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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, 2019

or

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

Commission File Number: 01-14010

Waters Corporation

(Exact name of registrant as specified in its charter)

Delaware	**13-3668640**
(State or other jurisdiction of incorporation or organization)	*(I.R.S. Employer Identification No.)*

34 Maple Street
Milford, Massachusetts 01757
(Address, including zip code, of principal executive offices)
(508) 478-2000
(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.01 per share	**WAT**	**New York Stock Exchange, Inc.**

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 whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or 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. (Check one):

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 ☑

State the aggregate market value of the registrant's common stock held by non-affiliates of the registrant as of June 29 , 2019: $14,554,561,947.

Indicate the number of shares outstanding of the registrant's common stock as of February 21, 2020: 62,158,045

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement that will be filed for the 2020 Annual Meeting of Stockholders are incorporated by reference in Part III.

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WATERS CORPORATION AND SUBSIDIARIES

ANNUAL REPORT ON FORM 10-K

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PART I

Item 1: *Business*

General

Waters Corporation (the "Company," "we," "our," or "us") is a specialty measurement company that operates with a fundamental underlying purpose to advance the science that enables our customers to enhance human health and well-being. Waters ™ has pioneered analytical workflow solutions involving liquid chromatography, mass spectrometry and thermal analysis innovations serving the life, materials and food sciences for more than 60 years. The Company primarily designs, manufactures, sells and services high performance liquid chromatography ("HPLC"), ultra performance liquid chromatography ("UPLC ™ " and together with HPLC, referred to as "LC") and mass spectrometry ("MS") technology systems and support products, including chromatography columns, other consumable products and comprehensive post-warranty service plans. These systems are complementary products that are frequently employed together ("LC-MS") and sold as integrated instrument systems using common software platforms. In addition, the Company designs, manufactures, sells and services thermal analysis, rheometry and calorimetry instruments through its TA ™ product line. The Company is also a developer and supplier of advanced software-based products that interface with the Company's instruments, as well as other manufacturers' instruments.

The Company's products are used by pharmaceutical, biochemical, industrial, nutritional safety, environmental, academic and governmental customers working in research and development, quality assurance and other laboratory applications. LC is a standard technique and is utilized in a broad range of industries to detect, identify, monitor and measure the chemical, physical and biological composition of materials, and to purify a full range of compounds. MS technology, principally in conjunction with chromatography, is employed in drug discovery and development, including clinical trial testing, the analysis of proteins in disease processes (known as "proteomics"), nutritional safety analysis and environmental testing. LC-MS instruments combine a liquid phase sample introduction and separation system with mass spectrometric compound identification and quantification. The Company's thermal analysis, rheometry and calorimetry instruments are used in predicting the suitability and stability of fine chemicals, pharmaceuticals, water, polymers, metals and viscous liquids for various industrial, consumer goods and healthcare products, as well as for life science research.

Waters Corporation, organized as a Delaware corporation in 1991, is a holding company that owns all of the outstanding common stock of Waters Technologies Corporation, its operating subsidiary. Waters Corporation became a publicly-traded company with its initial public offering ("IPO") in November 1995. Since the IPO, the Company has added two significant and complementary technologies to its range of products with the acquisitions of TA Instruments in May 1996 and Micromass Limited in September 1997.

Business Segments

The Company's business activities, for which discrete financial information is available, are regularly reviewed and evaluated by the chief operating decision maker. As a result of this evaluation, the Company determined that it has two operating segments: Waters and TA. The Waters operating segment is primarily in the business of designing, manufacturing, selling and servicing LC and MS instrument systems, columns and other precision chemistry consumables that can be integrated and used along with other analytical instruments. The TA operating segment is primarily in the business of designing, manufacturing, selling and servicing thermal analysis, rheometry and calorimetry instruments. The Company's two operating segments have similar economic characteristics; product processes; products and services; types and classes of customers; methods of distribution; and regulatory environments. Because of these similarities, the two segments have been aggregated into one reporting segment for financial statement purposes.

Information concerning revenues and long-lived assets attributable to each of the Company's products, services and geographic areas is set forth in Note 18 in the Notes to the Consolidated Financial Statements, which is incorporated herein by reference.

Waters Products and Markets

High Performance and Ultra Performance Liquid Chromatography

HPLC is a standard technique used to identify and analyze the constituent components of a variety of chemicals and other materials. The Company believes that HPLC's performance capabilities enable it to separate, identify and quantify a high proportion of all known chemicals. As a result, HPLC is used to analyze substances in a wide variety of industries for research and development purposes, quality control and process engineering applications.

The most significant end-use markets for HPLC are those served by the pharmaceutical and life science industries. In these markets, HPLC is used extensively to understand diseases, identify new drugs, develop manufacturing methods and assure the potency and purity of new pharmaceuticals. HPLC is also used in a variety of other applications, such as analyses of foods and beverages for nutritional labeling and compliance with safety regulations and the testing of water and air purity within the environmental testing industry, as well as applications in other industries, such as chemical and consumer products. Waters also has in vitro diagnostic (IVD) labelled products that are used as general-purpose instruments for clinical diagnostic applications, such as newborn screening and therapeutic drug management, in countries where these products are registered. HPLC is also used by universities, research institutions and governmental agencies, such as the United States Food and Drug Administration ("FDA") and the United States Environmental Protection Agency ("EPA") and their foreign counterparts that mandate safety and efficacy testing.

In 2004, Waters introduced a novel technology that the Company describes as ultra performance liquid chromatography that utilizes a packing material with small, uniform diameter particles and a specialized instrument, the ACQUITY UPLC ™ , to accommodate the increased pressure and narrower chromatographic bands that are generated by these small and tightly packed particles. By using the ACQUITY UPLC, researchers and analysts are able to achieve more comprehensive chemical separations and faster analysis times in comparison with many analyses previously performed by HPLC. In addition, in using the ACQUITY UPLC, researchers have the potential to extend the range of applications beyond that of HPLC, enabling them to uncover more levels of scientific information. While offering significant performance advantages, the ACQUITY UPLC is also compatible with the Company's software products and the general operating protocols of HPLC. For these reasons, the Company's customers and field sales and support organizations are well positioned to utilize this new technology and instrument. In 2018, the Company introduced the ACQUITY ARC ™ Bio System, a versatile, iron-free, bio-inert, quaternary liquid chromatograph specifically engineered to improve bioseparation analytical methods. The Company also introduced the ACQUITY UPLC PLUS series in 2018, consisting of the H-Class PLUS, H-Class PLUS Bio and I-Class PLUS systems, which incorporate foundational enhancements into the legacy systems. In 2019, the Company introduced the ACQUITY ™ Advanced Polymer Chromatography ™ System, which is the first fully solvent-compatible UPLC system to perform size exclusion, gradient polymer elution and solvent compatible reversed-phase liquid chromatographic separations on a single platform. The all-in-one system gives research scientists greater analytical versatility and speed when conducting research on next-generation polymers.

Waters manufactures LC instruments that are offered in configurations that allow for varying degrees of automation, from component configured systems for academic teaching and research applications to fully automated systems for regulated and high sample throughput testing, and that have a variety of detection technologies, from optical-based ultra-violet ("UV") absorbance, refractive index and fluorescence detectors to a suite of MS-based detectors, optimized for certain analyses.

The primary consumable products for LC are chromatography columns. These columns are packed with separation media used in the LC testing process and are typically replaced at regular intervals. The chromatography column contains one of several types of packing material, typically stationary phase particles made from silica or polymeric resins. As a pressurized sample is introduced to the column inlet and permeates through the packed column, it is separated into its constituent components.

Waters HPLC columns can be used on Waters-branded and competitors' LC systems. The Company believes that it is one of a few suppliers in the world that manufactures silica and polymeric resins, packs columns and distributes its own products. In doing so, the Company believes it can better ensure product consistency, a key attribute for its customers in quality control laboratories, and can react quickly to new customer requirements. The Company believes that its ACQUITY UPLC lines of columns are used primarily on its ACQUITY UPLC instrument systems and, furthermore, that its ACQUITY UPLC instruments primarily use ACQUITY UPLC columns. In 2018, the Company introduced the BioResolve ™ RP mAb Polyphenyl columns, which improve the consistency and reliability of the overly complex separations of monoclonal antibodies and antibody-drug conjugates. In 2019, the Company introduced the BioResolv SCX mAb Columns and VanGuard ™ FIT Cartridge technologies. These new cation exchange column lines with specialized consumables are designed to simplify and improve the characterization and monitoring of monoclonal antibody (mAb) therapeutics, as well as enable mAb charge-variant analyses as required by the World Health Organization, the FDA and the International Conference on Harmonization for confirming the efficacy and safety of biologics and biosimilars with discovery, development and manufacturing applications.

The Company's precision chemistry consumable products also include environmental and nutritional safety testing products, including Certified Reference Materials ("CRM"s) and Proficiency Testing ("PT") products. Laboratories around the world and across multiple industries use these products for quality control and proficiency testing and also purchase product support services required to help with their federal and state mandated accreditation requirements or with quality control over critical pharmaceutical analysis. In 2018, the Company introduced the VICAM ™ BPATest ™ , which provides a sensitive, precise determination of Bisphenol A in as little as ten minutes. VICAM also introduced a user-friendly lateral flow zearalenone strip test, the Zearala-V ™ AQUA ™ in 2018.

Mass Spectrometry and Liquid Chromatography-Mass Spectrometry

MS is a powerful analytical technology that is used to identify unknown compounds, to quantify known materials and to elucidate the structural and chemical properties of molecules by measuring the masses of molecules that have been converted into ions.

The Company is a technology and market leader in the development, manufacture, sale and service of MS instruments and components. These instruments are typically integrated and used along with other complementary analytical instruments and systems, such as LC, chemical electrophoresis and gas chromatography. A wide variety of instrumental designs fall within the overall category of MS instrumentation, including devices that incorporate quadrupole, ion trap, time-of-flight ("Tof"), magnetic sector and ion mobility technologies. Furthermore, these technologies are often used in tandem (MS-MS) to maximize the speed and/or efficacy of certain experiments.

Currently, the Company offers a wide range of MS instrument systems utilizing various combinations of quadrupole, Tof and ion mobility designs. These instrument systems are used in drug discovery and development, as well as for environmental, clinical and nutritional safety testing. The overwhelming majority of mass spectrometers sold by the Company are designed to utilize an LC system and a liquid compatible interface (such as an electrospray ionization source) as the sample introduction device. These products supply a diverse market with a strong emphasis on the pharmaceutical, biomedical, clinical, food and beverage and environmental market segments worldwide.

MS is an increasingly important detection technology for LC. The Company's smaller-sized mass spectrometers, such as the single quadrupole detector ("SQD") and the tandem quadrupole detector ("TQD"), are often referred to as LC "detectors" and are typically sold as part of an LC system or as an LC system upgrade. Larger quadrupole systems, such as the Xevo ™ TQ and Xevo TQ-S instruments, are used primarily for experiments performed for late-stage drug development, including clinical trial testing. Quadrupole time-of-flight ("Q-Tof") instruments, such as the Company's SYNAPT ™ G2-S, are often used to analyze the role of proteins in disease

processes, an application sometimes referred to as “proteomics”. In 2018, the Company introduced the DART QDa ™ system with LiveID ™ , a direct-from-sample analytical system that verifies sample authenticity or adulteration, specifically for food applications. The Company also introduced the Xevo TQ-GC mass spectrometer in 2018, which allows laboratories to meet and exceed low part-per-billion limits of detection when quantifying pesticide residues and other contaminants in food using GC-MS/MS methods set forth by worldwide regulatory agencies/authorities. In addition, the Company introduced the RenataDX ™ screening system, a flow-injection tandem mass spectrometry system for rapid high-throughput analysis of extracted dried blood spots and other human biological matrices. In 2019, the Company introduced the BioAccord ™ system, a liquid chromatography-mass spectrometry solution that expands access to high-resolution time-of-flight mass spectrometry capabilities. The system provides new levels of user experience with automated setup and self-diagnosis delivered through an intuitive user interface. Also in 2019, the Company introduced the Cyclic IMS system, which seamlessly integrates cyclic ion mobility technology into a high-performance research-grade time-of-flight mass spectrometer. In addition, the Company introduced the SYNAPT XS, a new highly flexible, high-resolution mass spectrometer for research and development labs focused on discovery applications. The Company also reinforced its tandem quadrupole mass spectrometry portfolio during the current year with upgrades to the Xevo TQ-S micro and the introduction of the new Xevo TQ-S cronos. The Xevo TQ-S micro features new performance enhancements that bring the quantitation of highly polar, ionic compounds in food to a higher level. The Xevo TQ-S cronos is a new, tandem quadrupole mass spectrometer purposely-built for routine quantitation of large numbers of small-molecule organic compounds over a wide concentration range. The Xevo TQ-S micro and the Xevo TQ-S cronos are also well suited to meet regulatory requirements for pesticide residue analysis, the monitoring for contaminants in processed foods, identifying drugs of abuse, and performing impurity profiling of pharmaceuticals.

LC and MS are typically embodied within an analytical system tailored for either a dedicated class of analyses or as a general purpose analytical device. An increasing percentage of the Company’s customers are purchasing LC and MS components simultaneously and it has become common for LC and MS instrumentation to be used within the same laboratory and operated by the same user. The descriptions of LC and MS above reflect the historical segmentation of these analytical technologies and the historical categorization of their respective practitioners. Increasingly in today’s instrument market, this segmentation and categorization is becoming obsolete as a high percentage of instruments used in the laboratory embody both LC and MS technologies as part of a single device. In response to this development and to further promote the high utilization of these hybrid instruments, the Company has organized its Waters operating segment to develop, manufacture, sell and service integrated LC-MS systems.

Based upon reports from independent marketing research firms and publicly-disclosed sales figures from competitors, the Company believes that it is one of the world’s largest manufacturers and distributors of LC and LC-MS instrument systems, chromatography columns and other consumables and related services.

The Company has been a developer and supplier of software-based products that interface with the Company’s instruments, as well as other suppliers’ instruments. The Company’s newest software technology, UNIFI ™ , is a scientific information system that is the culmination of a multi-year effort to substantially bring all of Waters’ preexisting, distinct software systems under one operating system. UNIFI joins Waters’ suite of informatics products – Empower ™ Chromatography Data Software, MassLynx ™ Mass Spectrometry Software and NuGenesis ™ Scientific Data Management System, each of which is used to support innovations within world-leading institutions. UNIFI is the industry’s first comprehensive software that seamlessly integrates UPLC chromatography, mass spectrometry and informatics data workflows. In 2018, the Company announced new analysis capabilities across a variety of molecules by integrating UNIFI acquired data from the Company’s Vion ™ IMS QTof or Xevo GS XS mass spectrometers with Molecular Discovery’s Mass-MetaSite and WebMetabase processing software.

Waters Service

Services provided by Waters enable customers to maximize technology productivity, support customer compliance activities and provide transparency into enterprise resource management efficiencies. The customer

benefits from improved budget control, data-driven technology adoption and accelerated workflow at a site or on a global perspective. The Company considers its service offerings to be highly differentiated from our competition, as evidenced by a consistent increase in annual service revenues. The Company's principal competitors in the service market include PerkinElmer, Inc., Agilent Technologies, Inc., Thermo Fisher Scientific Inc. and General Electric Company. These competitors can provide certain services on Waters instruments to varying degrees and always present competitive risk.

The servicing and support of instruments, software and accessories is an important source of revenue and represented over 35% of sales for Waters in 2019. These revenues are derived primarily through the sale of support plans, demand services, spare parts, customer performance validation services and customer training. Support plans typically involve scheduled instrument maintenance and an agreement to promptly repair a non-functioning instrument in return for a fee described in a contract that is priced according to the configuration of the instrument.

TA Products and Markets

Thermal Analysis, Rheometry and Calorimetry

Thermal analysis measures the physical or thermodynamic characteristics of materials as a function of temperature. Changes in temperature affect several characteristics of materials, such as their heat flow characteristics, physical state, weight, dimension and mechanical and electrical properties, which may be measured by one or more thermal analysis techniques, including calorimetry. Consequently, thermal analysis techniques are widely used in the development, production and characterization of materials in various industries, such as plastics, chemicals, automobiles, pharmaceuticals and electronics.

Rheometry instruments often complement thermal analyzers in characterizing materials. Rheometry characterizes the flow properties of materials and measures their viscosity, elasticity and deformation under different types of "loading" or other conditions. The information obtained under such conditions provides insight into a material's behavior during processing, packaging, transport, usage and storage.

Thermal analysis, rheometry and calorimetry instruments are heavily used in material testing laboratories and, in many cases, provide information useful in predicting the suitability and stability of industrial polymers, fine chemicals, pharmaceuticals, water, metals and viscous liquids in various industrial, consumer goods and healthcare products, as well as for life science research. As with systems offered by Waters, a range of instrument configurations is available with increasing levels of sample handling and information processing automation. In addition, systems and accompanying software packages can be tailored for specific applications

In 2017, TA introduced the TAM Air microcalorimeter. Although designed to characterize the curing of cement, this instrument is an ideal platform for imaginative experimental design in a wide range of applications, including cement and concrete, material science, food, pharmaceuticals and environmental analysis. TA also introduced three new dilatometer product lines in its 800 platform, which are high precision systems designed to measure dimensional changes of a specimen brought about by dynamic thermal events in a wide range of applications, including material science, ceramics and metals. In 2017, TA introduced the Discovery SDT 650, which provides a true simultaneous measurement of weight change and differential heat flow using advanced technologies, such as dual sample TGA, modulated DSC and modulated and hi-resolution TGA. In addition, TA introduced the Discovery HP-TGA750, a benchtop high pressure TGA that utilizes a patented ultra-high resolution magnetic suspension balance and new high precision temperature control system. Late in 2017, TA introduced the Discovery DMA 850, which measures the viscoelastic mechanical properties of material under controlled conditions of temperature, environment and mechanical stimulus (stress or strain). The DMA 850 features frictionless air bearing supports and a linear optical encoder, which ensures stable, accurate, high-resolution displacement measurement across the full travel range and enables displacement control of 5 nm. In 2017, TA introduced the WinTest ^{TM} 8.0 software package, which will be standard on all new ElectroForce ^{TM} products. In addition, TA introduced the ElectroForce DMA 3200 in 2017, which combines fatigue and dynamic mechanical analysis into a single mechanical test platform.

In 2019, TA introduced a range of new instruments including the TMA 450, a Rheo-Raman ™ capability for the DHR product line, and a High Sensitivity Pressure Cell for the ARES-G2 Rheometer. The Discovery ™ TMA 450, precisely measures dimensional changes of materials from (150) to 1,000 °C and handles virtually all sample configurations for testing in expansion, compression, flexure and tension modes. The Rheo-Raman capability for the DHR product line combines a Raman spectrometer with the DHR to enable simultaneous collection of rheology and Raman spectroscopy data. This combination allows for direct correlation between flow characteristics and the unique spectroscopic fingerprints of each material including information about its chemical and morphological structure. The High Sensitivity Pressure Cell for the ARES-G2 Rheometer enables scientists to perform sensitive viscoelastic measurements under controlled atmospheric pressure and temperature and gain detailed understanding of complex fluid behavior in complex environments.

Also in 2019, TA introduced the MSF16 Multi-Specimen Fatigue Instrument. The MSF16 extends the capability of accelerated cyclic components and products under repeated loading, significantly accelerating fatigue analysis.

TA Service

Similar to Waters, the servicing and support of TA's instruments is an important source of revenue and represented more than 25% of sales for TA in 2019. TA operates independently from the Waters operating segment, though many of its overseas offices are situated in Waters' facilities to achieve operational efficiencies. TA has dedicated field sales and service operations. Service sales are primarily derived from the sale of support plans, replacement parts and billed labor fees associated with the repair, maintenance and upgrade of installed systems.

Global Customers

The Company typically has a broad and diversified customer base that includes pharmaceutical accounts, other industrial accounts, universities and governmental agencies. Purchase of the Company's instrument systems is often dependent on its customers' capital spending, or funding as in the cases of academic, governmental and research institutions, which often fluctuate from year to year. The pharmaceutical segment represents the Company's largest sector and includes multinational pharmaceutical companies, generic drug manufacturers, contract research organizations ("CRO"s) and biotechnology companies. The Company's other industrial customers include chemical manufacturers, polymer manufacturers, food and beverage companies and environmental testing laboratories. The Company also sells to universities and governmental agencies worldwide. The Company's technical sales and support staff members work closely with its customers in developing and implementing applications that meet their full range of analytical requirements. During 2019, 57% of the Company's net sales were to pharmaceutical accounts, 30% to other industrial accounts and 13% to academic institutions and governmental agencies.

The Company typically experiences an increase in sales in the fourth quarter, as a result of purchasing habits for capital goods of many customers who tend to exhaust their spending budgets by calendar year end. The Company does not rely on any single customer for a material portion of its sales. During fiscal years 2019, 2018 and 2017, no single customer accounted for more than 2% of the Company's net sales.

Sales and Service

The Company has one of the largest direct sales and service organizations focused exclusively on the analytical workflows offered by the Company. Across these product technologies, using respective specialized sales and service workforces, the Company serves its customer base with 56 sales offices throughout the world as of December 31, 2019 and approximately 4,000, 3,900 and 3,800 field representatives in 2019, 2018 and 2017, respectively. This investment in sales and service personnel serves to maintain and expand the Company's installed base of instruments. The Company's sales representatives have direct responsibility for account relationships, while service representatives work in the field to install instruments, train customers and minimize

instrument downtime. In-house and field-based technical support representatives work directly with customers, providing them assistance with applications and procedures on Company products. The Company provides customers with comprehensive information through various corporate and regional internet websites and product literature, and also makes consumable products available through electronic ordering facilities and a dedicated catalog.

Manufacturing and Distribution

The Company provides high product quality by overseeing each stage of the production of its instruments, columns and chemical reagents.

The Company currently assembles a portion of its LC instruments at its facility in Milford, Massachusetts, where it performs machining, assembly and testing. The Milford facility maintains quality management and environmental management systems in accordance with the requirements of ISO 9001:2015, ISO 13485:2016 and ISO 14001:2015, and adheres to applicable regulatory requirements (including the FDA Quality System Regulation and the European In-Vitro Diagnostic Directive). The Company outsources manufacturing of certain electronic components, such as computers, monitors and circuit boards, to outside vendors that meet the Company's quality requirements. In addition, the Company outsources the manufacturing of certain LC instrument systems and components to well-established contract manufacturing firms in Singapore. The Company's Singapore entity is ISO 9001:2015 certified and manages all Asian outsourced manufacturing as well as the distribution of all products from Asia. The Company may pursue outsourcing opportunities as they arise but believes it maintains adequate supply chain and manufacturing capabilities in the event of disruption or natural disasters.

The Company manufactures specialty Supercritical Fluid Chromatography ("SFC") and Supercritical Fluid Extraction ("SFE") products in its facility in Sharpsburg, Pennsylvania. The Sharpsburg facility is aligned with the policies and procedures for product manufacturing and distribution as adhered to in the Milford, Massachusetts facility and is under the same structural leadership organization.

The Company primarily manufactures and distributes its LC columns at its facilities in Taunton, Massachusetts and Wexford, Ireland. In February 2018, the Company's Board of Directors approved expanding its Taunton location and anticipates spending an estimated $215 million to build and equip this new state-of-the-art manufacturing facility. The Company has incurred $85 million of costs on this facility through the end of 2019. The Taunton facility processes, sizes and treats silica and polymeric media that are packed into columns, solid phase extraction cartridges and bulk shipping containers in both Taunton and Wexford. The Wexford facility also manufactures and distributes certain data, instruments and software components for the Company's LC, MS and TA product lines. The Company's Taunton facility is certified to ISO 9001:2015. The Wexford facility is certified to ISO 9001:2015 and ISO 13485:2016/EN ISO 13485:2016. VICAM ^{TM} manufactures antibody-linked resins and magnetic beads that are packed into columns and kits in Milford, Massachusetts and Nixa, Missouri. The Company manufactures and distributes its Analytical Standards and Reagents and Environmental Resource Associates ("ERA") product lines at its facility in Golden, Colorado, which is certified to ISO 9001:2015 and accredited to ISO/IEC 17025:2017, ISO/IEC 17034:16 and ISO Guide 34. Some ERA products are also manufactured in the Wexford, Ireland facility, which is also accredited to ISO/IEC 17025:2005, ISO/IEC 17034:2016.

The Company manufactures and distributes its MS products at its facilities in Wilmslow, England and Wexford, Ireland. Certain components or modules of the Company's MS instruments are manufactured at its facility in Solihull, England and by long-standing outside contractors. Each stage of this supply chain is closely monitored by the Company to maintain high quality and performance standards. The instruments, components or modules are then returned to the Company's facilities, where its engineers perform final assembly, calibrations to customer specifications and quality control procedures. The Company's MS facilities are certified to ISO 9001:2015 and ISO 13485:2016/EN ISO 13485:2016 and adhere to applicable regulatory requirements (including the FDA Quality System Regulation and the European In-Vitro Diagnostic Directive).

TA's thermal analysis, rheometry and calorimetry products are manufactured and distributed at the Company's New Castle, Delaware, Wakefield, Massachusetts, Eden Prairie, Minnesota, Lindon, Utah and Huellhorst, Germany facilities. Similar to MS, elements of TA's products are manufactured by outside contractors and are then returned to the Company's facilities for final assembly, calibration and quality control. The Company's New Castle facility is certified to ISO 9001:2015 and ISO 17025:2005 standards and the Eden Prairie facility is certified to both ISO 9001:2015 and ISO/IEC 17025:2017 standards.

Raw Materials

The Company purchases a variety of raw materials, primarily consisting of high temperature alloy sheet metal and castings, forgings, pre-plated metals and electrical components from various vendors. The materials used by the Company's operations are generally available from a number of sources and in sufficient quantities to meet current requirements subject to normal lead times.

The Company is subject to rules of the Securities and Exchange Commission ("SEC") under the Dodd-Frank Wall Street Reform and Consumer Protection Act, requiring disclosure as to whether certain materials (tantalum, tin, gold and tungsten), known as conflict minerals, which may be contained in the Company's products, are mined from the Democratic Republic of the Congo and adjoining countries. In 2018, the Company was not able to determine with certainty the country of origin of some of the conflict minerals in its manufactured products. However, the Company does not have knowledge that any of its conflict minerals originated from the Democratic Republic of the Congo or adjoining countries. The Company is in the process of evaluating its 2019 supply chain, and the Company plans to file its 2019 Form SD with the SEC in May 2020. The results of this and future evaluations may impose additional costs and may introduce new risks related to the Company's ability to verify the origin of any conflict minerals contained in its products.

In addition, the Company continues to monitor environmental health and safety regulations in countries in which it operates throughout the world, in particular, European Union and China Restrictions on the use of certain Hazardous Substances in electrical and electronic equipment (RoHS) and European Union Waste Electrical and Electronic Equipment directives. Further information regarding these regulations is available on the Company's website, www.waters.com , under the caption "About Waters / Environmental Health & Safety".

Research and Development

The Company maintains an active research and development program focused on the development and commercialization of products that extend, complement and update its existing product offering. The Company's research and development expenditures for 2019, 2018 and 2017 were $143 million, $143 million and $133 million, respectively. In addition, in 2017, the Company incurred a $5 million charge for acquired in-process research and development related to milestone payments associated with a licensing arrangement for certain intellectual property relating to mass spectrometry technologies yet to be commercialized and for which there was no future alternative use as of the acquisition date. This licensing arrangement is significantly related to new, biologically-focused applications, as well as other applications, and requires the Company to make additional future payments of up to $7 million if certain milestones are achieved, as well as royalties on future net sales.

Nearly all of the Company's LC products have been developed at the Company's main research and development center located in Milford, Massachusetts, with input and feedback from the Company's extensive field organizations and customers. The majority of the Company's MS products are developed at facilities in England and most of the Company's current materials characterization products are developed at the Company's research and development center in New Castle, Delaware. At December 31, 2019, 2018 and 2017, there were 1,089, 1,011 and 1,004 employees, respectively, involved in the Company's research and development efforts. The Company has increased research and development expenses from its continued commitment to invest significantly in new product development and existing product enhancements, and as a result of acquisitions.

Despite the Company's active research and development programs, there can be no assurance that the Company's product development and commercialization efforts will be successful or that the products developed by the Company will be accepted by the marketplace.

Employees

The Company employed approximately 7,500 employees at December 31, 2019 and 7,200 at both December 31, 2018 and 2017, with approximately 39% of the Company's employees located in the United States. The Company believes its employee relations are generally good. The Company's employees are not unionized or affiliated with any internal or external labor organizations. The Company firmly believes that its future success largely depends upon its continued ability to attract and retain highly skilled employees.

