-free. Additionally, our costs may increase if one or more of our customers demand that we change the sourcing of materials we cannot identify as conflict-free.

Our inability to timely implement new manufacturing technologies or install manufacturing equipment could adversely affect our results of operations. We subcontract a portion of our wafer fabrication and assembly and testing of our products, and we depend on third parties to provide advanced logic manufacturing process technology development. We do not have long-term contracts with all of these suppliers, and the number of alternate suppliers is limited. Reliance on these suppliers involves risks, including possible shortages of capacity in periods of high demand, suppliers' inability to develop and deliver advanced logic manufacturing process technology in a timely, cost effective, and appropriate manner and the possibility of suppliers' imposition of increased costs on us.

Our results of operations and our reputation could be affected by warranty claims, product liability claims, product recalls or legal proceedings.

Claims based on warranty, product liability, epidemic or delivery failures, or other grounds relating to our products, manufacturing, services, designs, communications or cybersecurity could lead to significant expenses as we defend the claims or pay damage awards or settlements. In the event of a claim, we may also incur costs if we decide to compensate the affected customer or end consumer. Any such claims may also cause us to write off the value of related inventory. We maintain product liability insurance, but there is no guarantee that such insurance will be available or adequate to protect against all such claims. In addition, it is possible for a customer to recall a product containing a TI part, for example, with respect to products used in automotive applications or handheld electronics, which may cause us to incur costs and expenses relating to the recall. Any of these events could adversely affect our results of operations, financial condition and reputation.

Our operations could be affected by the complex laws, rules and regulations to which our business is subject.

We are subject to complex laws, rules and regulations affecting our domestic and international operations relating to, for example, the environment, safety and health; exports and imports; bribery and corruption; tax; data privacy and protection; labor and employment; competition; market access; intellectual property ownership and infringement; and the movement of currency. Compliance with these laws, rules and regulations may be onerous and expensive and could restrict our ability to manufacture or ship our products and operate our business. If we fail to comply or if we become subject to enforcement activity, we could be subject to fines, penalties or other legal liability. Furthermore, should these laws, rules and regulations be amended or expanded, or new ones enacted, we could incur materially greater compliance costs or restrictions on our ability to manufacture our products and operate our business.

Some of these complex laws, rules and regulations – for example, those related to environmental, safety and health requirements – may particularly affect us in the jurisdictions in which we manufacture products, especially if such laws and regulations: require the use of abatement equipment beyond what we currently employ; require the addition or elimination of a raw material or process to or from our current manufacturing processes; or impose costs, fees or reporting requirements on the direct or indirect use of energy, natural resources, or materials or gases used or emitted into the environment in connection with the manufacture of our products. A substitute for a prohibited raw material or process might not be available, or might not be available at reasonable cost.

Our results of operations could be affected by changes in tax-related matters.

We have facilities in more than 30 countries and as a result are subject to taxation and audit by a number of taxing authorities. Tax rates vary among the jurisdictions in which we operate. If our tax rate increases, our results of operations could be adversely affected. A number of factors could cause our tax rate to increase, including a change in the jurisdictions in which our profits are earned and taxed; a change in the mix of profits from those jurisdictions; changes in available tax credits or deductions, including for amounts relating to stock compensation; changes in applicable tax rates; changes in tariff regulations or surcharges; changes in accounting principles; or adverse resolution of audits by taxing authorities. We have deferred tax assets on our balance sheet. Changes in applicable tax laws and regulations or in our business performance could affect our ability to realize those deferred tax assets, which could also affect our results of operations.

In addition, we are subject to laws and regulations in various jurisdictions that determine how much profit has been earned and when it is subject to taxation in that jurisdiction. These laws and regulations can be complex and subject to interpretation. Changes in these laws and regulations, including those that align with the Organisation for Economic Cooperation and Development's Base Erosion and Profit Shifting recommendations, could affect the locations where we are deemed to earn income, which could in turn affect our results of operations. Each quarter we forecast our tax expense based on our forecast of our performance for the year. If that performance forecast changes, our forecasted tax expense will change.

If in the future we repatriate any of our earnings represented by non-cash, operating assets such as inventory and fixed assets, we might incur incremental non-U.S. taxes, which could affect our results of operations.

Our results of operations and financial condition could be adversely affected if a customer or a distributor suffers a loss with respect to our inventory.

We have consignment inventory programs in place for some of our largest customers and distributors. If a customer or distributor were to experience a loss with respect to TI-consigned inventory, our results of operations and financial condition may be adversely affected if we do not recover the full value of the lost inventory from the customer, distributor or insurer, or if our recovery is delayed.

Our results of operations could be adversely affected by our distributors' promotion of competing product lines or our distributors' financial performance.

In 2018, about 65 percent of our revenue was generated from sales of our products through distributors. Our distributors carry competing product lines, and our sales could be affected if our distributors promote competing products over our products. Moreover, our results of operations could be affected if our distributors suffer financial difficulties that result in their inability to pay amounts owed to us. Disputes with or the loss of significant distributors could be disruptive or harmful to our current business.

Our margins may vary over time.

Our profit margins may be adversely affected by a number of factors, including decreases in customer demand and shipment volume; obsolescence of our inventory; shifts in our product mix; changes in tariffs; changes in our manufacturing processes; and new accounting pronouncements or changes in existing accounting practices or standards. In addition, we operate in a highly competitive market environment that might adversely affect pricing for our products. Because we own much of our manufacturing capacity, a significant portion of our operating costs is fixed. In general, these fixed costs do not decline with reductions in customer demand or factory loadings, and can adversely affect profit margins as a result.

Our performance depends in part on our ability to enforce our intellectual property rights and to maintain freedom of operation.

Access to worldwide markets depends in part on the continued strength of our intellectual property portfolio in all jurisdictions where we conduct business. There can be no assurance that, as our business evolves, we will obtain the necessary intellectual property rights, or that we will be able to independently develop the technology, software or know-how necessary to conduct our business or that we can do so without infringing the intellectual property rights of others. To the extent that we have to rely on licensed technology from others, there can be no assurance that we will be able to obtain licenses at all or on terms we consider reasonable. We may, directly or indirectly, face infringement claims from third parties, including non-practicing entities that have acquired patents to pursue enforcement actions against other companies. We may also face infringement claims where we or our customers make, use or sell products and where the intellectual property laws may be less established or less predictable. These assertions, whether or not of any merit, could expose us to claims for damages and/or injunctions from third parties, as well as claims for indemnification by our customers in instances where we have a contractual or other legal obligation to indemnify them against damages resulting from infringement claims.

We actively enforce and protect our own intellectual property rights. However, our efforts cannot prevent all misappropriation or improper use of our protected technology and information, including, for example, third parties' use of our patented or copyrighted technology, or our trade secrets in their products without the right to do so, or third parties' sale of counterfeit products bearing our trademark. The risk of unfair copying or cloning may impede our ability to sell our products. The laws of countries where we operate may not protect our intellectual property rights to the same extent as U.S. laws.

Our debt could affect our operations and financial condition.

From time to time, we issue debt securities with various interest rates and maturities. While we believe we will have the ability to service this debt, our ability to make principal and interest payments when due depends upon our future performance, which will be subject to general economic conditions, industry cycles, and business and other factors affecting our operations, including our other risk factors, many of which are beyond our control. In addition, our obligation to make principal and interest payments could divert funds that otherwise would be invested in our operations or returned to shareholders, or could cause us to raise funds by, for example, issuing new debt or equity or selling assets.

Our results of operations and liquidity could be affected by changes in the financial markets.

We maintain bank accounts, one or more multi-year revolving credit agreements, and a portfolio of investments to support the financing needs of the company. Our ability to fund our operations, invest in our business, make strategic acquisitions, service our debt obligations and meet our cash return objectives depends upon continuous access to our bank and investment accounts, and may depend on access to our bank credit lines that support commercial paper borrowings and provide additional liquidity through short-term bank loans. If we are unable to access these accounts and credit lines (for example, due to instability in the financial markets), our results of operations and financial condition could be adversely affected and our ability to access the capital markets or redeem our investments could be restricted.

Increases in health care and pension benefit costs could affect our results of operations and financial condition.

Federal and state health care reform programs could increase our costs with regard to medical coverage of our employees, which could reduce profitability and affect our results of operations and financial condition. In addition, obligations related to our pension and other postretirement plans reflect assumptions that affect the planned funding and costs of these plans, including the actual return on plan assets, discount rates, plan participant population demographics and changes in pension regulations. Changes in these assumptions may affect plan funding, cash flow and results of operations, and our costs and funding obligations could increase significantly if our plans' actual experience differs from these assumptions.

Our continued success depends in part on our ability to retain and recruit a sufficient number of qualified employees in a competitive environment.

Our continued success depends in part on the retention and recruitment of skilled personnel, as well as the effective management of succession for key employees. Skilled and experienced personnel in our industry, including engineering, management, marketing, technical and staff personnel, are in high demand and competition for their talents is intense. There can be no assurance that we will be able to successfully retain and recruit the key engineering, management and technical personnel that we require to execute our business strategy. Our ability to recruit internationally or deploy employees to various locations may be limited by immigration laws.

Our ability to successfully implement business and organizational changes could affect our business plans and results of operations.

From time to time, we undertake business and organizational changes, including acquisitions, divestitures and restructuring actions, to support or carry out our strategic objectives. Our failure to successfully implement these changes could adversely affect our business plans and operating results. For example, we may not realize the expected benefits of an acquisition if we are unable to timely and successfully integrate acquired operations, product lines and technology, and our pre-acquisition due diligence may not identify all possible issues and risks that might arise with respect to an acquisition. Further, we may not achieve or sustain the expected growth or cost savings benefits of business and organizational changes, and restructuring charges could differ materially in amount and timing from our expectations.

Material impairments of our goodwill or intangible assets could adversely affect our results of operations.

We have a significant amount of goodwill and intangible assets on our consolidated balance sheet. Charges associated with impairments of goodwill or intangible assets could adversely affect our financial condition and results of operations.

ITEM 1B. Unresolved Staff Comments.

Not applicable.

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ITEM 2. Properties.

Our principal executive offices are located at 12500 TI Boulevard, Dallas, Texas. The following table indicates the general location of our principal manufacturing and design operations and the reportable segments that make major use of them. Except as otherwise indicated, we own these facilities.

	Analog	Embedded Processing
Dallas, Texas	X	X
Houston, Texas		X
Sherman, Texas	X	
Tucson, Arizona *	X	
Santa Clara, California	X	
South Portland, Maine	X	
Chengdu, China †	X	X
Shanghai, China *	X	X
Freising, Germany	X	X
Bangalore, India †	X	X
Aizu, Japan	X	X
Miho, Japan	X	X
Kuala Lumpur, Malaysia †	X	X
Melaka, Malaysia †	X	
Aguascalientes, Mexico *	X	
Baguio, Philippines †	X	X
Pampanga (Clark), Philippines †	X	X
Greenock, Scotland #	X	
Taipei, Taiwan †	X	X

*Leased.

Portions of the facilities are leased and owned. This may include land leases.

#In February 2019, we entered into an agreement to sell our manufacturing facility in Greenock, Scotland. The sale is expected to close during the first quarter of 2019.

Our facilities in the United States contained approximately 13.0 million square feet at December 31, 2018, of which approximately 0.6 million square feet were leased. Our facilities outside the United States contained approximately 10.0 million square feet at December 31, 2018, of which approximately 1.5 million square feet were leased.

At the end of 2018, we occupied substantially all of the space in our facilities.

Leases covering our currently occupied leased facilities expire at varying dates, generally within the next five years. We believe our current properties are suitable and adequate for their intended purpose.

ITEM 3. Legal Proceedings.

We are involved in various inquiries and proceedings that arise in the ordinary course of our business. We believe that the amount of our liability, if any, will not have a material adverse effect upon our financial condition, results of operations or liquidity.

ITEM 4. Mine Safety Disclosures.

Not applicable.

PART II

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

The information concerning the number of stockholders of record at December 31, 2018, is contained in Item 6, "Summary of Selected Financial Data."

TI common stock is quoted on The Nasdaq Global Select Market under the ticker symbol TXN. The following table contains information regarding our purchases of our common stock during the fourth quarter of 2018.

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs ^(a)	Approximate Dollar Value of Shares that May Yet Be Purchased Under the Plans or Programs ^(a)
October 1, 2018 through October 31, 2018	10,869,754	\$ 97.50	10,823,353	\$ 17.10 billion
November 1, 2018 through November 30, 2018	5,992,830	95.44	5,992,830	16.53 billion
December 1, 2018 through December 31, 2018	4,062,116	93.96	4,062,116	16.14 billion
Total	20,924,700 ^(b)	\$ 96.22 ^(b)	20,878,299	\$ 16.14 billion ^(c)

(a) All open-market purchases during the quarter were made under the authorizations from our board of directors to purchase up to \$7.5 billion and \$6.0 billion of additional shares of TI common stock announced September 17, 2015 and September 21, 2017, respectively. On September 20, 2018, our board of directors authorized the purchase of an additional \$12.0 billion of our common stock.

(b) In addition to open-market purchases, 46,401 shares of common stock were surrendered by employees to satisfy tax withholding obligations in connection with the vesting of restricted stock units.

(c) As of December 31, 2018, this amount consisted of the remaining portion of the \$6.0 billion authorized in September 2017 and the \$12.0 billion authorized in September 2018. No expiration date has been specified for these authorizations.

ITEM 6. Selected Financial Data.

(Millions of dollars, except share and per-share amounts)	For Years Ended December 31,				
	2018	2017	2016	2015	2014
Cash flow data:					
Cash flows from operating activities	\$ 7,189	\$ 5,363	\$ 4,614	\$ 4,397	\$ 4,054
Capital expenditures	1,131	695	531	551	385
Free cash flow (a)	6,058	4,668	4,083	3,846	3,669
Dividends paid	2,555	2,104	1,646	1,444	1,323
Stock repurchases	5,100	2,556	2,132	2,741	2,831
Income statement data:					
Revenue by segment:					
Analog	10,801	9,900	8,536	8,339	8,104
Embedded Processing	3,554	3,498	3,023	2,787	2,740
Other	1,429	1,563	1,811	1,874	2,201
Revenue	15,784	14,961	13,370	13,000	13,045
Gross profit	10,277	9,614	8,257	7,575	7,447
Operating expenses (R&D and SG&A)	3,243	3,202	3,098	2,995	3,164
Acquisition charges	318	318	319	329	330
Restructuring charges/other	3	11	(15)	(71)	(50)
Operating profit	6,713	6,083	4,855	4,322	4,003
Net income	\$ 5,580	\$ 3,682	\$ 3,595	\$ 2,986	\$ 2,821

A portion of net income is allocated to unvested restricted stock units (RSUs) on which we pay dividend equivalents. Diluted earnings per share (EPS) is calculated using the following:

Net income	\$ 5,580	\$ 3,682	\$ 3,595	\$ 2,986	\$ 2,821
Income allocated to RSUs	(42)	(33)	(44)	(42)	(43)
Income allocated to common shares for diluted EPS	\$ 5,538	\$ 3,649	\$ 3,551	\$ 2,944	\$ 2,778
Average diluted shares outstanding (millions)	990	1,012	1,021	1,043	1,080
Diluted EPS	\$ 5.59	\$ 3.61	\$ 3.48	\$ 2.82	\$ 2.57
Cash dividends declared per common share	\$ 2.63	\$ 2.12	\$ 1.64	\$ 1.40	\$ 1.24

(a) Free cash flow is a non-GAAP measure derived by subtracting capital expenditures from cash flows from operating activities.

(Millions of dollars, except other data items)	December 31,				
	2018	2017	2016	2015	2014
Balance sheet data:					
Cash, cash equivalents and short-term investments	\$ 4,233	\$ 4,469	\$ 3,490	\$ 3,218	\$ 3,541
Total assets	17,137	17,642	16,431	16,230	17,372
Current portion of long-term debt	749	500	631	1,000	1,001

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Long-term debt	4,319	3,577	2,978	3,120	3,630
Other data - Number of:					
Employees	29,888	29,714	29,865	29,977	31,003
Stockholders of record	13,825	14,260	14,910	15,563	16,361

See Management's Discussion and Analysis of Financial Condition and Results of Operations and Financial Statements and Supplementary Data.

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

Overview

We design, make and sell semiconductors to electronics designers and manufacturers all over the world. Our business model is designed around the following four sustainable competitive advantages that we believe, in combination, put us in a unique class of companies:

• **A strong foundation of manufacturing and technology.** We invest in manufacturing technologies and do most of our manufacturing in-house. This strategic decision to directly control our manufacturing helps ensure a consistent supply of products for our customers and also allows us to invest in technology that differentiates the features of our products. We have focused on creating a competitive manufacturing cost advantage by investing in our advanced analog 300-millimeter capacity, which has about a 40 percent cost advantage per unpackaged chip over 200-millimeter. To strengthen this advantage, we are planning our next phase of 300-millimeter capacity expansion as 300-millimeter wafers will continue to support the majority of our Analog growth.

• **Broad portfolio of differentiated analog and embedded processing semiconductors.** Our customers need multiple chips for their systems. The breadth of our portfolio means we can meet more of these needs than our competitors can, which gives us access to more customers and the opportunity to sell more products and generate more revenue per customer system. We invest more than \$1 billion each year to develop new products for our portfolio, which includes tens of thousands of products.

