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

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)	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)	Infotainment & cluster Advanced driver assistance systems (ADAS) Passive safety Hybrid, electric & powertrain systems Body electronics & lighting
Personal electronics (23% of TI revenue)	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)	Wireless infrastructure Wired networking Broadband fixed line access Datacom module
Enterprise systems (7% of TI revenue)	Enterprise projectors Data center & enterprise computing Enterprise machine
Other (calculators and other)	

(3% of TI revenue)

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 Anderskouv	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. Anderskouv, Ilan and Lizardi and Mses. 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. Anderskouv 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 f~~or ~~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.

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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.

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.

	For Years Ended December 31,				
(Millions of dollars, except share and per-share amounts)	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.

	December 31,				
(Millions of dollars, except other data items)	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

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.

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

- 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

	Payments Due by Period				
Contractual Obligations	2019	2020/2021	2022/2023	Thereafter	Total
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.

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	For Years Ended December 31,		
(Millions of dollars, except share and per-share amounts)	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.

Consolidated Balance Sheets	December 31,	
(Millions of dollars, except share amounts)	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

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	—