Competition

The analytical instrument systems, supplies and services market is highly competitive. The Company encounters competition from several worldwide suppliers and other companies in both domestic and foreign markets for each of its three primary technologies. The Company competes in its markets primarily on the basis of product performance, reliability, service and, to a lesser extent, price. Competitors continuously introduce new products and have instrument businesses that are generally more diversified than the Company's business. Some competitors have greater financial resources and broader distribution than the Company's.

In the markets served by Waters, the Company's principal competitors include: Agilent Technologies, Inc., Shimadzu Corporation, Bruker Corporation, Danaher Corporation and Thermo Fisher Scientific Inc. In the markets served by TA, the Company's principal competitors include: PerkinElmer, Inc., Mettler-Toledo International Inc., NETZSCH-Geraetebau GmbH, Thermo Fisher Scientific Inc., Malvern PANalytical Ltd., a subsidiary of Spectris plc, and Anton-Paar GmbH.

The market for consumable LC products, including separation columns, is highly competitive and generally more fragmented than the analytical instruments market. The Company encounters competition in the consumable columns market from chemical companies that produce column sorbents and small specialized companies that primarily pack purchased sorbents into columns and subsequently package and distribute columns. The Company believes that it is one of the few suppliers that processes silica and polymeric resins, packs columns and distributes its own products. The Company competes in this market on the basis of performance, reproducibility, reputation and, to a lesser extent, price. In recent years, the Company's principal competitors for consumable products have included: Danaher Corporation; Merck KGaA; Agilent Technologies, Inc.; General Electric Company and Thermo Fisher Scientific Inc. The ACQUITY UPLC instrument is designed to offer a predictable level of performance when used with ACQUITY UPLC columns and the Company believes that the expansion of the ACQUITY UPLC instrument base will enhance its chromatographic column business because of the high level of synergy between ACQUITY UPLC columns and the ACQUITY UPLC instruments.

Patents, Trademarks and Licenses

The Company owns a number of United States and foreign patents and has patent applications pending in the United States and abroad. Certain technology and software has been acquired or is licensed from third parties. The Company also owns a number of trademarks. The Company's patents, trademarks and licenses are viewed as valuable assets to its operations. However, the Company believes that no one patent or group of patents, trademark or license is, in and of itself, essential to the Company such that its loss would materially affect the Company's business as a whole.

Environmental Matters and Climate Change

The Company is subject to foreign and U.S. federal, state and local laws, regulations and ordinances that (i) govern activities or operations that may have adverse environmental effects, such as discharges to air and

water as well as handling and disposal practices for solid and hazardous wastes, and (ii) impose liability for the costs of cleaning up and certain damages resulting from sites of past spills, disposals or other releases of hazardous substances. The Company believes that it currently conducts its operations and has operated its business in the past in substantial compliance with applicable environmental laws. From time to time, Company operations have resulted or may result in noncompliance with environmental laws or liability for cleanup pursuant to environmental laws. The Company does not currently anticipate any material adverse effect on its operations, financial condition or competitive position as a result of its efforts to comply with environmental laws.

The Company is sensitive to the growing global debate with respect to climate change. An internal sustainability working group develops increasingly robust data with respect to the Company's utilization of carbon producing substances in an effort to continuously reduce the Company's carbon footprint. In 2019, the Company published a sustainability report identifying the various actions and behaviors the Company adopted in 2018 concerning its commitment to both the environment and the broader topic of social responsibility. See Item 1A, Risk Factors – *The effects of climate change could harm the Company's business* , for more information on the potential significance of climate change legislation. See also Note 18 in the Notes to the Consolidated Financial Statements for financial information about geographic areas.

Available Information

The Company files or furnishes all required reports with the SEC. The Company is an electronic filer and the SEC maintains a website that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC. The address of the SEC electronic filing website is http://www.sec.gov . The Company also makes available, free of charge on its website, its annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and any amendments to those reports as soon as reasonably practicable after such material is electronically filed with or furnished to the SEC. The website address for Waters Corporation is http://www.waters.com and SEC filings can be found under the caption "Investors".

Forward-Looking Statements

Certain of the statements in this Form 10-K, including the information incorporated by reference herein, may contain forward-looking statements with respect to future results and events, including any statements regarding, among other items, anticipated trends or growth in the Company's business, including, but not limited to, the impact of new or proposed tariff or trade regulations or changes in the interpretation or enforcement of existing regulations; the impact of foreign currency translation on financial results; development of products by acquired businesses; the growth rate of sales and research and development expenses; the impact of costs associated with developing new technologies and bringing these new technologies to market; the impact of new product launches and the associated costs, such as the amortization expense related to software platforms; geographic sales mix of business; development of products by acquired businesses and the amount of contingent payments to the sellers of an acquired business; anticipated expenses, including interest expense, capitalized software costs and effective tax rates; the impact of the Tax Cuts and Jobs Act (the "2017 Tax Act") in the U.S.; the impact and outcome of the Company's various ongoing tax audit examinations; the achievement of contractual milestones to preserve foreign tax rates; the impact and outcome of litigation matters; the impact of the loss of intellectual property protection; the impact of new accounting standards and pronouncements; the adequacy of the Company's supply chain and manufacturing capabilities and facilities; the impact of regulatory compliance; the Company's expected cash flow, borrowing capacity, debt repayment and refinancing; the Company's ability to fund working capital, capital expenditures, service debt, repay outstanding lines of credit, make authorized share repurchases, fund potential acquisitions and pay any adverse litigation or tax audit liabilities, particularly in the U.S.; future impairment charges; the Company's contributions to defined benefit plans; the Company's expectations regarding changes to its financial position; compliance with applicable environmental laws; and the impact of recent acquisitions on sales and earnings.

Many of these statements appear, in particular, in Part II, Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations of this Form 10-K. Statements that are not statements of historical

fact may be deemed forward-looking statements. You can identify these forward-looking statements by the use of the words “feels”, “believes”, “anticipates”, “plans”, “expects”, “may”, “will”, “would”, “intends”, “suggests”, “appears”, “estimates”, “projects”, “should” and similar expressions, whether in the negative or affirmative. These statements are subject to various risks and uncertainties, many of which are outside the control of the Company, including, and without limitation:

- Foreign currency exchange rate fluctuations that could adversely affect translation of the Company’s future sales, financial operating results and the condition of its non-U.S. operations, especially when a currency weakens against the U.S. dollar.
- Current global economic, sovereign and political conditions and uncertainties, particularly regarding the effect of new or proposed tariff or trade regulations; the United Kingdom’s exit from the European Union, as well as the Chinese government’s ongoing tightening of restrictions on procurement by government-funded customers; the Company’s ability to access capital and maintain liquidity in volatile market conditions; changes in timing and demand for the Company’s products among the Company’s customers and various market sectors, particularly if they should reduce capital expenditures or are unable to obtain funding, as in the cases of academic, governmental and research institutions; the effect of mergers and acquisitions on customer demand for the Company’s products; and the Company’s ability to sustain and enhance service.
- Negative industry trends; changes in the competitive landscape as a result of changes in ownership, mergers and continued consolidation among the Company’s competitors; introduction of competing products by other companies and loss of market share; pressures on prices from customers or resulting from competition; regulatory, economic and competitive obstacles to new product introductions; lack of acceptance of new products; expansion of our business in developing markets; spending by certain end-markets; ability to obtain alternative sources for components and modules; and the possibility that future sales of new products related to acquisitions, which trigger contingent purchase payments, may exceed the Company’s expectations.
- Increased regulatory burdens as the Company’s business evolves, especially with respect to the FDA and EPA, among others, as well as regulatory, environmental and logistical obstacles affecting the distribution of the Company’s products, including the impact, if any, of the coronavirus in China or elsewhere; completion of purchase order documentation by our customers; and the customers’ ability to obtain letters of credit or other financing alternatives.
- Risks associated with lawsuits, particularly involving claims for infringement of patents and other intellectual property rights.
- The impact and costs incurred from changes in accounting principles and practices; the impact and costs of changes in statutory or contractual tax rates in jurisdictions in which the Company operates, specifically as it relates to the 2017 Tax Act in the U.S.; shifts in taxable income among jurisdictions with different effective tax rates; and the outcome of and costs associated with ongoing and future tax audit examinations or changes in respective country legislation affecting the Company’s effective rates.

Certain of these and other factors are further described below in Item 1A, Risk Factors, of this Form 10-K. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements, whether because of these factors or for other reasons. All forward-looking statements speak only as of the date of this annual report on Form 10-K and are expressly qualified in their entirety by the cautionary statements included in this report. Except as required by law, the Company does not assume any obligation to update any forward-looking statements.

Item 1A: ***Risk Factors***

The Company is subject to risks and uncertainties, including, but not limited to, the following:

The Company's international operations may be negatively affected by political events, wars or terrorism and regulatory changes, related to either a specific country or a larger region. These potential political, currency and economic disruptions, as well as foreign currency exchange rate fluctuations, could have a material adverse effect on the Company's results of operations or financial condition.

Approximately 71% and 72% of the Company's net sales in 2019 and 2018, respectively, were outside of the United States and were primarily denominated in foreign currencies. In addition, the Company has considerable manufacturing operations in Ireland and the U.K., as well as significant subcontractors located in Singapore. As a result, a significant portion of the Company's sales and operations are subject to certain risks, including adverse developments in the political, regulatory and economic environment, in particular, uncertainty regarding possible changes to foreign and domestic trade policy; the effect of the U.K.'s exit from the European Union as well as the financial difficulties and debt burden experienced by a number of European countries; the instability and potential impact of war or terrorism; the instability and possible dissolution of the Euro as a single currency; sudden movements in a country's foreign exchange rates due to a change in a country's sovereign risk profile or foreign exchange regulatory practices; tariffs and other trade barriers; the impact of public health epidemics, such as the coronavirus currently impacting China and elsewhere; difficulties in staffing and managing foreign operations; and associated adverse operational, contractual and tax consequences.

Additionally, the U.S. dollar value of the Company's net sales, cost of sales, operating expenses, interest, taxes and net income varies with foreign currency exchange rate fluctuations. Significant increases or decreases in the value of the U.S. dollar relative to certain foreign currencies, particularly the Euro, Japanese yen and British pound, could have a material adverse effect or benefit on the Company's results of operations or financial condition.

Global economic conditions may decrease demand for the Company's products and harm the Company's financial results.

The Company is a global business that may be adversely affected by changes in global economic conditions. These changes in global economic conditions, both inside and outside the U.S., may affect the demand for the Company's products and services. This may result in a decline in sales in the future, increased rate of order cancellations or delays, increased risk of excess or obsolete inventories, longer sales cycles and potential difficulty in collecting sales proceeds. There can be no assurance regarding demand for the Company's products and services in the future.

The Company's financial results are subject to changes in customer demand, which may decrease for a number of reasons, many beyond the Company's control.

The demand for the Company's products is dependent upon the size of the markets for its LC, LC-MS, thermal analysis, rheometry and calorimetry products; the timing and level of capital spending and expenditures of the Company's customers; changes in governmental regulations, particularly affecting drug, food and drinking water testing; funding available to academic, governmental and research institutions; general economic conditions and the rate of economic growth in the Company's major markets; and competitive considerations. The Company typically experiences an increase in sales in its fourth quarter as a result of purchasing habits for capital goods by customers that tend to exhaust their spending budgets by calendar year end. However, there can be no assurance that the Company will effectively forecast customer demand and appropriately allocated research and development expenditures to products with high growth and high margin prospects. Additionally, there can be no assurance that the Company's results of operations or financial condition will not be adversely impacted by a change in any of the factors listed above or the continuation of uncertain global economic conditions.

Additionally, the analytical instrument market may, from time to time, experience low sales growth. Approximately 57% and 56% of the Company's net sales in 2019 and 2018, respectively, were to worldwide pharmaceutical and biotechnology companies, which may be periodically subject to unfavorable market conditions and consolidations. Unfavorable industry conditions could have a material adverse effect on the Company's results of operations or financial condition.

Disruption in worldwide financial markets could adversely impact the Company's access to capital and financial condition.
Financial markets in the U.S., Europe and Asia have experienced times of extreme disruption, including, among other things, sharp increases in the cost of new capital, credit rating downgrades and bailouts, severely diminished capital availability and severely reduced liquidity in money markets. Financial and banking institutions have also experienced disruptions, resulting in large asset write-downs, higher costs of capital, rating downgrades and reduced desire to lend money. There can be no assurance that there will not be future deterioration or prolonged disruption in financial markets or financial institutions. Any future deterioration or prolonged disruption in financial markets or financial institutions in which the Company participates may impair the Company's ability to access its existing cash, utilize its existing syndicated bank credit facility funded by such financial institutions, and impair its ability to access sources of new capital. The cost to the Company of any new capital raised and interest expense would increase if this were to occur.

Competitors may introduce more effective or less expensive products than the Company's, which could result in decreased sales. The competitive landscape may transform as a result of potential changes in ownership, mergers and continued consolidations among the Company's competitors, which could harm the Company's business.
The analytical instrument market and, in particular, the portion related to the Company's HPLC, UPLC, LC-MS, thermal analysis, rheometry and calorimetry product lines, is highly competitive and subject to rapid changes in technology. The Company encounters competition from several international instrument suppliers and other companies in both domestic and foreign markets. Some competitors have instrument businesses that are generally more diversified than the Company's business, but are typically less focused on the Company's chosen markets. Over the years, some competitors have merged with other competitors for various reasons, including increasing product line offerings, improving market share and reducing costs. There can be no assurance that the Company's competitors will not introduce more effective and less costly products than those of the Company or that the Company will be able to increase its sales and profitability from new product introductions. There can be no assurance that the Company's sales and marketing forces will compete successfully against the Company's competitors in the future.

Strategies for organic growth require developing new technologies and bringing these new technologies to market, which could negatively impact the Company's financial results.
The Company's corporate strategy is fundamentally based on winning through organic innovation and deep application expertise. The Company is in the process of developing new products with recently acquired technologies. The future development of these new products will require a significant amount of spending over the next few years before significant, robust sales will be realized. Furthermore, these new products will be sold into both the non-clinical and clinical markets, and any new products requiring FDA clearance may take longer to bring to market. There can be no assurance given as to the timing of these new product launches and the ultimate realization of sales and profitability in the future.

The Company's software or hardware may contain coding or manufacturing errors that could impact their function, performance and security, and result in other negative consequences.
Despite testing prior to the release and throughout the lifecycle of a product or service, the detection and correction of any errors in released software or hardware can be time consuming and costly. This could delay the development or release of new products or services, or new versions of products or services, create security vulnerabilities in the Company's products or services, and adversely affect market acceptance of products or services. If the Company experiences errors or delays in releasing its software or hardware, or new versions thereof, its sales could be affected and revenues could decline. Errors in software or hardware could expose the Company to product liability, performance and warranty claims as well as harm to brand and reputation, which could impact future sales.

The loss of key members of management and the risks inherent in succession planning could adversely affect the Company's results of operations or financial condition.

The operation of the Company requires managerial and operational expertise. None of the Company's key management employees, with the exception of the Chairman and Chief Executive Officer and the Senior Vice President and Chief Financial Officer, have an employment contract with the Company and there can be no assurance that such individuals will remain with the Company. If, for any reason, other such key personnel do not continue to be active in management, the Company's results of operations or financial condition could be adversely affected.

Disruption of operations at the Company's manufacturing facilities could harm the Company's financial condition.

The Company manufactures LC instruments at facilities in Milford, Massachusetts and through a subcontractor in Singapore; precision chemistry separation columns at its facilities in Taunton, Massachusetts and Wexford, Ireland; MS products at its facilities in Wilmslow, England, Solihull, England and Wexford, Ireland; thermal analysis and rheometry products at its facilities in New Castle, Delaware and other instruments and consumables at various other locations as a result of the Company's acquisitions. Any prolonged disruption to the operations at any of these facilities, whether due to labor difficulties, destruction of or damage to any facility or other reasons, could have a material adverse effect on the Company's results of operations or financial condition.

Failure to adequately protect intellectual property could have materially adverse effects on the Company's results of operations or financial condition.

There can be no assurance that any patents held by the Company will not be challenged, invalidated or circumvented or that the rights granted thereunder will provide competitive advantages to the Company. Additionally, there could be successful claims against the Company by third-party patent holders with respect to certain Company products that may infringe the intellectual property rights of such third parties. The Company's patents, including those licensed from others, expire on various dates. If the Company is unable to protect its intellectual property rights, it could have an adverse and material effect on the Company's results of operations or financial condition.

The Company's business would suffer if the Company were unable to acquire adequate sources of supply.

Most of the raw materials, components and supplies purchased by the Company are available from a number of different suppliers; however, a number of items are purchased from limited or single sources of supply and disruption of these sources could have, at a minimum, a temporary adverse effect on shipments and the financial results of the Company. A prolonged inability to obtain certain materials or components could have an adverse effect on the Company's financial condition or results of operations and could result in damage to its relationships with its customers and, accordingly, adversely affect the Company's business.

The Company's sales would deteriorate if the Company's outside contractors fail to provide necessary components or modules.

Certain components or modules of the Company's LC and MS instruments are manufactured by outside contractors, including the manufacturing of LC instrument systems and related components by contract manufacturing firms in Singapore. Disruptions of service by these outside contractors could have an adverse effect on the supply chain and the financial results of the Company. A prolonged inability to obtain these components or modules could have an adverse effect on the Company's financial condition or results of operations.

The Company's business could be harmed by actions of distributors and other third parties that sell our products.

The Company sells some products through third parties, including distributors and value-added resellers. This exposes us to various risks, including competitive pressure, concentration of sales volumes, credit risks and compliance risks. We may rely on one or a few key distributors for a product or market and the loss of these

distributors could reduce our revenue or net earnings. Distributors may also face financial difficulties, including bankruptcy, which could harm our collection of accounts receivable. Violations of the U.S. Foreign Corrupt Practices Act ("FCPA"), the U.K. Bribery Act or similar anti-bribery laws by distributors or other third-party intermediaries could materially impact our business. Risks related to our use of distributors may reduce sales, increase expenses and weaken our competitive position.

The Company may be harmed by improper conduct of any of our employees, agents or business partners.

We cannot provide assurance that our internal controls and compliance systems will always protect the Company from acts committed by employees, agents or business partners that would violate domestic and international laws, including laws governing payments to government officials, bribery, fraud, kickbacks and false claims, pricing, sales and marketing practices, conflicts of interest, competition, export and import compliance, money laundering and data privacy. In particular, the FCPA, the U.K. Bribery Act and similar anti-bribery laws generally prohibit companies and their intermediaries from making improper payments to government officials for the purpose of obtaining or retaining business, and we operate in many parts of the world that have experienced governmental corruption to some degree. Any such improper actions or allegations of such acts could damage our reputation and subject us to civil or criminal investigations in the U.S. and in other jurisdictions and related shareholder lawsuits, could lead to substantial civil and criminal, monetary and non-monetary penalties and could cause us to incur significant legal and investigatory fees. In addition, the government may seek to hold us liable as a successor for violations committed by companies in which we invest or that we acquire. We also rely on our suppliers to adhere to our supplier standards of conduct and material violations of such standards of conduct could occur that could have a material effect on our business, reputation and financial statements.

The effects of climate change could harm the Company's business.

The Company's manufacturing processes for certain of its products involve the use of chemicals and other substances that are regulated under various international, federal, state and local laws governing the environment. In the event that any future climate change legislation would require that stricter standards be imposed by domestic or international environmental regulatory authorities with respect to the use and/or levels of possible emissions from such chemicals and/or other substances, the Company may be required to make certain changes and adaptations to its manufacturing processes. Any such changes could have a material adverse effect on the financial statements of the Company.

Another potential effect of climate change is an increase in the severity of global weather conditions. The Company's manufacturing facilities are located in the U.S., U.K., Ireland and Germany. In addition, the Company manufactures a growing percentage of its HPLC, UPLC and MS products in both Singapore and Ireland. Severe weather and geological conditions or events, including earthquakes, hurricanes and/or tsunamis, could potentially cause significant damage to the Company's manufacturing facilities in each of these countries. The effects of such damage and the resulting disruption of manufacturing operations and the impact of lost sales could have a material adverse impact on the financial results of the Company.

The Company's financial results are subject to unexpected shifts in pre-tax income between tax jurisdictions, changing application of tax law and tax audit examinations.

The Company is subject to rates of income tax that range from 0% up to 34% in various jurisdictions in which it conducts business. In addition, the Company typically generates a substantial portion of its income in the fourth quarter of each fiscal year. Geographical shifts in income from previous quarters' projections caused by factors including, but not limited to, changes in volume and product mix and fluctuations in foreign currency translation rates, could therefore have potentially significant favorable or unfavorable effects on the Company's income tax expense, effective tax rate and results of operations.

Governments in the jurisdictions in which the Company operates implement changes to tax laws and regulations from time to time. Any changes in corporate income tax rates or regulations regarding transfer

pricing or repatriation of dividends or capital, as well as changes in the interpretation of existing tax laws and regulations, in the jurisdictions in which the Company operates could adversely affect the Company's cash flow and lead to increases in its overall tax burden, which would negatively affect the Company's profitability.

The Company has a contractual tax rate in Singapore of 0% through March 2021, based upon the achievement and continued satisfaction of certain operational and financial milestones, which the Company expects to continue to meet. Currently, the Company has determined that it is more likely than not to realize the contractual tax rate in Singapore of 0% and has not recognized any uncertain tax position in its balance sheet related to the achievement of the contractual milestones in Singapore. In the event that it appears that the milestone targets will not be met, the Company will no longer be entitled to a 0% contractual tax rate benefit on income earned in Singapore dating back to the start date of the agreement (April 1, 2016), at which time all tax benefits previously recorded would be reversed and an income tax charge equal to the statutory tax of 17% on income earned during that period would be recorded.

As a global business, the Company is subject to tax audit examinations in various jurisdictions throughout the world. The Company must manage the cost and disruption of responding to governmental audits, investigation and proceedings. In addition, the impact of the settlement of pending or future tax audit examination could have an unfavorable effect on the Company's income tax expense, effective tax rate and results of operations.

The Company's financial condition and results of operations could be adversely affected if the Company is unable to maintain a sufficient level of cash flow.

The Company had $1.7 billion in debt and $337 million in cash, cash equivalents and investments as of December 31, 2019. As of December 31, 2019, the Company also had the ability to borrow an additional $1.2 billion from its existing, committed credit facility. All but a small portion of the Company's debt was in the U.S. There is a substantial cash requirement in the U.S. to fund operations and capital expenditures, service debt interest obligations, finance potential U.S. acquisitions and continue authorized stock repurchase programs. As such, the Company's financial condition and results of operations could be adversely impacted if the Company is unable to generate and maintain a sufficient level of cash flow to address these requirements through (1) cash from operations, (2) the Company's ability to access its existing cash and revolving credit facility, (3) the ability to expand the Company's borrowing capacity and (4) other sources of capital obtained at an acceptable cost.

Debt covenants, and the Company's failure to comply with them, could negatively impact the Company's capital and financial results.

The Company's debt is subject to restrictive debt covenants that limit the Company's ability to engage in certain activities that could otherwise benefit the Company. These debt covenants include restrictions on the Company's ability to enter into certain contracts or agreements, which may limit the Company's ability to make dividend or other payments, secure other indebtedness, enter into transactions with affiliates and consolidate, merge or transfer all or substantially all of the Company's assets. The Company is also required to meet specified financial ratios under the terms of the Company's debt agreements. The Company's ability to comply with these financial restrictions and all other covenants is dependent on the Company's future performance, which is subject to, but not limited to, prevailing economic conditions and other factors, including factors that are beyond the Company's control, such as foreign exchange rates, interest rates, changes in technology and changes in the level of competition.

Disruption, cyber attack or unforeseen problems with the security, maintenance or upgrade of the Company's information and web-based systems could have an adverse effect on the Company's operations and financial condition.

The Company relies on its technology infrastructure and that of its software and banking partners, among other functions, to interact with suppliers, sell products and services, fulfill contract obligations, ship products, collect and make electronic wire and check based payments and otherwise conduct business. The Company's technology

infrastructure may be vulnerable to damage or interruption from, but not limited to, natural disasters, power loss, telecommunication failures, terrorist attacks, computer viruses, unauthorized access to customer or employee data, unauthorized access to and funds transfers from Company bank accounts and other attempts to harm the Company's systems. Any prolonged disruption to the Company's technology infrastructure, at any of its facilities, could have a material adverse effect on the Company's results of operations or financial condition.

If the Company's security measures are compromised or fail to adequately protect its technology infrastructure, research and development efforts or manufacturing operations, the Company's products and services may be perceived as vulnerable or unreliable, the information [protected by] the Company's controls and processes may be subject to unauthorized access, acquisition or modification, the Company's brand and reputation could be damaged, the services that the Company provides to its customers could be disrupted, and customers may stop using the Company's products and services, all of which could reduce the Company's revenue and earnings, increase its expenses and expose the Company to legal claims and regulatory actions.
The Company is in the business of designing, manufacturing, selling and servicing analytical instruments to life science, pharmaceutical, biochemical, industrial, nutritional safety, and environmental, academic and governmental customers working in research and development, quality assurance and other laboratory applications, and the Company is also a developer and supplier of software-based products that support instrument systems. Many of the Company's customers are in highly regulated industries. While the Company has invested time and resources implementing measures designed to protect the integrity and security of its technology infrastructure, research and development processes, manufacturing operations, products and services, and the internal and external data managed by the Company, there is a risk these measures will be defeated or compromised or that they are otherwise insufficient to protect against existing or emerging threats. The Company also has acquired companies, products, services and technologies over time and may face inherent risk when integrating these acquisitions into the Company. In addition, at times, the Company faces attempts by third parties to defeat its security measures or exploit vulnerabilities in its systems. These risks will increase as the Company continues to grow and expand geographically, and its systems, products and services become increasingly digital and sensor- and web-based.

The Company could suffer significant damage to its brand and reputation if a security incident resulted in unauthorized access to, acquisition of, or modification to the Company's technology infrastructure, research and development processes, manufacturing operations, its products and services as well as the internal and external data managed by the Company. Such an incident could disrupt the Company's operations and customers could lose confidence in the Company's ability to deliver quality and reliable products or services. This could negatively impact sales and could increase costs related to fixing and addressing these incidents and any vulnerabilities exposed by them, as well as to lawsuits, regulatory investigations, claims or legal liability including contractual liability, costs and expenses owed to customers and business partners.

Compliance failures could harm the Company's business.
The Company is subject to regulation by various federal, state and foreign governments and agencies in areas including, among others, health and safety, import/export, privacy and data protection, FCPA and environmental laws and regulations. A portion of the Company's operations are subject to regulation by the FDA and similar foreign regulatory agencies. These regulations are complex and govern an array of product activities, including design, development, labeling, manufacturing, promotion, sales and distribution. Any failure by the Company to comply with applicable governmental regulations could result in product recalls, the imposition of fines, restrictions on the Company's ability to conduct or expand its operations or the cessation of all or a portion of its operations.

Regulators globally are increasingly imposing greater fines and penalties for privacy and data protection violations, and the European Union has enacted a broad data protection regulation with fines based on a percentage of global revenues. Changes in laws or regulations associated with enhanced protection of certain sensitive types of personal information, such as information related to health, could greatly increase the cost of

compliance and the cost of providing the Company's products or services. Any failure, or perceived failure, by the Company to comply with laws and regulations on privacy, data security or consumer protection, or other policies, public perception, standards, self-regulatory requirements or legal obligations, could result in lost or restricted business, proceedings, actions or fines brought against the Company or levied by governmental entities or others, or could otherwise adversely affect the business and harm the Company's reputation.

Some of the Company's operations are subject to domestic and international laws and regulations with respect to the manufacturing, handling, use or sale of toxic or hazardous substances. This requires the Company to devote substantial resources to maintain compliance with those applicable laws and regulations. If the Company fails to comply with such requirements in the manufacturing or distribution of its products, it could face civil and/or criminal penalties and potentially be prohibited from distributing or selling such products until they are compliant.

Some of the Company's products are also subject to the rules of certain industrial standards bodies, such as the International Standards Organization. The Company must comply with these rules, as well as those of other agencies, such as the United States Occupational Safety and Health Administration. Failure to comply with such rules could result in the loss of certification and/or the imposition of fines and penalties, which could have a material adverse effect on the Company's operations.