• **Broadest reach of market channels.** Customers often begin their initial product selection process and design-in journey on our website, and the breadth of our portfolio attracts more customers to our website than any of our competitors' websites. Our web presence, combined with our global sales force that is also greater in size than those of our competitors, are advantages that give us unique access to about 100,000 customers designing TI semiconductors into their end products.

• **Diversity and longevity of our products, markets and customer positions.** Together, the attributes above result in diverse and long-lived positions that deliver high terminal value to our shareholders. Because of the breadth of our portfolio, we are not dependent on any single product, customer, technology or market. Some of our products generate revenue for decades, which strengthens the return on our investments.

Our strategic focus, and where we invest the majority of our resources, is on Analog and Embedded Processing, with a particular emphasis on designing and selling those products into the industrial and automotive markets, which we believe represent the best growth opportunities. Analog and embedded processing products sold into industrial and automotive markets provide long product life cycles, intrinsic diversity and less capital-intensive manufacturing, which we believe offer stability, profitability and strong cash generation. This business model is the foundation of our capital management strategy, which is based on our belief that free cash flow growth, especially on a per-share basis, is important for maximizing shareholder value over the long term. We also believe that free cash flow will be valued only if it is productively invested in the business or returned to shareholders.

The combined effect of these sustainable competitive advantages is that over time we have gained market share in Analog and Embedded Processing and have grown free cash flow. Our business model puts us in a unique class of companies with the ability to grow, generate cash and return that cash to shareholders.

Management's discussion and analysis of financial condition and results of operations (MD&A) should be read in conjunction with the financial statements and the related notes that appear elsewhere in this document. In the following discussion of our results of operations:

• **Our segments represent groups of similar products that are combined on the basis of similar design and development requirements, product characteristics, manufacturing processes and distribution channels, and how management allocates resources and measures results.** See Note 1 to the financial statements for more information regarding our segments.

• **When we discuss our results:**

o

Unless otherwise noted, changes in our revenue are attributable to changes in customer demand, which are evidenced by fluctuations in shipment volumes.

oNew products tend not to have a significant impact on our revenue in any given period because we sell such a large number of products.

oFrom time to time, our revenue and gross profit are affected by changes in demand for higher-priced or lower-priced products, which we refer to as changes in the “mix” of products shipped.

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o Because we own much of our manufacturing capacity, a significant portion of our operating cost is fixed. When factory loadings decrease, our fixed costs are spread over reduced output and, absent other circumstances, our profit margins decrease. Conversely, as factory loadings increase, our fixed costs are spread over increased output and, absent other circumstances, our profit margins increase. Increases and decreases in factory loadings tend to correspond to increases and decreases in demand.

• The 2017 enactment of the U.S. Tax Cuts and Jobs Act (the Tax Act) reduces our annual operating tax rate, which does not include discrete tax items, from 31 percent in 2017 to an ongoing rate of about 16 percent starting in 2019. In 2018, our annual operating tax rate was 20 percent, 4 percentage points higher, primarily due to a transitional non-cash expense. For an explanation of the term “annual operating tax rate,” see the Non-GAAP financial information section.

• After a sustained period of growth, in late 2018 the semiconductor market entered a downturn. As a result, demand for our products weakened, and we expect this weakness to continue in 2019. During this time, we will continue to be disciplined with our operating plan and expenses, while focusing on long-term investments to strengthen our competitive advantages.

• All dollar amounts in the tables are stated in millions of U.S. dollars.

Results of operations

We continued to perform well in 2018, even as the year ended with a semiconductor market slowdown. We focus on Analog and Embedded Processing, with an emphasis on the industrial and automotive markets, because these products serve highly diverse markets with thousands of applications and have long-term growth opportunities. Gross margin of 65.1 percent reflected the quality of our product portfolio, as well as the efficiency of our manufacturing strategy, including the benefit of 300-millimeter Analog production.

Our focus on Analog and Embedded Processing allows us to generate strong cash flow from operations. Our cash flow from operations of \$7.19 billion underscored the strength of our business model. Free cash flow was \$6.06 billion and represented 38.4 percent of revenue, up from 31.2 percent a year ago. During 2018, we returned \$7.66 billion to shareholders through a combination of stock repurchases and dividends. Our strategy is to return all free cash flow to shareholders. Our dividends represented 42 percent of free cash flow, underscoring their sustainability. Free cash flow is a non-GAAP financial measure. See the Non-GAAP financial information section.

Details of financial results – 2018 compared with 2017

Revenue of \$15.78 billion increased \$823 million, or 6 percent, primarily due to higher revenue from Analog. Embedded Processing also grew.

Gross profit of \$10.28 billion was up \$663 million, or 7 percent, due to higher revenue and lower manufacturing costs. As a percentage of revenue, gross profit increased to 65.1 percent from 64.3 percent.

Operating expenses (R&D and SG&A) were \$3.24 billion compared with \$3.20 billion.

Acquisition charges of \$318 million were non-cash. See Note 8 to the financial statements.

Operating profit was \$6.71 billion, or 42.5 percent of revenue, compared with \$6.08 billion, or 40.7 percent of revenue.

Other income and expense (OI&E) was \$98 million of income compared with \$75 million of income. See Note 13 to the financial statements.

Interest and debt expense of \$125 million increased \$47 million due to the issuance of additional long-term debt.

Our provision for income taxes was \$1.11 billion compared with \$2.40 billion, which includes a discrete tax benefit of \$198 million in 2018 and a discrete tax expense of \$540 million in 2017. The decrease in our tax provision was due to the enactment of the Tax Act in 2017, which included a reduction in the statutory tax rate in 2018 and the tax on indefinitely reinvested earnings recorded in 2017. The benefits of the Tax Act in 2018 were partially offset by higher income before income taxes. Our effective tax rate, which includes discrete tax items, was 17 percent in 2018 compared with 39 percent in 2017. See Note 5 to the financial statements for a reconciliation of the U.S. statutory income tax rate to our effective tax rate.

Net income was \$5.58 billion compared with \$3.68 billion. EPS was \$5.59 compared with \$3.61.

Segment results – 2018 compared with 2017

Analog (includes Power, Signal Chain and High Volume product lines)

	2018	2017	Change
Revenue	\$ 10,801	\$ 9,900	9 %
Operating profit	5,109	4,468	14 %
Operating profit % of revenue	47.3 %	45.1 %	

Analog revenue increased due to Power and, to a lesser extent, Signal Chain, partially offset by a decline in High Volume. Operating profit increased due to higher revenue and associated gross profit.

Embedded Processing (includes Connected Microcontrollers and Processors product lines)

	2018	2017	Change
Revenue	\$ 3,554	\$ 3,498	2 %
Operating profit	1,205	1,143	5 %
Operating profit % of revenue	33.9 %	32.7 %	

Embedded Processing revenue increased due to Connected Microcontrollers. Processors revenue was about even. Operating profit increased primarily due to higher gross profit.

Other (includes DLP® products, calculators and custom ASIC products)

	2018	2017	Change
Revenue	\$ 1,429	\$ 1,563	(9)%
Operating profit *	399	472	(15)%
Operating profit % of revenue	27.9 %	30.2 %	

* Includes acquisition charges and restructuring charges/other

Other revenue decreased by \$134 million, and operating profit decreased by \$73 million.

Details of financial results – 2017 compared with 2016

Revenue of \$14.96 billion was up \$1.59 billion, or 12 percent, from 2016 due to higher revenue from Analog and Embedded Processing.

Gross profit of \$9.61 billion was up \$1.36 billion, or 16 percent, primarily due to higher revenue. As a percentage of revenue, gross profit increased to 64.3 percent from 61.8 percent.

Operating expenses were \$3.20 billion compared with \$3.10 billion, as we allocated resources from manufacturing support and SG&A into R&D activities.

Acquisition charges of \$318 million were non-cash.

Restructuring charges/other was a charge of \$11 million compared with a credit of \$15 million in 2016. These amounts are included in Other for segment reporting purposes. See Note 12 to the financial statements.

Operating profit was \$6.08 billion, or 40.7 percent of revenue, compared with \$4.86 billion, or 36.3 percent of revenue.

OI&E was \$75 million of income compared with \$155 million of income in 2016.

Our provision for income taxes was \$2.40 billion compared with \$1.34 billion. The increase was due to the enactment of the Tax Act and, to a lesser extent, higher income before income taxes. Our effective tax rate, which includes discrete tax items, was 39 percent in 2017 compared with 27 percent in 2016.

Net income was \$3.68 billion compared with \$3.60 billion. EPS was \$3.61 compared with \$3.48.

Segment results – 2017 compared with 2016

Analog

	2017	2016	Change
Revenue	\$ 9,900	\$ 8,536	16 %
Operating profit	4,468	3,416	31 %
Operating profit % of revenue	45.1 %	40.0 %	

Analog revenue increased due to Power and Signal Chain. High Volume also grew, but to a lesser extent. Operating profit increased primarily due to higher revenue and associated gross profit.

Embedded Processing

	2017	2016	Change
Revenue	\$ 3,498	\$ 3,023	16 %
Operating profit	1,143	817	40 %
Operating profit % of revenue	32.7 %	27.0 %	

Embedded Processing revenue increased due to growth in both product lines, led by Processors. Operating profit increased primarily due to higher revenue and associated gross profit.

Other

	2017	2016	Change
Revenue	\$ 1,563	\$ 1,811	(14)%
Operating profit *	472	622	(24)%
Operating profit % of revenue	30.2 %	34.3 %	

* Includes acquisition charges and restructuring charges/other

Other revenue decreased by \$248 million primarily due to custom ASIC products and the recognition of royalties in OI&E instead of revenue, which began in the first quarter of 2017. Operating profit decreased by \$150 million.

Financial condition

At the end of 2018, total cash (cash and cash equivalents plus short-term investments) was \$4.23 billion, a decrease of \$236 million from the end of 2017.

Accounts receivable were \$1.21 billion, a decrease of \$71 million compared with the end of 2017. Days sales outstanding at the end of 2018 were 29 compared with 31 at the end of 2017.

Inventory was \$2.22 billion, an increase of \$260 million from the end of 2017. Days of inventory at the end of 2018 were 152 compared with 134 at the end of 2017.

Liquidity and capital resources

Our primary source of liquidity is cash flow from operations. Additional sources of liquidity are cash and cash equivalents, short-term investments and a variable rate, revolving credit facility. Cash flows from operating activities for 2018 were \$7.19 billion, an increase of \$1.83 billion from 2017. This increase was due to higher net income, which benefited from a lower effective tax rate.

Our revolving credit facility is with a consortium of investment-grade banks and allows us to borrow up to \$2 billion until March 2023. This credit facility also serves as support for the issuance of commercial paper. As of December 31,

2018, our credit facility was undrawn, and we had no commercial paper outstanding.

Investing activities for 2018 used \$78 million compared with \$1.13 billion in 2017. Capital expenditures were \$1.13 billion compared with \$695 million in 2017 and were primarily for semiconductor manufacturing equipment in both periods. We had sales of short-term investments, net of purchases, that provided cash proceeds of \$1.07 billion compared with purchases of short-term investments, net of sales, that used cash of \$460 million in 2017. We received \$9 million from asset sales compared with \$40 million in 2017.

Financing activities for 2018 used \$6.33 billion compared with \$3.73 billion in 2017. In 2018, we received net proceeds of \$1.50 billion from the issuance of fixed-rate, long-term debt and retired maturing debt of \$500 million. In 2017, we received net proceeds of \$1.10 billion from the issuance of fixed-rate, long-term debt and retired maturing debt of \$625 million. Dividends paid in 2018 were \$2.56 billion compared with \$2.10 billion in 2017, reflecting an increase in the dividend rate, partially offset by fewer shares outstanding. We used \$5.10 billion to repurchase 49.5 million shares of our common stock compared with \$2.56 billion used in 2017 to repurchase 30.6 million shares. Employee exercises of stock options provided cash proceeds of \$373 million compared with \$483 million in 2017.

We had \$2.44 billion of cash and cash equivalents and \$1.80 billion of short-term investments as of December 31, 2018. We believe we have the necessary financial resources and operating plans to fund our working capital needs, capital expenditures, dividend and debt-related payments, and other business requirements for at least the next 12 months.

Non-GAAP financial information

This MD&A includes references to free cash flow and ratios based on that measure. These are financial measures that were not prepared in accordance with generally accepted accounting principles in the United States (GAAP). Free cash flow was calculated by subtracting capital expenditures from the most directly comparable GAAP measure, cash flows from operating activities (also referred to as cash flow from operations).

We believe that free cash flow and the associated ratios provide insight into our liquidity, our cash-generating capability and the amount of cash potentially available to return to shareholders, as well as insight into our financial performance. These non-GAAP measures are supplemental to the comparable GAAP measures.

Reconciliation to the most directly comparable GAAP-based measures is provided in the table below.

	For Years Ended December 31,		
	2018	2017	2016
Cash flow from operations (GAAP)	\$ 7,189	\$ 5,363	\$ 4,614
Capital expenditures	(1,131)	(695)	(531)
Free cash flow (non-GAAP)	\$ 6,058	\$ 4,668	\$ 4,083
Revenue	\$ 15,784	\$ 14,961	\$ 13,370
Cash flow from operations as a percent of revenue (GAAP)	45.5 %	35.8 %	34.5 %
Free cash flow as a percent of revenue (non-GAAP)	38.4 %	31.2 %	30.5 %

This MD&A also includes references to an annual operating tax rate, a non-GAAP term we use to describe the estimated annual effective tax rate, a GAAP measure that by definition does not include discrete tax items. We believe the term annual operating tax rate helps differentiate from the effective tax rate, which includes discrete tax items.

Long-term contractual obligations

Contractual Obligations	Payments Due by Period				Total
	2019	2020/2021	2022/2023	Thereafter	
Long-term debt (a)	\$ 886	\$ 1,281	\$ 1,188	\$ 3,876	\$ 7,231
Purchase commitments (b)	389	469	37	15	910
Tax on indefinitely reinvested earnings (c)	—	46	156	304	506
Operating leases (d)	56	82	47	39	224
Deferred compensation plans (e)	17	46	48	111	222
Total (f)	\$ 1,348	\$ 1,924	\$ 1,476	\$ 4,345	\$ 9,093

- (a) Principal and related interest payments for our long-term debt obligations, including amounts classified as the current portion of long-term debt.
- (b) Includes payments for software licenses and contractual arrangements with suppliers when there is a fixed, non-cancellable payment schedule or when minimum payments are due with a reduced delivery schedule. Excludes cancellable arrangements.
- (c) Future payments for the one-time transition tax on our indefinitely reinvested earnings related to the enactment of the Tax Act. See Note 5 to the financial statements for more details.
- (d) Includes minimum payments for leased facilities and equipment and purchases of industrial gases under contracts accounted for as operating leases.
- (e) Estimated payments for certain liabilities that existed as of December 31, 2018.
- (f) Excludes \$286 million of uncertain tax liabilities under ASC 740, as well as any planned future funding contributions to retirement benefit plans. Amounts associated with uncertain tax liabilities have been excluded because of the difficulty in making reasonably reliable estimates of the timing of cash settlements with the respective taxing authorities. Regarding future funding of retirement benefit plans, we plan to contribute about \$50 million in 2019, but funding projections beyond 2019 are not practical to estimate due to the rules affecting tax-deductible contributions and the impact from the plans' asset performance, interest rates and potential U.S. and non-U.S. legislation.

Critical accounting policies

Our accounting policies are more fully described in Note 2 of the consolidated financial statements. As disclosed in Note 2, the preparation of consolidated financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions about future events that affect the amounts reported in the financial statements and accompanying notes. However, based on facts and circumstances inherent in developing estimates and assumptions, management believes it is unlikely that applying other estimates and assumptions would have a material impact on the financial statements. We consider the following accounting policies to be those that are most important to the portrayal of our financial condition and that require a higher degree of judgment.

Revenue recognition

Based on management's assessment of the revenue recognition criteria, we usually recognize revenue from sales of our products to distributors upon shipment or delivery to the distributors. For our consignment arrangements with distributors, delivery occurs when the distributor pulls product from consignment inventory that we store at designated locations. Recognition is not contingent upon resale of the products to the distributors' customers in either scenario.

Revenue is recognized net of allowances, which are management's estimates of future credits to be granted to distributors under programs common in the semiconductor industry. These allowances are not material and generally include special pricing arrangements, product returns due to quality issues, and incentives designed to maximize growth opportunities.

Allowances are based on analysis of historical data and contractual terms and are recorded when revenue is recognized. We believe we can reasonably and reliably estimate allowances for credits to distributors in a timely manner.

Income taxes

In determining net income for financial statement purposes, we must make certain estimates and judgments in the calculation of tax provisions and the resultant tax liabilities, and in the recoverability of deferred tax assets that arise from temporary differences between the tax and financial statement recognition of revenue and expense.

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In the ordinary course of global business, there may be many transactions and calculations where the ultimate tax outcome is uncertain. The calculation of tax liabilities involves dealing with uncertainties in the application of complex tax laws. We recognize potential liabilities for anticipated tax audit issues in the United States and other tax jurisdictions based on an estimate of the ultimate resolution of whether, and the extent to which, additional taxes will be due. Although we believe the estimates are reasonable, no assurance can be given that the final outcome of these matters will not be different than what is reflected in the historical income tax provisions and accruals.