As a publicly-traded company, the Company is subject to the rules of the SEC and the New York Stock Exchange. In addition, the Company must comply with the Sarbanes-Oxley regulations, which require the Company to establish and maintain adequate internal control over financial reporting. The Company's efforts to comply with such laws and regulations are time consuming and costly. While we continue to enhance our controls, we cannot be certain that we will be able to prevent future significant deficiencies or material weaknesses. Failure to comply with such regulations or having inadequate internal controls could have a material adverse effect on the Company's financial condition and operations, which could cause investors to lose confidence in our reported financial information and could have a negative effect on the trading price of our stock and our access to capital.

The Company is subject to the rules of the SEC under the Dodd-Frank Wall Street Reform and Consumer Protection Act, requiring disclosure as to whether certain materials (tantalum, tin, gold and tungsten), known as conflict minerals, which may be contained in the Company's products, are mined from the Democratic Republic of the Congo and adjoining countries. In 2018, the Company was not able to determine with certainty the country of origin of some of the conflict minerals in its manufactured products. However, the Company does not have knowledge that any of its conflict minerals originated from the Democratic Republic of the Congo or adjoining countries. The Company is in the process of evaluating its 2019 supply chain, and the Company plans to file its 2019 Form SD with the SEC in May 2020. The results of this and future evaluations may impose additional costs and may introduce new risks related to the Company's ability to verify the origin of any conflict minerals contained in its products.

The Company's financial condition and results of operations could be adversely affected by changes to the Company's retirement plans or retirement plan assets.

The Company sponsors various retirement plans, both inside and outside the U.S. Any changes in regulations made by governments in countries in which the Company sponsors retirement plans could adversely impact the Company's cash flows or results of operations. In connection with these retirement plans, the Company is exposed to market risks associated with changes in the various capital markets. For example, changes in long-term interest rates affect the discount rate that is used to measure the Company's retirement plan obligations and related expense. In addition, changes in the market value of investments held by the retirement plans could materially impact the funded status of the retirement plans, and affect the related pension expense and level and timing of contributions required under applicable laws.

Estimates and assumptions made in accounting for the Company's results from operations are dependent on future results, which involve significant judgments and may be imprecise and may differ materially from actual results.

The preparation of consolidated financial statements in conformity with generally accepted accounting principles requires the Company to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent liabilities at the dates of the financial statements. These estimates and assumptions must be made due to certain information used in preparation of our financial statements which is dependent on future events, cannot be calculated with a high degree of precision from data available or is not capable of being readily calculated based on generally accepted methodologies. The Company believes that the accounting related to revenue recognition, bad debts, inventory valuation, goodwill and intangible assets, income taxes, warranty and installation provisions, litigation, retirement plan obligations, stock-based compensation, business combinations and asset acquisitions, uncertain tax positions and contingencies involves significant judgments and estimates. Actual results for all estimates could differ materially from the estimates and assumptions used, which could have a material adverse effect on our financial condition and results of operations.

Item 1B: *Unresolved Staff Comments*

None.

Item 2: *Properties*

Waters Corporation operates 23 United States facilities and 67 international facilities, including field offices. The Company believes its facilities are suitable and adequate for its current production level and for reasonable growth over the next several years. The Company's primary facilities are summarized in the table below.

Primary Facility Locations

Location	Function (1)	Owned/Leased
Golden, CO	M, R, S, D, A	Leased
New Castle, DE	M, R, S, D, A	Owned
Franklin, MA	D	Leased
Milford, MA	M, R, S, A	Owned
Taunton, MA	M, R	Owned
Cambridge, MA	R, S	Leased
Wakefield, MA	M, R, S, D, A	Leased
Eden Prairie, MN	M, R, S, D, A	Leased
Nixa, MO	M, S, D, A	Leased
Sharpsburg, PA	M, R, S, D, A	Leased
Lindon, UT	M, R, S, D, A	Leased
Newcastle, England	R, S, D, A	Leased
Solihull, England	M,A	Owned
Wilmslow, England	M, R, S, D, A	Owned
St. Quentin, France	S, A	Leased
Bochum, Germany	R, S, A	Leased
Huellhorst, Germany	M, R, S, D, A	Owned
Budapest, Hungary	R	Leased
Wexford, Ireland	M, R, D, A	Owned
Etten-Leur, Netherlands	S, D, A	Owned
Brasov, Romania	R, A	Leased
Singapore	R, S, D, A	Leased

(1) M = Manufacturing; R = Research; S = Sales and Service; D = Distribution; A = Administration

The Company operates and maintains 11 field offices in the United States and 56 field offices abroad in addition to sales offices in the primary facilities listed above. The Company's field office locations are listed below.

Field Office Locations (2)

United States	International		
Costa Mesa, CA	Australia	India	Portugal
Pleasanton, CA	Austria	Ireland	Poland
Wood Dale, IL	Belgium	Israel	Puerto Rico
Carmel, IN	Brazil	Italy	Spain
Columbia, MD	Canada	Japan	Sweden
Beverly, MA	Czech Republic	Korea	Switzerland
Durham, NC	Denmark	Malaysia	Taiwan
Morrisville, NC	Finland	Mexico	United Kingdom
Parsippany, NJ	France	Netherlands	
Plymouth Meeting, PA	Germany	Norway	
Bellaire, TX	Hungary	People's Republic of China	

(2) The Company operates more than one field office within certain states and foreign countries.

Item 3: ***Legal Proceedings***

From time to time, the Company and its subsidiaries are involved in various litigation matters arising in the ordinary course of business. The Company believes it has meritorious arguments in its current litigation matters and believes any outcome, either individually or in the aggregate, will not be material to the Company's financial position or results of operations.

Item 4: ***Mine Safety Disclosures***

Not applicable.

INFORMATION ABOUT OUR EXECUTIVE OFFICERS

Officers of the Company are elected annually by the Board of Directors and hold office at the discretion of the Board of Directors. The following persons serve as executive officers of the Company:

Christopher J. O'Connell, 53, has served as a Director of the Company since September 2015, when he assumed the position of President and Chief Executive Officer of the Company. In December 2017, Mr. O'Connell was appointed as the Chairman of the Board of Directors of the Company. Mr. O'Connell served as Executive Vice President and President of Restorative Therapies Group of Medtronic plc from August 2009 to August 2015. From 1994 to August 2009, Mr. O'Connell served in the following positions at Medtronic plc: Senior Vice President and President of Medtronic Diabetes, President of Medtronic Physio-Control, Vice President of Sales and Marketing for the Cardiac Rhythm Management business, Vice President/General Manager of the Patient Management Business, Vice President of Corporate Strategy, Director of Investor Relations and Corporate Development Associate.

Keeley Aleman, 43, was appointed Senior Vice President, General Counsel and Secretary in October of 2019. Ms. Aleman joined Waters Corporation in 2006 as the Assistant General Counsel and held various legal roles focusing on business transactions, commercial strategies, international development, compliance, corporate governance and organizational matters. Prior to joining Waters Corporation she held corporate associate positions at Goodwin Procter, LLP, and Testa, Hurwitz & Thibeault, LLP.

Sherry L. Buck, 56, was appointed Senior Vice President and Chief Financial Officer in January 2017. Previously, Ms. Buck served as the Vice President, Chief Financial Officer of Libbey Inc. since August 2012. From 1993 to 2012, Ms. Buck held several positions at Whirlpool Corporation, including Vice President, Finance/Chief Financial Officer, Global Product and Enterprise Cost Leadership; Vice President, Finance—US; Vice President, Cost Leadership; Vice President, Finance—International; and Vice President, Business Performance Management.

Robert G. Carson, 46, was appointed Senior Vice President, Corporate Development in February 2018. Prior to joining Waters Corporation, he held several positions during his 16 years at Medtronic plc, including Vice President and General Manager, Pacemaker Business from January 2017 to January 2018. In addition, Mr. Carson spent nearly 12 years in Medtronic's spinal implants and biologics business, serving as Vice President and General Manager from July 2016 to January 2017, Vice President of Global Marketing & Strategy from April 2015 to July 2016 and Vice President & Therapy Segment Leader from October 2012 to April 2015. Mr. Carson began his career with Banc of America Securities.

Dr. Michael C. Harrington, 59, was appointed Senior Vice President, Global Markets in February 2016. Dr. Harrington joined Waters Corporation in 1987 and has held several senior positions with Waters Corporation, including Vice President, Europe and Asia Pacific Operations, Senior Director of US Sales Operations, Director of US Chemistry Sales and General Manager of Phase Separations. Prior to joining Waters Corporation, Dr. Harrington held senior sales positions at Celsis, Inc.

Jonathan M. Pratt, 50, was appointed Senior Vice President and President, TA Instruments in August 2019. Prior to joining Waters Corporation, Mr. Pratt was President of Beckman Coulter Life Sciences. Additionally, he held senior positions at Pall Corporation, where he was President of its Food & Beverage, Laboratory and ForteBio businesses.

Francis Kim, 53, was appointed Senior Vice President, Global Operations in February 2018. Mr. Kim previously served as Vice President of Global Quality Assurance since November 2016. Prior to joining Waters Corporation, he held several positions during his 20 years at Medtronic plc, including Vice President of Quality, Restorative Therapies Group from May 2015 to November 2016 and Vice President of Quality, Regulatory and Clinical Affairs, Surgical Technologies Division from January 2011 to May 2015. On February 17, 2020, Mr. Kim notified the Company that he will be resigning his position on March 16, 2020.

Ian S. King, 63, was appointed Senior Vice President, Global Products in July 2017. Mr. King joined Waters in 1982 and previously served as Senior Vice President, Instrument Technology; Vice President, Separations Technologies; and Vice President and General Manager of Consumable Division, as well as a variety of scientific and management positions in Waters Corporation's international subsidiaries. Prior to joining Waters Corporation, Mr. King worked at Edinburgh University as a research scientist.

Elizabeth B. Rae, 62, was appointed Senior Vice President, Global Human Resources in February 2016 and was Vice President of Human Resources since October 2005 and Vice President of Worldwide Compensation and Benefits since January 2002. Ms. Rae joined Waters Corporation in January 1996 as Director of Worldwide Compensation. Prior to joining Waters Corporation, she held senior human resources positions in retail, healthcare and financial services companies.

PART II

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

The Company's common stock is registered under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and is listed on the New York Stock Exchange under the symbol "WAT". As of February 21, 2020, the Company had 80 common stockholders of record. The Company has not declared or paid any dividends on its common stock in its past three fiscal years and does not intend to pay cash dividends in the foreseeable future. Any future determination to pay cash dividends will be made at the discretion of the Board of Directors and will depend on restrictions and other factors the Board of Directors may deem relevant. The Company has not made any sales of unregistered equity securities in the years ended December 31, 2019, 2018 or 2017.

Securities Authorized for Issuance under Equity Compensation Plans

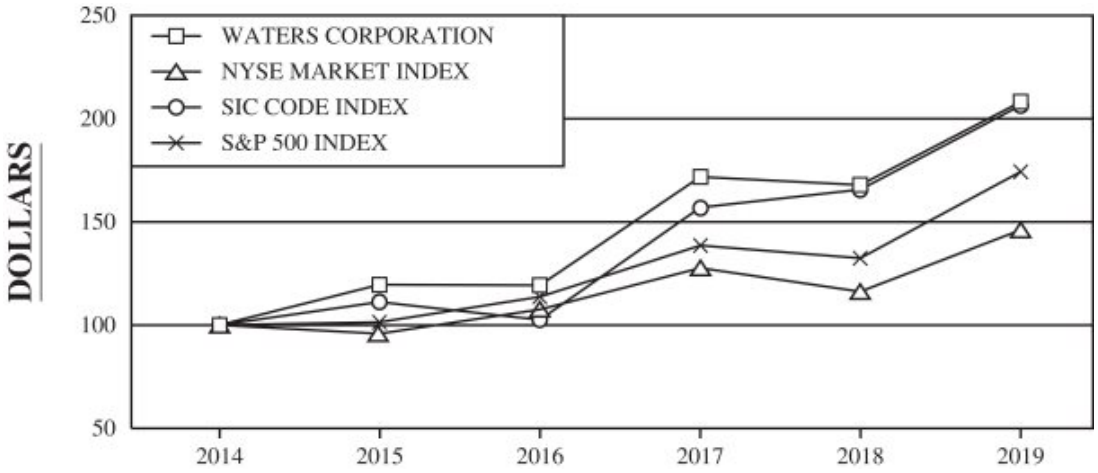
Equity compensation plan information is incorporated by reference from Part III, Item 12, Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters, of this document and should be considered an integral part of this Item 5.

Stock Price Performance Graph

The following performance graph and related information shall not be deemed to be "soliciting material" or to be "filed" with the SEC, nor shall such information be incorporated by reference into any future filing under the Securities Act of 1933, as amended, or the Exchange Act, except to the extent that the Company specifically incorporates it by reference into such filing.

The following graph compares the cumulative total return on $100 invested as of December 31, 2014 (the last day of public trading of the Company's common stock in fiscal year 2014) through December 31, 2019 (the last day of public trading of the common stock in fiscal year 2019) in the Company's common stock, the NYSE Market Index, the SIC Code 3826 Index and the S&P 500 Index. The return of the indices is calculated assuming reinvestment of dividends during the period presented. The Company has not paid any dividends since its IPO. The stock price performance shown on the graph below is not necessarily indicative of future price performance.

COMPARISON OF CUMULATIVE TOTAL RETURN SINCE DECEMBER 31, 2014
AMONG WATERS CORPORATION, NYSE MARKET INDEX, SIC CODE 3826 INDEX – LABORATORY ANALYTICAL INSTRUMENTS AND S&P 500 INDEX



	2014	2015	2016	2017	2018	2019
WATERS CORPORATION	$ 100.00	$ 119.39	$ 119.22	$ 171.39	$ 167.36	$ 207.28
NYSE MARKET INDEX	$ 100.00	$ 95.91	$ 107.36	$ 127.46	$ 116.06	$ 145.66
SIC CODE INDEX	$ 100.00	$ 111.14	$ 102.42	$ 156.71	$ 165.13	$ 205.80
S&P 500 INDEX	$ 100.00	$ 101.38	$ 113.51	$ 138.29	$ 132.23	$ 173.86

Purchases of Equity Securities by the Issuer

The following table provides information about purchases by the Company during the three months ended December 31, 2019 of equity securities registered by the Company under the Exchange Act (in thousands, except per share data):

Period	Total Number of Shares Purchased (1)	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Programs (2)	Maximum Dollar Value of Shares that May Yet Be Purchased Under the Programs (2)
September 29, 2019 to October 26, 2019	646	$ 217.06	646	$ 2,112,901
October 27, 2019 to November 23, 2019	797	$ 214.93	797	$ 1,941,602
November 24, 2019 to December 31, 2019	1,092	$ 228.96	1,092	$ 1,691,643
Total	2,535	$ 221.52	2,535	$ 1,691,643

(1) The Company's repurchase activity related to the vesting of restricted stock units during the three months ended December 31, 2019 was insignificant.

(2) In January 2019, the Company's Board of Directors authorized the Company to repurchase up to $4 billion of its outstanding common stock in open market or private transactions over a two-year period. This new program replaced the remaining amounts available under the pre-existing authorization.

Item 6: Selected Financial Data

The following table sets forth selected historical consolidated financial and operating data for the periods indicated. The statement of operations and balance sheet data is derived from financial statements for the years 2019, 2018, 2017, 2016 and 2015. The Company's financial statements as of December 31, 2019 and 2018, and for each of the three years in the period ended December 31, 2019 are included in Part II, Item 8, Financial Statements and Supplementary Data, of this Form 10-K.

In thousands, except per share and employees data	2019	2018	2017	2016	2015
STATEMENT OF OPERATIONS DATA:					
Net sales	$2,406,596	$2,419,929	$2,309,078	$2,167,423	$2,042,332
Income from operations before income taxes	$ 678,239	$ 682,146	$ 641,097	$ 600,114	$ 541,918
Net income*	$ 592,198	$ 593,794	$ 20,311	$ 521,503	$ 469,275
Net income per basic common share*	$ 8.76	$ 7.71	$ 0.25	$ 6.46	$ 5.70
Weighted-average number of basic common shares	67,627	76,992	79,793	80,786	82,336
Net income per diluted common share*	$ 8.69	$ 7.65	$ 0.25	$ 6.41	$ 5.65
Weighted-average number of diluted common shares and equivalents	68,166	77,618	80,604	81,417	83,087
BALANCE SHEET AND OTHER DATA:					
Cash, cash equivalents and investments	$ 337,144	$1,735,224	$3,393,701	$2,813,032	$2,399,263
Working capital, including current maturities of debt**	$ 721,157	$2,214,232	$3,663,977	$3,115,124	$2,649,457
Total assets**	$2,557,055	$3,727,426	$5,324,354	$4,662,059	$4,268,677
Long-term debt	$1,580,797	$1,148,172	$1,897,501	$1,701,966	$1,493,027
Stockholders' (deficit) equity***	$ (216,281)	$1,567,258	$2,233,788	$2,301,949	$2,058,851
Employees	7,467	7,246	7,020	6,899	6,594

* The provision for income taxes for 2017 includes a $550 million estimate for the impact of the enactment of the 2017 Tax Act, which was signed into law on December 22, 2017. The $550 million income tax provision reduced net income per share by $6.82. The $550 million income tax provision primarily consists of an estimated transition tax, as well as estimated income tax provisions for state and withholding taxes and a provision associated with the remeasurement of the Company's deferred tax assets and liabilities from 35% to the new U.S. corporate income tax rate of 21%.

The Company adopted new accounting guidance related to stock-based compensation in 2017. The new accounting guidance requires the excess tax benefits or deficiencies related to stock-based compensation to be reflected in the consolidated statements of operations as a component of the provision for income taxes, whereas they were previously recognized in equity. This aspect of the new accounting guidance was required to be adopted on a prospective basis for the statement of operations and retroactive restatement was not permitted. In 2019, 2018 and 2017, the Company recognized an excess tax benefit, which decreased income tax expense by $9 million, $9 million and $20 million, respectively, and added $0.14, $0.11 and $0.24, respectively, to net income per diluted share.

In addition, in December 2018, the Company settled a pension plan obligation by making lump-sum cash payments and purchasing annuity contracts for participants to permanently extinguish the pension plan's obligations. As a result, the Company recorded a $46 million charge, which consisted of a $6 million cash contribution to the plan and a $40 million non-cash charge related to the reversal of unrecognized actuarial losses recorded in accumulated other comprehensive income in the stockholders' equity. The $46 million pre-tax charge reduced net income per diluted share by $0.39.

** In January 2019, the company adopted new accounting guidance related to the accounting for leases. The new guidance requires lessees to present the assets and liabilities that arise from leases on their balance sheets. The standard required using a modified retrospective transition approach to be applied to leases existing as of, or entered into after, January 1, 2019. As a result, the Company recorded a $93 million right-of-use asset as of December 31, 2019. The adoption of this standard did not have a material impact on the Company's results of operations, cash flows and stockholder's (deficit) equity.

*** In 2018, the Company adopted new accounting guidance which eliminates the deferral of tax effects on intra-entity transfers other than inventory and requires an entity to recognize the income tax consequences when the transfer occurs. The Company adopted this standard as of January 1, 2018 with a $4 million charge to beginning retained earnings in the consolidated balance sheet.

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

Business and Financial Overview

The Company has two operating segments: Waters ™ and TA ™ . Waters products and services primarily consist of high performance liquid chromatography ("HPLC"), ultra performance liquid chromatography ("UPLC ™ " and together with HPLC, referred to as "LC"), mass spectrometry ("MS") and precision chemistry consumable products and related services. TA products and services primarily consist of thermal analysis, rheometry and calorimetry instrument systems and service sales. The Company's products are used by pharmaceutical, biochemical, industrial, nutritional safety, environmental, academic and governmental customers. These customers use the Company's products to detect, identify, monitor and measure the chemical, physical and biological composition of materials and to predict the suitability and stability of fine chemicals, pharmaceuticals, water, polymers, metals and viscous liquids in various industrial, consumer goods and healthcare products.

The Company's operating results are as follows for the years ended December 31, 2019, 2018 and 2017 (dollars in thousands, except per share data):

	Year Ended December 31,			% change	
	2019	2018	2017	*2019 vs. 2018*	*2018 vs. 2017*
Revenues:					
Product sales	$1,567,189	$1,604,993	$1,552,349	*(2%)*	*3%*
Service sales	839,407	814,936	756,729	*3%*	*8%*
Total net sales	2,406,596	2,419,929	2,309,078	*(1%)*	*5%*
Costs and operating expenses:					
Cost of sales	1,010,700	992,564	947,067	*2%*	*5%*
Selling and administrative expenses	534,791	536,902	544,363	—	*(1%)*
Research and development expenses	142,955	143,403	132,593	—	*8%*
Purchased intangibles amortization	9,693	7,712	6,743	*26%*	*14%*
Litigation (settlement) provision	—	(426)	11,114	*100%*	*(104%)*
Acquired in-process research and development	—	—	5,000	—	*(100%)*
Operating income	708,457	739,774	662,198	*(4%)*	*12%*
Operating income as a % of sales	*29.4%*	*30.6%*	*28.7%*		
Other expense	(3,586)	(47,794)	(340)	**	**
Interest expense, net	(26,632)	(9,834)	(20,761)	*171%*	*(53%)*
Income before income taxes	678,239	682,146	641,097	*(1%)*	*6%*
Provision for income taxes	86,041	88,352	620,786	*(3%)*	*(86%)*
Net income	$ 592,198	$ 593,794	$ 20,311	—	**
Net income per diluted common share	$ 8.69	$ 7.65	$ 0.25	*14%*	**

** Percentage not meaningful

The Company's net sales decreased approximately 1% in 2019 as compared to 2018, and increased 5% in 2018 as compared to 2017. Foreign currency translation decreased sales by 2% in 2019 and increased sales by 1% in 2018. Unless otherwise noted, sales growth or decline percentages are presented as compared with the same period in the prior year.

Instrument system sales decreased 4% and increased 2% in 2019 and 2018, respectively. In 2019, the decrease in instrument system sales was primarily driven by weaker demand for our products by our customers due to uncertainty caused by macroeconomic conditions and governmental policy changes. In 2018, the increase in instrument system sales was primarily driven by an increase in demand for LC and TA's instrument systems. Foreign currency translation decreased instrument system sales by 1% in 2019 and increased instrument system sales by 1% in 2018. Recurring revenues (combined sales of precision chemistry consumables and services) increased 3% and 8% in 2019 and 2018, respectively, as a result of a larger installed base of customers and higher billing demand for service sales. Recurring revenues were impacted by foreign currency, which decreased sales by 2% in 2019 and increased sales by 2% in 2018.

Geographically, the decline in the Company's sales in 2019 was a result of increased sales in the U.S., Canada, Japan and the rest of Asia being offset by a decrease in sales in other geographies on weaker demand for our products due to uncertainty caused by macroeconomic conditions, primarily from Brexit as well as Latin America, and governmental policy changes in China. In addition, the effect of foreign currency translation negatively impacted sales by 2% overall. The Company's sales growth in 2018 was primarily driven by the 7% sales growth in Asia, with China's sales growing 15%.

Sales in Europe decreased 4% in 2019 and increased 4% in 2018. In 2019, Europe sales were impacted by weak demand in Western Europe caused by the political uncertainties of Brexit and the effect of foreign currency translation, which reduced sales by 4% in 2019 and increased sales by 3% in 2018.

Sales in the Americas decreased 1% in 2019 and increased 3% in 2018. The Americas sales in 2019 were negatively impacted by macroeconomic conditions in Latin America, and the 2018 Americas sales growth can be attributed to the increase in sales after the lower customer demand stemming from the 2017 natural disasters in the U.S., Mexico and Puerto Rico.

Sales to pharmaceutical customers were flat in 2019 and grew 5% in 2018. Sales to pharmaceutical customers in 2019 were negatively impacted by the lower customer demand in China for our instrument systems as a result of changes in governmental policy and lower sales in Latin America. Despite the sales declines in China and Latin America, the need for global access to prescription drugs and the testing of newer and complex biologic drugs increased in the rest of the world.

Combined sales to industrial customers, which include material characterization, food, environmental and fine chemical markets, declined 2% in 2019 and grew 2% in 2018. The 2019 industrial customer sales were negatively impacted by a 6% decline in TA instrument system sales and a 1% decline from the effect of foreign currency translation.

Combined sales to academic and governmental customers increased 2% in 2019 and 8% in 2018, with the effect of foreign currency translation decreasing sales by 1% in 2019 and increasing sales by 1% in 2018. Sales to academic and governmental customers are highly dependent on when institutions receive funding to purchase our instrument systems and, as such, sales growth rates can vary significantly from period to period.

Operating income was $708 million in 2019, a decrease of 4% as compared to 2018. This decrease can be attributed to lower sales volume, the effect of foreign currency translation and $10 million of severance-related costs in connection with a reduction in workforce that occurred in early 2019, offset by lower variable incentive compensation costs.

Operating income increased 12% in 2018 as compared to 2017. This increase was primarily a result of the effect of higher sales volume achieved in 2018, as well as the effect of approximately $33 million of facility closure, litigation and intellectual property payment charges from 2017 that did not recur in 2018.

The Company's effective tax rates were 12.7%, 13.0% and 96.8% for 2019, 2018 and 2017, respectively. Net income per diluted share was $8.69, $7.65 and $0.25 in 2019, 2018 and 2017, respectively. In 2018, the Company settled a pension plan obligation and incurred a $46 million expense which reduced the net income per diluted share by $0.39. In 2017, The Company incurred a $550 million income tax provision related to the 2017 Tax Cuts and Jobs Act ("2017 Tax Act") which reduced the net income per diluted share by $6.82, and excluding the 2017 Tax Act income tax provision, the Company's effective tax rate in 2017 would have been 11.0%.

The Company generated $643 million, $604 million and $698 million of net cash flows from operations in 2019, 2018 and 2017, respectively. The increase in operating cash flow in 2019 was primarily a result of payments made in 2018 that did not recur, including $103 million of income tax payments made in the U.S. relating to the Company's estimated 2017 transition tax liability and 2018 estimated tax payments, a $15 million litigation settlement payment and $11 million of contributions to certain defined benefit pension plans. Included in the 2019 net cash flow from operations is $29 million of income tax payments made in the U.S. in relation to the 2017 transition tax liability. Over the next three years, the Company is required to make annual U.S. federal tax payments of approximately $38 million to tax authorities in connection with the Company's estimated remaining transition tax liabilities of $404 million under the 2017 Tax Act. The final 60% of the total liability is required to be paid over a three-year period beginning in 2023.

Cash flows used in investing activities included capital expenditures related to property, plant, equipment and software capitalization of $164 million, $96 million and $85 million in 2019, 2018 and 2017, respectively. In 2019, $68 million of capital expenditures paid related to the expansion of the Company's precision chemistry consumable operations in the U.S. The Company has incurred $85 million of costs for this facility through the end of 2019. In 2018, the Company acquired the sole intellectual property rights to the Desorption Electrospray Ionization ("DESI") imaging technology for $30 million in cash and a future contractual obligation to pay a minimum royalty of $3 million over the remaining life of the patent. DESI is a mass spectrometry imaging technique that is used to develop medical therapies.

In January 2019, the Company's Board of Directors authorized the Company to repurchase up to $4 billion of its outstanding common stock over a two-year period. During 2019, 2018 and 2017, the Company repurchased 11.1 million, 6.8 million and 1.8 million shares of the Company's outstanding common stock at a cost of $2.5 billion, $1.3 billion and $323 million, respectively, under the January 2019 authorization and other previously announced programs. As of December 31, 2019, the Company has a total of $1.7 billion authorized for future repurchases. The Company believes that it has the financial flexibility to fund these share repurchases given current cash and investment levels and debt borrowing capacity, as well as to invest in research, technology and business acquisitions to further grow the Company's sales and profits.

In September 2019, the Company issued fixed interest rate senior unsecured notes with an aggregate principal amount of $500 million, of which $200 million of the outstanding notes matures in seven years and the remaining $300 million matures in 10 years. The Company used the proceeds from the issuance of these senior unsecured notes to repay other outstanding debt and for general corporate purposes.

During 2019 and 2018, the Company entered into $260 million and $300 million, respectively, of U.S.-to-Euro interest rate cross-currency swap agreements that hedge the Company's net investment in its Euro denominated net assets, bringing the total currency interest rate cross-currency swap agreement notional value to $560 million at December 31, 2019. As a result of entering into these agreements, the Company lowered its net interest expense by $12 million and $3 million during 2019 and 2018, respectively. The Company anticipates that these swap agreements will lower net interest expense by approximately $15 million in 2020, $11 million in 2021 and $1 million in 2022 as the three-year term of the agreements expire.

In January 2020, the Company made organizational changes to better align its resources with its growth and innovation strategies, resulting in a worldwide workforce reduction, impacting 3% of the Company's employees. The Company expects to incur approximately $25 million of severance costs, lease termination costs and other related costs during 2020.

In January 2020, the Company entered into a definitive agreement to acquire Andrew Alliance, an innovator in specialty laboratory automation technology, including software and robotics for approximately $80 million. This acquisition is not expected to have a material effect on the Company sales and expenses in 2020.

Results of Operations

Sales by Geography

Geographic sales information is presented below for the years ended December 31, 2019, 2018 and 2017 (dollars in thousands):

	Year Ended December 31,			% change	
	2019	2018	2017	2019 vs. 2018	2018 vs. 2017
Net Sales:					
Asia:					
China	$ 439,557	$ 443,321	$ 387,059	*(1%)*	*15%*
Japan	180,707	173,357	167,258	*4%*	*4%*
Asia Other	318,848	305,613	308,300	*4%*	*(1%)*
Total Asia	939,112	922,291	862,617	*2%*	*7%*
Americas:					
United States	692,277	683,596	669,274	*1%*	*2%*
Americas Other	137,964	151,581	140,715	*(9%)*	*8%*
Total Americas	830,241	835,177	809,989	*(1%)*	*3%*
Europe	637,243	662,461	636,472	*(4%)*	*4%*
Total net sales	$2,406,596	$2,419,929	$2,309,078	*(1%)*	*5%*

In 2019, sales in China were negatively impacted by economic uncertainty caused by certain regulatory changes in our food and pharmaceutical markets. The 4% increase in sales in Japan was driven by instrument systems, primarily to pharmaceutical and academic and governmental customers, as well as foreign currency translation, which increased Japan's sales by 2% in 2019. Sales growth in Asia Other was due primarily to pharmaceutical and academic and governmental customer classes in 2019. Sales in the U.S. increased by 1% despite large pharmaceutical customers slowing capital spending on our instrument systems. Sales declines in the rest of the Americas and Europe were broad-based across all product and customer classes due to macroeconomic conditions and political instability, except in Europe where sales to academic and governmental customers grew 8%. Sales in Europe were also negatively impacted by the effect of foreign currency translation, which decreased sales 4% in 2019.

In 2018, sales in China increased across all product lines and were driven by double-digit increases in sales to pharmaceutical, academic and governmental customers. The effect of foreign currency translation increased sales in Japan by 2% in 2018 and sales growth was also driven by increased sales to pharmaceutical and industrial customers. The sales decline in Asia Other in 2018 was a result of lower customer demand in India and weaker sales to environmental customers in the first quarter of 2018. In 2018, sales growth in Europe was driven by TA's products and services and recurring revenues to pharmaceutical and industrial customers. In addition, the effect of foreign currency translation increased sales in Europe by 3% in 2018. Sales growth in the U.S. in 2018 was driven by recurring revenues and TA instruments. Sales in the rest of the Americas had double-digit sales growth for instrument systems and double-digit sales growth for pharmaceutical customers, which was offset by a decline in sales to industrial customers.

Net sales by customer class are presented below for the years ended December 31, 2019, 2018 and 2017 (dollars in thousands):

	Year Ended December 31,			% change	
	2019	2018	2017	2019 vs. 2018	2018 vs. 2017
Pharmaceutical	$1,365,275	$1,365,731	$1,294,668	—	5%
Industrial	719,377	737,144	721,088	(2%)	2%
Academic and governmental	321,944	317,054	293,322	2%	8%
Total net sales	$2,406,596	$2,419,929	$2,309,078	(1%)	5%

In 2019, sales to pharmaceutical customers were negatively impacted by the effect of foreign currency translation, which decreased sales to pharmaceutical customers by 2%, as well as a slower release of capital budgets by our customers due to uncertain macroeconomic conditions due to Brexit and regulatory changes in our food and pharmaceutical markets in China. Offsetting those declines was an increase in the need for global access to prescription drugs and the testing of newer and complex biologic drugs. The decline in sales to industrial customers in 2019 was due to weaker demand for our LC-MS instruments and also a 4% decline in TA sales. The increase in sales to academic and governmental customers was primarily due to higher instrument system sales.

In 2018, sales to pharmaceutical customers were driven by recurring revenues, with double-digit growth in China, Canada and Latin America. Sales growth for the industrial market in 2018 was driven by TA products and services, and mid-single-digit sales growth in Europe, Japan and India. The increase in sales to academic and governmental customers in 2018 was broad-based across all product classes and geographies, with double-digit growth in China, India and Canada.

Waters Products and Services Net Sales

Net sales for Waters products and services are as follows for the years ended December 31, 2019, 2018 and 2017 (dollars in thousands):

	Year Ended December 31,						% change	
	2019	% of Total	2018	% of Total	2017	% of Total	2019 vs. 2018	2018 vs. 2017
Waters instrument systems	$ 963,871	45%	$1,000,625	47%	$ 988,750	48%	(4%)	1%
Chemistry consumables	412,018	19%	400,287	18%	372,157	18%	3%	8%
Total Waters product sales	1,375,889	64%	1,400,912	65%	1,360,907	66%	(2%)	3%
Waters service	761,594	36%	738,433	35%	686,656	34%	3%	8%
Total Waters net sales	$2,137,483	100%	$2,139,345	100%	$2,047,563	100%	—	4%

Precision chemistry consumables sales increased in both 2019 and 2018, driven by sales in the U.S. and China, primarily to pharmaceutical customers, on the uptake in columns and application-specific testing kits. Waters service sales in both 2019 and 2018 benefited from increased sales of service plans and higher service demand billings to a higher installed base of customers. Waters instrument system sales (LC and MS technology-based) decreased in 2019 in most major geographical regions, primarily due to lower sales to pharmaceutical and industrial customers due to uncertainty caused by macroeconomic conditions relating to Brexit and other regulatory changes in certain regions. The effect of foreign currency translation decreased Waters sales by 2% in 2019 and had a minimal impact on Waters sales in 2018.

In 2019, Waters sales increased 2% in Asia, were flat in the Americas and decreased 3% in Europe, where the effect of foreign currency decreased sales by 4%. Within Asia, Waters sales decreased 1% in China and increased 4% in Japan and 9% in the rest of Asia, excluding India.

In 2018, Waters sales increased 7% in Asia, 4% in Europe and 2% in the Americas. Waters sales increased 15% in China in 2018 and were broad-based across all product classes, with double-digit increases in sales to pharmaceutical, academic and governmental customers. Waters sales in Japan in 2018 increased 5%, with the effect of foreign currency translation increasing sales 2%. Sales in Asia Other declined 2% in 2018, primarily due to lower customer demand in India and a negative 2% impact of foreign currency translation. In the Americas, U.S. sales increased 1% in 2018.

TA Product and Services Net Sales

Net sales for TA products and services are as follows for the years ended December 31, 2019 and December 31, 2018 (dollars in thousands):

	Year Ended December 31,						% change	
	2019	% of Total	2018	% of Total	2017	% of Total	2019 vs. 2018	2018 vs. 2017
TA instrument systems	$191,300	71%	$204,081	73%	$191,442	73%	(6%)	7%
TA service	77,813	29%	76,503	27%	70,073	27%	2%	9%
Total TA net sales	$269,113	100%	$280,584	100%	$261,515	100%	(4%)	7%

TA's instrument system sales declined in 2019 primarily due to lower customer demand resulting from macroeconomic conditions, tariff posturing and political instability, while 2018 instrument system sales growth was broad-based across all product classes. TA service sales increased due to sales of service plans and billings to a higher installed base of customers. The effect of foreign currency translation had a minimal impact on TA's sales in both 2019 and 2018.

In 2019, TA sales decreased 4% in the Americas, 12% in Europe and increased 1% in Asia. TA sales in the U.S. increased 9% in 2018, while sales in the rest of the Americas increased 8%. TA's sales in Asia were driven by double-digit sales growth in India and 8% sales growth in China, which was offset by declines in Japan.

Cost of Sales

Cost of sales for 2019 increased 2% as compared to 2018, due to a change in sales mix. The effect of foreign currency translation decreased cost of sales by 1% in 2019 primarily from the favorable foreign currency translation effect the British Pound had on the Company's U.K. manufacturing operations.

Cost of sales is affected by many factors, including, but not limited to, foreign currency translation, product mix, product costs of instrument systems and amortization of software platforms. At current foreign currency exchange rates, the Company expects that the impact of foreign currency translation may decrease sales and gross profit during 2020.

Selling and Administrative Expenses

Selling and administrative expenses were flat in 2019 and decreased 1% in 2018. In 2019, selling and administrative expenses were impacted by merit compensation costs that were offset by lower variable incentive compensation costs. In addition, 2019 was also impacted by the $10 million of severance-related costs in connection with a reduction in workforce that occurred in January of 2019. The effect of foreign currency translation decreased selling and administrative expenses by 1% in 2019 and had a minimal impact in 2018.

As a percentage of net sales, selling and administrative expenses were 22.2%, 22.2% and 23.6% for 2019, 2018 and 2017, respectively.

Research and Development Expenses
Research and development expenses were flat in 2019 and increased 8% in 2018. Research and development expenses in both 2019 and 2018 were impacted by additional headcount, merit compensation and costs associated with new products and the development of new technology initiatives. Foreign currency translation decreased research and development costs by 2% in 2019 and had a minimal impact on research and development costs in 2018.

Acquired In-Process Research and Development
During 2017, the Company incurred charges of $5 million for acquired in-process research and development related to milestone payments associated with a licensing arrangement for certain intellectual property relating to mass spectrometry technologies yet to be commercialized and for which there was no future alternative use as of the acquisition date. These licensing arrangements are significantly related to new, biologically-focused applications, as well as other applications, and require the Company to make additional future payments of up to $7 million if certain milestones are achieved, as well as royalties on future net sales. These future payments may be significant and occur over multiple years.

Interest Expense, Net
The increase in net interest expense in 2019 was primarily attributable to higher outstanding debt balances and lower interest income on lower cash, cash equivalents and investment balances, being somewhat offset by the additional interest income from the U.S.-to-Euro interest rate cross-currency swap agreements.

Provision for Income Taxes
The Company's effective tax rates were 12.7%, 13.0% and 96.8% in 2019, 2018 and 2017, respectively.

The Company's effective income tax rate differs from the U.S. federal statutory rate each year due to differences in the proportionate amounts of pre-tax income recognized in jurisdictions with different effective tax rates and the items discussed below.

The four principal jurisdictions in which the Company manufactures are the U.S., Ireland, the U.K. and Singapore, where the statutory tax rates were 21%, 12.5%, 19% and 17%, respectively, as of December 31, 2019. The Company has a received a tax holiday on qualifying activities in Singapore through March 2021, based upon the achievement of certain contractual milestones, which the Company expects to continue to meet. The effect of applying the 0% contractual tax rate rather than the statutory tax rate to income from qualifying activities in Singapore increased the Company's net income during the years ended December 31, 2019, 2018 and 2017 by $24 million, $28 million and $25 million, respectively, and increased the Company's net income per diluted share by $0.35, $0.36 and $0.31, respectively.

During 2019, the Company's effective tax rate differed from the 21% U.S. statutory tax rate primarily due to the jurisdictional mix of earnings, an $11 million provision related to the Global Intangible Low-Taxed Income ("GILTI") tax and a tax benefit of $9 million on stock-based compensation.

The 2018 effective tax rate differed from the U.S. federal statutory tax rate primarily due to the jurisdictional mix of earnings, a $14 million provision related to the GILTI tax, an $8 million provision for a change in foreign currency exchange rates related to the transition tax, a $9 million benefit related to stock-based compensation and a $6 million net benefit related to the finalization of the impact of the Tax Cuts and Jobs Act (the "2017 Act").

The 2017 effective tax rate of 96.8% differs from the 35% U.S. statutory tax rate primarily due to the 2017 Act and the jurisdictional mix of earnings. As a result of the 2017 Act, for the year ended December 31, 2017, the Company accrued a $550 million tax provision, which consisted of $490 million related to the federal transition tax, $40 million for state income taxes and foreign withholding taxes and $20 million for the revaluation of the

Company's deferred tax assets and liabilities at the new federal tax rate of 21%. This provision reduced net income per diluted share by $6.82 in 2017, and the Company's effective tax rate was 11.0% excluding this $550 million provision. During 2017, the Company also had a benefit of $20 million related to stock-based compensation. The remaining differences between effective tax rates can primarily be attributed to differences in the proportionate amounts of pre-tax income recognized in jurisdictions with different effective tax rates.

Prior to the enactment of the 2017 Act, the Company had indefinite reinvestment assertion on a significant portion of its undistributed earnings from foreign subsidiaries. At the end of 2018, and as a result of the enactment of the 2017 Act, we reevaluated our historic assertion and no longer considered these earnings to be indefinitely reinvested in our foreign subsidiaries. The Company recorded a tax provision of $3 million and $4 million for 2019 and 2018, respectively, for future withholding taxes and U.S. state taxes on repatriation of 2019 and 2018 undistributed earnings.

The Company's effective tax rate is influenced by many significant factors, including, but not limited to, the wide range of income tax rates in jurisdictions in which the Company operates; sales volumes and profit levels in each tax jurisdiction; changes in tax laws, tax rates and policies; the outcome of various ongoing tax audit examinations; and the impact of foreign currency transactions and translation. As a result of variability in these factors, the Company's effective tax rates in the future may not be similar to the effective tax rates for the current or prior years, or for previously forecasted periods.

Liquidity and Capital Resources

Condensed Consolidated Statements of Cash Flows (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Net income	$ 592,198	$ 593,794	$ 20,311
Depreciation and amortization	105,296	108,408	106,002
Stock-based compensation	38,577	37,541	39,436
Deferred income taxes	9,620	2,405	45,510
In-process research and development and other non-cash charges	—	—	5,000
Change in accounts receivable	(22,195)	(47,921)	(24,013)
Change in inventories	(31,854)	(25,396)	731
Change in accounts payable and other current liabilities	9,784	(81,663)	3,175
Change in deferred revenue and customer advances	12,189	2,721	10,386
Effect of the 2017 Tax Cuts and Jobs Act	(3,229)	(6,059)	530,383
Other changes	(67,299)	20,616	(39,281)
Net cash provided by operating activities	643,087	604,446	697,640
Net cash provided by (used in) investing activities	768,802	1,683,302	(535,752)
Net cash used in financing activities	(1,872,678)	(2,119,522)	(63,869)
Effect of exchange rate changes on cash and cash equivalents	224	(14,265)	38,669
(Decrease) increase in cash and cash equivalents	$ (460,565)	$ 153,961	$ 136,688

Cash Flow from Operating Activities

Net cash provided by operating activities was $643 million, $604 million and $698 million in 2019, 2018 and 2017, respectively. The changes within net cash provided by operating activities include the following significant changes in the sources and uses of net cash provided by operating activities, aside from the changes in net income:

- The changes in accounts receivable were primarily attributable to timing of payments made by customers and timing of sales. Days sales outstanding was 77 days at December 31, 2019, 74 days at December 31, 2018 and 71 days at 2017.

- The changes in inventory were primarily attributable to new product launches and the increase in safety stock in advance of Brexit.
- The changes in accounts payable and other current liabilities were the result of timing of payments to vendors. In addition, the change in 2019 as compared to 2018 includes $29 million and $103 million, respectively, of income tax payments made in the U.S. relating to the Company's estimated 2017 tax reform liability and 2018 estimated income tax payments and a $15 million litigation settlement payment.
- Net cash provided from deferred revenue and customer advances results from annual increases in new service contracts as a higher installed base of customers renew annual service contracts.
- Other changes were attributable to variation in the timing of various provisions, expenditures, prepaid income taxes and accruals in other current assets, other assets, other liabilities, and income tax expenses related to the 2017 Tax Act. In addition, in 2018, the Company made $11 million of contributions to certain defined benefit pension plans.

Cash Provided By (Used in) Investing Activities

Net cash provided by investing activities totaled $769 million and $1,683 million in 2019 and 2018, respectively, while net cash used in investing activities totaled $536 million in 2017. Additions to fixed assets and capitalized software were $164 million, $96 million and $85 million in 2019, 2018 and 2017, respectively. In February 2018, the Company's Board of Directors approved expanding its chemistry synthesis operations in the U.S. The Company anticipates spending an estimated $215 million to build and equip this new state-of-the-art manufacturing facility, which will be paid for with existing cash, investments and debt capacity. Through December 31, 2019, the Company has incurred $85 million of costs for this facility.

During 2018 and 2017, the Company purchased $1.0 billion and $3.0 billion of investments, respectively. During 2019, 2018 and 2017, $1.0 billion, $2.8 billion and $2.5 billion of investments matured, respectively. The majority of the proceeds received in 2019 and 2018 were repatriated into the U.S. at lower income tax rates as a result of the 2017 Tax Act and used to reduce the Company's debt and to repurchase shares.

Asset and business acquisitions, net of cash acquired, were $31 million during 2018. There were no business acquisitions in 2019 or 2017. During 2019 and 2018, the Company made $9 million and $8 million of investments in unaffiliated companies, respectively. During 2017, the Company made a $7 million payment for an investment in a developer of analytical system solutions used to make measurements, predict stability and accelerate product discovery in the routine analytic, process monitoring and quality control release processes for life science and biopharmaceutical markets. Also during 2017, the Company made payments of $5 million to acquire and license intellectual property relating to mass spectrometry technologies yet to be commercialized.

In January 2020, the company entered into a definitive agreement to acquire Andrew Alliance, an innovator in specialty laboratory automation technology, including software and robotics for approximately $80 million in cash. This acquisition is not expected to have a material effect on the Company's sales and expenses in 2020.

Cash Used in Financing Activities

In September 2019, the Company issued fixed interest rate senior unsecured notes with an aggregate principle of $500 million, of which $200 million of the outstanding notes matures in seven years and the remaining $300 million matures in 10 years. The Company used the proceeds from the issuance of these senior unsecured notes to repay other outstanding debt and for general corporate purposes.

In November 2017, the Company entered into a credit agreement (the "2017 Credit Agreement"), which provides for a $1.5 billion revolving facility and a $300 million term loan. The revolving facility and term loan both mature on November 30, 2022 and require no scheduled prepayments before that date.

The interest rates applicable to the 2017 Credit Agreement are, at the Company's option, equal to either the alternate base rate (which is a rate per annum equal to the greatest of (a) the prime rate in effect on such day, (b) the Federal Reserve Bank of New York Rate on such day plus 1/2 of 1% per annum and (c) the adjusted LIBO rate on such day (or if such day is not a business day, the immediately preceding business day) for a deposit in U.S. dollars with a maturity of one month plus 1% per annum) or the applicable 1, 2, 3 or 6 month adjusted LIBO rate or EURIBO rate for Euro-denominated loans, in each case, plus an interest rate margin based upon the Company's leverage ratio, which can range between 0 and 12.5 basis points for alternate base rate loans and between 80 and 112.5 basis points for LIBO rate or EURIBO rate loans. The facility fee on the 2017 Credit Agreement ranges between 7.5 and 25 basis points per annum, based on the leverage ratio, of the amount of the revolving facility commitments and the outstanding term loan. The 2017 Credit Agreement requires that the Company comply with an interest coverage ratio test of not less than 3.50:1 as of the end of any fiscal quarter for any period of four consecutive fiscal quarters and a leverage ratio test of not more than 3.50:1 as of the end of any fiscal quarter. In addition, the 2017 Credit Agreement includes negative covenants, affirmative covenants, representations and warranties and events of default that are customary for investment grade credit facilities.

Interest on the Company's fixed rate senior unsecured notes is payable semi-annually each year. Interest on the floating rate senior unsecured notes is payable quarterly. The Company may prepay all or some of the senior unsecured notes at any time in an amount not less than 10% of the aggregate principal amount outstanding, plus the applicable make-whole amount or prepayment premium for Series H and J senior unsecured notes. In the event of a change in control of the Company (as defined in the note purchase agreement), the Company may be required to prepay the senior unsecured notes at a price equal to 100% of the principal amount thereof, plus accrued and unpaid interest. These senior unsecured notes require that the Company comply with an interest coverage ratio test of not less than 3.50:1 for any period of four consecutive fiscal quarters and a leverage ratio test of not more than 3.50:1 as of the end of any fiscal quarter. In addition, these senior unsecured notes include customary negative covenants, affirmative covenants, representations and warranties and events of default.

The Company's net debt borrowings increased by $535 million in 2019, decreased by $850 million in 2018 and increased by $170 million in 2017. As of December 31, 2019, the Company had a total of $1.7 billion in outstanding debt, which consisted of $1.1 billion in outstanding senior unsecured notes, $300 million borrowed under a term loan and $325 million borrowed under a revolving credit facility, with both the term loan and revolving credit facilities under the 2017 Credit Agreement. As of December 31, 2019, the Company had a total amount available to borrow under the 2017 Credit Agreement of $1,173 million after outstanding letters of credit. As of December 31, 2019, the Company was in compliance with all debt covenants.

As of December 31, 2019, the Company has entered into three-year interest rate cross-currency swap derivative agreements with a notional value of $560 million to hedge the variability in the movement of foreign currency exchange rates on a portion of its Euro-denominated net asset investments. As a result of entering into these agreements, the Company lowered its net interest expense by $12 million and $3 million during 2019 and 2018, respectively. The Company anticipates that these swap agreements will lower net interest expense by approximately $15 million annually in 2020, $11 million in 2021 and $1 million in 2022 as the three-year term of the agreements expire.

In January 2019, the Company's Board of Directors authorized the Company to repurchase up to $4 billion of its outstanding common stock over a two-year period. During 2019, 2018 and 2017, the Company repurchased 11.1 million, 6.8 million and 1.8 million shares of the Company's outstanding common stock at a cost of $2.5 billion, $1.3 billion and $323 million, respectively, under the January 2019 authorization and other previously announced programs. In addition, the Company repurchased $8 million, $10 million and $10 million of common stock related to the vesting of restricted stock units during the years ended December 31, 2019, 2018 and 2017, respectively.

The Company received $54 million, $52 million and $98 million of proceeds from the exercise of stock options and the purchase of shares pursuant to the Company's employee stock purchase plan in 2019, 2018 and 2017, respectively.

The Company had cash and cash equivalents of $337 million as of December 31, 2019. The majority of the Company's cash and cash equivalents are generated from foreign operations, with $249 million held by foreign subsidiaries at December 31, 2019, of which $176 million was held in currencies other than U.S. dollars. The Company believes it has sufficient levels of cash flow and access to its existing cash and cash equivalents, as well as the ability to raise funds from external sources and the borrowing capacity from existing, committed credit facilities, to fund operations and capital expenditures, service debt interest, finance potential acquisitions and continue the authorized stock repurchase program in the U.S. These cash requirements are managed by the Company's cash flow from operations, its existing cash and cash equivalents and the use of the Company's revolving credit facility.

Management believes, as of the date of this report, that the Company's financial position, along with expected future cash flows from earnings based on historical trends and the ability to raise funds from external sources and the borrowing capacity from existing, committed credit facilities, will be sufficient to service debt and fund working capital and capital spending requirements, authorized share repurchase amounts and potential acquisitions for at least the next twelve months. Prior to the enactment of the 2017 Act, the Company had an indefinite reinvestment assertion on a significant portion of its undistributed earnings from foreign subsidiaries. At the end of 2018, and as a result of the enactment of the 2017 Act, we reevaluated our historic assertion and no longer considered these earnings to be indefinitely reinvested in our foreign subsidiaries.

Contractual Obligations and Commercial Commitments

The following is a summary of the Company's known contractual obligations as of December 31, 2019 (in thousands):

	Payments Due by Year (1)							
	Total	2020	2021	2022	2023	2024	2025	After 2025
Notes payable and debt	$ 100,366	$ 100,366	$ —	$ —	$ —	$ —	$ —	$ —
Interest on senior unsecured notes	214,160	33,962	30,273	28,160	27,182	24,654	22,714	47,215
Long-term debt (2)	1,585,000	—	150,000	625,000	50,000	100,000	—	660,000
2017 Tax Act liability	403,768	38,454	38,454	38,454	72,101	96,135	120,170	—
Operating leases	103,359	29,489	21,774	16,743	9,175	6,867	5,550	13,761
Total	$ 2,406,653	$ 202,271	$ 240,501	$ 708,357	$ 158,458	$ 227,656	$ 148,434	$ 720,976

(1) Does not include normal purchases made in the ordinary course of business and uncertain tax positions discussed below.

(2) The interest rates applicable to the 2017 Credit Agreement are, at the Company's option, equal to either the alternate base rate (which is a rate per annum equal to the greatest of (a) the prime rate in effect on such day, (b) the Federal Reserve Bank of New York Rate on such day plus 1/2 of 1% per annum and (c) the adjusted LIBO rate on such day (or if such day is not a business day, the immediately preceding business day) for a deposit in U.S. dollars with a maturity of one month plus 1% per annum) or the applicable 1, 2, 3 or 6 month adjusted LIBO rate or EURIBO rate for Euro-denominated loans, in each case, plus an interest rate margin based upon the Company's leverage ratio, which can range between 0 and 12.5 basis points for alternate base rate loans and between 80 and 112.5 basis points for LIBO rate or EURIBO rate loans. The facility fee on the 2017 Credit Agreement ranges between 7.5 and 25 basis points per annum, based on the leverage ratio, of the amount of the revolving facility commitments and the outstanding term loan. The 2017 Credit Agreement requires that the Company comply with an interest coverage ratio test of not less than 3.50:1 as of the end of any fiscal quarter for any period of four consecutive fiscal quarters and a leverage ratio test of not more than 3.50:1 as of the end of any fiscal quarter. In addition, the 2017 Credit Agreement includes negative covenants, affirmative covenants, representations and warranties and events of default that are customary for investment grade credit facilities. As of December 31, 2019, the Company was in compliance with all such covenants.

The following is a summary of the Company's known commercial commitments as of December 31, 2019 (in thousands):

	Amount of Commitments Expiration Per Period							
	Total	2020	2021	2022	2023	2024	2025	After 2025
Letters of credit	$1,797	$1,797	$—	$—	$—	$—	$—	$ —

From time to time, the Company and its subsidiaries are involved in various litigation matters arising in the ordinary course of business. The Company believes it has meritorious arguments in its current litigation matters and believes any outcome, either individually or in the aggregate, will not be material to the Company's financial position or results of operations.

The Company has long-term liabilities for deferred employee compensation, including pension and supplemental executive retirement plans. The payments related to the supplemental retirement plan are not included above since they are dependent upon when the employee retires or leaves the Company and whether the employee elects lump-sum or annuity payments. During fiscal year 2020, the Company expects to contribute approximately $3 million to $6 million to the Company's defined benefit plans.

The Company has contingent consideration for an earnout pertaining to its July 2014 acquisition of the net assets of Medimass Research, Development and Service Kft. ("Medimass"). The earnout payments are not included above since they are dependent upon many factors that cannot be predicted with any certainty. The estimated fair value of the contingent consideration as of December 31, 2019 is $3 million.

The Company licenses certain technology and software from third parties. Future minimum license fees payable under existing license agreements as of December 31, 2019 are immaterial. The Company enters into licensing arrangements with third parties that require future milestone or royalty payments contingent upon future events. Upon the achievement of certain milestones in existing agreements, the Company could make additional future payments of up to $7 million, as well as royalties on future net sales. It is not possible to predict with reasonable certainty whether these milestones will be achieved or the timing for achievement. As a result, these potential payments are not included in the table above.

The Company has not paid any dividends and has no plans, at this time, to pay any dividends in the future.

Off-Balance Sheet Arrangements

The Company has not created, and is not party to, any special-purpose or off-balance sheet entities for the purpose of raising capital, incurring debt or operating parts of its business that are not consolidated (to the extent of the Company's ownership interest therein) into the consolidated financial statements. The Company has not entered into any transactions with unconsolidated entities whereby it has subordinated retained interests, derivative instruments or other contingent arrangements that expose the Company to material continuing risks, contingent liabilities or any other obligation under a variable interest in an unconsolidated entity that provides financing, liquidity, market risk or credit risk support to the Company.

The Company enters into standard indemnification agreements in its ordinary course of business. Pursuant to these agreements, the Company indemnifies, holds harmless and agrees to reimburse the indemnified party for losses suffered or incurred by the indemnified party, generally the Company's business partners or customers, in connection with patent, copyright or other intellectual property infringement claims by any third party with respect to its current products, as well as claims relating to property damage or personal injury resulting from the performance of services by the Company or its subcontractors. The maximum potential amount of future payments the Company could be required to make under these indemnification agreements is unlimited. Historically, the Company's costs to defend lawsuits or settle claims relating to such indemnity agreements have been minimal and management accordingly believes the estimated fair value of these agreements is immaterial.