As part of our financial process, we must assess the likelihood that our deferred tax assets can be recovered. If recovery is not likely, the provision for taxes must be increased by recording a reserve in the form of a valuation allowance for the deferred tax assets that are estimated not to be ultimately recoverable. In this process, certain relevant criteria are evaluated including the existence of deferred tax liabilities that can be used to absorb deferred tax assets, the taxable income in prior years that can be used to absorb net operating losses and credit carrybacks, and taxable income in future years. Our judgment regarding future recoverability of our deferred tax assets based on these criteria may change due to various factors, including changes in U.S. or international tax laws and changes in market conditions and their impact on our assessment of taxable income in future periods. These changes, if any, may require material adjustments to the deferred tax assets and an accompanying reduction or increase in net income in the period when such determinations are made. Also, our plans for the permanent reinvestment or eventual repatriation of the accumulated earnings of certain non-U.S. operations could change. Such changes could have a material effect on tax expense in future years.

Inventory valuation allowances

Inventory is valued net of allowances for unsalable or obsolete raw materials, work-in-process and finished goods. Statistical allowances are determined quarterly for raw materials and work-in-process based on historical disposals of inventory for salability and obsolescence reasons. For finished goods, quarterly statistical allowances are determined by comparing inventory levels of individual parts to historical shipments, current backlog and estimated future sales in order to identify inventory judged unlikely to be sold. A specific allowance for each material type will be carried if there is a significant event not captured by the statistical allowance. Examples are an end-of-life part or demand with imminent risk of cancellation. Allowances are also calculated quarterly for instances where inventoried costs for individual products are in excess of the net realizable value for those products. Actual future write-offs of inventory for salability and obsolescence reasons may differ from estimates and calculations used to determine valuation allowances due to changes in customer demand, customer negotiations, technology shifts and other factors.

Changes in accounting standards

See Note 2 to the financial statements for information on new accounting standards.

Off-balance sheet arrangements

As of December 31, 2018, we had no significant off-balance sheet arrangements as defined in Item 303(a)(4)(ii) of SEC Regulation S-K.

Commitments and contingencies

See Note 11 to the financial statements for a discussion of our commitments and contingencies.

ITEM 7A. Quantitative and Qualitative Disclosures About Market Risk.

Foreign exchange risk

The U.S. dollar is our functional currency for financial reporting. Our non-U.S. entities own assets or liabilities denominated in U.S. dollars or other currencies. Exchange rate fluctuations impact taxable income in those jurisdictions, and consequently impact our effective tax rate.

Our balance sheet also reflects amounts remeasured from non-U.S. dollar currencies. Because most of the aggregate non-U.S. dollar balance sheet exposure is hedged by forward currency exchange contracts, based on year-end 2018 balances and currency exchange rates, a hypothetical 10 percent plus or minus fluctuation in non-U.S. currency exchange rates relative to the U.S. dollar would result in a pre-tax currency exchange gain or loss of about \$3 million.

We use these forward currency exchange contracts to reduce the earnings impact that exchange rate fluctuations may have on our non-U.S. dollar net balance sheet exposures. For example, at year-end 2018, we had forward currency exchange contracts outstanding with a notional value of \$525 million to hedge net balance sheet exposures (including \$160 million to sell Japanese yen, \$99 million to sell euros and \$94 million to sell Indian rupees). Similar hedging activities existed at year-end 2017.

Interest rate risk

We have the following potential exposure to changes in interest rates: (1) the effect of changes in interest rates on the fair value of our investments in cash equivalents and short-term investments, which could produce a gain or a loss; and (2) the effect of changes in interest rates on the fair value of our debt.

As of December 31, 2018, a hypothetical 100 basis point increase in interest rates would decrease the fair value of our investments in cash equivalents and short-term investments by about \$4 million and decrease the fair value of our long-term debt by \$330 million. Because interest rates on our long-term debt are fixed, changes in interest rates would not affect the cash flows associated with long-term debt.

Equity risk

Long-term investments at year-end 2018 include the following:

• Investments in mutual funds – includes mutual funds that were selected to generate returns that offset changes in certain liabilities related to deferred compensation arrangements. The mutual funds hold a variety of debt and equity investments.

• Investments in venture capital funds – includes investments in limited partnerships (accounted for under either the equity method or at cost as non-marketable equity securities).

• Equity investments – includes non-marketable (non-publicly traded) equity securities.

Investments in mutual funds are stated at fair value. Changes in prices of the mutual fund investments are expected to offset related changes in deferred compensation liabilities such that a 10 percent increase or decrease in the investments' fair values would not materially affect operating results. Non-marketable equity securities and certain venture capital funds are stated at cost minus impairment, if any, plus or minus changes resulting from qualifying observable price changes. Investments in the remaining venture capital funds are stated using the equity method. See Note 7 to the financial statements for details of equity and other long-term investments.

ITEM 8. Financial Statements and Supplementary Data.

List of Financial Statements (Item 15(a))

Income for each of the three years in the period ended December 31, 2018

Comprehensive income for each of the three years in the period ended December 31, 2018

Balance sheets as of December 31, 2018 and 2017

Cash flows for each of the three years in the period ended December 31, 2018

Stockholders' equity for each of the three years in the period ended December 31, 2018

Schedules have been omitted because the required information is not present or not present in amounts sufficient to require submission of the schedule, or because the information required is included in the consolidated financial statements or the notes thereto.

Consolidated Statements of Income (Millions of dollars, except share and per-share amounts)	For Years Ended December 31,		
	2018	2017	2016
Revenue	\$ 15,784	\$ 14,961	\$ 13,370
Cost of revenue (COR)	5,507	5,347	5,113
Gross profit	10,277	9,614	8,257
Research and development (R&D)	1,559	1,508	1,356
Selling, general and administrative (SG&A)	1,684	1,694	1,742
Acquisition charges	318	318	319
Restructuring charges/other	3	11	(15)
Operating profit	6,713	6,083	4,855
Other income (expense), net (OI&E)	98	75	155
Interest and debt expense	125	78	80
Income before income taxes	6,686	6,080	4,930
Provision for income taxes	1,106	2,398	1,335
Net income	\$ 5,580	\$ 3,682	\$ 3,595
Earnings per common share (EPS):			
Basic	\$ 5.71	\$ 3.68	\$ 3.54
Diluted	\$ 5.59	\$ 3.61	\$ 3.48
Average shares outstanding (millions):			
Basic	970	991	1,003
Diluted	990	1,012	1,021

A portion of net income is allocated to unvested restricted stock units (RSUs) on which we pay dividend equivalents. Diluted EPS is calculated using the following:

Net income	\$ 5,580	\$ 3,682	\$ 3,595
Income allocated to RSUs	(42)	(33)	(44)
Income allocated to common stock for diluted EPS	\$ 5,538	\$ 3,649	\$ 3,551

See accompanying notes.

Consolidated Statements of Comprehensive Income (Millions of dollars)	For Years Ended December 31,		
	2018	2017	2016
Net income	\$ 5,580	\$ 3,682	\$ 3,595
Other comprehensive income (loss)			
Net actuarial losses of defined benefit plans:			
Adjustment, net of tax effect of \$35, (\$26) and \$6	(98)	92	(43)
Recognized within net income, net of tax effect of (\$15), (\$27) and (\$25)	50	56	51
Prior service credit of defined benefit plans:			
Adjustment, net of tax effect of \$1, \$1 and \$0	(6)	(2)	—
Recognized within net income, net of tax effect of \$1, \$1 and \$2	(3)	(5)	(3)
Derivative instruments:			
Change in fair value, net of tax effect of \$1, \$0 and \$0	(2)	—	—
Recognized within net income, net of tax effect of \$0, \$0 and \$0	—	1	1
Other comprehensive income (loss), net of taxes	(59)	142	6
Total comprehensive income	\$ 5,521	\$ 3,824	\$ 3,601

See accompanying notes.

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Consolidated Balance Sheets (Millions of dollars, except share amounts)	December 31,	
	2018	2017
Assets		
Current assets:		
Cash and cash equivalents	\$ 2,438	\$ 1,656
Short-term investments	1,795	2,813
Accounts receivable, net of allowances of (\$19) and (\$8)	1,207	1,278
Raw materials	181	126
Work in process	1,070	1,089
Finished goods	966	742
Inventories	2,217	1,957
Prepaid expenses and other current assets	440	1,030
Total current assets	8,097	8,734
Property, plant and equipment at cost	5,425	4,789
Accumulated depreciation	(2,242)	(2,125)
Property, plant and equipment	3,183	2,664
Long-term investments	251	268
Goodwill	4,362	4,362
Acquisition-related intangibles	628	946
Deferred tax assets	295	264
Capitalized software licenses	89	110
Overfunded retirement plans	92	208
Other long-term assets	140	86
Total assets	\$ 17,137	\$ 17,642
Liabilities and stockholders' equity		
Current liabilities:		
Current portion of long-term debt	\$ 749	\$ 500
Accounts payable	478	466
Accrued compensation	724	722
Income taxes payable	103	128
Accrued expenses and other liabilities	420	442
Total current liabilities	2,474	2,258
Long-term debt	4,319	3,577
Underfunded retirement plans	118	89
Deferred tax liabilities	42	78
Other long-term liabilities	1,190	1,303
Total liabilities	8,143	7,305
Stockholders' equity:		
Preferred stock, \$25 par value. Authorized – 10,000,000 shares		
Participating cumulative preferred – None issued	—	—
Common stock, \$1 par value. Authorized – 2,400,000,000 shares		
Shares issued – 1,740,815,939	1,741	1,741
Paid-in capital	1,950	1,776
Retained earnings	37,906	34,662
Treasury common stock at cost		
Shares: 2018 – 795,665,646; 2017 – 757,657,217	(32,130)	(27,458)
Accumulated other comprehensive income (loss), net of taxes (AOCI)	(473)	(384)
Total stockholders' equity	8,994	10,337

Total liabilities and stockholders' equity	\$ 17,137	\$ 17,642
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See accompanying notes.

Consolidated Statements of Cash Flows (Millions of dollars)	For Years Ended December		
	31, 2018	2017	2016
Cash flows from operating activities			
Net income	\$ 5,580	\$ 3,682	\$ 3,595
Adjustments to net income:			
Depreciation	590	539	605
Amortization of acquisition-related intangibles	318	318	319
Amortization of capitalized software	46	47	31
Stock compensation	232	242	252
Gains on sales of assets	(3)	—	(40)
Deferred taxes	(105)	112	(202)
Increase (decrease) from changes in:			
Accounts receivable	71	(7)	(108)
Inventories	(282)	(167)	(99)
Prepaid expenses and other current assets	669	76	(81)
Accounts payable and accrued expenses	(7)	51	72
Accrued compensation	(7)	(3)	36
Income taxes payable	158	468	333
Changes in funded status of retirement plans	36	21	(73)
Other	(107)	(16)	(26)
Cash flows from operating activities	7,189	5,363	4,614
Cash flows from investing activities			
Capital expenditures	(1,131)	(695)	(531)
Proceeds from asset sales	9	40	—
Purchases of short-term investments	(5,641)	(4,555)	(3,503)
Proceeds from short-term investments	6,708	4,095	3,390
Other	(23)	(12)	(6)
Cash flows from investing activities	(78)	(1,127)	(650)
Cash flows from financing activities			
Proceeds from issuance of long-term debt	1,500	1,099	499
Repayment of debt	(500)	(625)	(1,000)
Dividends paid	(2,555)	(2,104)	(1,646)
Stock repurchases	(5,100)	(2,556)	(2,132)
Proceeds from common stock transactions	373	483	472
Other	(47)	(31)	(3)
Cash flows from financing activities	(6,329)	(3,734)	(3,810)
Net change in cash and cash equivalents	782	502	154
Cash and cash equivalents at beginning of period	1,656	1,154	1,000
Cash and cash equivalents at end of period	\$ 2,438	\$ 1,656	\$ 1,154

See accompanying notes.

Consolidated Statements of Stockholders' Equity (Millions of dollars, except per-share amounts)	Common Stock	Paid-in Capital	Retained Earnings	Treasury Common Stock	AOI
Balance, December 31, 2015	\$ 1,741	\$ 1,629	\$ 31,176	\$ (24,068)	\$ (532)
2016					
Net income	—	—	3,595	—	—
Dividends declared and paid (\$1.64 per share)	—	—	(1,646)	—	—
Common stock issued for stock-based awards	—	(204)	—	677	—
Stock repurchases	—	—	—	(2,132)	—
Stock compensation	—	252	—	—	—
Other comprehensive income (loss), net of taxes	—	—	—	—	6
Dividend equivalents paid on restricted stock units	—	—	(18)	—	—
Other	—	(3)	—	—	—
Balance, December 31, 2016	1,741	1,674	33,107	(25,523)	(526)
2017					
Net income	—	—	3,682	—	—
Dividends declared and paid (\$2.12 per share)	—	—	(2,104)	—	—
Common stock issued for stock-based awards	—	(138)	—	621	—
Stock repurchases	—	—	—	(2,556)	—
Stock compensation	—	242	—	—	—
Other comprehensive income (loss), net of taxes	—	—	—	—	142
Dividend equivalents paid on restricted stock units	—	—	(17)	—	—
Other	—	(2)	(6)	—	—
Balance, December 31, 2017	1,741	1,776	34,662	(27,458)	(384)
2018					
Net income	—	—	5,580	—	—
Dividends declared and paid (\$2.63 per share)	—	—	(2,555)	—	—
Common stock issued for stock-based awards	—	(55)	—	428	—
Stock repurchases	—	—	—	(5,100)	—
Stock compensation	—	232	—	—	—
Other comprehensive income (loss), net of taxes	—	—	—	—	(59)
Dividend equivalents paid on restricted stock units	—	—	(17)	—	—
Cumulative effect of accounting changes	—	—	236	—	(30)
Other	—	(3)	—	—	—
Balance, December 31, 2018	\$ 1,741	\$ 1,950	\$ 37,906	\$ (32,130)	\$ (473)

See accompanying notes.

Notes to financial statements

1. Description of business, including segment and geographic area information

We design, make and sell semiconductors to electronics designers and manufacturers all over the world. We have two reportable segments, which are established along major categories of products as follows:

•Analog – consisting of the following product lines: Power, Signal Chain and High Volume.

•Embedded Processing – consisting of the following product lines: Connected Microcontrollers and Processors.

We report the results of our remaining business activities in Other. Other includes operating segments that do not meet the quantitative thresholds for individually reportable segments and cannot be aggregated with other operating segments. Other includes DLP® products, calculators and custom ASIC products.

In Other, we also include items that are not used in evaluating the results of or in allocating resources to our segments. Examples of these items include acquisition charges (see Note 8); restructuring charges (see Note 12); and certain corporate-level items, such as litigation expenses, environmental costs, insurance settlements, and gains and losses from other activities, including asset dispositions. We allocate the remainder of our expenses associated with corporate activities to our operating segments based on specific methodologies, such as percentage of operating expenses or headcount.

Our centralized manufacturing and support organizations, such as facilities, procurement and logistics, provide support to our operating segments, including those in Other. Costs incurred by these organizations, including depreciation, are charged to the segments on a per-unit basis. Consequently, depreciation expense is not an independently identifiable component within the segments' results and, therefore, is not provided.

With the exception of goodwill, we do not identify or allocate assets by operating segment, nor does the chief operating decision maker evaluate operating segments using discrete asset information. We have no material intersegment revenue. The accounting policies of the segments are consistent with those described below in the summary of significant accounting policies and practices.

Segment information

	For Years Ended December 31,		
	2018	2017	2016
Revenue:			
Analog	\$ 10,801	\$ 9,900	\$ 8,536
Embedded Processing	3,554	3,498	3,023
Other	1,429	1,563	1,811
Total revenue	\$ 15,784	\$ 14,961	\$ 13,370
Operating profit:			
Analog	\$ 5,109	\$ 4,468	\$ 3,416
Embedded Processing	1,205	1,143	817
Other	399	472	622
Total operating profit	\$ 6,713	\$ 6,083	\$ 4,855

Geographic area information

The following geographic area information includes revenue, based on product shipment destination, and property, plant and equipment, based on physical location. The revenue information is not necessarily indicative of the geographic area in which the end applications containing our products are ultimately consumed because our products tend to be shipped to the locations where our customers manufacture their products. Specifically, many of our products are shipped to our customers in China who may include these parts in the manufacture of their own end products, which they may in turn export to their customers around the world.

	For Years Ended December 31,		
	2018	2017	2016
Revenue:			
United States	\$ 2,288	\$ 1,901	\$ 1,682
Asia (a)	9,240	8,824	8,024
Europe, Middle East and Africa	3,047	2,907	2,393
Japan	869	1,049	1,040
Rest of world	340	280	231
Total revenue	\$ 15,784	\$ 14,961	\$ 13,370

(a) Revenue from products shipped into China was \$7.0 billion, \$6.6 billion and \$6.0 billion in 2018, 2017 and 2016, respectively.

	December 31,	
	2018	2017
Property, plant and equipment:		
United States	\$ 1,812	\$ 1,469
Asia (a)	1,116	964
Europe, Middle East and Africa	84	97
Japan	157	118
Rest of world	14	16
Total property, plant and equipment	\$ 3,183	\$ 2,664

(a) Property, plant and equipment at our two sites in the Philippines was \$437 million as of December 31, 2018 and 2017. Property, plant and equipment at our sites in China was \$313 million and \$236 million as of December 31, 2018 and 2017, respectively.

2. Basis of presentation and significant accounting policies and practices

Basis of presentation

The consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States (GAAP). The basis of these financial statements is comparable for all periods presented herein, except for the effects of adopting a new accounting standard in 2018 related to revenue recognition.