Critical Accounting Policies and Estimates

Summary

The preparation of consolidated financial statements requires the Company to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent liabilities. Critical accounting policies are those that are central to the presentation of the Company's financial condition and results of operations that require management to make estimates about matters that are highly uncertain and that would have a material impact on the Company's results of operations given changes in the estimate that are reasonably likely to occur from period to period or use of different estimates that reasonably could have been used in the current period. On an ongoing basis, the Company evaluates its policies and estimates. The Company bases its estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual amounts may differ from these estimates under different assumptions or conditions. There are other items within the Company's consolidated financial statements that require estimation, but are not deemed critical as defined above. Changes in estimates used in these and other items could potentially have a material impact on the Company's consolidated financial statements.

Revenue Recognition

The Company adopted new accounting guidance regarding the recognition of revenue from contracts with customers as of January 1, 2018 and applied the modified-retrospective method. The Company elected the practical expedient and only evaluated the contracts that were considered incomplete as of January 1, 2018 when quantifying the cumulative effect adjustment under the modified retrospective method. Ultimately, the Company determined that there was not a significant change in the timing or pattern of revenue recognition for the Company's products and services. The adoption of this standard did not have a material impact on the Company's financial position, results of operations or cash flows and, as such, did not require any adjustments to information reported in the prior year. The revenue recognition policies described below were effective as of January 1, 2018.

The Company recognizes revenue upon transfer of control of promised products and services to customers in an amount that reflects the consideration the Company expects to receive in exchange for those products or services. The Company generally enters into contracts that include a combination of products and services. Revenue is allocated to distinct performance obligations and is recognized net of allowances for returns and discounts.

The Company recognizes revenue on product sales at the time control of the product transfers to the customer. In substantially all of the Company's arrangements, title of the product transfers at shipping point and, as a result, the Company determined control transfers at the point of shipment. In more limited cases, there are destination-based shipping terms and, thus, control is deemed to transfer when the products arrive at the customer site. All incremental costs of obtaining a contract are expensed as and when incurred if the expected amortization period of the asset that would have been recognized is one year or less. Shipping and handling costs are included as a component of cost of sales. In situations where the control of the goods transfers prior to the completion of the Company's obligation to ship the products to its customers, the Company has elected the practical expedient to account for the shipping services as a fulfillment cost. Accordingly, such costs are recognized when control of the related goods is transferred to the customer. In more rare situations, the Company has revenue associated with products that contain specific customer acceptance criteria and the related revenue is not recognized before the customer acceptance criteria are satisfied. The Company elected to exclude from the measurement of the transaction price all taxes assessed by a governmental authority that are both imposed on and concurrent with specific revenue-producing transactions and collected by the Company from a customer.

Generally, the Company's contracts for products include a performance obligation related to installation. The Company has determined that the installation represents a distinct performance obligation and revenue is

recognized separately upon the completion of installation. The Company determines the amount of the transaction price to allocate to the installation service based on the standalone selling price of the product and the service, which requires judgment. The Company determines the relative standalone selling price of installation based upon a number of factors, including hourly service billing rates and estimated installation hours. In developing these estimates, the Company considers past history, competition, billing rates of current services and other factors.

The Company has sales from standalone software, which are included in instrument systems revenue. These arrangements typically include software licenses and maintenance contracts, both of which the Company has determined are distinct performance obligations. The Company determines the amount of the transaction price to allocate to the license and maintenance contract based on the relative standalone selling price of each performance obligation. Software license revenue is recognized at the point in time when control has been transferred to the customer. The revenue allocated to the software maintenance contract is recognized on a straight-line basis over the maintenance period, which is the contractual term of the contract, as a time-based measure of progress best reflects the Company's performance in satisfying this obligation. Unspecified rights to software upgrades are typically sold as part of the maintenance contract on a when-and-if-available basis.

Payment terms and conditions vary among the Company's revenue streams, although terms generally include a requirement of payment within 30 to 60 days of product shipment. Prior to providing payment terms to customers, an evaluation of their credit risk is performed. Returns and customer credits are infrequent and insignificant and are recorded as a reduction to sales. Rights of return are not included in sales arrangements and, therefore, there is minimal variable consideration included in the transaction price of our products.

Service revenue includes (i) service and software maintenance contracts and (ii) service calls (time and materials). Instrument service contracts and software maintenance contracts are typically annual contracts, which are billed at the beginning of the contract or maintenance period. The amount of the service and software maintenance contract is recognized on a straight-line basis to revenue over the maintenance service period, which is the contractual term of the contract, as a time-based measure of progress best reflects the Company's performance in satisfying this obligation. There are no deferred costs associated with the service contract, as the cost of the service is recorded when the service is performed. Service calls are recognized to revenue at the time a service is performed.

The Company's deferred revenue liabilities at December 31, 2019 was $214 million on the consolidated balance sheets consist of the obligation on instrument service contracts and customer payments received in advance, prior to transfer of control of the instrument. The Company records deferred revenue primarily related to its service contracts, where consideration is billable at the beginning of the service period.

Loss Provisions on Accounts Receivable and Inventory

The Company maintains allowances for doubtful accounts for estimated losses resulting from the inability of its customers to make required payments. If the financial condition of the Company's customers were to deteriorate, resulting in an impairment of their ability to make payments, additional allowances may be required. The Company does not request collateral from its customers, but collectibility is enhanced through the use of credit card payments and letters of credit. The Company assesses collectibility based on a number of factors, including, but not limited to, past transaction history with the customer, the credit-worthiness of the customer, industry trends and the macro-economic environment. Historically, the Company has not experienced significant bad debt losses. Sales returns and allowances are estimates of future product returns related to current period revenue. Material differences may result in the amount and timing of revenue for any period if management made different judgments or utilized different estimates for sales returns and allowances for doubtful accounts. The Company's accounts receivable balance at December 31, 2019 was $588 million, net of allowances for doubtful accounts of $10 million.

The Company values all of its inventories at the lower of cost or net realizable value on a first-in, first-out basis ("FIFO"). The Company estimates revisions to its inventory valuations based on technical obsolescence,

historical demand, projections of future demand, including that in the Company's current backlog of orders, and industry and market conditions. If actual future demand or market conditions are less favorable than those projected by management, additional write-downs may be required. The Company's inventory balance at December 31, 2019 was recorded at its net realizable value of $321 million, which is net of write-downs of $26 million.

Long-Lived Assets, Intangible Assets and Goodwill

The Company assesses the impairment of identifiable intangibles, long-lived assets and goodwill whenever events or changes in circumstances indicate that the carrying value may not be recoverable. Factors the Company considers important which could trigger impairment include, but are not limited to, the following:

- significant underperformance relative to historical or projected future operating results, particularly as it pertains to capitalized software and patent costs;
- significant negative industry or economic trends, competitive products and technologies; and
- significant changes or developments in strategic technological collaborations or legal matters which affect the Company's capitalized patents, purchased technology, trademarks and intellectual properties, such as licenses.

When the Company determines that the carrying value of an individual intangible asset, long-lived asset or goodwill may not be recoverable based upon the existence of one or more of the above indicators, an estimate of undiscounted future cash flows produced by that intangible asset, long-lived asset or goodwill, including its eventual residual value, is compared to the carrying value to determine whether impairment exists. In the event that such cash flows are not expected to be sufficient to recover the carrying amount of the asset, the asset is written-down to its estimated fair value. Net intangible assets, long-lived assets and goodwill amounted to $240 million, $417 million and $356 million, respectively, as of December 31, 2019.

The Company performs annual impairment reviews of its goodwill on December 31 of each year. For goodwill impairment review purposes, the Company has two reporting units: Waters and TA. The Company currently does not expect to record an impairment charge in the foreseeable future as the fair values of the reporting units significantly exceeds the carrying value of the reporting units; however, there can be no assurance that, at the time future reviews are completed, a material impairment charge will not be recorded. The factors that could cause a material goodwill impairment charge in the future include, but are not limited to, the following:

- significant decline in the Company's projected revenue, earnings or cash flows;
- significant adverse change in legal factors or business climate;
- significant decline in the Company's stock price or the stock price of comparable companies;
- adverse action or assessment by a regulator; and
- unanticipated competition.

Income Taxes

As part of the process of preparing the consolidated financial statements, the Company is required to estimate its income taxes in each of the jurisdictions in which it operates. This process involves the Company estimating its income taxes, taking into account the amount, timing and character of taxable income, tax deductions and credits and assessing changes in tax laws, regulations, agreements and treaties. Differing treatment of items for tax and accounting purposes, such as depreciation, amortization and inventory reserves, result in deferred tax assets and liabilities, which are included within the consolidated balance sheets. In the event that actual results differ from these estimates, or the Company adjusts these estimates in future periods, such changes could materially impact the Company's financial position and results of operations.

The accounting standards for income taxes require that a company continually evaluate the necessity of establishing or changing a valuation allowance for deferred tax assets depending on whether it is more likely than not that the actual benefit of those assets will be realized in future periods.

Uncertain Tax Positions

The Company accounts for its uncertain tax return positions in accordance with the accounting standards for income taxes, which require financial statement reporting of the expected future tax consequences of uncertain tax positions on the presumption that all concerned tax authorities possess full knowledge of those tax positions, as well as all of the pertinent facts and circumstances, but prohibit any discounting of unrecognized tax benefits associated with those positions for the time value of money. The Company classified interest and penalties related to unrecognized tax benefits as a component of the provision for income taxes. At December 31, 2019, the Company had unrecognized tax benefits, excluding interest and penalties, of $28 million.

The Company has been granted a 0% contractual tax rate in Singapore that requires the achievement of certain operational and financial milestones that the Company expects to meet, to the extent not already achieved, by December 31, 2020 and maintain through at least March 31, 2021. As part of the Company's determination of uncertain tax positions, the Company regularly assesses its progress against these operational and financial milestone targets to determine whether the milestones can be reasonably achieved. These milestones were negotiated with the Singaporean tax authorities and established based on the Company's historical financial performance; the anticipated customer end-market demand, particularly in certain regions in the world, and the Company's anticipated future operating plans. These assessments require significant judgments and estimates about the Company's ability to meet the milestone targets for the following types of objectives: reaching and maintaining annual revenue and business spending targets; meeting capital expenditures targets; attaining and sustaining employment targets; and establishing a local research and development and service center. The Company regularly monitors its actual and forecasted sales and operating results against these milestones and the Company makes the determination as to whether the future forecasted financial results are most likely to be achieved. These milestones are very similar in nature to the previous Singaporean tax holiday contractual agreements that the Company successfully completed. These milestones are not required to be met until December 2020, at the earliest, which gives the Company sufficient time to make any necessary adjustments to its operating plans to achieve the milestones.

Currently, the Company has determined that it is more likely than not to realize the contractual tax rate in Singapore of 0% and has not recognized an uncertain tax position in its balance sheet related to the achievement of the contractual milestones in Singapore. However, these milestones can be significantly influenced by the business climate in Singapore and the Company's overall financial performance and, in the event that the Company determines that the milestone targets are not expected to be met, the Company would no longer be able to record a tax benefit at a 0% contractual tax rate on income earned in Singapore from and after the April 1, 2016 start date of the contract period. At such time, the Company would record an income tax charge on the affected Singapore income earned back to April 1, 2016 at the Singapore statutory tax rate(s) (currently 17%), with a corresponding income tax liability recorded on the balance sheet. For the year ended 2019, the effect of applying the contractual tax rate rather than the statutory tax rate to income from qualifying activities in Singapore increased the Company's net income and net income per diluted share by $24 million and $0.35, respectively.

Warranty

Product warranties are recorded at the time revenue is recognized for certain product shipments. While the Company engages in extensive product quality programs and processes, including actively monitoring and evaluating the quality of its component suppliers, the Company's warranty obligation is affected by product failure rates, material usage and service delivery costs incurred in correcting a product failure. Should actual product failure rates, material usage or service delivery costs differ from the Company's previous estimates, revisions to the estimated warranty liability would be required. At December 31, 2019, the Company's warranty liability was $12 million.

Litigation

As described in Part I, Item 3, Legal Proceedings, of this Form 10-K, the Company is a party to various pending litigation matters. With respect to each pending claim, management determines whether it can reasonably estimate whether a loss is probable and, if so, the probable range of that loss. If and when management has determined, with respect to a particular claim, both that a loss is probable and that it can reasonably estimate the range of that loss, the Company records a charge equal to either its best estimate of that loss or the lowest amount in that probable range of loss. The Company will disclose additional exposures when the range of loss is subject to considerable uncertainty.

Pension and Other Retirement Benefits

In 2018, the Company settled its defined benefit pension plan in the U.S. As a result of this settlement, the Company's defined benefit pension obligations were significantly reduced in 2018 and 2019. The Company still maintains a number of smaller defined benefit pension plans and other retirement benefits throughout the world. Assumptions used in determining projected benefit obligations and the fair values of plan assets for the Company's remaining less significant pension plans and other retirement benefits are evaluated periodically by management. Changes in assumptions are based on relevant Company data. Critical assumptions, such as the discount rate used to measure the benefit obligations and the expected long-term rate of return on plan assets, are evaluated and updated annually. The Company has assumed that the weighted-average expected long-term rate of return on plan assets will be 6.25% for its U.S. benefit plans and 3.11% for its non-U.S. benefit plans.

At the end of each year, the Company determines the discount rate that reflects the current rate at which the pension liabilities could be effectively settled. The Company utilized Milliman's Bond Matching model to determine the discount rate for its U.S. benefit plans. The Company determined the discount rate for its non-U.S. benefit plans based on the analysis of the Mercer Pension Discount Curve for high quality investments as of December 31, 2019 that best matched the timing of the plan's future cash flows for the period to maturity of the pension benefits. Once the interest rates were determined, the plan's cash flow was discounted at the spot interest rate back to the measurement date. At December 31, 2019, the Company determined the weighted-average discount rate to be 3.42% for the U.S. benefit plans and 1.38% for the non-U.S. benefits plans.

A one-quarter percentage point increase in the assumed long-term rate of return would decrease the Company's net periodic benefit cost by less than $1 million. A one-quarter percentage point increase in the discount rate would decrease the Company's net periodic benefit cost by less than $1 million.

Stock-based Compensation

The accounting standards for stock-based compensation require that all share-based payments to employees be recognized in the statements of operations based on their fair values. The Company has used the Black-Scholes option pricing model and Monte Carlo simulation model to determine the fair value of its stock option awards and performance stock unit awards, respectively. Under the fair-value recognition provisions of this statement, share-based compensation cost is measured at the grant date based on the value of the award and is recognized as expense over the vesting period. Determining the fair value of share-based awards at the grant date requires judgment, including estimating stock price volatility and employee stock option exercise behaviors. If actual results differ significantly from these estimates, stock-based compensation expense and the Company's results of operations could be materially impacted. As stock-based compensation expense recognized in the consolidated statements of operations is based on awards that ultimately are expected to vest, the amount of the expense has been reduced for estimated forfeitures. These accounting standards require forfeitures to be estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates. Forfeitures are estimated based on historical experience. If factors change and the Company employs different assumptions in the application of these accounting standards, the compensation expense that the Company records in future periods may differ significantly from what the Company has recorded in the current period. The Company recognizes the expense using the straight-line attribution method.

As of December 31, 2019, unrecognized compensation costs and related weighted-average lives over which the costs will be amortized were as follows (in millions):

	Unrecognized Compensation Costs	Weighted-Average Life in Years
Stock options	$ 32	3.2
Restricted stock units	36	3.3
Performance stock units	10	1.9
Restricted stock	—	—
Total	$ 78	3.1

Business Combinations and Asset Acquisitions

The Company accounts for business acquisitions under the accounting standards for business combinations. The results of each acquisition are included in the Company's consolidated results as of the acquisition date and the purchase price of an acquisition is allocated to tangible and intangible assets and assumed liabilities based on their estimated fair values. Any excess of the fair value consideration transferred over the estimated fair values of the net assets acquired is recognized as goodwill. Acquired in-process research and development ("IPR&D") included in a business combination is capitalized as an indefinite-lived intangible asset. Development costs incurred after the acquisition are expensed as incurred and acquired IPR&D is tested for impairment annually until completion of the acquired programs. Upon commercialization, this indefinite-lived intangible asset is then accounted for as a finite-lived intangible asset and amortized on a straight-line basis over its estimated useful life, subject to periodic impairment reviews. If the research and development project is abandoned, the indefinite-lived asset is charged to expense. Legal costs, due diligence costs, business valuation costs and all other business acquisition costs are expensed when incurred.

The Company also acquires intellectual property through licensing arrangements. These arrangements often require upfront payments and may include additional milestone or royalty payments, contingent upon certain future events. IPR&D acquired in an asset acquisition (as opposed to a business combination) is expensed immediately unless there is an alternative future use. Subsequent payments made for the achievement of milestones are evaluated to determine whether they have an alternative future use or should be expensed. Payments made to third parties subsequent to commercialization are capitalized and amortized over the remaining useful life of the related asset, and are classified as intangible assets.

Recent Accounting Standard Changes and Developments

Information regarding recent accounting standard changes and developments is incorporated by reference from Part II, Item 8, Financial Statements and Supplementary Data, of this document and should be considered an integral part of this Item 7. See Note 2 in the Notes to the Consolidated Financial Statements for recently adopted and issued accounting standards.

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

Derivative Transactions

The Company is a global company that operates in over 35 countries and, as a result, the Company's net sales, cost of sales, operating expenses and balance sheet amounts are significantly impacted by fluctuations in foreign currency exchange rates. The Company is exposed to currency price risk on foreign currency exchange rate fluctuations when it translates its non-U.S. dollar foreign subsidiaries' financial statements into U.S. dollars, and when any of the Company's subsidiaries purchase or sell products or services in a currency other than its own currency.

The Company's principal strategies in managing exposures to changes in foreign currency exchange rates are to (1) naturally hedge the foreign-currency-denominated liabilities on the Company's balance sheet against

corresponding assets of the same currency, such that any changes in liabilities due to fluctuations in foreign currency exchange rates are typically offset by corresponding changes in assets and (2) mitigate foreign exchange risk exposure of international operations by hedging the variability in the movement of foreign currency exchange rates on a portion of its Euro-denominated net asset investments. The Company presents the derivative transactions in financing activities in the statement of cash flows.

Foreign Currency Exchange Contracts

The Company does not specifically enter into any derivatives that hedge foreign-currency-denominated operating assets, liabilities or commitments on its balance sheet, other than a portion of certain third-party accounts receivable and accounts payable, and the Company's net worldwide intercompany receivables and payables, which are eliminated in consolidation. The Company periodically aggregates these net worldwide balances by currency and then enters into foreign currency exchange contracts that mature within 90 days to hedge a portion of the remaining balance to minimize some of the Company's currency price risk exposure. The foreign currency exchange contracts are not designated for hedge accounting treatment. Principal hedged currencies include the Euro, Japanese yen, British pound, Mexican peso and Brazilian real.

Interest Rate Cross-Currency Swap Agreements

As of December 31, 2019, the Company has entered into three-year interest rate cross-currency swap derivative agreements with a notional value of $560 million to hedge the variability in the movement of foreign currency exchange rates on a portion of its Euro-denominated net asset investments. Under hedge accounting, the change in fair value of the derivative that relates to changes in the foreign currency spot rate are recorded in the currency translation adjustment in other comprehensive income and remain in accumulated comprehensive income in stockholders' (deficit) equity until the sale or substantial liquidation of the foreign operation. The difference between the interest rate received and paid under the interest rate cross-currency swap derivative agreement is recorded in interest income in the statement of operations.

The Company's foreign currency exchange contracts and interest rate cross-currency swap agreements included in the consolidated balance sheets are classified as follows (in thousands):

	December 31, 2019		December 31, 2018	
	Notional Value	Fair Value	Notional Value	Fair Value
Foreign currency exchange contracts:				
Other current assets	$ 119,576	$ 16	$ 112,212	$ 503
Other current liabilities	$ 29,495	$ 1,028	$ 40,175	$ 224
Interest rate cross-currency swap agreements:				
Other assets	$ 560,000	$ 4,485	$ 300,000	$ 1,093
Accumulated other comprehensive income		$ (4,485)		$ (1,093)

The following is a summary of the activity included in the statements of comprehensive income related to the foreign currency exchange contracts (in thousands):

	Financial Statement Classification	Year Ended December 31, 2019	2018	2017
Foreign currency exchange contracts:				
Realized (losses) gains on closed contracts	Cost of sales	$ (3,552)	$(6,684)	$3,894
Unrealized (losses) gains on open contracts	Cost of sales	(1,292)	(105)	1,054
Cumulative net pre-tax (losses) gains	Cost of sales	$ (4,844)	$(6,789)	$4,948
Interest rate cross-currency swap agreements:				
Interest earned	Interest income	$11,709	$ 2,713	$ —
Unrealized gains on open contracts	Stockholders' (deficit) equity	$ 4,485	$ 1,093	$ —

Assuming a hypothetical adverse change of 10% in year-end exchange rates (a strengthening of the U.S. dollar), the fair market value of the foreign currency exchange contracts outstanding as of December 31, 2019 would decrease pre-tax earnings by approximately $15 million. Assuming a hypothetical adverse change of 10% in year-end exchange rates (a strengthening of the U.S. dollar), the fair market value of the interest rate cross-currency swap agreements outstanding as of December 31, 2019 would increase by approximately $56 million and would be recorded to foreign currency translation in other comprehensive income within stockholders' (deficit) equity. The related impact on interest income would not have a material effect on pre-tax earnings.

The Company's cash and cash equivalents are not subject to significant interest rate risk due to the short maturities of these instruments. The Company's cash equivalents represent highly liquid investments, with original maturities of 90 days or less, primarily in bank deposits, U.S. treasury bill money market funds and commercial paper. As of December 31, 2019, the carrying value of the Company's cash and cash equivalents approximated fair value.

The Company is exposed to the risk of interest rate fluctuations from the investments of cash generated from operations. Investments with maturities greater than 90 days are classified as investments, and are held primarily in U.S. dollar-denominated treasury bills and commercial paper, bank deposits and corporate debt securities. As of December 31, 2019, the Company estimates that a hypothetical adverse change of 100 basis points across all maturities would not have a material effect on the fair market value of its portfolio.

The Company is also exposed to the risk of exchange rate fluctuations. The Company maintains cash balances in various operating accounts in excess of federally insured limits, and in foreign subsidiary accounts in currencies other than the U.S. dollar. As of December 31, 2019 and 2018, $249 million out of $337 million and $471 million out of $1,735 million, respectively, of the Company's total cash, cash equivalents and investments were held by foreign subsidiaries. In addition, $176 million out of $337 million and $251 million out of $1,735 million of cash, cash equivalents and investments were held in currencies other than the U.S. dollar at December 31, 2019 and 2018, respectively. As of December 31, 2019, the Company had no holdings in auction rate securities or commercial paper issued by structured investment vehicles.

Assuming a hypothetical adverse change of 10% in year-end exchange rates (a strengthening of the U.S. dollar), the fair market value of the Company's cash, cash equivalents and investments held in currencies other than the U.S. dollar as of December 31, 2019 would decrease by approximately $18 million, of which the majority would be recorded to foreign currency translation in other comprehensive income within stockholders' (deficit) equity.

Item 8: ***Financial Statements and Supplementary Data***

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. 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.

Under the supervision and with the participation of our management, including our chief executive officer and chief financial officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on our evaluation under the framework in *Internal Control — Integrated Framework (2013)* , our management, including our chief executive officer and chief financial officer, concluded that our internal control over financial reporting was effective as of December 31, 2019.

The effectiveness of our internal control over financial reporting as of December 31, 2019 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which is included herein.

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Waters Corporation

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Waters Corporation and its subsidiaries (the "Company") as of December 31, 2019 and 2018, and the related consolidated statements of operations, of comprehensive income, of stockholders' equity (deficit) and of cash flows for each of the three years in the period ended December 31, 2019, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control — Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control — Integrated Framework* (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Goodwill Impairment Assessment

As described in Notes 2 and 8 to the consolidated financial statements, the Company's consolidated goodwill balance was $356 million as of December 31, 2019. Management performs an impairment test as of December 31 of each year, or more frequently if events or circumstances that would more likely than not reduce the fair value of a reporting unit below its carrying amount. Under the impairment test, if a reporting unit's carrying amount exceeds its estimated fair value, goodwill impairment is recognized to the extent that the carrying amount of goodwill exceeds the implied fair value of the goodwill. The fair value of reporting units was estimated using a discounted cash flows technique, which includes certain management assumptions, such as estimated future cash flows, estimated growth rates and discount rates. The estimated fair value of the reporting units significantly exceeds the carrying value.

The principal considerations for our determination that performing procedures relating to the goodwill impairment assessment is a critical audit matter are there was significant judgment by management when developing the fair value measurement of the reporting units. This in turn led to a high degree of effort in performing procedures and evaluating audit evidence related to management's estimated future cash flows, including the estimated growth rates.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's goodwill impairment assessment, including controls over the valuation of the Company's reporting units. These procedures also included, among others, testing management's process for developing the fair value estimate, evaluating the appropriateness of the discounted cash flow model, testing the completeness, accuracy, and relevance of underlying data used in the model and evaluating the significant

assumptions used by management, including the estimated growth rates. Evaluating management's assumptions related to estimated revenue growth rates involved evaluating whether the growth rates used by management were reasonable considering the current and past performance of the reporting units and whether those growth rates were consistent with evidence obtained in other areas of the audit.

/s/ PricewaterhouseCoopers LLP
Boston, Massachusetts
February 25, 2020

We have served as the Company's auditor since 1994.

WATERS CORPORATION AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS

	December 31, 2019	December 31, 2018
	(In thousands, except per share data)	
ASSETS		
Current assets:		
Cash and cash equivalents	$ 335,715	$ 796,280
Investments	1,429	938,944
Accounts receivable, net	587,734	568,316
Inventories	320,551	291,569
Other current assets	67,062	68,054
Total current assets	1,312,491	2,663,163
Property, plant and equipment, net	417,342	343,083
Intangible assets, net	240,203	246,902
Goodwill	356,128	355,614
Operating lease assets	93,358	—
Other assets	137,533	118,664
Total assets	$ 2,557,055	$ 3,727,426
LIABILITIES AND STOCKHOLDERS' (DEFICIT) EQUITY		
Current liabilities:		
Notes payable and debt	$ 100,366	$ 178
Accounts payable	49,001	68,168
Accrued employee compensation	43,467	64,545
Deferred revenue and customer advances	176,360	164,965
Current operating lease liabilities	27,125	—
Accrued income taxes	45,967	22,943
Accrued warranty	11,964	12,300
Other current liabilities	137,084	115,832
Total current liabilities	591,334	448,931
Long-term liabilities:		
Long-term debt	1,580,797	1,148,172
Long-term portion of retirement benefits	59,159	55,853
Long-term income tax liabilities	394,562	430,866
Long-term operating lease liabilities	66,881	—
Other long-term liabilities	80,603	76,346
Total long-term liabil ities	2,182,002	1,711,237
Total liabilities	2,773,336	2,160,168
Commitments and contingencies (Notes 6, 9, 10, 11, 12 , 13 and 1 7)		
Stockholders' (deficit) equity:		
Preferred stock, par value $0.01 per share, 5,000 shares authorized, no ne issued at December 31, 2019 and December 31, 2018	—	—
Common stock, par value $0.01 per share, 400,000 shares authorized, 161,030 and 160,472 shares issued, 62,587 and 73,115 shares outstanding at December 31, 2019 and December 31, 2018, respectively	1,610	1,605
Additional paid-in capital	1,926,753	1,834,741
Retained earnings	6,587,403	5,995,205
Treasury stock, at cost, 98,443 and 87,357 shares at December 31, 2019 and December 31, 2018, respectively	(8,612,576)	(6,146,322)
Accumulated other comprehensive loss	(119,471)	(117,971)
Total stockholders' (deficit) equity	(216,281)	1,567,258
Total liabilities and stockholders' (deficit) equity	$ 2,557,055	$ 3,727,426

The accompanying notes are an integral part of the consolidated financial statements.

WATERS CORPORATION AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF OPERATIONS

	Year Ended December 31,		
	2019	2018	2017
	(In thousands, except per share data)		
Revenues:			
Product sales	$1,567,189	$1,604,993	$1,552,349
Service sales	839,407	814,936	756,729
Total net sales	2,406,596	2,419,929	2,309,078
Costs and operating expenses:			
Cost of product sales	642,706	656,275	623,214
Cost of service sales	367,994	336,289	323,853
Selling and administrative expenses	534,791	536,902	544,363
Research and development expenses	142,955	143,403	132,593
Purchased intangibles amortization	9,693	7,712	6,743
Litigation provision (settlement) (Note 11)	—	(426)	11,114
Acquired in-process research and development (Note 2)	—	—	5,000
Total costs and operating expenses	1,698,139	1,680,155	1,646,880
Operating income	708,457	739,774	662,198
Other expense	(3,586)	(47,794)	(340)
Interest expense	(48,690)	(48,641)	(56,839)
Interest income	22,058	38,807	36,078
Income before income taxes	678,239	682,146	641,097
Provision for income taxes	86,041	88,352	620,786
Net income	$ 592,198	$ 593,794	$ 20,311
Net income per basic common share	$ 8.76	$ 7.71	$ 0.25
Weighted-average number of basic common shares	67,627	76,992	79,793
Net income per diluted common share	$ 8.69	$ 7.65	$ 0.25
Weighted-average number of diluted common shares and equivalents	68,166	77,618	80,604

The accompanying notes are an integral part of the consolidated financial statements.

WATERS CORPORATION AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

	Year Ended December 31,		
	2019	2018	2017
	(In thousands)		
Net income	$592,198	$593,794	$ 20,311
Other comprehensive (loss) income:			
Foreign currency translation	1,631	(36,279)	101,148
Unrealized gains (losses) on investments before income taxes	3,046	698	(1,794)
Income tax (expense) benefit	(641)	443	68
Unrealized gains (losses) on investments, net of tax	2,405	1,141	(1,726)
Retirement liability adjustment before reclassifications	(9,360)	(6,722)	7,832
Amounts reclassified to other expense	1,979	48,792	3,948
Retirement liability adjustment before income taxes	(7,381)	42,070	11,780
Income tax benefit (expense)	1,845	(14,836)	(4,989)
Retirement liability adjustment, net of tax	(5,536)	27,234	6,791
Other comprehensive (loss) income	(1,500)	(7,904)	106,213
Comprehensive income	$590,698	$585,890	$126,524

The accompanying notes are an integral part of the consolidated financial statements.

WATERS CORPORATION AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year Ended December 31,		
	2019	2018	2017
	(In thousands)		
Cash flows from operating activities:			
Net income	$ 592,198	$ 593,794	$ 20,311
Adjustments to reconcile net income to net cash provided by operating activities:			
Stock-based compensation	38,577	37,541	39,436
Deferred income taxes	9,620	2,405	45,510
Depreciation	53,839	57,952	61,450
Amortization of intangibles	51,457	50,456	44,552
In-process research and development and other non-cash charges	—	—	5,000
Change in operating assets and liabilities, net of acquisitions:			
Increase in accounts receivable	(22,195)	(47,921)	(24,013)
(Increase) decrease in inventories	(31,854)	(25,396)	731
Increase in other current assets	(10,918)	(12,446)	(16,323)
(Increase) decrease in other assets	(16,470)	6,047	(24,098)
Increase (decrease) in accounts payable and other current liabilities	9,784	(81,663)	3,175
I ncrease in deferred revenue and customer advances	12,189	2,721	10,386
Effect of the 2017 Tax Cuts and Jobs Act	(3,229)	(6,059)	530,383
(Decrease) i ncrease in other liabilities	(39,911)	27,015	1,140
Net cash provided by operating activities	643,087	604,446	697,640
Cash flows from investing activities:			
Additions to property, plant, equipment and software capitalization	(163,823)	(96,079)	(85,473)
Asset and business acquisitions, net of cash acquired	—	(31,486)	—
Investment in unaffiliated company	(8,843)	(7,615)	(7,000)
Paym ents for intellectual p roperty licen ses	—	—	(5,000)
P urc hases of investments	(36,951)	(1,006,080)	(2,960,379)
Maturities and sales of inves tments	978,419	2,824,562	2,522,100
Net cash provided by (used in) investing activities	768,802	1,683,302	(535,752)
Cash flows from financing activities:			
Proceeds from debt issuances	925,670	274	1,480,190
Payments on debt	(390,482)	(850,435)	(1,310,214)
Payments of debt issuance costs	(2,932)	—	(2,984)
Proceeds from stock plans	53,715	52,429	97,789
Purchases of treasury shares	(2,469,258)	(1,315,106)	(332,544)
Proceeds from (payments for) derivative contracts	10,609	(6,684)	3,894
Net cash used in financing activities	(1,872,678)	(2,119,522)	(63,869)
Effect of exchange rate changes on cash and cash equivalents	224	(14,265)	38,669
(Decrease) increase in cash and cash equivalents	(460,565)	153,961	136,688
Cash and cash equivalents at beginning of period	796,280	642,319	505,631
Cash and cash equivalents at end of period	$ 335,715	$ 796,280	$ 642,319
Supplemental cash flow information:			
Income taxes paid	$ 87,998	$ 159,397	$ 70,583
Interest paid	$ 42,843	$ 50,798	$ 56,503

The accompanying notes are an integral part of the consolidated financial statements.

WATERS CORPORATION AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY (DEFICIT)

	Number of Common Shares	Common Stock	Additional Paid-In Capital	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Income (Loss)	Total Stockholders' Equity (Def i cit)
				(In thousands)			
Balance December 31, 2016	158,634	$ 1,586	$1,607,241	$5,385,069	$(4,475,667)	$ (216,280)	$ 2,301,949
Net income	—	—	—	20,311	—	—	20,311
Other comprehensive income	—	—	—	—	—	106,213	106,213
Issuance of common stock for employees:							
Employee Stock Purchase Plan	50	1	6,874	—	—	—	6,875
Stock options exercised	972	10	90,904	—	—	—	90,914
Treasury stock	—	—	—	—	(332,544)	—	(332,544)
Stock-based compensation	189	1	40,069	—	—	—	40,070
Balance December 31, 2017	159,845	$ 1,598	$1,745,088	$5,405,380	$(4,808,211)	$ (110,067)	$ 2,233,788
Adoption of new accounting pronouncement	—	—	—	(3,969)	—	—	(3,969)
Net income	—	—	—	593,794	—	—	593,794
Other comprehensive loss	—	—	—	—	—	(7,904)	(7,904)
Issuance of common stock for employees:							
Employee Stock Purchase Plan	45	—	7,874	—	—	—	7,874
Stock options exercised	438	5	44,550	—	—	—	44,555
Treasury stock	—	—	—	—	(1,338,111)	—	(1,338,111)
Stock-based compensation	144	2	37,229	—	—	—	37,231
Balance December 31, 2018	160,472	$ 1,605	$1,834,741	$5,995,205	$(6,146,322)	$ (117,971)	$ 1,567,258
Net income	—	—	—	592,198	—	—	592,198
Other comprehensive loss	—	—	—	—	—	(1,500)	(1,500)
Issuance of common stock for employees:							
Employee Stock Purchase Plan	43	—	7,996	—	—	—	7,996
Stock options exercised	406	4	45,715	—	—	—	45,719
Treasury stock	—	—	—	—	(2,466,254)	—	(2,466,254)
Stock-based compensation	109	1	38,301	—	—	—	38,302
Balance December 31, 2019	161,030	$ 1,610	$1,926,753	$6,587,403	$(8,612,576)	$ (119,471)	$ (216,281)

The accompanying notes are an integral part of the consolidated financial statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1 Description of Business and Organization

Waters Corporation (the "Company," "we," "our," or "us") is a specialty measurement company that operates with a fundamental underlying purpose to advance the science that enables our customers to enhance human health and well-being. The Company has pioneered analytical workflow solutions involving liquid chromatography, mass spectrometry and thermal analysis innovations serving the life, materials and food sciences for more than 60 years. The Company primarily designs, manufactures, sells and services high performance liquid chromatography ("HPLC"), ultra performance liquid chromatography ("UPLC ™ " and together with HPLC, referred to as "LC") and mass spectrometry ("MS") technology systems and support products, including chromatography columns, other consumable products and comprehensive post-warranty service plans. These systems are complementary products that are frequently employed together ("LC-MS") and sold as integrated instrument systems using common software platforms. LC is a standard technique and is utilized in a broad range of industries to detect, identify, monitor and measure the chemical, physical and biological composition of materials, and to purify a full range of compounds. MS technology, principally in conjunction with chromatography, is employed in drug discovery and development, including clinical trial testing, the analysis of proteins in disease processes (known as "proteomics"), nutritional safety analysis and environmental testing. LC-MS instruments combine a liquid phase sample introduction and separation system with mass spectrometric compound identification and quantification. In addition, the Company designs, manufactures, sells and services thermal analysis, rheometry and calorimetry instruments through its TA ™ product line. These instruments are used in predicting the suitability and stability of fine chemicals, pharmaceuticals, water, polymers, metals and viscous liquids for various industrial, consumer goods and healthcare products, as well as for life science research. The Company is also a developer and supplier of advanced software-based products that interface with the Company's instruments, as well as other manufacturers' instruments.

2 Basis of Presentation and Summary of Significant Accounting Policies

Use of Estimates

The preparation of consolidated financial statements in conformity with generally accepted accounting principles ("GAAP") requires the Company to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent liabilities at the dates of the financial statements. On an ongoing basis, the Company evaluates its estimates, including those related to revenue recognition, goodwill and intangible assets, income taxes, litigation, stock-based compensation and contingencies, and to a lesser extent, product returns and allowances, bad debts, inventory valuation, warranty and installation provisions, retirement plan obligations and equity investments, which are not as significant to our financial statements. The Company bases its estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual amounts may differ from these estimates under different assumptions or conditions.

Risks and Uncertainties

The Company is subject to risks common to companies in the analytical instrument industry, including, but not limited to, global economic and financial market conditions, fluctuations in foreign currency exchange rates, fluctuations in customer demand, development by its competitors of new technological innovations, costs of developing new technologies, levels of debt and debt service requirements, risk of disruption, dependence on key personnel, protection and litigation of proprietary technology, shifts in taxable income between tax jurisdictions and compliance with regulations of the U.S. Food and Drug Administration and similar foreign regulatory authorities and agencies.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Reclassifications

Certain amounts from prior year have been reclassified in the accompanying financial statements in order to be consistent with the current year's classification.

Principles of Consolidation

The consolidated financial statements include the accounts of the Company and its subsidiaries, which are wholly owned. The Company consolidates entities in which it owns or controls fifty percent or more of the voting shares. All inter-company balances and transactions have been eliminated.

Translation of Foreign Currencies

The functional currency of each of the Company's foreign operating subsidiaries is the local currency of its country of domicile, except for the Company's subsidiaries in Hong Kong, Singapore and the Cayman Islands, where the underlying transactional cash flows are denominated in currencies other than the respective local currency of domicile. The functional currency of the Hong Kong, Singapore and Cayman Islands subsidiaries is the U.S. dollar, based on the respective entity's cash flows.

For most of the Company's foreign operations, assets and liabilities are translated into U.S. dollars at exchange rates prevailing on the balance sheet date, while revenues and expenses are translated at average exchange rates prevailing during the respective period. Any resulting translation gains or losses are included in accumulated other comprehensive income in the consolidated balance sheets.

The Company's net sales derived from operations outside the United States were 71 %, 72 % and 71 % in 2019, 2018 and 2017, respectively. Gains and losses from foreign currency transactions are included primar ily in cost of sales in the consolidated statements of operations. In 2019, 2018 and 2017, foreign currency transactions resulted in net losses of $ 9 million, $ 3 million and $ 1 million, respectively.

Seasonality of Business

The Company typically experiences an increase in sales in the fourth quarter, as a result of purchasing habits for capital goods of customers that tend to exhaust their spending budgets by calendar year end.

Cash, Cash Equivalents and Investments

Cash equivalents represent highly liquid investments, with original maturities of 90 days or less, primarily in bank deposits, U.S. treasury bill money market funds and commercial paper. Investments with longer maturities are classified as investments, and are held primarily in U.S. treasury bills, U.S. dollar-denominated treasury bills and commercial paper, bank deposits and corporate debt securities.

Investments are classified as available-for-sale in accordance with the accounting standards for investments in debt securities. All debt securities are recorded at fair market value and any unrealized holding gains and losses, to the extent deemed temporary, are included in accumulated other comprehensive income in stockholders' (deficit) equity, net of the related tax effects. If any adjustment to fair value reflects a decline in the value of the investment, the Company considers all available evidence to evaluate the extent to which the decline is "other than temporary" and, if so, records a loss as a charge to the statement of operations. The Company classifies its investments exclusive of those categorized as cash equivalents.

The Company maintains cash balances in various operating accounts in excess of federally insured limits, and in foreign subsidiary accounts in currencies other than the U.S. dollar. As of December 31, 2019 and 2018, $249 million out of $337 million and $471 million out of $1,735 million, respectively, of the Company's total

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

cash, cash equivalents and investments were held by foreign subsidiaries. In addition, $176 million out of $337 million and $251 million out of $1,735 million of cash, cash equivalents and investments were held in currencies other than the U.S. dollar at December 31, 2019 and 2018, respectively.

Accounts Receivable and Allowance for Doubtful Accounts

Trade accounts receivable are recorded at the invoiced amount and do not bear interest. The Company has very limited use of rebates and other cash considerations payable to customers and, as a result, the transaction price determination does not have any material variable consideration. The allowance for doubtful accounts is the best estimate of the amount of probable credit losses in the existing accounts receivable. The allowance is based on a number of factors, including historical experience and the customer's credit-worthiness. The allowance for doubtful accounts is reviewed on at least a quarterly basis. Past due balances over 90 days and over a specified amount are reviewed individually for collectibility. Account balances are charged against the allowance when the Company determines it is probable that the receivable will not be recovered. The Company does not have any off-balance sheet credit exposure related to its customers. Historically, the Company has not experienced significant bad debt losses.

The following is a summary of the activity of the Company's allowance for doubtful accounts for the year ended December 31, 2019, 2018 and 2017 (in thousands):

	Balance at Beginning of Period	Additions	Deduction	Balance at End of Period
Allowance for Doubtful Accounts				
December 31, 2019	$ 7,663	$ 4,701	$ (2,804)	$ 9,560
December 31, 2018	$ 6,109	$ 6,333	$ (4,779)	$ 7,663
December 31, 2017	$ 5,141	$ 3,752	$ (2,784)	$ 6,109

Concentration of Credit Risk

The Company sells its products and services to a significant number of large and small customers throughout the world, with net sales to the pharmaceutical industry of approximately 57 % in each of the years 2019, 2018 and 2017. None of the Company's individual customers accounted for more than 2 % of annual Company sales in 2019, 2018 or 2017. The Company performs continuing credit evaluations of its customers and generally does not require collateral, but in certain circumstances may require letters of credit or deposits. Historically, the Company has not experienced significant bad debt losses.

Inventory

The Company values all of its inventories at the lower of cost or net realizable value on a first-in, first-out basis ("FIFO").

Income Taxes

Deferred income taxes are recognized for temporary differences between the financial statement and income tax basis of assets and liabilities using tax rates in effect for the years in which the differences are expected to reverse. A valuation allowance is provided to offset any net deferred tax assets if, based upon the available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized. Appropriate long-term liabilities have also been recorded to recognize uncertain tax positions.

As part of the 2017 Tax Act, there is a provision for the taxation of certain off-shore earnings referred to as the Global Intangible Low-Taxed Income ("GILTI") provision. This provision taxes off-shore earnings at a rate of 10.5%, partially offset with foreign tax credits. In connection with this provision, the Company's accounting policy is to treat this new tax as a current period cost.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Property, Plant and Equipment

Property, plant and equipment are recorded at cost. Expenditures for maintenance and repairs are charged to expense, while the costs of significant improvements are capitalized. Depreciation is provided using the straight-line method over the following estimated useful lives: buildings — fifteen to thirty-nine years; building improvements — five to ten years; leasehold improvements — the shorter of the economic useful life or life of lease; and production and other equipment — three to ten years. Upon retirement or sale, the cost of the assets disposed of and the related accumulated depreciation are eliminated from the consolidated balance sheets and related gains or losses are reflected in the consolidated statements of operations.

Asset Impairments

The Company reviews its long-lived assets for impairment in accordance with the accounting standards for property, plant and equipment. Whenever events or circumstances indicate that the carrying amount of an asset may not be recoverable, the Company evaluates the recoverability of the carrying value of the asset based on the expected future cash flows, relying on a number of factors, including, but not limited to, operating results, business plans, economic projections and anticipated future cash flows. If the asset is deemed not recoverable, it is written down to fair value and the impairment is recorded in the consolidated statements of operations.

Business Combinations and Asset Acquisitions

The Company accounts for business acquisitions under the accounting standards for business combinations. The results of each acquisition are included in the Company's consolidated results as of the acquisition date and the purchase price of an acquisition is allocated to tangible and intangible assets and assumed liabilities based on their estimated fair values. Any excess of the fair value consideration transferred over the estimated fair values of the net assets acquired is recognized as goodwill. Acquired in-process research and development ("IPR&D") included in a business combination is capitalized as an indefinite-lived intangible asset. Development costs incurred after the acquisition are expensed as incurred and acquired IPR&D is tested for impairment annually until completion of the acquired programs. Upon commercialization, this indefinite-lived intangible asset is then accounted for as a finite-lived intangible asset and amortized on a straight-line basis over its estimated useful life, subject to periodic impairment reviews. If the research and development project is abandoned, the indefinite-lived asset is charged to expense. Legal costs, due diligence costs, business valuation costs and all other business acquisition costs are expensed when incurred.

The Company also acquires intellectual property through licensing arrangements. These arrangements often require upfront payments and may include additional milestone or royalty payments, contingent upon certain future events. IPR&D acquired in an asset acquisition (as opposed to a business combination) is expensed immediately unless there is an alternative future use. Subsequent payments made for the achievement of milestones are evaluated to determine whether they have an alternative future use or should be expensed. Payments made to third parties subsequent to commercialization are capitalized and amortized over the remaining useful life of the related asset, and are classified as intangible assets.

Goodwill and Other Intangible Assets

The Company tests for goodwill impairment using a fair-value approach at the reporting unit level annually, or earlier, if an event occurs or circumstances change that would more likely than not reduce the fair value of a reporting unit below its carrying amount. Additionally, the Company performs an annual goodwill impairment assessment for its reporting units as of December 31 each year. The goodwill and other intangible assets accounting standards define a reporting unit as an operating segment, or one level below an operating segment, if discrete financial information is prepared and reviewed by management. For goodwill impairment review

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

purposes, the Company has two reporting units: Waters ™ and TA ™ . Goodwill is allocated to the reporting units at the time of acquisition. Under the impairment test, if a reporting unit's carrying amount exceeds its estimated fair value, goodwill impairment is recognized to the extent that the carrying amount of goodwill exceeds the implied fair value of the goodwill. The fair value of reporting units was estimated using a discounted cash flows technique, which includes certain management assumptions, such as estimated future cash flows, estimated growth rates and discount rates.

The Company's intangible assets include purchased technology; capitalized software development costs; costs associated with acquiring Company patents, trademarks and intellectual properties, such as licenses; and acquired IPR&D. Purchased intangibles are recorded at their fair market values as of the acquisition date and amortized over their estimated useful lives, ranging from one to fifteen years. Other intangibles are amortized over a period ranging from one to ten years. Acquired IPR&D is amortized from the date of completion of the acquired program over its estimated useful life. IPR&D and indefinite-lived intangibles are tested annually for impairment.

Software Development Costs

The Company capitalizes internal and external software development costs for products offered for sale in accordance with the accounting standards for the costs of software to be sold, leased, or otherwise marketed. Capitalized costs are amortized to cost of sales over the period of economic benefit, which approximates a straight-line basis over the estimated useful lives of the related software products, generally three to ten years. The Company capitalized $40 million and $34 million of direct expenses that were related to the development of software in 2019 and 2018, respectively. Net capitalized software included in intangible assets totaled $149 million and $147 million at December 31, 2019 and 2018, respectively. See Note 8 , "Goodwill and Other Intangibles".

The Company capitalizes internal software development costs for internal use. Capitalized internal software development costs are amortized over the period of economic benefit, which approximates a straight-line basis over ten years. Net capitalized internal software included in property, plant and equipment totaled $ 3 million and $ 2 million at December 31, 2019 and 2018, respectively.

Other Investments

The Company accounts for its investments that represent less than twenty percent ownership, and for which the Company does not have the ability to exercise significant influence, using the accounting standards for investments in equity securities. Investments for which the Company does not have the ability to exercise significant influence, and for which there is not a readily determinable market value, are accounted for at cost, adjusted for subsequent observable price changes as applicable. The Company periodically evaluates the carrying value of its investments for which the Company does not have the ability to exercise significant influence, and for which there is not a readily determinable fair value and carries them at cost, less impairment, adjusted for subsequent observable price changes. For equity investments in which the Company has the ability to exercise significant influence over operating and financial policies of the investee, the equity method of accounting is used. The Company's share of net income or losses of equity investments is included in the consolidated statements of operations and was not material in any period presented.

During the year ended December 31, 2019, the Company made $9 million of investments in unaffiliated companies. During the year ended December 31, 2018, the Company made a $8 million investment in a developer of analytical system solutions used to make measurements, predict stability and accelerate product discovery in the routine analytic, process monitoring and quality control release processes for life science and biopharmaceutical markets.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Fair Value Measurements

In accordance with the accounting standards for fair value measurements and disclosures, certain of the Company's assets and liabilities are measured at fair value on a recurring basis as of December 31, 2019 and 2018. Fair values determined by Level 1 inputs utilize observable data, such as quoted prices in active markets. Fair values determined by Level 2 inputs utilize data points other than quoted prices in active markets that are observable either directly or indirectly. Fair values determined by Level 3 inputs utilize unobservable data points for which there is little or no market data, which require the reporting entity to develop its own assumptions.

The following table represents the Company's assets and liabilities measured at fair value on a recurring basis at December 31, 2019 (in thousands):

	Total at December 31, 2019	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Time deposits	$ 1,642	$ —	$ 1,642	$ —
Waters 401(k) Restoration Plan assets	30,158	30,158	—	—
Foreign currency exchange contracts	16	—	16	—
Interest rate cross-currency swap agreements	4,485	—	4,485	—
Total	$ 36,301	$ 30,158	$ 6,143	$ —
Liabilities:				
Contingent consideration	$ 2,557	$ —	$ —	$ 2,557
Foreign currency exchange contracts	1,028	—	1,028	—
Total	$ 3,585	$ —	$ 1,028	$ 2,557

The following table represents the Company's assets and liabilities measured at fair value on a recurring basis at December 31, 2018 (in thousands):

	Total at December 31, 2018	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
U.S. Treasury securities	$ 164,315	$ —	$ 164,315	$ —
Foreign government securities	3,463	—	3,463	—
Corporate debt securities	723,059	—	723,059	—
Time deposits	108,638	—	108,638	—
Waters 401(k) Restoration Plan assets	33,104	33,104	—	—
Foreign currency exchange contracts	503	—	503	—
Interest rate cross-currency swap agreements	1,093		1,093	
Total	$ 1,034,175	$ 33,104	$1,001,071	$ —
Liabilities:				
Contingent consideration	$ 2,476	$ —	$ —	$ 2,476
Foreign currency exchange contracts	224	—	224	—
Total	$ 2,700	$ —	$ 224	$ 2,476

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Fair Value of 401(k) Restoration Plan Assets

The 401(k) Restoration Plan is a nonqualified defined contribution plan and the assets were held in registered mutual funds and have been classified as Level 1. The fair values of the assets in the plan are determined through market and observable sources from daily quoted prices on nationally recognized securities exchanges.

Fair Value of Cash Equivalents, Investments, Foreign Currency Exchange Contracts and Interest Rate Cross-Currency Swap Agreements

The fair values of the Company's cash equivalents, investments and foreign currency exchange contracts are determined through market and observable sources and have been classified as Level 2. These assets and liabilities have been initially valued at the transaction price and subsequently valued, typically utilizing third-party pricing services. The pricing services use many inputs to determine value, including reportable trades, benchmark yields, credit spreads, broker/dealer quotes, current spot rates and other industry and economic events. The Company validates the prices provided by third-party pricing services by reviewing their pricing methods and obtaining market values from other pricing sources.

Fair Value of Contingent Consideration

The fair value of the Company's liability for contingent consideration relates to earnout payments in connection with the July 2014 acquisition of Medimass Research, Development and Service Kft. and is determined using a probability-weighted discounted cash flow model, which uses significant unobservable inputs, and has been classified as Level 3. Subsequent changes in the fair value of the contingent consideration liability are recorded in the results of operations. The fair value of the contingent consideration liability associated with future earnout payments is based on several factors, including the estimated future results and a discount rate that reflects both the likelihood of achieving the estimated future results and the Company's creditworthiness. A change in any of these unobservable inputs can significantly change the fair value of the contingent consideration. Although there is no contractual limit, the fair value of future contingent consideration payments was estimated to be $ 3 million and $ 2 million at December 31, 2019 and 2018, respectively, based on the Company's best estimate, as the earnout is based on future sales of certain products, some of which are currently in development, through 2034.

Fair Value of Other Financial Instruments

The Company's accounts receivable, accounts payable and variable interest rate debt are recorded at cost, which approximates fair value due to their short-term nature. The carrying value of the Company's fixed interest rate debt was $1.0 billion and $510 million at December 31, 2019 and 2018, respectively. The fair value of the Company's fixed interest rate debt was estimated using discounted cash flow models, based on estimated current rates offered for similar debt under current market conditions for the Company. The fair value of the Company's fixed interest rate debt was estimated to be $1.0 billion and $502 million at December 31, 2019 and 2018, respectively, using Level 2 inputs.

Derivative Transactions

The Company is a global company that operates in over 35 countries and, as a result, the Company's net sales, cost of sales, operating expenses and balance sheet amounts are significantly impacted by fluctuations in foreign currency exchange rates. The Company is exposed to currency price risk on foreign currency exchange rate fluctuations when it translates its non-U.S. dollar foreign subsidiaries' financial statements into U.S. dollars and when any of the Company's subsidiaries purchase or sell products or services in a currency other than its own currency.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The Company's principal strategies in managing exposures to changes in foreign currency exchange rates are to (1) naturally hedge the foreign-currency-denominated liabilities on the Company's balance sheet against corresponding assets of the same currency, such that any changes in liabilities due to fluctuations in foreign currency exchange rates are typically offset by corresponding changes in assets and (2) mitigate foreign exchange risk exposure of international operations by hedging the variability in the movement of foreign currency exchange rates on a portion of its Euro-denominated net asset investments. The Company presents the derivative transactions in financing activities in the statement of cash flows.

Foreign Currency Exchange Contracts

The Company does not specifically enter into any derivatives that hedge foreign-currency-denominated operating assets, liabilities or commitments on its balance sheet, other than a portion of certain third-party accounts receivable and accounts payable, and the Company's net worldwide intercompany receivables and payables, which are eliminated in consolidation. The Company periodically aggregates its net worldwide balances by currency and then enters into foreign currency exchange contracts that mature within 90 days to hedge a portion of the remaining balance to minimize some of the Company's currency price risk exposure. The foreign currency exchange contracts are not designated for hedge accounting treatment. Principal hedged currencies include the Euro, Japanese yen, British pound, Mexican peso and Brazilian real.

Interest Rate Cross-Currency Swap Agreements

As of Decem b er 31, 2019 , the Company has entered into three-year interest rate cross-currency swap derivative agreements with a notional value of $560 million to hedge the variability in the movement of foreign currency exchange rates on a portion of its Euro-denominated net asset investments. Under hedge accounting, the change in fair value of the derivative that relates to changes in the foreign currency spot rate are recorded in the currency translation adjustment in other comprehensive income and remain in accumulated comprehensive income in stockholders' (deficit) equity until the sale or substantial liquidation of the foreign operation. The difference between the interest rate received and paid under the interest rate cross-currency swap derivative agreement is recorded in interest income in the statement of operations.