The consolidated financial statements include the accounts of all subsidiaries. All intercompany balances and transactions have been eliminated in consolidation. All dollar amounts in the financial statements and tables in these notes, except per-share amounts, are stated in millions of U.S. dollars unless otherwise indicated. We have reclassified

certain amounts in the prior periods' financial statements to conform to the 2018 presentation.

The preparation of financial statements requires the use of estimates from which final results may vary.

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Significant accounting policies and practices

Revenue recognition

We generate revenue primarily from the sale of semiconductor products, either directly to a customer or to a distributor, or at the conclusion of a consignment process. We have a variety of types of contracts with our customers and distributors. In determining whether a contract exists, we evaluate the terms of the arrangement, the relationship with the customer or distributor and their ability to pay.

We recognize revenue from sales of our products, including sales to our distributors, when control is transferred. Control is considered transferred when title and risk of loss pass, when the customer becomes obligated to pay and, where required, when the customer has accepted the products. This transfer generally occurs at a point in time upon shipment or delivery to the customer or distributor, depending upon the terms of the sales order. Payment for sales to customers and distributors is generally due on our standard commercial terms. For sales to distributors, payment is not contingent upon resale of the products.

Revenue from sales of our products that are subject to inventory consignment agreements is recognized at a point in time, when the customer or distributor pulls product from consignment inventory that we store at designated locations. Transfer of control occurs at that point, when title and risk of loss transfers and the customer or distributor becomes obligated to pay for the products pulled from inventory. Until the products are pulled for use or sale by the customer or distributor, we retain control over the products' disposition, including the right to pull back or relocate the products.

The revenue recognized is adjusted based on allowances, which are prepared on a portfolio basis using a most likely amount methodology based on analysis of historical data and contractual terms. These allowances, which are not material, generally include adjustments for pricing arrangements, product returns and incentives. The length of time between invoicing and payment is not significant under any of our payment terms. In instances where the timing of revenue recognition differs from the timing of invoicing, we have determined our contracts generally do not include a significant financing component.

In addition, we record allowances for accounts receivable that we estimate may not be collected. We monitor collectability of accounts receivable primarily through review of accounts receivable aging. When collection is at risk, we assess the impact on amounts recorded for bad debts and, if necessary, record a charge in the period such determination is made.

We recognize shipping fees, if any, received from customers in revenue. We include the related shipping and handling costs in cost of revenue. The majority of our customers pay these fees directly to third parties.

Advertising costs

We expense advertising and other promotional costs as incurred. This expense was \$34 million, \$39 million and \$44 million in 2018, 2017 and 2016, respectively.

Income taxes

We account for income taxes using an asset and liability approach. We record the amount of taxes payable or refundable for the current year and the deferred tax assets and liabilities for future tax consequences of events that have been recognized in the financial statements or tax returns. We record a valuation allowance when it is more likely than not that some or all of the deferred tax assets will not be realized.

Other assessed taxes

Some transactions require us to collect taxes such as sales, value-added and excise taxes from our customers. These transactions are presented in our Consolidated Statements of Income on a net (excluded from revenue) basis.

Earnings per share (EPS)

We use the two-class method for calculating EPS because the restricted stock units (RSUs) we grant are participating securities containing non-forfeitable rights to receive dividend equivalents. Under the two-class method, a portion of net income is allocated to RSUs and excluded from the calculation of income allocated to common stock, as shown in the table below.

Computation and reconciliation of earnings per common share are as follows (shares in millions):

	For Years Ended December 31,								
	2018			2017			2016		
	Net	Shares	EPS	Net	Shares	EPS	Net	Shares	EPS
	Income			Income			Income		
Basic EPS:									
Net income	\$ 5,580			\$ 3,682			\$ 3,595		
Income allocated to RSUs	(43)			(34)			(45)		
Income allocated to common stock	\$ 5,537	970	\$ 5.71	\$ 3,648	991	\$ 3.68	\$ 3,550	1,003	\$ 3.54
Dilutive effect of stock compensation plans		20			21			18	
Diluted EPS:									
Net income	\$ 5,580			\$ 3,682			\$ 3,595		
Income allocated to RSUs	(42)			(33)			(44)		
Income allocated to common stock	\$ 5,538	990	\$ 5.59	\$ 3,649	1,012	\$ 3.61	\$ 3,551	1,021	\$ 3.48

Potentially dilutive securities representing 4 million and 6 million shares of common stock that were outstanding in 2018 and 2017, respectively, were excluded from the computation of diluted earnings per common share during these periods because their effect would have been anti-dilutive. No potentially dilutive securities were excluded from the computation of diluted earnings per common share during 2016.

Investments

We present investments on our Consolidated Balance Sheets as cash equivalents, short-term investments or long-term investments, which are detailed below. See Note 7 for additional information.

Cash equivalents and short-term investments – We consider investments in available-for-sale debt securities with maturities of 90 days or less from the date of our investment to be cash equivalents. We consider investments in available-for-sale debt securities with maturities beyond 90 days from the date of our investment as being available for use in current operations and include them in short-term investments. The primary objectives of our cash equivalent and short-term investment activities are to preserve capital and maintain liquidity while generating appropriate returns.

Long-term investments – Long-term investments consist of mutual funds, venture capital funds and non-marketable equity securities.

Inventories

Inventories are stated at the lower of cost or estimated net realizable value. Cost is generally computed on a currently adjusted standard cost basis, which approximates cost on a first-in first-out basis. Standard cost is based on the normal utilization of installed factory capacity. Cost associated with underutilization of capacity is expensed as incurred.

Inventory held at consignment locations is included in our finished goods inventory. Consigned inventory was \$314 million and \$303 million as of December 31, 2018 and 2017, respectively.

We review inventory quarterly for salability and obsolescence. A statistical allowance is provided for inventory considered unlikely to be sold. The statistical allowance is based on an analysis of historical disposal activity, historical customer shipments, as well as estimated future sales. A specific allowance for each material type will be carried if there is a significant event not captured by the statistical allowance. We write off inventory in the period in which disposal occurs.

Property, plant and equipment; acquisition-related intangibles; and other capitalized costs

Property, plant and equipment are stated at cost and depreciated over their estimated useful lives using the straight-line method. Our cost basis includes certain assets acquired in business combinations that were initially recorded at fair value as of the date of acquisition. Leasehold improvements are amortized using the straight-line method over the shorter of the remaining lease term or the estimated useful lives of the improvements. We amortize acquisition-related intangibles on a straight-line basis over the estimated economic life of the assets. Capitalized software licenses generally are amortized on a straight-line basis over the term of the license. Fully depreciated or amortized assets are written off against accumulated depreciation or amortization.

Impairments of long-lived assets

We regularly review whether facts or circumstances exist that indicate the carrying values of property, plant and equipment or other long-lived assets, including intangible assets, are impaired. We assess the recoverability of assets by comparing the projected undiscounted net cash flows associated with those assets to their respective carrying amounts. Any impairment charge is based on the excess of the carrying amount over the fair value of those assets. Fair value is determined by available market valuations, if applicable, or by discounted cash flows.

Goodwill

Goodwill is reviewed for impairment annually or more frequently if certain impairment indicators arise. We perform our annual goodwill impairment test as of October 1 for our reporting units, which compares the fair value for each reporting unit to its associated carrying value, including goodwill. See Note 8 for additional information.

Foreign currency

The functional currency for our non-U.S. subsidiaries is the U.S. dollar. Accounts recorded in currencies other than the U.S. dollar are remeasured into the functional currency. Current assets (except inventories), deferred taxes, other assets, current liabilities and long-term liabilities are remeasured at exchange rates in effect at the end of each reporting period. Property, plant and equipment with associated depreciation and inventories are valued at historical exchange rates. Revenue and expense accounts other than depreciation for each month are remeasured at the appropriate daily rate of exchange. Currency exchange gains and losses from remeasurement are credited or charged to OI&E.

Derivatives and hedging

We use derivative financial instruments to manage exposure to foreign exchange risk. These instruments are primarily forward foreign currency exchange contracts, which are used as economic hedges to reduce the earnings impact that exchange rate fluctuations may have on our non-U.S. dollar net balance sheet exposures. Gains and losses from changes in the fair value of these forward foreign currency exchange contracts are credited or charged to OI&E. We do not apply hedge accounting to our foreign currency derivative instruments.

In connection with the issuance of long-term debt, we may use financial derivatives such as treasury-rate lock agreements that are recognized in AOCI and amortized over the life of the related debt. The results of these derivative transactions have not been material.

We do not use derivatives for speculative or trading purposes.

Changes in accounting standards – adopted standards for current period

Accounting Standard Update (ASU) No. 2014-09, Revenue from Contracts with Customers (Topic 606)

This standard provides a single set of guidelines for revenue recognition to be used across all industries and requires additional disclosures. We adopted Accounting Standards Codification Topic 606 (ASC 606) as of January 1, 2018, using the modified retrospective transition method applied only to contracts that were not completed as of the adoption date. The reported results for 2018 reflect the application of the new accounting guidance, while the reported results for prior period amounts are not adjusted and continue to be reported in accordance with our historical accounting under ASC 605, Revenue Recognition.

The most significant impact from adopting the standard relates to our accounting for royalty income on licenses of intellectual property; however, the effect of such change during any individual reporting period will not materially

impact our results of operations and financial position. Although royalty income is recorded within OI&E, the new revenue guidance applies to these agreements by analogy, and therefore, such agreements have been evaluated for ASC 606 transition considerations. Under ASC 606, royalty income for our fixed-rate royalty agreements is bifurcated between two performance obligations: providing a right to use our initial patent portfolio and the right to access our future patents when those patents are developed. We have determined that the value of these agreements is allocated more heavily to the initial performance obligation. As a result, income from these agreements is recognized predominately at the time of contract execution rather than ratably over the life of the agreements, accelerating the timing of when we recognize royalty income in OI&E.

The timing of revenue recognition, billings and cash collections may result in billed accounts receivable, unbilled receivables (contract assets), and customer advances and deposits (contract liabilities). These items are included in other current and non-current assets and liabilities on the Consolidated Balance Sheets. Generally, we invoice customers for payment upon shipment or when goods are pulled from consignment inventory, which results in an unconditional right to consideration. The time frame between when the customer places an order for products and when it is shipped is less than 12 months.

Occasionally, as of the end of a reporting period, some performance obligations associated with contracts are unsatisfied or only partially satisfied. In accordance with the practical expedients available in the guidance, we do not disclose the value of unsatisfied performance obligations for contracts with an original expected duration of one year or less. Additionally, sales commissions are expensed when incurred because the amortization period would have been one year or less.

We recognized an increase to opening retained earnings of \$206 million, net of taxes, as of January 1, 2018, due to the cumulative impact of adopting ASC 606. A contract asset of \$283 million and deferred tax liabilities of \$55 million were recorded as of January 1, 2018, related to the transition period adjustments.

ASU No. 2018-02, Income Statement – Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income

This standard allows a reclassification of stranded tax effects as a result of the U.S. Tax Cuts and Jobs Act (the Tax Act) from AOCI to retained earnings. The provisions from this guidance are effective for interim and annual periods beginning after January 1, 2019. This standard should be applied either in the period of adoption or retrospectively to each period (or periods) in which the effects of the Tax Act are recognized.

We elected to early adopt this standard during the fourth quarter of 2018 concurrent with the completion of our accounting for the tax effects of the enactment of the Tax Act, applying the guidance to the period of adoption. As a result, we reclassified stranded tax effects of \$30 million from the 2018 opening balance of AOCI into retained earnings. See Note 5 for additional information related to our accounting for the effects of the Tax Act.

Other standards

The following standards were also adopted:

ASU	Description	Adopted Date
ASU No. 2016-01	Financial Instruments – Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities	January 1, 2018
ASU No. 2017-01	Business Combinations (Topic 805): Clarifying the Definition of a Business	January 1, 2018
ASU No. 2017-04	Intangibles – Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment	October 1, 2018
ASU No. 2017-05	Other Income – Gains and Losses from the Derecognition of Nonfinancial Assets (Subtopic 610-20): Clarifying the Scope of Asset Derecognition Guidance and Accounting for Partial Sales of Nonfinancial Assets	January 1, 2018

Changes in accounting standards – standards not yet adopted

ASU No. 2016-02, Leases (Topic 842)

This standard requires all leases that have a term of over 12 months to be recognized on the balance sheet with the liability for lease payments and the corresponding right-of-use asset initially measured at the present value of amounts expected to be paid over the term. Recognition of the costs of these leases on the income statement will be dependent upon their classification as either an operating or a finance lease. This standard is effective for interim and annual periods beginning January 1, 2019.

We are adopting this standard effective January 1, 2019, using the optional transition method, applying the guidance to leases existing at, or entered into after, the beginning of the period of adoption. We are also electing certain practical expedients permitted under the transition guidance. In preparation for adoption of the standard, we have implemented system functionality to enable the preparation of financial information. The most significant impact from adopting the standard will be the recognition of right-of-use assets and lease liabilities for operating leases on our Consolidated Balance Sheets, which will increase total assets by about 2 percent.

ASU No. 2016-13, Financial Instruments – Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments

This standard requires entities to use a current lifetime expected credit loss methodology to measure impairments of certain financial assets. Using this methodology will result in earlier recognition of losses than under the current incurred loss approach, which requires waiting to recognize a loss until it is probable of having been incurred. There are other provisions within the standard that affect how impairments of other financial assets may be recorded and presented, and that expand disclosures. This standard will be effective for our interim and annual periods beginning January 1, 2020, with early adoption permitted beginning January 1, 2019, and must be applied on a modified retrospective basis. We are evaluating the potential impact of this standard, but we do not expect it to have a material impact on our financial position and results of operations.

Other standards

We are evaluating the impact of the following standards, but we do not expect them to have a material impact on our financial position and results of operations. We plan to adopt these standards as of their effective dates.

ASU	Description	Effective Date
ASU No. 2017-12	Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities	January 1, 2019
ASU No. 2018-13	Fair Value Measurement (Topic 820): Disclosure Framework – Changes to the Disclosure Requirements for Fair Value Measurement	January 1, 2020
ASU No. 2018-14	Compensation – Retirement Benefits – Defined Benefit Plans – General (Subtopic 715-20): Disclosure Framework – Changes to the Disclosure Requirements for Defined Benefit Plans	January 1, 2020
ASU No. 2018-15	Intangibles – Goodwill and Other – Internal-Use Software (Subtopic 350-40): Customer’s Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract	January 1, 2020

3. Stock compensation

We have stock options outstanding to participants under long-term incentive plans. The option price per share may not be less than the fair market value of our common stock on the date of the grant. The options have a 10-year term, generally vest ratably over four years, and continue to vest after the option recipient retires.

We also have RSUs outstanding to participants under long-term incentive plans. Each RSU represents the right to receive one share of TI common stock on the vesting date, which is generally four years after the date of grant. Upon vesting, the shares are issued without payment by the grantee. RSUs continue to vest after the recipient retires. Holders of RSUs receive an annual cash payment equivalent to the dividends paid on our common stock.

We have options and RSUs outstanding to non-employee directors under director compensation plans. The plans generally provide for annual grants of stock options and RSUs, a one-time grant of RSUs to each new non-employee director and the issuance of TI common stock upon the distribution of stock units credited to deferred compensation accounts established for such directors.

We also have an employee stock purchase plan (ESPP) under which options are offered to all eligible employees in amounts based on a percentage of the employee’s compensation, subject to a cap. Under the plan, the option price per share is 85 percent of the fair market value on the exercise date.

Total stock compensation expense recognized is as follows:

	For Years Ended December 31,		
	2018	2017	2016
COR	\$ 25	\$ 36	\$ 40
R&D	69	59	60

SG&A	138	147	152
Total	\$ 232	\$ 242	\$ 252

These amounts include expenses related to non-qualified stock options, RSUs and stock options offered under our ESPP and are net of estimated forfeitures.

We recognize compensation expense for non-qualified stock options and RSUs on a straight-line basis over the minimum service period required for vesting of the award, adjusting for estimated forfeitures based on historical activity. Awards issued to employees who are retirement eligible or nearing retirement eligibility are expensed on an accelerated basis. Options issued under our ESPP are expensed over a three-month period.

Fair-value methods and assumptions

We account for all awards granted under our various stock compensation plans at fair value. We estimate the fair values for non-qualified stock options using the Black-Scholes-Merton option-pricing model with the following weighted average assumptions:

	For Years Ended December					
	31,		2017		2016	
	2018		2017		2016	
Weighted average grant date fair value, per share	\$ 23.20		\$ 16.49		\$ 10.03	
Weighted average assumptions used:						
Expected volatility	23	%	24	%	25	%
Expected lives (in years)	7.2		7.2		7.3	
Risk-free interest rates	2.57	%	2.36	%	1.72	%
Expected dividend yields	2.25	%	2.52	%	2.87	%

We determine expected volatility on all options granted using available implied volatility rates. We believe that market-based measures of implied volatility are currently the best available indicators of the expected volatility used in these estimates.

We determine expected lives of options based on the historical option exercise experience of our optionees using a rolling 10-year average. We believe the historical experience method is the best estimate of future exercise patterns currently available.

Risk-free interest rates are determined using the implied yield currently available for zero-coupon U.S. government issues with a remaining term equal to the expected life of the options.

Expected dividend yields are based on the annualized approved quarterly dividend rate and the current market price of our common stock at the time of grant. No assumption for a future dividend rate change is included unless there is an approved plan to change the dividend in the near term.

The fair value per share of RSUs is determined based on the closing price of our common stock on the date of grant.

Our ESPP is a discount-purchase plan and consequently the Black-Scholes-Merton option-pricing model is not used to determine the fair value per share of these awards. The fair value per share under this plan equals the amount of the discount.

Long-term incentive and director compensation plans

Stock option and RSU transactions under our long-term incentive and director compensation plans are as follows:

	Stock Options		RSUs	
	Weighted		Weighted	
	Average		Average	
	Exercise		Grant	
	Price		Date Fair	
			Value	
Shares	per Share	Shares	per Share	

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Outstanding grants, December 31, 2017	44,754,593	\$ 48.49	9,225,643	\$ 55.40
Granted	4,617,486	110.07	1,247,239	110.05
Stock options exercised/RSUs vested	(8,432,458)	42.63	(2,769,994)	44.50
Forfeited and expired	(1,034,167)	77.30	(397,345)	70.34
Outstanding grants, December 31, 2018	39,905,454	56.10	7,305,543	66.72

The weighted average grant date fair values per share of RSUs granted in 2018, 2017 and 2016 were \$110.05, \$79.52 and \$53.98, respectively. In 2018, 2017 and 2016, the total grant date fair values of shares vested from RSU grants were \$123 million, \$149 million and \$178 million, respectively.

As of December 31, 2018, the number of shares remaining available for future issuance under these plans was 50,167,414.

Summarized information about stock options outstanding as of December 31, 2018, is as follows:

Exercise Price Range	Stock Options Outstanding			Options Exercisable	
	Number Outstanding (Shares)	Weighted Average Remaining Contractual Life (Years)	Weighted Average Exercise Price per Share	Number Exercisable (Shares)	Weighted Average Exercise Price per Share
\$ 14.47 to 20.00	573,629	0.1	\$ 14.96	573,629	\$ 14.96
20.01 to 40.00	9,508,056	2.9	31.21	9,508,056	31.21
40.01 to 60.00	19,883,804	6.2	50.95	12,397,285	49.53
60.01 to 80.00	5,612,386	8.1	79.21	1,143,118	79.20
80.01 to 100.00	37,917	9.3	91.16	3,714	91.54
100.01 to 113.30	4,289,662	9.1	110.15	—	—
14.47 to 113.30	39,905,454	5.9	56.10	23,625,802	42.76

In 2018, 2017 and 2016, the aggregate intrinsic values (i.e., the difference in the closing market price on the date of exercise and the exercise price paid by the optionee) of options exercised were \$561 million, \$632 million and \$424 million, respectively.

Summarized information as of December 31, 2018, about outstanding stock options that are vested and expected to vest, as well as stock options that are currently exercisable, is as follows:

	Outstanding Stock Options (Fully Vested and Expected to Vest) (a)	Options Exercisable
Number of outstanding (shares)	39,274,492	23,625,802
Weighted average remaining contractual life (in years)	5.9	4.7
Weighted average exercise price per share	\$ 55.60	\$ 42.76
Intrinsic value (millions of dollars)	\$ 1,591	\$ 1,222

(a) Includes effects of expected forfeitures of approximately 1 million shares. Excluding the effects of expected forfeitures, the aggregate intrinsic value of stock options outstanding was \$1.60 billion.

As of December 31, 2018, total future compensation related to equity awards not yet recognized in our Consolidated Statements of Income was \$224 million, consisting of \$97 million related to unvested stock options and \$127 million related to unvested RSUs. The \$224 million is expected to be recognized as follows: \$110 million in 2019, \$72 million in 2020, \$37 million in 2021 and \$5 million in 2022.

Employee stock purchase plan

Options outstanding under the ESPP as of December 31, 2018, had an exercise price equal to 85 percent of the fair market value of TI common stock on the date of automatic exercise. The automatic exercise occurred on January 2, 2019, resulting in an exercise price of \$80.29 per share. Of the total outstanding options, none were exercisable as of

December 31, 2018.

ESPP transactions are as follows:

	ESPP	
	(Shares)	Exercise Price
Outstanding grants, December 31, 2017	202,179	\$ 89.74
Granted	847,535	87.48
Exercised	(819,878)	90.06
Outstanding grants, December 31, 2018	229,836	80.29

The weighted average grant date fair values per share of options granted under the ESPP in 2018, 2017 and 2016 were \$15.43, \$12.99 and \$9.79, respectively. In 2018, 2017 and 2016, the total intrinsic value of options exercised under these plans was \$13 million, \$13 million and \$12 million, respectively.

As of December 31, 2018, the number of shares remaining available for future issuance under this plan was 34,555,101.

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Effect on shares outstanding and treasury shares

Treasury shares were acquired in connection with the board-authorized stock repurchase program. As of December 31, 2018, \$16.14 billion of stock repurchase authorizations remain, and no expiration date has been specified.

Our current practice is to issue shares of common stock from treasury shares upon exercise of stock options, distribution of director deferred compensation and vesting of RSUs. The following table reflects the changes in our treasury shares:

	Stock Options	RSUs	Treasury Shares
Balance, December 31, 2015			729,547,527
Repurchases			35,480,036
Shares used for:			
Stock options/RSUs	(14,516,606)	(5,639,666)	
Stock applied to taxes	—	1,336,476	
ESPP	(1,362,202)	—	
Director deferred stock units	—	—	(13,587)
Total issued	(15,878,808)	(4,303,190)	(20,181,998)
Balance, December 31, 2016			744,831,978
Repurchases			30,570,129
Shares used for:			
Stock options/RSUs	(13,313,019)	(4,419,464)	
Stock applied to taxes	—	1,058,100	
ESPP	(1,065,757)	—	
Director deferred stock units	—	—	(4,750)
Total issued	(14,378,776)	(3,361,364)	(17,740,140)
Balance, December 31, 2017			757,657,217
Repurchases			49,482,220
Shares used for:			
Stock options/RSUs	(8,432,458)	(2,769,994)	
Stock applied to taxes	—	553,720	
ESPP	(819,878)	—	
Director deferred stock units	—	—	(5,181)
Total issued	(9,252,336)	(2,216,274)	(11,468,610)
Balance, December 31, 2018			795,665,646

The effects on cash flows are as follows:

	For Years Ended December 31,		
	2018	2017	2016
Proceeds from common stock transactions (a)	\$ 373	\$ 483	\$ 472

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Tax benefit realized from stock compensation	\$ 179	\$ 341	\$ 255
Reduction to deferred tax asset	(43)	(91)	(105)
Excess tax benefit for stock compensation	\$ 136	\$ 250	\$ 150

(a) Net of taxes paid for employee shares withheld of \$60 million, \$83 million and \$70 million in 2018, 2017 and 2016, respectively.

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4. Profit sharing plans

Profit sharing benefits are generally formulaic and determined by one or more subsidiary or company-wide financial metrics. We pay profit sharing benefits primarily under the company-wide TI Employee Profit Sharing Plan. This plan provides for profit sharing to be paid based solely on TI's operating margin for the full calendar year. Under this plan, TI must achieve a minimum threshold of 10 percent operating margin before any profit sharing is paid. At 10 percent operating margin, profit sharing will be 2 percent of eligible payroll. The maximum amount of profit sharing available under the plan is 20 percent of eligible payroll, which is paid only if TI's operating margin is at or above 35 percent for a full calendar year.

We recognized \$354 million, \$355 million and \$346 million of profit sharing expense under the TI Employee Profit Sharing Plan in 2018, 2017 and 2016, respectively.

5. Income taxes

Income before income taxes is comprised of the following components:

	For Years Ended December 31,		
	2018	2017	2016
U.S.	\$ 5,672	\$ 5,130	\$ 3,953
Non-U.S.	1,014	950	977
Total	\$ 6,686	\$ 6,080	\$ 4,930

Provision for income taxes is comprised of the following components:

	For Years Ended December 31,								
	2018			2017			2016		
	Current	Deferred	Total	Current	Deferred	Total	Current	Deferred	Total
U.S. federal	\$ 979	\$ (98)	\$ 881	\$ 2,101	\$ 51	\$ 2,152	\$ 1,289	\$ (122)	\$ 1,167
Non-U.S.	225	(8)	217	173	61	234	238	(80)	158
U.S. state	7	1	8	12	—	12	10	—	10
Total	\$ 1,211	\$ (105)	\$ 1,106	\$ 2,286	\$ 112	\$ 2,398	\$ 1,537	\$ (202)	\$ 1,335

Principal reconciling items from the U.S. statutory income tax rate to the effective tax rate (provision for income taxes as a percentage of income before income taxes) are as follows:

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	For Years Ended		
	December 31,		
	2018	2017	2016
U.S. statutory income tax rate	21.0%	35.0%	35.0%
U.S. tax benefit for foreign derived intangible income	(5.3)	—	—
U.S. Tax Act transitional non-cash expense	4.2	—	—
U.S. Tax Act enactment-date effects and measurement period adjustments	(0.7)	12.7	—
U.S. tax on global intangible low-taxed income	0.4	—	—
U.S. tax benefit for manufacturing	—	(1.6)	(1.5)
U.S. excess tax benefit for stock compensation	(2.0)	(4.1)	(3.0)
U.S. R&D tax credit	(1.3)	(1.1)	(1.2)
U.S. non-deductible expenses	0.2	0.2	0.3
Non-U.S. effective tax rates	0.1	(2.5)	(3.7)
Impact of changes to uncertain tax positions	—	0.7	0.6
Other	(0.1)	0.1	0.6
Effective tax rate	16.5%	39.4%	27.1%

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The Tax Act was enacted on December 22, 2017. The Tax Act reduces the U.S. statutory income tax rate from 35 percent to 21 percent and requires companies to pay a one-time tax on indefinitely reinvested earnings of certain non-U.S. subsidiaries that were previously tax deferred. We applied the guidance in Staff Accounting Bulletin No. 118 when accounting for the enactment-date effects of the Tax Act in 2017 and throughout 2018. As of December 31, 2017, we had not completed our accounting for the enactment-date income tax effects of the Tax Act for the following aspects: one-time tax on indefinitely reinvested earnings and the effects on our existing deferred tax balances. As of December 31, 2018, we completed our accounting for the enactment-date income tax effects of the Tax Act. We booked a provisional amount of \$773 million in 2017 and reduced our provisional amount by \$44 million in 2018, for a net of \$729 million. The Tax Act also included the global intangible low-taxed income (GILTI) tax for years beginning in 2018. We account for the effects of GILTI as a component of income tax expense in the period in which the tax arises.

The earnings represented by non-cash operating assets, such as fixed assets and certain inventory, will continue to be permanently reinvested outside the United States. The tax on indefinitely reinvested earnings eliminates any additional U.S. taxation of these earnings upon repatriation to the United States. Consequently, no U.S. tax provision has been made for the future remittance of these earnings. However, withholding taxes in certain non-U.S. jurisdictions will be incurred upon repatriation of available cash to the United States. A provision has been made for deferred taxes on these undistributed earnings to the extent that dividend payments from these subsidiaries are expected to result in a withholding tax liability. As of December 31, 2018, we have no basis differences that would result in material unrecognized deferred tax liabilities.

Our effective tax rate is affected by U.S. tax benefits and tax rates applicable to our operations in many of the jurisdictions in which we operate, most of which were lower than the U.S. statutory income tax rate prior to enactment of the Tax Act. These non-U.S. tax rates are generally statutory in nature and without expiration.

The primary components of deferred tax assets and liabilities are as follows:

	December 31,	
	2018	2017
Deferred tax assets:		
Deferred loss and tax credit carryforwards	\$ 247	\$ 256
Accrued expenses	129	119
Stock compensation	122	107
Inventories and related reserves	107	93
Retirement costs for defined benefit and retiree health care	80	38
Other	—	9
Total deferred tax assets, before valuation allowance	685	622
Valuation allowance	(172)	(165)
Total deferred tax assets, after valuation allowance	513	457
Deferred tax liabilities:		
Acquisition-related intangibles and fair-value adjustments	(142)	(207)
International earnings	(43)	(64)
Other	(75)	—
Total deferred tax liabilities	(260)	(271)
Net deferred tax asset	\$ 253	\$ 186

The deferred tax assets and liabilities based on tax jurisdictions are presented on our Consolidated Balance Sheets as follows:

	December 31,	
	2018	2017
Deferred tax assets	\$ 295	\$ 264
Deferred tax liabilities	(42)	(78)
Net deferred tax asset	\$ 253	\$ 186

We make an ongoing assessment regarding the realization of U.S. and non-U.S. deferred tax assets. This assessment is based on our evaluation of relevant criteria, including the existence of deferred tax liabilities that can be used to absorb deferred tax assets, taxable income in prior carryback years and expectations for future taxable income. Valuation allowances increased by \$7 million and \$37 million in 2018 and 2017, respectively. These changes had no impact to net income in 2018 or 2017.

We have U.S. and non-U.S. tax loss carryforwards of approximately \$6 million, none of which will expire before the year 2028.

Cash payments made for income taxes, net of refunds, were \$705 million, \$1.80 billion and \$1.15 billion in 2018, 2017 and 2016, respectively.

Uncertain tax positions

We operate in a number of tax jurisdictions, and our income tax returns are subject to examination by tax authorities in those jurisdictions who may challenge any item on these tax returns. Because the matters challenged by authorities are typically complex, their ultimate outcome is uncertain. Before any benefit can be recorded in our financial statements, we must determine that it is “more likely than not” that a tax position will be sustained by the appropriate tax authorities. We recognize accrued interest related to uncertain tax positions and penalties as components of OI&E.

The changes in the total amounts of uncertain tax positions are as follows:

	2018	2017	2016
Balance, January 1	\$ 300	\$ 243	\$ 84
Additions based on tax positions related to the current year	3	17	4
Additions for tax positions of prior years	1	42	189
Reductions for tax positions of prior years	—	(1)	(2)
Settlements with tax authorities	(18)	(1)	(32)
Balance, December 31	\$ 286	\$ 300	\$ 243
Interest income (expense) recognized in the year ended December 31	\$ (15)	\$ (19)	\$ 4
Interest receivable (payable) as of December 31	\$ (49)	\$ (38)	\$ 13

The liability for uncertain tax positions is a component of other long-term liabilities on our Consolidated Balance Sheets.

All of the \$286 million and \$300 million liabilities for uncertain tax positions as of December 31, 2018 and 2017, respectively, are comprised of positions that, if recognized, would lower the effective tax rate. If these liabilities are ultimately realized, \$30 million and \$13 million of existing deferred tax assets in 2018 and 2017, respectively, would also be realized. It is reasonably possible that the \$286 million liability as of December 31, 2018, could decrease by up to \$223 million in 2019 for the resolution of a tax depreciation-related position.

As of December 31, 2018, the statute of limitations remains open for U.S. federal tax returns for 2013 and following years. Audit activities related to our U.S. federal tax returns through 2012 have been completed except for certain pending tax treaty procedures for relief from double taxation. The procedures for relief from double taxation pertain to U.S. federal tax returns for the years 2006 through 2012. The audit of the U.S. federal tax returns for 2013 through 2015 is underway.

In non-U.S. jurisdictions, the years open to audit represent the years still open under the statute of limitations. With respect to major jurisdictions outside the United States, our subsidiaries are no longer subject to income tax audits for years before 2007.

6. Financial instruments and risk concentration

Financial instruments

We hold derivative financial instruments such as forward foreign currency exchange contracts, the fair value of which was not material as of December 31, 2018. Our forward foreign currency exchange contracts outstanding as of December 31, 2018, had a notional value of \$525 million to hedge our non-U.S. dollar net balance sheet exposures, including \$160 million to sell Japanese yen, \$99 million to sell euros and \$94 million to sell Indian rupees.

Our investments in cash equivalents, short-term investments and certain long-term investments, as well as our deferred compensation liabilities, are carried at fair value. Our postretirement plan assets are carried at fair value or net asset value per share. The carrying values for other current financial assets and liabilities, such as accounts receivable and accounts payable, approximate fair value due to the short maturity of such instruments. The carrying value of our long-term debt approximates the fair value as measured using broker-dealer quotes, which are Level 2 inputs. See Note 7 for a description of fair value and the definition of Level 2 inputs.

Risk concentration

We are subject to counterparty risks from financial institutions, customers and issuers of debt securities. Financial instruments that could subject us to concentrations of credit risk are primarily cash deposits, cash equivalents, short-term investments and accounts receivable. To manage our credit risk exposure, we place cash investments in investment-grade debt securities and limit the amount of credit exposure to any one issuer. We also limit counterparties on cash deposits and financial derivative contracts to financial institutions with investment-grade ratings.

Concentrations of credit risk with respect to accounts receivable are limited due to our large number of customers and their dispersion across different industries and geographic areas. We maintain allowances for expected returns, disputes, adjustments, incentives and collectability. These allowances are deducted from accounts receivable on our Consolidated Balance Sheets.

Details of these accounts receivable allowances are as follows:

	2018	2017	2016
Balance, January 1	\$ 8	\$ 17	\$ 7
Amounts charged (credited) to operating results	11	(9)	10
Recoveries and write-offs, net	—	—	—
Balance, December 31	\$ 19	\$ 8	\$ 17

Major customer

No end customer accounted for 10 percent or more of revenue in 2018, 2017 or 2016.

7. Valuation of debt and equity investments and certain liabilities

Debt and equity investments measured at fair value

Available-for-sale debt investments and trading securities are stated at fair value, which is generally based on market prices or broker quotes. See Fair-value considerations below. Unrealized gains and losses from available-for-sale debt securities are recorded as an increase or decrease, net of taxes, in AOCI on our Consolidated Balance Sheets.