The Company's foreign currency exchange contracts and interest rate cross-currency swap agreements included in the consolidated balance sheets are classified as follows (in thousands):

	December 31, 2019		December 31, 2018	
	Notional Value	Fair Value	Notional Value	Fair Value
Foreign currency exchange contracts:				
Other current assets	$ 119,576	$ 16	$ 112,212	$ 503
Other current liabilities	$ 29,495	$ 1,028	$ 40,175	$ 224
Interest rate cross-currency swap agreements:				
Other assets	$ 560,000	$ 4,485	$ 300,000	$ 1,093
Accumulated other comprehensive income		$ (4,485)		$ (1,093)

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The following is a summary of the activity included in the statements of comprehensive income related to the foreign currency exchange contracts (in thousands):

	Financial Statement Classification	Year Ended December 31, 2019	2018	2017
Foreign currency exchange contracts:				
Realized (losses) gains on closed contracts	Cost of sales	$ (3,552)	$(6,684)	$3,894
Unrealized (losses) gains on open contracts	Cost of sales	(1,292)	(105)	1,054
Cumulative net pre-tax (losses) gains	Cost of sales	$ (4,844)	$(6,789)	$4,948
Interest rate cross-currency swap agreements:				
Interest earned	Interest income	$11,709	$ 2,713	$ —
Unrealized gains on open contracts	Stockholders' (deficit) equity	$ 4,485	$ 1,093	$ —

Stockholders' (Deficit) Equity

In January 2019, the Company's Board of Directors authorized the Company to repurchase up to $4 billion of its outstanding common stock over a two-year period. During 2019, 2018 and 2017, the Company repurchased 11.1 million, 6.8 million and 1.8 million shares of the Company's outstanding common stock at a cost of $2.5 billion, $1.3 billion and $323 million, respectively, under the January 2019 authorization and other previously announced programs. In addition, the Company repurchased $8 million, $10 million and $10 million of common stock related to the vesting of restricted stock units during the years ended December 31, 2019, 2018 and 2017, respectively. As of December 31, 2019, the Company has a total of $1.7 billion authorized for future repurchases.

The Company accrued $20 million and $23 million at December 31, 2019 and 2018, respectively, as a result of treasury stock purchases that were unsettled. These transactions were settled in January 2020 and 2019, respectively.

Product Warranty Costs

The Company accrues estimated product warranty costs at the time of sale, which are included in cost of sales in the consolidated statements of operations. While the Company engages in extensive product quality programs and processes, including actively monitoring and evaluating the quality of its component suppliers, the Company's warranty obligation is affected by product failure rates, material usage and service delivery costs incurred in correcting a product failure. The amount of the accrued warranty liability is based on historical information, such as past experience, product failure rates, number of units repaired and estimated costs of material and labor. The liability is reviewed for reasonableness at least quarterly.

The following is a summary of the activity of the Company's accrued warranty liability for the years ended December 31, 2019, 2018 and 2017 (in thousands):

	Balance at Beginning of Period	Accruals for Warranties	Settlements Made	Balance at End of Period
Accrued warranty liability:				
December 31, 2019	$ 12,300	$ 7,540	$ (7,876)	$ 11,964
December 31, 2018	$ 13,026	$ 5,033	$ (5,759)	$ 12,300
December 31, 2017	$ 13,391	$ 8,746	$ (9,111)	$ 13,026

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Advertising Costs

All advertising costs are expensed as incurred and are included in selling and administrative expenses in the consolidated statements of operations. Advertising expenses were $6 million, $7 million and $6 million for 2019, 2018 and 2017, respectively.

Research and Development Expenses

Research and development expenses are comprised of costs incurred in performing research and development activities, including salaries and benefits, facilities costs, overhead costs, contract services and other outside costs. Research and development expenses are expensed as incurred. During 2017, the Company incurred a $ 5 million charge for acquired in-process research and development related to the licensing of certain intellectual property relating to mass spectrometry technologies yet to be commercialized and for which there was no future alternative use as of the acquisition date. These licensing arrangements are significantly related to new, biologically-focused applications, as well as other applications, and require the Company to make additional future payments of up to $7 million if certain milestones are achieved, as well as royalties on future net sales.

Stock-Based Compensation

The Company has two stock-based compensation plans, which are described in Note 14, “Stock-Based Compensation”.

Earnings Per Share

In accordance with the earnings per share accounting standards, the Company presents two earnings per share (“EPS”) amounts. Income per basic common share is based on income available to common shareholders and the weighted-average number of common shares outstanding during the periods presented. Income per diluted common share includes additional dilution from potential common stock, such as stock issuable pursuant to the exercise of stock options outstanding.

Retirement Plans

The Company sponsors various retirement plans, which are described in Note 17, “Retirement Plans”.

Comprehensive Income

The Company accounts for comprehensive income in accordance with the accounting standards for comprehensive income, which establish the accounting rules for reporting and displaying comprehensive income. These standards require that all components of comprehensive income be reported in a financial statement that is displayed with the same prominence as other financial statements.

Subsequent Events

In January 2020, the Company made organizational changes to better align its resources with its growth and innovation strategies, resulting in a worldwide workforce reduction, impacting 3% of the Company’s employees. The Company expects to incur approximately $25 million of severance-related costs, lease termination costs and other related costs during 2020.

In January 2020, the Company entered into a definitive agreement to acquire Andrew Alliance, an innovator in specialty laboratory automation technology, including software and robotics for approximately $80 million. This acquisition is not expected to have a material effect on the Company sales and expenses in 2020.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Recently Adopted Accounting Standards

In February 2016, accounting guidance was issued regarding the accounting for leases. This new comprehensive lease standard amends various aspects of existing accounting guidance for leases. The core principle of the new guidance requires lessees to present the assets and liabilities that arise from leases on their balance sheets. This guidance was effective for annual and interim reporting periods beginning after December 15, 2018. The Company has adopted this standard using a modified retrospective transition approach to be applied to leases existing as of, or entered into after, January 1, 2019. The adoption of this standard did have a material effect on the Company's balance sheet by recording a right-of-use lease asset and lease liabilities in the amount $100 million as of January 1, 2019; however, it did not have a material impact on the Company's results of operations, cash flows and retained earnings.

In March 2017, accounting guidance was issued to amend the amortization period for certain purchased callable debt securities held at a premium. Specifically, the amortization period for certain callable debt securities was shortened to end at the earliest call date. This guidance was effective for annual and interim periods beginning after December 15, 2018. The Company adopted this standard as of January 1, 2019 and the adoption of this standard did not have a material impact on the Company's financial position, results of operations and cash flows.

In February 2018, accounting guidance was issued to address the impact of the 2017 Tax Act on items recorded in accumulated other comprehensive income. Current accounting guidance requires deferred tax liabilities and assets to be adjusted for the effect of a change in tax laws or rates with the effect recorded in income from continuing operations, even if the related tax effects were originally recognized in other comprehensive income, the new guidance allows a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the 2017 Tax Act. This guidance was effective for annual and interim periods beginning after December 15, 2018. The Company adopted this standard as of January 1, 2019 and the adoption of this standard did not have a material impact on the Company's financial position, results of operations and cash flows.

In August 2018, accounting guidance was issued to address the capitalization of implementation costs associated with hosting arrangements that meet the definition of a service contract. The new guidance clarified that the internal-use software capitalization guidance should be used to determine when implementation costs are capitalizable. This guidance is effective for annual and interim periods beginning after December 15, 2019 and early adoption is permitted. The Company elected to prospectively adopt this guidance as of January 1, 2019 and the adoption of this standard did not have a material impact on the Company's financial position, results of operations and cash flows.

Recently Issued Accounting Standards

In June 2016, accounting guidance was issued that modifies the recognition of credit losses related to financial assets, such as debt securities, trade receivables, net investments in leases, off-balance sheet credit exposures, and other financial assets that have the contractual right to receive cash. Current guidance requires the recognition of a credit loss when it is considered probable that a loss event has occurred. The new guidance requires the measurement of expected credit losses to be based upon relevant information, including historical experience, current conditions, and reasonable and supportable forecasts that affect the collectability of the asset. As such, expected credit losses may be recognized sooner under the new guidance due to the broader range of information that will be required to determine credit loss estimates. The new guidance also amends the current other-than-temporary impairment model used for debt securities classified as available-for-sale. When the fair value of an available-for-sale debt security is below its amortized cost, the new guidance requires the total unrealized loss to be bifurcated into its credit and non-credit components. Any expected credit losses or subsequent recoveries will

be recognized in earnings and any changes not considered credit related will continue to be recognized within other comprehensive income. This guidance is effective for annual and interim periods beginning after December 15, 2019. The Company currently does not expect that the adoption of this standard will have a material effect on the Company's financial position, results of operations and cash flows.

In January 2017, accounting guidance was issued that simplifies the accounting for goodwill impairment. The guidance eliminates step 2 of the goodwill impairment test, which requires a hypothetical purchase price allocation. This guidance is effective for annual and interim periods beginning after December 15, 2019 and early adoption is permitted. The Company currently does not expect that the adoption of this standard will have a material effect on the Company's financial position, results of operations and cash flows.

In August 2018, accounting guidance was issued that modifies the disclosure requirements of fair value measurements. The amendments remove disclosures that are no longer considered cost beneficial, clarify the specific requirements of disclosure and add disclosure requirements identified as relevant. This guidance is effective for annual and interim periods beginning after December 15, 2019 and early adoption is permitted. The Company does not expect that the adoption of this standard will have a material impact on the Company's financial position, results of operations and cash flows.

In August 2018, accounting guidance was issued that modifies the disclosure requirements of retirement benefit plans. The amendments remove disclosures that are no longer considered cost beneficial, clarify the specific requirements of disclosure and add disclosure requirement identified as relevant. This guidance is effective for annual and interim periods beginning after December 15, 2020 and early adoption is permitted. The Company does not expect that the adoption of this standard will have a material impact on the Company's financial position, results of operations and cash flows.

In December 2019, accounting guidance was issued that simplifies the accounting for income taxes by removing certain exceptions within the current guidance; including the approach for intraperiod tax allocation, the methodology for calculating income taxes in an interim period, and the recognition of deferred tax liabilities for outside basis differences. The amendment also improves consistent application by clarifying and amending existing guidance related to aspects of the accounting for franchise taxes and enacted changes in tax laws or rates and clarifies the accounting for transactions that result in a step up in the tax basis of goodwill. This guidance is effective for annual and interim periods beginning after December 15, 2020 and early adoption is permitted. The Company does not expect that the adoption of this standard will have a material impact on the Company's financial position, results of operations and cash flows.

3 Revenue Recognition

The Company adopted new accounting guidance regarding the recognition of revenue from contracts with customers as of January 1, 2018 and applied the modified-retrospective method. The Company elected the practical expedient and only evaluated the contracts that were considered incomplete as of January 1, 2018 when quantifying the cumulative effect adjustment under the modified retrospective method. Ultimately, the Company determined that there was not a significant change in the timing or pattern of revenue recognition for the Company's products and services. The adoption of this standard did not have a material impact on the Company's financial position, results of operations or cash flows and, as such, did not require any adjustments to information reported in the prior year. The revenue recognition policies described below were effective as of January 1, 2018.

The Company recognizes revenue upon transfer of control of promised products and services to customers in an amount that reflects the consideration the Company expects to receive in exchange for those products or services. The Company generally enters into contracts that include a combination of products and services. Revenue is allocated to distinct performance obligations and is recognized net of allowances for returns and discounts.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The Company recognizes revenue on product sales at the time control of the product transfers to the customer. In substantially all of the Company's arrangements, title of the product transfers at shipping point and, as a result, the Company determined control transfers at the point of shipment. In more limited cases, there are destination-based shipping terms and, thus, control is deemed to transfer when the products arrive at the customer site. All incremental costs of obtaining a contract are expensed as and when incurred if the expected amortization period of the asset that would have been recognized is one year or less. Shipping and handling costs are included as a component of cost of sales. In situations where the control of the goods transfers prior to the completion of the Company's obligation to ship the products to its customers, the Company has elected the practical expedient to account for the shipping services as a fulfillment cost. Accordingly, such costs are recognized when control of the related goods is transferred to the customer. In more rare situations, the Company has revenue associated with products that contain specific customer acceptance criteria and the related revenue is not recognized before the customer acceptance criteria are satisfied. The Company elected to exclude from the measurement of the transaction price all taxes assessed by a governmental authority that are both imposed on and concurrent with specific revenue-producing transactions and collected by the Company from a customer.

Generally, the Company's contracts for products include a performance obligation related to installation. The Company has determined that the installation represents a distinct performance obligation and revenue is recognized separately upon the completion of installation. The Company determines the amount of the transaction price to allocate to the installation service based on the standalone selling price of the product and the service, which requires judgment. The Company determines the relative standalone selling price of installation based upon a number of factors, including hourly service billing rates and estimated installation hours. In developing these estimates, the Company considers past history, competition, billing rates of current services and other factors.

The Company has sales from standalone software, which are included in instrument systems revenue. These arrangements typically include software licenses and maintenance contracts, both of which the Company has determined are distinct performance obligations. The Company determines the amount of the transaction price to allocate to the license and maintenance contract based on the relative standalone selling price of each performance obligation. Software license revenue is recognized at the point in time when control has been transferred to the customer. The revenue allocated to the software maintenance contract is recognized on a straight-line basis over the maintenance period, which is the contractual term of the contract, as a time-based measure of progress best reflects the Company's performance in satisfying this obligation. Unspecified rights to software upgrades are typically sold as part of the maintenance contract on a when-and-if-available basis.

Payment terms and conditions vary among the Company's revenue streams, although terms generally include a requirement of payment within 30 to 60 days of product shipment. Prior to providing payment terms to customers, an evaluation of their credit risk is performed. Returns and customer credits are infrequent and insignificant and are recorded as a reduction to sales. Rights of return are not included in sales arrangements and, therefore, there is minimal variable consideration included in the transaction price of our products.

Service revenue includes (1) service and software maintenance contracts and (2) service calls (time and materials). Instrument service contracts and software maintenance contracts are typically annual contracts, which are billed at the beginning of the contract or maintenance period. The amount of the service and software maintenance contract is recognized on a straight-line basis to revenue over the maintenance service period, which is the contractual term of the contract, as a time-based measure of progress best reflects the Company's performance in satisfying this obligation. There are no deferred costs associated with the service contract, as the cost of the service is recorded when the service is performed. Service calls are recognized to revenue at the time a service is performed.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The Company's deferred revenue liabilities on the consolidated balance sheets consist of the obligation on instrument service contracts and customer payments received in advance, prior to transfer of control of the instrument. The Company records deferred revenue primarily related to its service contracts, where consideration is billable at the beginning of the service period.

The following is a summary of the activity of the Company's deferred revenue and customer advances for the year ended December 31, 2019, 2018 and 2017 (in thousands):

	December 31,		
	2019	2018	2017
Balance at the beginning of the period	$ 204,257	$ 192,589	$ 173,780
Recognition of revenue included in balance at beginning of the period	(176,981)	(159,258)	(143,589)
Revenue deferred during the period, net of revenue recognized	186,419	170,926	162,398
Balance at the end of the period	$ 213,695	$ 204,257	$ 192,589

The Company classified $ 38 million and $ 39 million of deferred revenue and customer advances in other long-term liabilities at December 31, 2019 and 2018, respectively.

The amount of deferred revenue and customer advances equals the transaction price allocated to unfulfilled performance obligations for the period presented. Such amounts are expected to be recognized in the future as follows (in thousands):

	December 31, 2019
Deferred revenue and customer advances expected to be recognized in:	
One year or less	$ 176,360
13-24 months	21,029
25 months and beyond	16,306
Total	$ 213,695

4 Marketable Securities

The Company's marketable securities within cash equivalents and investments included in the consolidated balance sheets are detailed as follows (in thousands):

	December 31, 2019			
	Amortized Cost	Unrealized Gain	Unrealized Loss	Fair Value
Time deposits	$ 1,642	$ —	$ —	$ 1,642
Total	$ 1,642	$ —	$ —	$ 1,642
Amounts included in:				
Cash equivalents	$ 213	$ —	$ —	$ 213
Investments	1,429	—	—	1,429
Total	$ 1,642	$ —	$ —	$ 1,642

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

	December 31, 2018			
	Amortized Cost	Unrealized Gain	Unrealized Loss	Fair Value
U.S. Treasury securities	$ 164,619	$ 16	$ (320)	$ 164,315
Foreign government securities	3,486	1	(24)	3,463
Corporate debt securities	725,778	41	(2,760)	723,059
Time deposits	108,638	—	—	108,638
Total	$ 1,002,521	$ 58	$ (3,104)	$ 999,475
Amounts included in:				
Cash equivalents	$ 60,532	$ —	$ (1)	$ 60,531
Investments	941,989	58	(3,103)	938,944
Total	$ 1,002,521	$ 58	$ (3,104)	$ 999,475

The estimated fair value of marketable debt securities by maturity date is as follows (in thousands):

	December 31, 2019	December 31, 2018
Due in one year or less	$ 1,642	$ 797,649
Due after one year through three years	—	201,826
Total	$ 1,642	$ 999,475

Net realized gains and losses on sales of investments were not material in 2019, 2018 and 2017.

5 Inventories

Inventories are classified as follows (in thousands):

	December 31, 2019	December 31, 2018
Raw materials	$ 126,850	$ 111,641
Work in progress	15,457	15,552
Finished goods	178,244	164,376
Total inventories	$ 320,551	$ 291,569

During 2019, 2018 and 2017, the Company recorded inventory-related excess and obsolescence provisions of $13 million, $8 million and $2 million, respectively.

6 Property, Plant and Equipment

Property, plant and equipment consist of the following (in thousands):

	December 31,	
	2019	2018
Land and land improvements	$ 37,040	$ 36,554
Buildings and leasehold improvements	355,425	299,103
Production and other equipment	537,211	494,302
Construction in progress	57,985	41,909
Total property, plant and equipment	987,661	871,868
Less: accumulated depreciation and amortization	(570,319)	(528,785)
Property, plant and equipment, net	$ 417,342	$ 343,083

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

In February 2018, the Company's Board of Directors approved expanding its precision chemistry consumable manufacturing operations in the U.S. The Company anticipates spending an estimated $215 million to build and equip this new state-of-the-art manufacturing facility, and has spent $85 million on this facility through December 31, 2019.

During 2019, 2018 and 2017, the Company retired and disposed of approximately $11 million, $9 million and $15 million of property, plant and equipment, respectively, most of which was fully depreciated and no longer in use. Gains on disposals were immaterial for the years ended December 31, 2019, 2018 and 2017.

7 Acquisitions

In July 2018, the Company acquired the sole intellectual property rights to the Desorption Electrospray Ionization ("DESI") imaging technology for $30 million in cash and a future contractual obligation to pay a minimum royalty of $3 million over the remaining life of the patent. DESI is a mass spectrometry imaging technique that is used to develop medical therapies. The Company accounted for this transaction as an asset acquisition as it did not meet the definition of a business. The Company allocated $33 million of fair value to a purchased intangible asset which will be amortized over the useful life of 12 years.

In each acquisition, the sellers provided the Company with customary representations, warranties and indemnification, which would be settled in the future if and when a breach of the contractual representation or warranty condition occurs. The pro forma effect of the ongoing operations for Waters Corporation and the DESI imaging technology, either individually or in the aggregate, as though this acquisition had occurred at the beginning of the periods covered by this report was immaterial.

8 Goodwill and Other Intangibles

The carrying amount of goodwill was $356 million at both December 31, 2019 and 2018.

The Company's intangible assets included in the consolidated balance sheets are detailed as follows (dollars in thousands):

	December 31, 2019			December 31, 2018		
	Gross Carrying Amount	Accumulated Amortization	Weighted-Average Amortization Period	Gross Carrying Amount	Accumulated Amortization	Weighted-Average Amortization Period
Capitalized software	$481,986	$ 333,255	5 years	$454,307	$ 307,634	5 years
Purchased intangibles	200,523	151,722	11 years	201,566	144,184	11 years
Trademarks and IPR&D	13,782	—	—	13,677	—	—
Licenses	5,669	5,298	6 years	5,568	4,875	6 years
Patents and other intangibles	83,035	54,517	8 years	77,753	49,276	8 years
Total	$784,995	$ 544,792	7 years	$752,871	$ 505,969	7 years

The gross carrying value of intangible assets and accumulated amortization for intangible assets decreased by $12 million and $11 million, respectively, in the year ended December 31, 2019 due to the effects of foreign currency translation. Amortization expense for intangible assets was $51 million, $50 million and $45 million for the years ended December 31, 2019, 2018 and 2017, respectively. Amortization expense for intangible assets is estimated to be $52 million per year for each of the next five years.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

9 Debt

In September 2019, the Company issued the following senior unsecured notes:

Senior Unsecured Notes	Term	Interest Rate	Face Value (in millions)	Maturity Date
Series L	7 years	3.31%	$ 200	September 2026
Series M	10 years	3.53%	$ 300	September 2029

The Company used the proceeds from the issuance of these senior unsecured notes to repay other outstanding debt and for general corporate purposes. Interest on the Series L and M Senior Notes is payable semi-annually. The Company may prepay some or all of the Senior Notes at any time in an amount not less than 10% of the aggregate principal amount of the Senior Notes then outstanding, plus the applicable make-whole amount for Series L and M Senior Notes, in each case, upon no more than 60 nor less than 20 days' written notice to the holders of the Senior Notes. In the event of a change in control (as defined in the note purchase agreement) of the Company, the Company may be required to prepay the Senior Notes at a price equal to 100% of the principal amount thereof, plus accrued and unpaid interest. Other provisions for these senior unsecured notes are similar to the existing senior unsecured notes, as described below.

In November 2017, the Company entered into a credit agreement (the "2017 Credit Agreement") that provides for a $1.5 billion revolving facility and a $300 million term loan. The revolving facility and term loan both mature on November 30, 2022 and require no scheduled prepayments before that date.

The interest rates applicable to the 2017 Credit Agreement are, at the Company's option, equal to either the alternate base rate (which is a rate per annum equal to the greatest of (1) the prime rate in effect on such day, (2) the Federal Reserve Bank of New York Rate on such day plus 1/2 of 1% per annum and (3) the adjusted LIBO rate on such day (or if such day is not a business day, the immediately preceding business day) for a deposit in U.S. dollars with a maturity of one month plus 1% per annum) or the applicable 1, 2, 3 or 6 month adjusted LIBO rate or EURIBO rate for Euro-denominated loans, in each case, plus an interest rate margin based upon the Company's leverage ratio, which can range between 0 and 12.5 basis points for alternate base rate loans and between 80 and 112.5 basis points for LIBO rate or EURIBO rate loans. The facility fee on the 2017 Credit Agreement ranges between 7.5 and 25 basis points per annum, based on the leverage ratio, of the amount of the revolving facility commitments and the outstanding term loan. The 2017 Credit Agreement requires that the Company comply with an interest coverage ratio test of not less than 3.50:1 as of the end of any fiscal quarter for any period of four consecutive fiscal quarters and a leverage ratio test of not more than 3.50:1 as of the end of any fiscal quarter. In addition, the 2017 Credit Agreement includes negative covenants, affirmative covenants, representations and warranties and events of default that are customary for investment grade credit facilities.

As of December 31, 2019 and 2018, the Company had a total of $1.1 billion and $560 million, respectively, of outstanding senior unsecured notes. Interest on the fixed rate senior unsecured notes is payable semi-annually each year. Interest on the floating rate senior unsecured notes is payable quarterly. The Company may prepay all or some of the senior unsecured notes at any time in an amount not less than 10% of the aggregate principal amount outstanding, plus the applicable make-whole amount or prepayment premium for the Series H senior unsecured note. In the event of a change in control of the Company (as defined in the note purchase agreement), the Company may be required to prepay the senior unsecured notes at a price equal to 100% of the principal amount thereof, plus accrued and unpaid interest. These senior unsecured notes require that the Company comply with an interest coverage ratio test of not less than 3.50:1 for any period of four consecutive fiscal quarters and a leverage ratio test of not more than 3.50:1 as of the end of any fiscal quarter. In addition, these senior unsecured notes include customary negative covenants, affirmative covenants, representations and warranties and events of default.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

In February 2019, certain defined terms related to the subsidiary guarantors were amended in the 2017 Credit Agreement and senior unsecured note agreements. In addition, the Company amended the senior unsecured note agreements to allow the Company to elect an increase in the permitted leverage ratio from 3.50:1 to 4.0:1, for a period of three consecutive quarters, for a material acquisition of $400 million or more. During the period of time where the leverage ratio exceeds 3.50:1, the interest payable on the senior unsecured notes shall increase by 0.50%. The debt covenants in the senior unsecured note agreements were also modified to address the change in accounting guidance for leases.

As of December 31, 2019, the Company has entered into three-year interest rate cross-currency swap derivative agreements with a notional value of $560 million to hedge the variability in the movement of foreign currency exchange rates on a portion of its Euro-denominated net asset investments.

The Company had the following outstanding debt at December 31, 2019 and 2018 (in thousands):

	December 31, 2019	December 31, 2018
Foreign subsidiary lines of credit	$ 366	$ 178
Senior unsecured notes - Series B - 5.00%, due February 2020	100,000	—
Total notes payable and debt, current	100,366	178
Senior unsecured notes - Series B - 5.00%, due February 2020	—	100,000
Senior unsecured notes - Series E - 3.97%, due March 2021	50,000	50,000
Senior unsecured notes - Series F - 3.40%, due June 2021	100,000	100,000
Senior unsecured notes - Series G - 3.92%, due June 2024	50,000	50,000
Senior unsecured notes - Series H - floating rate*, due June 2024	50,000	50,000
Senior unsecured notes - Series I - 3.13%, due May 2023	50,000	50,000
Senior unsecured notes - Series K - 3.44%, due May 2026	160,000	160,000
Senior unsecured notes - Series L - 3.31%, due September 2026	200,000	—
Senior unsecured notes - Series M - 3.53%, due September 2029	300,000	—
Credit agreement	625,000	590,000
Unamortized debt issuance costs	(4,203)	(1,828)
Total long-term debt	1,580,797	1,148,172
Total debt	$ 1,681,163	$ 1,148,350

* Series H senior unsecured notes bear interest at a 3-month LIBOR for that floating rate interest period plus 1.25%.

As of both December 31, 2019 and 2018, the Company had a total amount available to borrow under the 2017 Credit Agreement of $1.2 billion after outstanding letters of credit. The weighted-average interest rates applicable to the senior unsecured notes and credit agreement borrowings collectively were 3.39% and 3.83% at December 31, 2019 and 2018, respectively. As of December 31, 2019, the Company was in compliance with all debt covenants.

The Company and its foreign subsidiaries also had available short-term lines of credit totaling $105 million and $90 million at December 31, 2019 and 2018, respectively, for the purpose of short-term borrowing and issuance of commercial guarantees. The weighted-average interest rates applicable to these short-term borrowings were 1.48% and 1.88% for December 31, 2019 and 2018, respectively.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Annual maturities of debt outstanding at December 31, 2019 are as follows (in thousands):

	Total
2020	$ 100,366
2021	150,000
2022	625,000
2023	50,000
2024	100,000
Thereafter	660,000
Total	$1,685,366

10 Income Taxes

Income tax data for the years ended December 31, 2019, 2018 and 2017 is as follows (in thousands):

	Year Ended December 31,		
	2019	2018	2017
The components of income from operations before income taxes are as follows:			
Domestic	$ 97,325	$ 57,822	$ 55,751
Foreign	580,914	624,324	585,346
Total	$ 678,239	$ 682,146	$ 641,097

	Year Ended December 31,		
	2019	2018	2017
The components of the income tax provision from operations were as follows:			
Federal	$ 7,009	$ 27,277	$ 499,828
State	3,329	(11,964)	21,163
Foreign	66,083	70,634	54,285
Total current tax provision	$ 76,421	$ 85,947	$ 575,276
Federal	$ 6,913	$ (3,256)	$ 35,949
Stat e	1,253	2,247	5,398
Foreign	1,454	3,414	4,163
Total deferred tax provision	9,620	2,405	45,510
Total provision	$ 86,041	$ 88,352	$ 620,786

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The differences between income taxes computed at the United States statutory rate and the provision for income taxes are summarized as follows for the years ended December 31, 2019, 2018 and 2017 (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Federal tax computed at U.S. statutory income tax rate	$ 142,430	$ 143,251	$ 224,384
Enactment of the 2017 Tax Cuts and Jobs Act	—	(6,059)	550,000
Foreign currency exchange impact on distributed earnings	(3,229)	7,495	—
GILTI, net of foreign tax credits	10,523	13,727	—
Settlement of tax audits	—	—	706
State income tax, net of federal income tax benefit	3,459	2,910	1,289
Net effect of foreign operations	(52,727)	(57,003)	(131,694)
Effect of stock-based compensation	(9,211)	(9,089)	(19,566)
Other, net	(5,204)	(6,880)	(4,333)
Provision for income taxes	$ 86,041	$ 88,352	$ 620,786

The Company's effective tax rates were 12.7%, 13.0% and 96.8% for the years ended December 31, 2019, 2018 and 2017, respectively.

The Company's effective income tax rate differs from the U.S. federal statutory rate each year due to differences in the proportionate amounts of pre-tax income recognized in jurisdictions with different effective tax rates and the items discussed below.