Other-than-temporary impairments on available-for-sale debt securities are recorded in OI&E in our Consolidated Statements of Income.

We classify certain mutual funds as trading securities. These mutual funds hold a variety of debt and equity investments intended to generate returns that offset changes in certain deferred compensation liabilities. We record changes in the fair value of these mutual funds and the related deferred compensation liabilities in SG&A.

Other equity investments

Our other investments include equity-method investments and non-marketable equity investments, which are not measured at fair value. These investments consist of interests in venture capital funds and other non-marketable equity securities. Gains and losses from equity-method investments are recognized in OI&E based on our ownership share of the investee's financial results.

Non-marketable equity securities are measured at cost with adjustments for observable changes in price or impairments. Prior to our adoption of ASU 2016-01 in 2018, these securities were accounted for using the cost method of accounting, measured at cost less other-than-temporary impairment. Gains and losses on non-marketable equity investments are recognized in OI&E.

Details of our investments are as follows:

	December 31, 2018			December 31, 2017		
	Cash and Cash Equivalents	Short-Term Investments	Long-Term Investments	Cash and Cash Equivalents	Short-Term Investments	Long-Term Investments
Measured at fair value:						
Available-for-sale debt securities:						
Money market funds	\$ 747	\$ —	\$ —	\$ 525	\$ —	\$ —
Corporate obligations	473	748	—	172	698	—
U.S. government agency and Treasury securities	988	1,047	—	700	2,115	—
Trading securities:						
Mutual funds	—	—	226	—	—	236
Total	2,208	1,795	226	1,397	2,813	236
Other measurement basis:						
Equity-method investments	—	—	21	—	—	26
Non-marketable equity investments	—	—	4	—	—	6
Cash on hand	230	—	—	259	—	—
Total	\$ 2,438	\$ 1,795	\$ 251	\$ 1,656	\$ 2,813	\$ 268

As of December 31, 2018 and 2017, unrealized gains and losses associated with our available-for-sale investments were not material. We did not recognize any credit losses related to available-for-sale investments in 2018, 2017 or 2016.

In 2018, 2017 and 2016, the proceeds from sales, redemptions and maturities of short-term available-for-sale investments were \$6.71 billion, \$4.10 billion and \$3.39 billion, respectively. Gross realized gains and losses from these sales were not material.

The following table presents the aggregate maturities of our available-for-sale debt investments as of December 31, 2018:

	Fair Value
One year or less	\$ 3,838
One to two years	165

There were no other-than-temporary declines and impairments in the values of our debt investments in 2018, 2017 or 2016.

Fair-value considerations

We measure and report certain financial assets and liabilities at fair value on a recurring basis. Fair value is defined as 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 on the

measurement date.

The three-level hierarchy discussed below indicates the extent and level of judgment used to estimate fair-value measurements.

Level 1 – Uses unadjusted quoted prices that are available in active markets for identical assets or liabilities as of the reporting date.

- Level 2 – Uses inputs other than Level 1 that are either directly or indirectly observable as of the reporting date through correlation with market data, including quoted prices for similar assets and liabilities in active markets and quoted prices in markets that are not active. Level 2 also includes assets and liabilities that are valued using models or other pricing methodologies that do not require significant judgment since the input assumptions used in the models, such as interest rates and volatility factors, are corroborated by readily observable data. We utilize a third-party data service to provide Level 2 valuations. We verify these valuations for reasonableness relative to unadjusted quotes obtained from brokers or dealers based on observable prices for similar assets in active markets.

Level 3 – Uses inputs that are unobservable, supported by little or no market activity and reflect the use of significant management judgment. These values are generally determined using pricing models that utilize management estimates of market participant assumptions. As of December 31, 2018 and 2017, we had no Level 3 assets or liabilities, other than certain assets held by our postretirement plans.

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The following are our assets and liabilities that were accounted for at fair value on a recurring basis. These tables do not include cash on hand, assets held by our postretirement plans, or assets and liabilities that are measured at historical cost or any basis other than fair value.

	December 31, 2018			December 31, 2017		
	Level 1	Level 2	Total	Level 1	2	Total
Assets:						
Money market funds	\$ 747	\$ —	\$ 747	\$ 525	\$ —	\$ 525
Corporate obligations	—	1,221	1,221	—	870	870
U.S. government agency and Treasury securities	2,035	—	2,035	2,765	50	2,815
Mutual funds	226	—	226	236	—	236
Total assets	\$ 3,008	\$ 1,221	\$ 4,229	\$ 3,526	\$ 920	\$ 4,446
Liabilities:						
Deferred compensation	\$ 246	\$ —	\$ 246	\$ 255	\$ —	\$ 255
Total liabilities	\$ 246	\$ —	\$ 246	\$ 255	\$ —	\$ 255

8. Goodwill and acquisition-related intangibles

Goodwill by segment as of December 31, 2018 and 2017, is as follows:

	Goodwill
Analog	\$ 4,158
Embedded Processing	172
Other	32
Total	\$ 4,362

We perform our annual goodwill impairment test as of October 1 and determine whether the fair value of each of our reporting units is in excess of its carrying value. Determination of fair value is based upon management estimates and judgment, using unobservable inputs in discounted cash flow models to calculate the fair value of each reporting unit. These unobservable inputs are considered Level 3 measurements, as described in Note 7. In 2018, 2017 and 2016, we determined no impairment was indicated.

The components of acquisition-related intangibles are as follows:

	Amortization Period (Years)	December 31, 2018			December 31, 2017		
		Gross Carrying Amount	Accumulated Amortization	Net	Gross Carrying Amount	Accumulated Amortization	Net
Developed technology	7 - 10	\$ 2,125	\$ 1,573	\$ 552	\$ 2,130	\$ 1,361	\$ 769
Customer relationships	8	810	734	76	810	633	177
Total		\$ 2,935	\$ 2,307	\$ 628	\$ 2,940	\$ 1,994	\$ 946

Acquisition charges

Acquisition charges represent the ongoing amortization of intangible assets resulting from the acquisition of National Semiconductor Corporation. These amounts are included in Other for segment reporting purposes, consistent with how management measures the performance of its segments.

Amortization of acquisition-related intangibles was \$318 million, \$318 million and \$319 million in 2018, 2017 and 2016, respectively. Fully amortized assets are written off against accumulated amortization. Remaining estimated amortization is as follows:

	Amortization of
	Acquisition-Related
	Intangibles
2019\$	288
2020	198
2021	142

9. Postretirement benefit plans

Plan descriptions

We have various employee retirement plans, including defined contribution, defined benefit and retiree health care benefit plans. For qualifying employees, we offer deferred compensation arrangements.

U.S. retirement plans

Our principal retirement plans in the United States are a defined contribution plan; an enhanced defined contribution plan; and qualified and non-qualified defined benefit pension plans. The defined benefit plans were closed to new participants in 1997, and then current participants were allowed to make a one-time election to continue accruing a benefit in the plans, or to cease accruing a benefit and instead to participate in the enhanced defined contribution plan described below.

Both defined contribution plans offer an employer-matching savings option that allows employees to make pre-tax and post-tax contributions to various investment choices. Employees who elected to continue accruing a benefit in the qualified defined benefit pension plans may also participate in the defined contribution plan, where employer-matching contributions are provided for up to 2 percent of the employee's annual eligible earnings. Employees who elected not to continue accruing a benefit in the defined benefit pension plans, and employees hired after November 1997 and through December 31, 2003, may participate in the enhanced defined contribution plan. This plan provides for a fixed employer contribution of 2 percent of the employee's annual eligible earnings, plus an employer-matching contribution of up to 4 percent of the employee's annual eligible earnings. Employees hired after December 31, 2003, do not receive the fixed employer contribution of 2 percent of the employee's annual eligible earnings.

As of December 31, 2018 and 2017, as a result of employees' elections, TI's U.S. defined contribution plans held shares of TI common stock totaling 9 million shares and 10 million shares valued at \$821 million and \$1.00 billion, respectively. Dividends paid on these shares in 2018 and 2017 were \$24 million and \$22 million, respectively. Effective April 1, 2016, the TI common stock fund was frozen to new contributions or transfers into the fund.

Our aggregate expense for the U.S. defined contribution plans was \$61 million in 2018 and 2017 and \$60 million in 2016.

The defined benefit pension plans include employees still accruing benefits, as well as employees and participants who no longer accrue service-related benefits, but instead, may participate in the enhanced defined contribution plan. Benefits under the qualified defined benefit pension plan are determined using a formula based upon years of service and the highest five consecutive years of compensation. We intend to contribute amounts to this plan to meet the minimum funding requirements of applicable local laws and regulations, plus such additional amounts as we deem appropriate. The non-qualified defined benefit plans are unfunded and closed to new participants.

U.S. retiree health care benefit plan

U.S. employees who meet eligibility requirements are offered medical coverage during retirement. We make a contribution toward the cost of those retiree medical benefits for certain retirees and their dependents. The contribution rates are based upon various factors, the most important of which are an employee's date of hire, date of retirement, years of service and eligibility for Medicare benefits. The balance of the cost is borne by the plan's participants. Employees hired after January 1, 2001, are responsible for the full cost of their medical benefits during retirement.

Non-U.S. retirement plans

We provide retirement coverage for non-U.S. employees, as required by local laws or to the extent we deem appropriate, through a number of defined benefit and defined contribution plans. Retirement benefits are generally based on an employee's years of service and compensation. Funding requirements are determined on an individual country and plan basis and are subject to local country practices and market circumstances.

As of December 31, 2018 and 2017, as a result of employees' elections, TI's non-U.S. defined contribution plans held TI common stock valued at \$23 million and \$27 million, respectively. Dividends paid on these shares of TI common stock in 2018 and 2017 were not material.

Effects on our Consolidated Statements of Income and Balance Sheets

Expense related to defined benefit and retiree health care benefit plans is as follows:

	U.S. Defined Benefit			U.S. Retiree Health Care			Non-U.S. Defined Benefit		
	2018	2017	2016	2018	2017	2016	2018	2017	2016
Service cost	\$ 19	\$ 22	\$ 22	\$ 5	\$ 5	\$ 5	\$ 36	\$ 37	\$ 34
Interest cost	35	42	42	15	17	20	45	44	52
Expected return on plan assets	(42)	(41)	(41)	(15)	(17)	(20)	(67)	(62)	(68)
Amortization of prior service credit	—	—	—	(3)	(4)	(3)	(1)	(2)	(2)
Recognized net actuarial loss	17	14	21	2	3	7	20	28	25
Net periodic benefit costs	29	37	44	4	4	9	33	45	41
Settlement losses	23	36	21	—	—	—	3	2	2
Total, including other postretirement losses	\$ 52	\$ 73	\$ 65	\$ 4	\$ 4	\$ 9	\$ 36	\$ 47	\$ 43

All defined benefit and retiree health care benefit plan expense components other than service cost are recognized in OI&E in our Consolidated Statements of Income. Service cost is recognized within operating profit.

For the U.S. qualified pension and retiree health care plans, the expected return on plan assets component of net periodic benefit cost is based upon a market-related value of assets. In accordance with U.S. GAAP, the market-related value of assets is the fair value adjusted by a smoothing technique whereby certain gains and losses are phased in over a period of three years.

Changes in the benefit obligations and plan assets for defined benefit and retiree health care benefit plans are as follows:

	U.S. Defined Benefit		U.S. Retiree Health Care		Non-U.S. Defined Benefit	
	2018	2017	2018	2017	2018	2017
Change in plan benefit obligation						
Benefit obligation at beginning of year:	\$ 998	\$ 1,030	\$ 414	\$ 434	\$ 2,469	\$ 2,361
Service cost	19	22	5	5	36	37
Interest cost	35	42	15	17	45	44
Participant contributions	—	—	11	9	7	6
Benefits paid	(10)	(9)	(41)	(39)	(87)	(90)
Settlements	(100)	(196)	—	—	(16)	(13)
Actuarial loss (gain)	(68)	109	(43)	(15)	6	(52)
Plan amendments	—	—	—	3	7	—
Effects of exchange rate changes	—	—	—	—	(56)	176
Benefit obligation at end of year	\$ 874	\$ 998	\$ 361	\$ 414	\$ 2,411	\$ 2,469
Change in plan assets						
Fair value of plan assets at beginning of year:	\$ 995	\$ 1,034	\$ 394	\$ 434	\$ 2,593	\$ 2,309
Actual return on plan assets	(56)	123	(12)	44	(52)	148
Employer contributions (qualified plans)	20	25	1	1	19	56
Employer contributions (non-qualified plans)	20	18	—	—	—	—

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Participant contributions	—	—	11	9	7	6
Benefits paid	(10)	(9)	(41)	(39)	(87)	(90)
Settlements	(100)	(196)	—	—	(16)	(13)
Effects of exchange rate changes	—	—	—	—	(54)	177
Other	—	—	(23)	(55)	—	—
Fair value of plan assets at end of year	\$ 869	\$ 995	\$ 330	\$ 394	\$ 2,410	\$ 2,593
Funded status at end of year	\$ (5)	\$ (3)	\$ (31)	\$ (20)	\$ (1)	\$ 124

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Amounts recognized on our Consolidated Balance Sheets as of December 31, are as follows:

	U.S. Defined Benefit	U.S. Retiree Health Care	Non-U.S. Defined Benefit	Total
2018				
Overfunded retirement plans	\$ 40	\$ —	\$ 52	\$ 92
Accrued expenses and other liabilities & other long-term liabilities	(8)	—	(3)	(11)
Underfunded retirement plans	(37)	(31)	(50)	(118)
Funded status at end of 2018	\$ (5)	\$ (31)	\$ (1)	\$ (37)
2017				
Overfunded retirement plans	\$ 58	\$ —	\$ 150	\$ 208
Accrued expenses and other liabilities & other long-term liabilities	(13)	—	(5)	(18)
Underfunded retirement plans	(48)	(20)	(21)	(89)
Funded status at end of 2017	\$ (3)	\$ (20)	\$ 124	\$ 101

Contributions to the plans meet or exceed all minimum funding requirements. We expect to contribute about \$50 million to our retirement benefit plans in 2019. The amounts shown for underfunded U.S. defined benefit plans were for non-qualified pension plans, which we do not fund because contributions to them are not tax deductible.

Accumulated benefit obligations, which are generally less than the projected benefit obligations as they exclude the impact of future salary increases, were \$793 million and \$899 million as of December 31, 2018 and 2017, respectively, for the U.S. defined benefit plans, and \$2.29 billion and \$2.33 billion as of December 31, 2018 and 2017, respectively, for the non-U.S. defined benefit plans.

The change in AOCI is as follows:

	U.S. Defined Benefit Net Actuarial Loss	U.S. Retiree Health Care Net Prior Actuarial Loss	U.S. Retiree Service Prior Credit	Non-U.S. Defined Benefit Net Actuarial Loss	Non-U.S. Service Prior Credit	Total Net Actuarial Loss	Total Prior Service Credit
AOCI balance, net of taxes, December 31, 2017	\$ 118	\$ 29	\$ (6)	\$ 247	\$ (4)	\$ 394	\$ (10)
Changes in AOCI by category:							
Adjustments	29	(16)	—	120	7	133	7
Recognized within net income	(39)	(2)	3	(24)	1	(65)	4
Tax effect	2	4	(1)	(26)	(1)	(20)	(2)
Cumulative effect of accounting changes (a)	25	6	(1)	—	—	31	(1)
Total change to AOCI	17	(8)	1	70	7	79	8
AOCI balance, net of taxes, December 31, 2018	\$ 135	\$ 21	\$ (5)	\$ 317	\$ 3	\$ 473	\$ (2)

(a) Reflects the adoption of ASU 2018-02. See Note 2 for additional information.

The estimated amounts of net actuarial loss and unrecognized prior service cost (credit) included in AOCI as of December 31, 2018, that are expected to be amortized into net periodic benefit cost over the next fiscal year are: \$10 million and none for the U.S. defined benefit plans; none and (\$2) million for the U.S. retiree health care benefit plan; and \$29 million and \$1 million for the non-U.S. defined benefit plans.

Information on plan assets

We report and measure the plan assets of our defined benefit pension and other postretirement plans at fair value. The tables below set forth the fair value of our plan assets using the same three-level hierarchy of fair-value inputs described in Note 7.

	December 31, 2018				Total
	Level 1	Level 2	Level 3	Other (a)	
Assets of U.S. defined benefit plan:					
Fixed income securities and cash equivalents	\$ —	\$ —	\$ —	\$ 563	\$ 563
Equity securities	—	—	—	306	306
Total	\$ —	\$ —	\$ —	\$ 869	\$ 869
Assets of U.S. retiree health care plan:					
Fixed income securities and cash equivalents	\$ 59	\$ —	\$ —	\$ 155	\$ 214
Equity securities	—	—	—	116	116
Total	\$ 59	\$ —	\$ —	\$ 271	\$ 330
Assets of non-U.S. defined benefit plans:					
Fixed income securities and cash equivalents	\$ 47	\$ 139	\$ —	\$ 1,602	\$ 1,788
Equity securities	33	1	—	588	622
Total	\$ 80	\$ 140	\$ —	\$ 2,190	\$ 2,410

(a) Consists of bond index and equity index funds, measured at net asset value per share, as well as cash equivalents.

	December 31, 2017				Total
	Level 1	Level 2	Level 3	Other (a)	
Assets of U.S. defined benefit plan:					
Fixed income securities and cash equivalents	\$ —	\$ —	\$ —	\$ 654	\$ 654
Equity securities	—	—	—	341	341
Total	\$ —	\$ —	\$ —	\$ 995	\$ 995
Assets of U.S. retiree health care plan:					
Fixed income securities and cash equivalents	\$ 132	\$ 2	\$ —	\$ 111	\$ 245
Equity securities	—	—	—	149	149
Total	\$ 132	\$ 2	\$ —	\$ 260	\$ 394
Assets of non-U.S. defined benefit plans:					
Fixed income securities and cash equivalents	\$ 16	\$ 183	\$ —	\$ 1,646	\$ 1,845
Equity securities	7	23	—	717	747
Other	—	—	1	—	1
Total	\$ 23	\$ 206	\$ 1	\$ 2,363	\$ 2,593

(a) Consists of bond index and equity index funds, measured at net asset value per share, as well as cash equivalents. The investments in our major benefit plans largely consist of low-cost, broad-market index funds to mitigate risks of concentration within market sectors. Our investment policy is designed to better match the interest rate sensitivity of the plan assets and liabilities. The appropriate mix of equity and bond investments is determined primarily through the

use of detailed asset-liability modeling studies that look to balance the impact of changes in the discount rate against the need to provide asset growth to cover future service cost. Most of our plans around the world have a greater proportion of fixed income securities with return characteristics that are more closely aligned with changes in the liabilities caused by discount rate volatility. For the U.S. plans, we utilize an option collar strategy to reduce the volatility of returns on certain investments in U.S. equity funds.

The only Level 3 asset in our worldwide benefit plans for the periods presented is a diversified property fund in a non-U.S. pension plan. These investments are valued using inputs from the fund managers and internal models. Changes to the fair value of this fund since December 31, 2016, have not been material, and are due to redemptions.

Assumptions and investment policies

	U.S. Defined Benefit		U.S. Retiree Health Care		Non-U.S. Defined Benefit	
	2018	2017	2018	2017	2018	2017
Weighted average assumptions used to determine benefit obligations:						
Discount rate	4.37%	3.75%	4.30%	3.63%	1.85%	1.84%
Long-term pay progression	3.30%	3.30%	n/a	n/a	2.96%	2.96%
Weighted average assumptions used to determine net periodic benefit cost:						
Discount rate	3.77%	4.21%	3.63%	4.08%	1.84%	1.76%
Long-term rate of return on plan assets	4.80%	4.30%	4.10%	4.10%	2.58%	2.60%
Long-term pay progression	3.30%	3.30%	n/a	n/a	2.96%	3.11%

We utilize a variety of methods to select an appropriate discount rate depending on the depth of the corporate bond market in the country in which the benefit plan operates. In the United States, we use a settlement approach whereby a portfolio of bonds is selected from the universe of actively traded high-quality U.S. corporate bonds. The selected portfolio is designed to provide cash flows sufficient to pay the plan's expected benefit payments when due. The resulting discount rate reflects the rate of return of the selected portfolio of bonds. For our non-U.S. locations with a sufficient number of actively traded high-quality bonds, an analysis is performed in which the projected cash flows from the defined benefit plans are discounted against a yield curve constructed with an appropriate universe of high-quality corporate bonds available in each country. In this manner, a present value is developed. The discount rate selected is the single equivalent rate that produces the same present value. For countries that lack a sufficient corporate bond market, a government bond index adjusted for an appropriate risk premium is used to establish the discount rate.

Assumptions for the expected long-term rate of return on plan assets are based on future expectations for returns for each asset class and the effect of periodic target asset allocation rebalancing. We adjust the results for the payment of reasonable expenses of the plan from plan assets. We believe our assumptions are appropriate based on the investment mix and long-term nature of the plans' investments. Assumptions used for the non-U.S. defined benefit plans reflect the different economic environments within the various countries.

The target allocation ranges for the plans that hold a substantial majority of the defined benefit assets are as follows:

	U.S. Defined Benefit	U.S. Retiree Health Care	Non-U.S. Defined Benefit
Fixed income securities and cash equivalents	65%	55% - 65%	60% - 100%
Equity securities	35%	35% - 45%	0% - 40%

We rebalance the plans' investments when they are not within the target allocation ranges.

Weighted average asset allocations as of December 31 are as follows:

	U.S. Defined Benefit		U.S. Retiree Health Care		Non-U.S. Defined Benefit	
	2018	2017	2018	2017	2018	2017
Fixed income securities and cash equivalents	65%	66%	65%	62%	74%	71%
Equity securities	35%	34%	35%	38%	26%	29%

None of the plan assets related to the defined benefit pension plans and retiree health care benefit plan are directly invested in TI common stock. As of December 31, 2018, we do not expect to return any of the defined benefit pension plans' assets to TI in the next 12 months.

The following assumed future benefit payments to plan participants in the next 10 years are used to measure our benefit obligations. Almost all of the payments, which may vary significantly from these assumptions, will be made from plan assets and not from company assets.

	U.S. Defined Benefit	U.S. Retiree Health Care	Non-U.S. Defined Benefit
2019	\$ 78	\$ 32	\$ 88
2020	105	31	90
2021	77	30	92
2022	79	29	95
2023	85	28	95
2024 – 2028	428	124	510

Assumed health care cost trend rates for the U.S. retiree health care benefit plan as of December 31 are as follows:

	2018	2017
Assumed health care cost trend rate for next year	7.25 %	7.50 %
Ultimate trend rate	5.00 %	5.00 %
Year in which ultimate trend rate is reached	2028	2028

A one percentage point increase or decrease in health care cost trend rates over all future periods would have increased or decreased the accumulated postretirement benefit obligation for the U.S. retiree health care benefit plan as of December 31, 2018, by \$1 million. The service cost and interest cost components of 2018 plan expense would have increased or decreased by less than \$1 million.

Deferred compensation arrangements

We have a deferred compensation plan that allows U.S. employees whose base salary and management responsibility exceed a certain level to defer receipt of a portion of their cash compensation. Payments under this plan are made based on the participant's distribution election and plan balance. Participants can earn a return on their deferred compensation based on notional investments in the same investment funds that are offered in our defined contribution plans.

As of December 31, 2018, our liability to participants of the deferred compensation plans was \$246 million and is recorded in other long-term liabilities on our Consolidated Balance Sheets. This amount reflects the accumulated participant deferrals and earnings thereon as of that date. As of December 31, 2018, we held \$226 million in mutual funds related to these plans that are recorded in long-term investments on our Consolidated Balance Sheets, and serve as an economic hedge against changes in fair values of our other deferred compensation liabilities. We record changes in the fair value of the liability and the related investment in SG&A as discussed in Note 7.

10. Debt and lines of credit

Short-term borrowings

We maintain a line of credit to support commercial paper borrowings, if any, and to provide additional liquidity through bank loans. As of December 31, 2018, we had a variable-rate revolving credit facility from a consortium of investment-grade banks that allows us to borrow up to \$2 billion until March 2023. The interest rate on borrowings under this credit facility, if drawn, is indexed to the applicable London Interbank Offered Rate (LIBOR). As of December 31, 2018, our credit facility was undrawn, and we had no commercial paper outstanding.

Long-term debt

We retired \$500 million of maturing debt in May 2018.

In the second quarter of 2018, we issued an aggregate principal amount of \$1.5 billion of fixed-rate, long-term debt due in 2048, comprised of the issuance of \$1.3 billion in May 2018 and an additional \$200 million in June 2018. We incurred \$16 million of issuance and other related costs. The proceeds of the offering were \$1.5 billion, net of the original issuance discount and premium, and were used for general corporate purposes.

We retired \$250 million of maturing debt in March 2017 and another \$375 million in June 2017.

In May 2017, we issued an aggregate principal amount of \$600 million of fixed-rate, long-term debt. The offering consisted of the reissuance of \$300 million of 2.75% notes due in 2021 at a premium and the issuance of \$300 million of 2.625% notes due in 2024 at a discount. We incurred \$3 million of issuance and other related costs. The proceeds of the offerings were \$605 million, net of the original issuance discount and premium, and were used for the repayment of maturing debt and general corporate purposes.

In November 2017, we issued a principal amount of \$500 million of fixed-rate, long-term debt due in 2027. We incurred \$3 million of issuance and other related costs. The proceeds of the offering were \$494 million, net of the original issuance discount, and were used for general corporate purposes.

In May 2016, we issued a principal amount of \$500 million of fixed-rate, long-term debt due in 2022. We incurred \$3 million of issuance and other related costs. The proceeds of the offering were \$499 million, net of the original issuance discount, and were used toward the repayment of a portion of \$1.0 billion of maturing debt retired in May 2016.

Long-term debt outstanding is as follows:

	December 31,	
	2018	2017
Notes due 2018 at 1.00%	\$ —	\$ 500
Notes due 2019 at 1.65%	750	750
Notes due 2020 at 1.75%	500	500
Notes due 2021 at 2.75%	550	550
Notes due 2022 at 1.85%	500	500
Notes due 2023 at 2.25%	500	500
Notes due 2024 at 2.625%	300	300
Notes due 2027 at 2.90%	500	500
Notes due 2048 at 4.15%	1,500	—
Total debt	5,100	4,100
Net unamortized discounts, premiums and issuance costs	(32)	(23)
Total debt, including net unamortized discounts, premiums and issuance costs	5,068	4,077
Current portion of long-term debt	(749)	(500)
Long-term debt	\$ 4,319	\$ 3,577

Interest and debt expense was \$125 million, \$78 million and \$80 million in 2018, 2017 and 2016, respectively. This was net of the amortized discounts, premiums and issuance costs. Cash payments for interest on long-term debt were \$114 million, \$75 million and \$88 million in 2018, 2017 and 2016, respectively. Capitalized interest was not material.

11. Commitments and contingencies

Purchase commitments

Some of our purchase commitments include payments for software licenses and contractual agreements with suppliers where there is a fixed, non-cancellable payment schedule or minimum payments due with a reduced delivery schedule.

Operating leases

We conduct certain operations in leased facilities and also lease a portion of our data processing and other equipment. In addition, certain long-term supply agreements to purchase industrial gases are accounted for as operating leases. Lease agreements frequently include purchase and renewal provisions and require us to pay taxes, insurance and

maintenance costs. Rental and lease expense incurred was \$79 million, \$81 million and \$86 million in 2018, 2017 and 2016, respectively.

As of December 31, 2018, we had committed to make the following minimum payments under our purchase commitments and non-cancellable operating leases:

	Purchase Commitments	Operating Leases
2019	\$ 389	\$ 56
2020	339	46
2021	130	36
2022	22	29
2023	15	18
Thereafter	15	39

Indemnification guarantees

We routinely sell products with an intellectual property indemnification included in the terms of sale. Historically, we have had only minimal, infrequent losses associated with these indemnities. Consequently, we cannot reasonably estimate any future liabilities that may result.

Warranty costs/product liabilities

We accrue for known product-related claims if a loss is probable and can be reasonably estimated. During the periods presented, there have been no material accruals or payments regarding product warranty or product liability. Historically, we have experienced a low rate of payments on product claims. Although we cannot predict the likelihood or amount of any future claims, we do not believe they will have a material adverse effect on our financial condition, results of operations or liquidity. Our stated warranties for semiconductor products obligate us to repair, replace or credit the purchase price of a covered product back to the buyer. Product claim consideration may exceed the price of our products.

General

We are subject to various legal and administrative proceedings. Although it is not possible to predict the outcome of these matters, we believe that the results of these proceedings will not have a material adverse effect on our financial condition, results of operations or liquidity.

12. Restructuring charges/other

Restructuring charges/other are included in Other for segment reporting purposes and are comprised of the following components:

	For Years Ended December 31,		
	2018	2017	2016
Restructuring charges (a)	\$ 6	\$ 11	\$ 25
Gains on sales of assets	(3)	—	(40)
Restructuring charges/other	\$ 3	\$ 11	\$ (15)

(a) Includes severance and benefits, accelerated depreciation, changes in estimates or other exit costs.
 Changes in accrued restructuring balances

	2018	2017	2016
Balance, January 1	\$ 29	\$ 40	\$ 32
Restructuring charges	6	11	25
Non-cash items (a)	(3)	(1)	(6)
Payments	(4)	(21)	(11)
Balance, December 31	\$ 28	\$ 29	\$ 40

(a) Reflects charges for impacts of accelerated depreciation and changes in exchange rates.

The restructuring accrual balances are reported as a component of either accrued expenses and other liabilities or other long-term liabilities on our Consolidated Balance Sheets, depending on the expected timing of payment.

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In February 2019, we entered into an agreement to sell our manufacturing facility in Greenock, Scotland. The sale is expected to close during the first quarter of 2019.

13. Supplemental financial information

Other income (expense), net (OI&E)

	For Years Ended December 31,		
	2018	2017	2016
Other income (a)	\$ 150	\$ 163	\$ 219
Other expense (b)	(52)	(88)	(64)
Total	\$ 98	\$ 75	\$ 155

(a) Other income includes interest, royalty and lease income; investment gains and losses; and other miscellaneous items. As of January 1, 2017, royalties are recorded in OI&E instead of revenue.

(b) Other expense includes a portion of pension and other retiree benefit costs. It also includes currency gains and losses and tax interest expense.

Prepaid expenses and other current assets

	December 31,	
	2018	2017
Prepaid taxes on intercompany inventory profits, net	\$ 132	\$ 768
Other	308	262
Total	\$ 440	\$ 1,030

Property, plant and equipment at cost

	Depreciable Lives (Years)	December 31,	
		2018	2017
Land	n/a	\$ 128	\$ 127
Buildings and improvements	5 - 40	2,497	2,467
Machinery and equipment	2 - 10	2,800	2,195
Total		\$ 5,425	\$ 4,789

Other long-term liabilities

	December 31,	
	2018	2017
Long-term portion of tax on indefinitely reinvested earnings	\$ 506	\$ 635
Other	684	668
Total	\$ 1,190	\$ 1,303

Accumulated other comprehensive income (loss), net of taxes (AOCI)

December 31,	
2018	2017

Postretirement benefit plans (a):		
Net actuarial loss	\$ (473)	\$ (394)
Prior service credit	2	10
Cash flow hedge derivative instruments	(2)	—
Total	\$ (473)	\$ (384)

(a) Includes \$30 million for the adoption of ASU 2018-02. See Note 2 for additional information.

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Details on amounts reclassified out of accumulated other comprehensive income (loss), net of taxes, to net income

Our Consolidated Statements of Comprehensive Income include items that have been recognized within net income in 2018, 2017 and 2016. The table below details where these transactions are recorded in our Consolidated Statements of Income.

	For Years Ended December 31,			Impact to Related Statement of Income Lines
	2018	2017	2016	
Net actuarial losses of defined benefit plans:				
Recognized net actuarial loss and settlement losses (a)	\$ 65	\$ 83	\$ 76	Decrease to OI&E
Tax effect	(15)	(27)	(25)	Decrease to provision for income taxes
Recognized within net income, net of taxes	\$ 50	\$ 56	\$ 51	Decrease to net income
Prior service credit of defined benefit plans:				
Amortization of prior service credit (a)	\$ (4)	\$ (6)	\$ (5)	Increase to OI&E
Tax effect	1	1	2	Increase to provision for income taxes
Recognized within net income, net of taxes	\$ (3)	\$ (5)	\$ (3)	Increase to net income
Derivative instruments:				
Amortization of treasury-rate locks	\$ —	\$ 1	\$ 1	Increase to interest and debt expense
Tax effect	—	—	—	Decrease to provision for income taxes
Recognized within net income, net of taxes	\$ —	\$ 1	\$ 1	Decrease to net income

(a) Detailed in Note 9.

14. Quarterly financial data (unaudited)

	2018 Quarters				2017 Quarters			
	4th	3rd	2nd	1st	4th	3rd	2nd	1st
Revenue	\$ 3,717	\$ 4,261	\$ 4,017	\$ 3,789	\$ 3,750	\$ 4,116	\$ 3,693	\$ 3,402
Gross profit	2,407	2,804	2,619	2,447	2,440	2,656	2,374	2,144
Included in operating profit:								
Acquisition charges	79	80	79	80	79	80	79	80
Restructuring charges/other	(2)	1	3	1	3	1	3	4
Operating profit	1,516	1,937	1,712	1,548	1,563	1,788	1,480	1,252
Net income	1,239	1,570	1,405	1,366	344	1,285	1,056	997
Basic EPS								
Basic EPS	\$ 1.29	\$ 1.61	\$ 1.43	\$ 1.38	\$ 0.35	\$ 1.29	\$ 1.05	\$ 0.99
Diluted EPS								
Diluted EPS	\$ 1.27	\$ 1.58	\$ 1.40	\$ 1.35	\$ 0.34	\$ 1.26	\$ 1.03	\$ 0.97

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of Texas Instruments Incorporated

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Texas Instruments Incorporated (the Company) as of December 31, 2018 and 2017, the related consolidated statements of income, comprehensive income, shareholders' equity and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (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 February 22, 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.

We have served as the Company's auditor since 1952.

Dallas, Texas

February 22, 2019

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ITEM 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure.

Not applicable.

ITEM 9A. Controls and Procedures.
Disclosure controls and procedures

An evaluation as of the end of the period covered by this report was carried out under the supervision and with the participation of TI's management, including its chief executive officer and chief financial officer, of the effectiveness of the design and operation of TI's disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934). Based upon that evaluation, the chief executive officer and chief financial officer concluded that those disclosure controls and procedures were effective.

Internal control over financial reporting

Report by management on internal control over financial reporting

The management of TI is responsible for establishing and maintaining effective internal control over financial reporting. TI's internal control system was designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation and fair presentation of financial statements issued for external purposes in accordance with generally accepted accounting principles. There has been no change in our internal control over financial reporting (as defined in Rule 13a-15(f) and 15d-15(f) under the Securities Exchange Act of 1934) that occurred during the fourth quarter of 2018 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

All internal control systems, no matter how well designed, have inherent limitations and 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.

TI management assessed the effectiveness of internal control over financial reporting as of December 31, 2018. In making this assessment, we used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria) in Internal Control – Integrated Framework. Based on our assessment, we believe that, as of December 31, 2018, our internal control over financial reporting is effective based on the COSO criteria.

TI's independent registered public accounting firm, Ernst & Young LLP, has issued an audit report on the effectiveness of our internal control over financial reporting, which immediately follows this report.

Report of independent registered public accounting firm on internal control over financial reporting

To the Shareholders and the Board of Directors of Texas Instruments Incorporated

Opinion on Internal Control over Financial Reporting

We have audited Texas Instruments Incorporated'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) (the COSO criteria). In our opinion, Texas Instruments Incorporated (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 Texas Instruments Incorporated as of December 31, 2018 and 2017, the related consolidated statements of income, comprehensive income, shareholders' equity and cash flows for each of the three years in the period ended December 31, 2018, and the related notes, and our report dated February 22, 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 report by management 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.

Dallas, Texas

February 22, 2019

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ITEM 9B. Other Information.

Not applicable.

PART III

ITEM 10. Directors, Executive Officers and Corporate Governance.

The information with respect to directors' names, ages, positions, term of office, periods of service and business experience, which is contained under the caption "Election of directors" in our proxy statement for the 2019 annual meeting of stockholders, is incorporated herein by reference to such proxy statement.

The information with respect to Section 16(a) beneficial ownership reporting compliance contained under the caption of the same name in our proxy statement for the 2019 annual meeting of stockholders is incorporated herein by reference to such proxy statement.

A list of our executive officers and their biographical information appears in Part I, Item 1 of this report.

Code of Ethics

We have adopted the Code of Ethics for TI Chief Executive Officer and Senior Finance Officers. A copy of the Code can be found on our website at www.ti.com/corporategovernance. We intend to satisfy the disclosure requirements of the SEC regarding amendments to, or waivers from, the Code by posting such information on the same website.

Audit Committee

The information contained under the caption "Committees of the board" with respect to the audit committee and the audit committee financial expert in our proxy statement for the 2019 annual meeting of stockholders is incorporated herein by reference to such proxy statement.

ITEM 11. Executive Compensation.

The information contained under the captions "Director compensation" and "Executive compensation" in our proxy statement for the 2019 annual meeting of stockholders is incorporated herein by reference to such proxy statement, provided that the Compensation Committee report shall not be deemed filed with this Form 10-K.

The information contained under the caption "Compensation committee interlocks and insider participation" in our proxy statement for the 2019 annual meeting of stockholders is incorporated herein by reference to such proxy statement.

ITEM 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.
Equity compensation plan information

The following table sets forth information about the company's equity compensation plans as of December 31, 2018.

Plan Category	Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights (1)	Weighted-Average Price of Outstanding Options, Warrants and Rights (2)	Number of Securities Remaining Available for Future Issuance under Equity Compensation Plans (excluding securities reflected in column (1)) (3)
Equity compensation plans approved by security holders	47,037,697 ^(a)	\$ 56.24 ^(b)	84,722,515 ^(c)
Equity compensation plans not approved by security holders	558,052 ^(d)	\$ 56.10 ^(b)	—
Total	47,595,749 ^(e)	\$ 56.24	84,722,515

- (a) Includes shares of TI common stock to be issued under the Texas Instruments 2003 Director Compensation Plan (the "2003 Director Plan"), the Texas Instruments 2009 Long-Term Incentive Plan (the "2009 LTIP") and predecessor stockholder-approved plans, the Texas Instruments 2009 Director Compensation Plan (the "2009 Director Plan"), the TI Employees 2014 Stock Purchase Plan (the "2014 ESPP") and the Texas Instruments 2018 Director Compensation Plan (the "2018 Director Plan").
- (b) Restricted stock units and stock units credited to directors' deferred compensation accounts are settled in shares of TI common stock on a one-for-one basis. Accordingly, such units have been excluded for purposes of computing the weighted- average exercise price.
- (c) Shares of TI common stock available for future issuance under the 2009 LTIP, the 2014 ESPP and the 2018 Director Plan. 48,175,749 shares remain available for future issuance under the 2009 LTIP and 1,991,665 shares remain available for future issuance under the 2018 Director Plan. Under the 2009 LTIP and the 2018 Director Plan, awards may be granted in the form of restricted stock units, options or other stock-based awards such as restricted stock.
- (d) Includes shares to be issued under the Texas Instruments 2003 Long-Term Incentive Plan (the "2003 LTIP"). The 2003 LTIP was replaced by the 2009 LTIP, which was approved by stockholders. No further grants may be made under the 2003 LTIP. Only non-management employees were eligible to receive awards under the 2003 LTIP. The 2003 LTIP authorized the grant of shares in the form of restricted stock units, options or other stock-based awards such as restricted stock. The plan is administered by a committee of independent directors (the Committee). The Committee had the sole discretion to grant to eligible participants one or more equity awards and to determine the number or amount of any award. Except in the case of awards made through assumption of, or in substitution for, outstanding awards previously granted by an acquired company, and except as a result of an adjustment event such as a stock split, the exercise price under any stock option, the grant price of any stock appreciation right, and the purchase price of any security that could be purchased under any other stock-based award under the 2003 LTIP could not be less than 100 percent of the fair market value of the stock or other security on the effective date of the grant of the option, right or award.

Also includes shares to be issued under the Texas Instruments Directors Deferred Compensation Plan and the Texas Instruments Restricted Stock Unit Plan for Directors. These plans were replaced by the stockholder-approved 2003 Director Plan (which was replaced by the 2009 Director Plan), and no further grants may be made under them.

(e) Includes 39,905,454 shares for issuance upon exercise of outstanding grants of options, 7,305,543 shares for issuance upon vesting of outstanding grants of restricted stock units, 229,836 shares for issuance under the 2014 ESPP and 154,916 shares for issuance in settlement of directors' deferred compensation accounts.

Security ownership of certain beneficial owners and management

The information that is contained under the captions "Security ownership of certain beneficial owners" and "Security ownership of directors and management" in our proxy statement for the 2019 annual meeting of stockholders is incorporated herein by reference to such proxy statement.

ITEM 13. Certain Relationships and Related Transactions, and Director Independence.

The information contained under the captions "Related person transactions" and "Director independence" in our proxy statement for the 2019 annual meeting of stockholders is incorporated herein by reference to such proxy statement.

ITEM 14. Principal Accountant Fees and Services.

The information with respect to principal accountant fees and services contained under the caption “Proposal to ratify appointment of independent registered public accounting firm” in our proxy statement for the 2019 annual meeting of stockholders is incorporated herein by reference to such proxy statement.

PART IV

ITEM 15. Exhibits, Financial Statement Schedules.

The financial statements are listed in the index included in Item 8, “Financial Statements and Supplementary Data.”

Designation of Exhibit	Description of Exhibit	Incorporated by Reference			Filed or Furnished Herewith
		File Form Number	Date of Filing	Exhibit Number	
3(a)	<u>Restated Certificate of Incorporation of the Registrant, dated April 18, 1985, as amended</u>	10-K 001-3761	February 24, 2015	3(a)	
3(b)	<u>By-Laws of the Registrant</u>	8-K 001-3761	December 12, 2016	3	
4(a)	<u>Indenture</u>	8-K 001-3761	May 23, 2011	4.2	
4(b)	<u>Officer’s Certificate</u>	8-K 001-3761	May 8, 2013	4.2	
4(c)	<u>Officer’s Certificate</u>	8-K 001-3761	March 12, 2014	4.2	
4(d)	<u>Officer’s Certificate</u>	8-K 001-3761	May 6, 2015	4.1	
4(e)	<u>Officer’s Certificate</u>	8-K 001-3761	May 6, 2016	4.1	
4(f)	<u>Officer’s Certificate</u>	8-K 001-3761	May 4, 2017	4.1	
4(g)	<u>Officer’s Certificate</u>	8-K 001-3761	November 3, 2017	4.1	
4(h)	<u>Officer’s Certificate</u>	8-K 001-3761	May 7, 2018	4.1	
4(i)	<u>Officer’s Certificate</u>	8-K 001-3761	June 8, 2018	4.1	
10(a)	<u>TI Deferred Compensation Plan, as amended*</u>	10-K 001-3761	February 24, 2016	10(a)	
10(b)	<u>TI Employees Non-Qualified Pension Plan, effective January 1, 2009, as amended*</u>	10-K 001-3761	February 24, 2016	10(b)	
10(c)	<u>TI Employees Non-Qualified Pension Plan II*</u>	10-K 001-3761	February 24, 2016	10(c)	
10(d)	<u>Texas Instruments Long-Term Incentive Plan, adopted April 15, 1993*</u>	10-K 001-3761	February 24, 2012	10(c)	
10(e)	<u>Texas Instruments 2000 Long-Term Incentive Plan as amended October 16, 2008*</u>	10-K 001-3761	February 24, 2015	10(e)	
10(f)	<u>Texas Instruments 2003 Long-Term Incentive Plan as amended October 16, 2008</u>	10-K 001-3761	February 24, 2015	10(f)	
10(g)		10-K 001-3761		10(h)	

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	<u>Texas Instruments Restricted Stock Unit Plan for Directors, as amended, dated April 16, 1998</u>		February 24, 2012
10(h)	<u>Texas Instruments Directors Deferred Compensation Plan, as amended, dated April 16, 1998</u>	10-K 001-3761	February 24, 10(i) 2012
10(i)	<u>Texas Instruments 2003 Director Compensation Plan as amended January 19, 2012</u>	10-K 001-3761	February 24, 10(j) 2015
10(j)	<u>Form of Non-Qualified Stock Option Agreement for Executive Officers under the Texas Instruments 2009 Long-Term Incentive Plan*</u>	10-K 001-3761	February 23, 10(k) 2017
10(k)	<u>Form of Restricted Stock Unit Award Agreement for Executive Officers under the Texas Instruments 2009 Long-Term Incentive Plan*</u>	10-K 001-3761	February 23, 10(l) 2017

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Incorporated by Reference

Designation of Exhibit	Description of Exhibit	Form	File Number	Date of Filing	Exhibit Number	Filed or
						Furnished Herewith
10(l)	<u>Texas Instruments 2009 Long-Term Incentive Plan as amended April 21, 2016*</u>	DEF 14A	001-3761	March 9, 2016	Appendix B	
10(m)	<u>Texas Instruments 2009 Director Compensation Plan as amended January 19, 2012</u>	10-K	001-3761	February 23, 2017	10(n)	
10(n)	<u>Texas Instruments 2018 Director Compensation Plan</u>	10-Q	001-3761	August 2, 2018	10(a)	
21	<u>List of Subsidiaries of the Registrant</u>					X
23	<u>Consent of Independent Registered Public Accounting Firm</u>					X
31(a)	<u>Rule 13a-14(a)/15(d)-14(a) Certification of Chief Executive Officer</u>					X
31(b)	<u>Rule 13a-14(a)/15(d)-14(a) Certification of Chief Financial Officer</u>					X
32(a)	<u>Section 1350 Certification of Chief Executive Officer</u>					X
32(b)	<u>Section 1350 Certification of Chief Financial Officer</u>					X
101.ins	Instance Document					X
101.sch	XBRL Taxonomy Schema					X
101.cal	XBRL Taxonomy Calculation Linkbase					X
101.Def	XBRL Taxonomy Definitions Document					X
101.lab	XBRL Taxonomy Labels Linkbase					X
101.pre	XBRL Taxonomy Presentation Linkbase					X

* Management compensation plans and arrangements

Notice regarding forward-looking statements

This report includes forward-looking statements intended to qualify for the safe harbor from liability established by the Private Securities Litigation Reform Act of 1995. These forward-looking statements generally can be identified by phrases such as TI or its management “believes,” “expects,” “anticipates,” “foresees,” “forecasts,” “estimates” or other words or phrases of similar import. Similarly, statements herein that describe TI’s business strategy, outlook, objectives, plans, intentions or goals also are forward-looking statements. All such forward-looking statements are subject to certain risks and uncertainties that could cause actual results to differ materially from those in forward-looking statements.

We urge you to carefully consider the following important factors that could cause actual results to differ materially from the expectations of TI or our management:

• Market demand for semiconductors, particularly in our end markets;

- Our ability to compete in products and prices in an intensely competitive industry;

• Customer demand that differs from forecasts and the financial impact of inadequate or excess company inventory that results from demand that differs from projections;

• Economic, social and political conditions in the countries in which we, our customers or our suppliers operate, including security risks; global trade policies; political and social instability; health conditions; possible disruptions in transportation, communications and information technology networks; and fluctuations in foreign currency exchange rates;

• Evolving cybersecurity threats to our information technology systems or those of our customers or suppliers;

• Natural events such as severe weather, geological events or health epidemics in the locations in which we, our customers or our suppliers operate;

• Our ability to develop, manufacture and market innovative products in a rapidly changing technological environment;

• Timely implementation of new manufacturing technologies and installation of manufacturing equipment, and the ability to obtain needed third-party foundry and assembly/test subcontract services;

• Availability and cost of raw materials, utilities, manufacturing equipment, third-party manufacturing services and manufacturing technology;

• Product liability or warranty claims, claims based on epidemic or delivery failure, or other claims relating to our products, manufacturing, services, design or communications, or recalls by our customers for a product containing one of our parts;

• Compliance with or changes in the complex laws, rules and regulations to which we are or may become subject, or actions of enforcement authorities, that restrict our ability to manufacture or ship our products or operate our business, or subject us to fines, penalties or other legal liability;

• Changes in tax law and accounting standards that can impact the tax rate applicable to us, the jurisdictions in which profits are determined to be earned and taxed, adverse resolution of tax audits, increases in tariff rates, and the ability to realize deferred tax assets;

• A loss suffered by one of our customers or distributors with respect to TI-consigned inventory;

• Financial difficulties of our distributors or their promotion of competing product lines to our detriment, or the loss of significant distributors;

• Losses or curtailments of purchases from key customers or the timing and amount of distributor and other customer inventory adjustments;

• Our ability to maintain or improve profit margins, including our ability to utilize our manufacturing facilities at sufficient levels to cover our fixed operating costs, in an intensely competitive and cyclical industry and despite changes in the regulatory environment;

• Our ability to maintain and enforce a strong intellectual property portfolio and maintain freedom of operation in all jurisdictions where we conduct business; or our exposure to infringement claims;

• Instability in the global credit and financial markets that affects our ability to fund our daily operations, invest in the business, make strategic acquisitions, or make principal and interest payments on our debt;

• Increases in health care and pension benefit costs;

• Our ability to recruit and retain skilled engineering, management and technical personnel, and effectively manage key employee succession;

• Our ability to successfully integrate and realize opportunities for growth from acquisitions, or our ability to realize our expectations regarding the amount and timing of restructuring charges and associated cost savings; and

• Impairments of our non-financial assets.

For a more detailed discussion of these factors see the Risk Factors discussion in Item 1A of this report. The forward-looking statements included in this report are made only as of the date of this report, and we undertake no obligation to update the forward-looking statements to reflect subsequent events or circumstances.

SIGNATURES

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

TEXAS INSTRUMENTS
INCORPORATED

By: /s/ Rafael R. Lizardi
Rafael R. Lizardi
Senior Vice President,
Chief Financial Officer
and Chief Accounting Officer

Date: February 22, 2019

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Each person whose signature appears below constitutes and appoints each of Richard K. Templeton, Rafael R. Lizardi, and Cynthia Hoff Trochu, or any of them, each acting alone, his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for such person and in his or her name, place and stead, in any and all capacities in connection with the annual report on Form 10-K of Texas Instruments Incorporated for the year ended December 31, 2018, to sign any and all amendments to the Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, each acting alone, full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or their substitutes or substitute, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this Report has been signed below by the following persons on behalf of the Registrant and in the capacities indicated as of the 22nd day of February 2019.

Signature	Title
/s/ Ralph W. Babb, Jr. Ralph W. Babb, Jr.	Director
/s/ Mark A. Blinn Mark A. Blinn	Director
/s/ Todd M. Bluedorn Todd M. Bluedorn	Director
/s/ Daniel A. Carp Daniel A. Carp	Director
/s/ Janet F. Clark Janet F. Clark	Director
/s/ Carrie S. Cox Carrie S. Cox	Director
/s/ Martin S. Craighead Martin S. Craighead	Director
/s/ Jean M. Hobby Jean M. Hobby	Director
/s/ Ronald Kirk Ronald Kirk	Director
/s/ Pamela H. Patsley Pamela H. Patsley	Director
/s/ Robert E. Sanchez Robert E. Sanchez	Director

/s/ Richard K. Templeton

Richard K. Templeton Director, Chairman of the Board, President and Chief Executive Officer

/s/ Rafael R. Lizardi

Rafael R. Lizardi Senior Vice President, Chief Financial Officer and Chief Accounting Officer