The four principal jurisdictions in which the Company manufactures are the U.S., Ireland, the U.K. and Singapore, where the statutory tax rates were 21%, 12.5%, 19% and 17%, respectively, as of December 31, 2019. The Company has a received a tax holiday on qualifying activities in Singapore through March 2021, based upon the achievement of certain contractual milestones, which the Company expects to continue to meet. The effect of applying the 0% contractual tax rate rather than the statutory tax rate to income from qualifying activities in Singapore increased the Company's net income during the years ended December 31, 2019, 2018 and 2017 by $24 million, $28 million and $25 million, respectively, and increased the Company's net income per diluted share by $0.35, $0.36 and $0.31, respectively.

During 2019, the Company's effective tax rate differed from the 21% U.S. statutory tax rate primarily due to the jurisdictional mix of earnings, a $11 million provision related to the GILTI tax and a tax benefit of $9 million on stock-based compensation.

The 2018 effective tax rate differed from the U.S. federal statutory tax rate primarily due to the jurisdictional mix of earnings, a $14 million provision related to the GILTI tax, an $8 million provision for a change in foreign currency exchange rates related to the transition tax, a $9 million benefit related to stock-based compensation and a $6 million net benefit related to the finalization of the impact of the Tax Cuts and Jobs Act (the "2017 Act").

The 2017 effective tax rate of 96.8% differs from the 35% U.S. statutory tax rate primarily due to the 2017 Act and the jurisdictional mix of earnings. As a result of the 2017 Act, for the year ended December 31, 2017, the Company accrued a $550 million tax provision. This provision reduced net income per diluted share by $6.82 in 2017, and the Company's effective tax rate was 11.0% excluding this $550 million provision. During 2017, the Company also had a benefit of $20 million related to stock-based compensation.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Prior to the enactment of the 2017 Act, the Company had an indefinite reinvestment assertion on a significant portion of its undistributed earnings from foreign subsidiaries. At the end of 2018, and as a result of the enactment of the 2017 Act, the Company reevaluated its historic assertion and no longer considered these earnings to be indefinitely reinvested in its foreign subsidiaries. The Company recorded a tax provision of $3 million and $4 million for 2019 and 2018, respectively, for future withholding taxes and U.S. state taxes on repatriation of 2019 and 2018 undistributed earnings.

The tax effects of temporary differences and carryforwards which give rise to deferred tax assets and deferred tax liabilities are summarized as follows (in thousands):

	December 31,	
	2019	2018
Deferred tax assets:		
Net operating losses and credits	$ 55,939	$ 63,052
Depreciation	4,776	7,495
Operating leases	19,849	—
Amortization	3,738	3,633
Stock-based compensation	9,790	9,984
Deferred compensation	20,077	22,058
Unrealized foreign currency gain/loss	7,955	5,881
Deferred revenue	9,696	4,654
Revaluation of equity investments and licenses	3,424	3,148
Inventory	4,824	4,588
Accrued liabilities and reserves	7,215	7,213
Other	3,839	4,073
Total deferred tax assets	151,122	135,779
Valuation allowance	(51,221)	(53,893)
Deferred tax assets, net of valuation allowance	99,901	81,886
Deferred tax liabilities:		
Capitalized software	(21,025)	(19,491)
Operating leases	(19,553)	—
Indefinite-lived intangibles	(14,363)	(13,753)
Deferred tax liability on foreign earning s	(18,027)	(20,443)
Total deferred tax liabilities	(72,968)	(53,687)
Net deferred tax assets	$ 26,933	$ 28,199

The Company has gross foreign net operating losses of $221 million that do not expire under current laws. As of December 31, 2019, the Company has provided a deferred tax valuation allowance of $51 million, of which $48 million relates to certain foreign net operating losses. The Company's net deferred tax assets associated with net operating losses and tax credit carryforwards are approximately $8 million as of December 31, 2019, which represent the future tax benefit of foreign net operating loss carryforwards that do not expire under current law.

The Company adopted new accounting guidance which eliminates the deferral of tax effects on intra-entity transfers other than inventory and requires an entity to recognize the income tax consequences when the transfer occurs. The Company adopted this standard as of January 1, 2018 with a $4 million charge to beginning retained earnings in the consolidated balance sheet.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The Company accounts for its uncertain tax return reporting positions in accordance with the accounting standards for income taxes, which require financial statement reporting of the expected future tax consequences of uncertain tax reporting positions on the presumption that all concerned tax authorities possess full knowledge of those tax reporting positions, as well as all of the pertinent facts and circumstances, but prohibit any discounting of unrecognized tax benefits associated with those reporting positions for the time value of money. The Company continues to classify interest and penalties related to unrecognized tax benefits as a component of the provision for income taxes.

The following is a summary of the activity of the Company's gross unrecognized tax benefits, excluding interest and penalties, for the year ended December 31, 2019, 2018 and 2017 (in thousands):

	2019	2018	2017
Balance at the beginning of the period	$26,108	$ 5,843	$ 9,964
Net reductions for settlement of tax audits	—	—	(22)
Net reductions for lapse of statutes taken during the period	(261)	(436)	(5,178)
Net additions for tax positions taken during the prior period	—	17,651	—
Net additions for tax positions taken during the current period	1,943	3,050	1,079
Balance at the end of the period	$27,790	$26,108	$ 5,843

As of 2019, the total amount of gross unrecognized tax benefits was $28 million, all of which, if recognized, would impact the Company's effective tax rate.

With limited exceptions, the Company is no longer subject to tax audit examinations in significant jurisdictions for the years ended on or before December 31, 2014. The Company continuously monitors the lapsing of statutes of limitations on potential tax assessments for related changes in the measurement of unrecognized tax benefits, related net interest and penalties and deferred tax assets and liabilities.

As of December 31, 2019, the Company expects to record additional reductions in the measurement of its unrecognized tax benefits and related net interest and penalties of approximately $1 million within the next twelve months due to potential tax audit settlements and the lapsing of statutes of limitations on potential tax assessments. The Company does not expect to record any other material reductions in the measurement of its unrecognized tax benefits within the next twelve months.

As of December 31, 2019, the Company is currently under an income tax audit in the U.S. for its 2016 tax year. The Company is also subject to various foreign audits and inquiries and we currently do not expect any material adjustments.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The following is a summary of the activity of the Company's valuation allowance for the years ended December 31, 2019, 2018 and 2017 (in thousands):

	Balance at Beginning of Period	Charged to Provision for Income Taxes*	Other**	Balance at End of Period
Valuation allowance for deferred tax assets:				
2019	$ 53,893	$ (1,242)	$(1,430)	$ 51,221
2018	$ 62,098	$ (2,128)	$(6,077)	$ 53,893
201 7	$ 61,225	$ (6,363)	$ 7,236	$ 62,098

* These amounts have been recorded as part of the income statement provision for income taxes. The income statement effects of these amounts have largely been offset by amounts related to changes in other deferred tax balance sheet accounts.

** The change in the valuation allowance during the year ended December 31, 2019 is primarily due to the effect of foreign currency translation on a valuation allowance related to a net operating loss carryforward. The change in the valuation allowance during the year ended December 31, 2018 was primarily due to the write-off of a valuation allowance to Retained Earnings for the tax effect related to intra-entity transfers. The change in the valuation allowance during the year ended December 31, 2017 was primarily due to the effect of foreign currency translation on a valuation allowance related to a net operating loss carryforward.

11 Litigation

From time to time, the Company and its subsidiaries are involved in various litigation matters arising in the ordinary course of business. The Company believes it has meritorious arguments in its current litigation matters and believes any outcome, either individually or in the aggregate, will not be material to the Company's financial position, results of operations or cash flows. During the year ended December 31, 2017, the Company incurred $11 million of litigation provisions and related costs, primarily related to the issuance of a verdict in a patent litigation case. In the first quarter of 2018, the Company resolved the case with a final settlement that resulted in a gain of $2 million. The accrued patent litigation expense is in other current liabilities in the consolidated balance sheets at December 31, 2019 and 2018.

12 Leases

The Company adopted new accounting guidance regarding the accounting for leases as of January 1, 2019 using a modified retrospective transition approach that was applied to leases existing as of, or entered into after, January 1, 2019. The Company elected the package of transition provisions available for expired or existing contracts, which allowed the Company to carryforward historical assessments of (1) whether contracts are or contain leases, (2) lease classification and (3) initial direct costs. Upon adoption, the Company recorded a right-of-use lease asset and lease liabilities in the amount $ 100 million as of January 1, 2019. The adoption of this standard did not have a material impact on the Company's results of operations, cash flows and retained earnings.

The Company's operating leases consist of property leases for sales, demonstration, laboratory, warehouse and office spaces, automotive leases for sales and service personnel and equipment leases, primarily used in our manufacturing and distribution operations. The lease policies described below were effective as of January 1, 2019. For leases with terms greater than 12 months, the Company recorded the related right-of-use asset and lease liability obligation at the present value of lease payments over the term of the leases. Some of the Company's leases include rental escalation clauses, renewal options and/or termination options that are factored into our determination of lease payments. A certain number of these leases contain rent escalation clauses, either fixed or adjusted periodically for inflation of market rates, that are factored into the Company's determination of

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

lease payments. The Company also has variable lease payments that do not depend on a rate or index, primarily for items such as real estate taxes and other expenses, which are recorded as variable costs when incurred. Variable costs incurred were not material in 2019.

In addition, the Company's lease agreements that contain lease and non-lease components are generally accounted for as a single lease component. The Company has elected not to apply the recognition requirements of the new accounting guidance to leases with terms less than 12 months. For these leases, the Company recognizes lease payments in net income on a straight-line basis over the term of the lease. Costs incurred related to leases with terms less than 12 months were not material in 2019. As of December 31, 2019 and 2018, the Company does not have leases that are classified as finance leases.

When available, the Company uses the rate implicit in the lease to discount lease payments to determine the present value of the lease liabilities; however, most of the leases do not provide a readily determinable implicit rate and, as required by the accounting guidance, the Company estimated its incremental secured borrowing rate to discount the lease payments based on information available at lease commencement (or, for the leases in existence on the adoption date, the January 1, 2019 information). The Company's incremental borrowing rate reflects the estimated rate of interest that the Company would pay to borrow on a collateralized basis over a similar term to the lease payments in a similar economic environment.

As of December 31, 2019, the Company has lease agreements that expire at various dates through 2034, with a weighted-average remaining lease term of 5.3 years. Rental expense was $36 million for the year ended December 31, 2019 under the new lease accounting standard and $28 million for the year ended December 31, 2018 under the previous lease accounting standard. As of December 31, 2019, the weighted-average discount rate used to determine the present value of lease liabilities was 3.80%. Cash paid for amounts included in the measurement of lease liabilities in operating activities in the statement of cash flows was $36 million during the year ended December 31, 2019. The Company recorded $118 million right-of-use assets in exchange for new operating lease liabilities during the year ended December 31, 2019. The total right-of-use assets recorded during 2019 includes the $100 million right-of-use assets recorded upon adoption as of January 1, 2019.

The Company's right-of-use lease assets and lease liabilities included in the consolidated balance sheets are classified as follows (in thousands):

	Financial Statement Classification	December 31, 2019
Assets:		
Property operating lease assets	Operating lease assets	$ 64,206
Automobile operating lease assets	Operating lease assets	27,197
Equipment operating lease assets	Operating lease assets	1,955
Total lease assets		$ 93,358
Liabilities:		
Current operating lease liabilities	Current operating lease liabilities	$ 27,125
Long-term operating lease liabilities	Long-term operating lease liabilities	66,881
Total lease liabilities		$ 94,006

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Undiscounted future minimum rents payable as of December 31, 2019 under non-cancelable leases with initial terms exceeding one year reconcile to lease liabilities included in the consolidated balance sheet as follows (in thousands):

2020	$ 29,489
2021	21,774
2022	16,743
2023	9,175
2024	6,867
2025 and thereafter	19,311
Total future minimum lease payments	103,359
Less: amount of lease payments representing interest	(9,353)
Present value of future minimum lease payments	94,006
Less: current operating lease liabilities	(27,125)
Long-term operating lease liabilities	$ 66,881

Prior to the adoption of the new lease accounting standard, undiscounted future minimum rents payable as of December 31, 2018 under non-cancelable leases with initial terms exceeding one year were as follows (in thousands):

2019	$ 28,417
2020	23,424
2021	16,032
2022	11,816
2023 and thereafter	23,269
Total future minimum lease payments	$ 102,958

13 Other Commitments and Contingencies

The Company licenses certain technology and software from third parties. Future minimum license fees payable under existing license agreements as of December 31, 2019 are immaterial for the years ended December 31, 2020 and thereafter. The Company enters into licensing arrangements with third parties that require future milestone or royalty payments contingent upon future events. Upon the achievement of certain milestones in existing agreements, the Company could make additional future payments of up to $7 million, as well as royalties on future net sales.

The Company enters into standard indemnification agreements in its ordinary course of business. Pursuant to these agreements, the Company indemnifies, holds harmless and agrees to reimburse the indemnified party for losses suffered or incurred by the indemnified party, generally the Company's business partners or customers, in connection with patent, copyright or other intellectual property infringement claims by any third party with respect to its current products, as well as claims relating to property damage or personal injury resulting from the performance of services by the Company or its subcontractors. The maximum potential amount of future payments the Company could be required to make under these indemnification agreements is unlimited. Historically, the Company's costs to defend lawsuits or settle claims relating to such indemnity agreements have been minimal and management accordingly believes the estimated fair value of these agreements is immaterial.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

14 Stock-Based Compensation

In May 2012, the Company's shareholders approved the Company's 2012 Equity Incentive Plan ("2012 Plan"). As of December 31, 2019, the 2012 Plan has 2.1 million shares available for grant in the form of incentive or non-qualified stock options, stock appreciation rights ("SARs"), restricted stock, restricted stock units, performance stock units or other types of awards. The Company issues new shares of common stock upon exercise of stock options, restricted stock unit conversion or performance stock unit conversion. Under the 2012 Plan, the exercise price for stock options may not be less than the fair market value of the underlying stock at the date of grant. The 2012 Plan is scheduled to terminate on May 9, 2022. Options generally will expire no later than ten years after the date on which they are granted and will become exercisable as directed by the Compensation Committee of the Board of Directors and generally vest in equal annual installments over a five-year period. A SAR may be granted alone or in conjunction with an option or other award. Shares of restricted stock, and restricted stock units and performance stock units may be issued under the 2012 Plan for such consideration as is determined by the Compensation Committee of the Board of Directors. As of December 31, 2019, the Company had stock options, restricted stock and restricted and performance stock unit awards outstanding.

In May 2009, the Company's shareholders approved the 2009 Employee Stock Purchase Plan, under which eligible employees may contribute up to 15 % of their earnings toward the quarterly purchase of the Company's common stock. The plan makes available 0.9 million shares of the Company's common stock, which includes the remaining shares available under the 1996 Employee Stock Purchase Plan. As of December 31, 2019, 1.5 million shares have been issued under both the 2009 and 1996 Employee Stock Purchase Plans. Each plan period lasts three months beginning on January 1, April 1, July 1 and October 1 of each year. The purchase price for each share of stock is the lesser of 90% of the market price on the first day of the plan period or 100% of the market price on the last day of the plan period. Stock-based compensation expense related to this plan was $1 million for each of the years ended December 31, 2019, 2018 and 2017, respectively.

The Company accounts for stock-based compensation costs in accordance with the accounting standards for stock-based compensation, which require that all share-based payments to employees be recognized in the statements of operations, based on their grant date fair values. The Company recognizes the expense using the straight-line attribution method. The stock-based compensation expense recognized in the consolidated statements of operations is based on awards that ultimately are expected to vest; therefore, the amount of expense has been reduced for estimated forfeitures. Forfeitures are estimated based on historical experience. If actual results differ significantly from these estimates, stock-based compensation expense and the Company's results of operations could be materially impacted. In addition, if the Company employs different assumptions in the application of these standards, the compensation expense that the Company records in the future periods may differ significantly from what the Company has recorded in the current period.

The consolidated statements of operations for the years ended December 31, 2019, 2018 and 2017 include the following stock-based compensation expense related to stock option awards, restricted stock awards, restricted stock unit awards, performance stock unit awards and the employee stock purchase plan (in thousands):

	2019	2018	2017
Cost of sales	$ 2,271	$ 2,212	$ 3,032
Selling and administrative expenses	30,907	30,443	33,335
Research and development expenses	5,399	4,886	3,069
Total stock-based compensation	$38,577	$37,541	$39,436

During the years ended December 31, 2019, 2018 and 2017, the Company recognized less than $1 million, $1 million and $4 million of expense, respectively, of stock-based compensation related to the modification of certain stock awards upon the retirement of senior executives.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Stock Options

In determining the fair value of the stock options, the Company makes a variety of assumptions and estimates, including volatility measures, expected yields and expected stock option lives. The fair value of each option grant was estimated on the date of grant using the Black-Scholes option pricing model. The Company uses implied volatility on its publicly-traded options as the basis for its estimate of expected volatility. The Company believes that implied volatility is the most appropriate indicator of expected volatility because it is generally reflective of historical volatility and expectations of how future volatility will differ from historical volatility. The expected life assumption for grants is based on historical experience for the population of non-qualified stock option exercises. The risk-free interest rate is the yield currently available on U.S. Treasury zero-coupon issues with a remaining term approximating the expected term used as the input to the Black-Scholes model. The relevant data used to determine the value of the stock options granted during the year ended December 31, 2019, 2018 and 2017 are as follows:

Options Issued and Significant Assumptions Used to Estimate Option Fair Values	2019	2018	2017
Options issued in thousands	146	321	389
Risk-free interest rate	2.5%	2.7%	2.2%
Expected life in years	5	6	6
Expected volatility	24.5%	25.3%	22.7%
Expected dividends	—	—	—

Weighted-Average Exercise Price and Fair Value of Options on the Date of Grant	2019	2018	2017
Exercise price	$230.37	$196.78	$170.24
Fair value	$ 61.75	$ 59.89	$ 45.73

The following table summarizes stock option activity for the plans for the year ended December 31, 2019 (in thousands, except per share data):

	Number of Shares	Exercise Price per Share			Weighted-Average Exercise Price per Share
Outstanding at December 31, 2018	1,790	$ 38.09	to	$208.47	$ 142.47
Granted	146	$183.41	to	$238.52	$ 230.37
Exercised	(406)	$ 38.09	to	$208.47	$ 113.06
Canceled	(75)	$113.36	to	$238.52	$ 159.67
Outstanding at December 31, 2019	1,455	$ 61.63	to	$238.52	$ 158.61

The following table details the options outstanding at December 31, 2019 by range of exercise prices (in thousands, except per share data):

Exercise Price Range	Number of Shares Outstanding	Weighted-Average Exercise Price	Remaining Contractual Life of Options Outstanding	Number of Shares Exercisable	Weighted-Average Exercise Price
$61.63 to $128.93	529	$ 117.10	5.1	430	$ 114.85
$128.94 to $192.62	520	$ 160.06	7.7	208	$ 149.37
$192.63 to $238.52	406	$ 210.84	8.2	91	$ 196.83
Total	1,455	$ 158.61	6.9	729	$ 134.94

During 2019, 2018 and 2017, the total intrinsic value of the stock options exercised (i.e., the difference between the market price at exercise and the price paid by the employee to exercise the options) was $45 million,

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

$44 million and $76 million, respectively. The total cash received from the exercise of these stock options was $46 million, $45 million and $91 million for the years ended December 31, 2019, 2018 and 2017, respectively.

The aggregate intrinsic value of the outstanding stock options at December 31, 2019 was $110 million. Options exercisable at December 31, 2019, 2018 and 2017 were 0.7 million , 0.8 million and 0.9 million, respectively. The weighted-average exercise prices of options exercisable at December 31, 2019, 2018 and 2017 were $134.94, $117.08 and $103.63, respectively. The weighted-average remaining contractual life of the exercisable outstanding stock options at December 31, 2019 was 6 years. The aggregate intrinsic value of stock options exercisable as of December 31, 2019 was $72 million.

At December 31, 2019, the Company had 1.4 million stock options that are vested and expected to vest. The intrinsic value, weighted-average exercise price and remaining contractual life of the vested and expected to vest stock options were $109 million, $158.33 and 6.9 years, respectively, at December 31, 2019.

As of December 31, 2019, there were $32 million of total unrecognized compensation costs related to unvested stock option awards that are expected to vest. These costs are expected to be recognized over a weighted-average period of 3.2 years.

Restricted Stock

During the years ended December 31, 2019, 2018 and 2017, the Company granted five thousand , five thousand and eight thousand shares of restricted stock, respectively. The weighted-average fair value per share on the grant date of the restricted stock granted in 2019, 2018 and 2017 was $183.41, $194.73 and $130.35, respectively. The Company has recorded $1 million of compensation expense in each of the years ended December 31, 2019, 2018 and 2017 related to the restricted stock grants. As of December 31, 2019, the Company had five thousand unvested shares of restricted stock outstanding, which have been fully expensed.

Restricted Stock Units

The following table summarizes the unvested restricted stock unit award activity for the year ended December 31, 2019 (in thousands, except per share data):

	Shares	Weighted-Average Grant Dat e Fair Value per Share
Unvested at December 31, 2018	304	$ 153.31
Granted	86	$ 235.31
Vested	(104)	$ 139.07
Forfeited	(26)	$ 167.60
Unvested at December 31, 2019	260	$ 184.70

Restricted stock units are generally granted annually in February and vest in equal annual installments over a five-year period. The amount of compensation costs recognized for the years ended December 31, 2019, 2018 and 2017 on the restricted stock units expected to vest were $14 million, $16 million and $17 million, respectively. As of December 31, 2019, there were $33 million of total unrecognized compensation costs related to the restricted stock unit awards that are expected to vest. These costs are expected to be recognized over a weighted-average period of 3.3 years.

Performance Stock Units

The Company’s performance stock units are equity compensation awards with a market vesting condition based on the Company’s Total Shareholder Return (“TSR”) relative to the TSR of the components of the S&P Health

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Care Index. TSR is the change in value of a stock price over time, including the reinvestment of dividends. The vesting schedule ranges from 0% to 200% of the target shares awarded.

In determining the fair value of the performance stock units, the Company makes a variety of assumptions and estimates, including volatility measures, expected yields and expected terms. The fair value of each performance stock unit grant was estimated on the date of grant using the Monte Carlo simulation model. The Company uses implied volatility on its publicly-traded options as the basis for its estimate of expected volatility. The Company believes that implied volatility is the most appropriate indicator of expected volatility because it is generally reflective of historical volatility and expectations of how future volatility will differ from historical volatility. The expected life assumption for grants is based on the performance period of the underlying performance stock units. The risk-free interest rate is the yield currently available on U.S. Treasury zero-coupon issues with a remaining term approximating the expected term used as the input to the Monte Carlo simulation model. The correlation coefficient is used to model the way in which each company in the S&P Health Care Index tends to move in relation to each other during the performance period. The relevant data used to determine the value of the performance stock units granted during the year ended December 31, 2019, 2018 and 2017 are as follows:

Performance Stock Units Issued and Significant Assumptions Used to Estimate Fair Values	2019	2018	2017
Performance stock units issued in thousands	13	40	40
Risk-free interest rate	2.4%	2.4%	1.6%
Expected life in years	2.8	3.0	3.0
Expected volatility	23.5%	22.0%	20.9%
Average volatility of peer companies	26.2%	25.9%	25.6%
Correlation Coefficient	34.2%	35.9%	37.8%
Expected dividends	—	—	—

The following table summarizes the unvested performance stock unit award activity for the year ended December 31, 2019 (in thousands, except per share data):

	Shares	Weighted-Average Fair Value per Share
Unvested at December 31, 2018	100	$ 212.34
Granted	13	$ 372.68
Forfeited	(8)	$ 200.26
Unvested at December 31, 2019	105	$ 233.11

The amount of compensation costs recognized for the years ended December 31, 2019 , 2018 and 2017 on the performance stock units expected to vest were $ 7 million , $5 million and less than $ 1 million, respectively . As of Decem b er 31, 2019, there were $ 10 million of total unrecognized compensation costs related to the restricted stock unit awards that are expected to vest. These costs are expected to be recognized over a weighted-average period of 1.9 years.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

15 Earnings Per Share

Basic and diluted EPS calculations are detailed as follows (in thousands, except per share data):

	Year Ended December 31, 2019		
	Net Income (Numerator)	Weighted-Average Shares (Denominator)	Per Share Amount
Net income per basic common share	$ 592,198	67,627	$ 8.76
Effect of dilutive stock option, restricted stock, performance stock unit and restricted stock unit securities	—	539	(0.07)
Net income per diluted common share	$ 592,198	68,166	$ 8.69

	Year Ended December 31, 2018		
	Net Income (Numerator)	Weighted-Average Shares (Denominator)	Per Share Amount
Net income per basic common share	$ 593,794	76,992	$ 7.71
Effect of dilutive stock option, restricted stock, performance stock unit and restricted stock unit securities	—	626	(0.06)
Net income per diluted common share	$ 593,794	77,618	$ 7.65

	Year Ended December 31, 2017		
	Net Income (Numerator)	Weighted-Average Shares (Denominator)	Per Share Amount
Net income per basic common share	$ 20,311	79,793	$ 0.25
Effect of dilutive stock option, restricted stock, performance stock unit and restricted stock unit securities	—	811	—
Net income per diluted common share	$ 20,311	80,604	$ 0.25

For the years ended December 31, 2019, 2018 and 2017, the Company had 0.1 million, 0.1 million and 0.4 million stock options that were antidilutive, respectively, due to having higher exercise prices than the Company's average stock price during the period. These securities were not included in the computation of diluted EPS. The effect of dilutive securities was calculated using the treasury stock method.

16 Accumulated Other Comprehensive Income

The components of accumulated other comprehensive income (loss) are detailed as follows (in thousands):

	Currency Translation	Unrealized Gain (Loss) on Retirement Plans	Unrealized Gain (Loss) on Investments	Accumulated Other Comprehensive Income (Loss)
Balance at December 31, 2017	$ (69,418)	$ (37,103)	$ (3,546)	$ (110,067)
Other comprehensive (loss) income, net of tax	(36,279)	27,234	1,141	(7,904)
Balance at December 31, 2018	$ (105,697)	$ (9,869)	$ (2,405)	$ (117,971)
Other comprehensive income (loss), net of tax	1,631	(5,536)	2,405	(1,500)
Balance at December 31, 2019	$ (104,066)	$ (15,405)	$ —	$ (119,471)

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

17 Retirement Plans

U.S. employees are eligible to participate in the Waters Employee Investment Plan, a 401(k) defined contribution plan, immediately upon hire. Employees may contribute up to 60% of eligible pay on a pre-tax or post-tax basis and the Company makes matching contributions of 100% for contributions up to 6% of eligible pay. The Company also sponsors a 401(k) Restoration Plan, which is a nonqualified defined contribution plan. Employees are 100% vested in employee and Company matching contributions for both plans. For the years ended December 31, 2019, 2018 and 2017, the Company's matching contributions amounted to $17 million, $17 million and $16 million, respectively.

The Company adopted new accounting guidance which requires that an employer disaggregate the service cost component from other components of net benefit cost. As a result of the adoption of this standard, the components of net periodic benefit cost other than the service cost component are included in other income in the consolidated statements of operations and all previous periods have been adjusted accordingly.

In May 2018, the Company's board of directors approved the termination of two defined benefit pension plans in the U.S. for which the pay credit accruals have been frozen, the Waters Retirement Plan and the Waters Retirement Restoration Plan (collectively, the "U.S. Pension Plans"). In December 2018, the Company settled the Waters Retirement Plan obligation by making lump-sum cash payments and purchasing annuity contracts for participants to permanently extinguish the pension plan's obligations. As a result, the Company recorded a $46 million charge to other expense, which consisted of a $6 million cash contribution to the plan and a $40 million non-cash charge related to the reversal of unrecognized actuarial losses recorded in accumulated other comprehensive income in the stockholders' equity. The $46 million pre-tax charge reduced net income per diluted share by $0.39. The termination of the Waters Retirement Restoration Plan was completed in 2019.

The Company also sponsors other employee benefit plans in the U.S., including a retiree healthcare plan, which provides reimbursement for medical expenses and is contributory. There are various employee benefit plans outside the United States (both defined benefit and defined contribution plans). Certain non-U.S. defined benefit plans ("Non-U.S. Pension Plans") are included in the disclosures below, which are required under the accounting standards for retirement benefits.

The Company contributed $15 million, $13 million and $12 million in the years ended December 31, 2019, 2018 and 2017, respectively, to the non-U.S. plans (primarily defined contribution plans) which are currently outside of the scope of the required disclosures. The eligibility and vesting of non-U.S. plans are consistent with local laws and regulations.

The net periodic pension cost is made up of several components that reflect different aspects of the Company's financial arrangements as well as the cost of benefits earned by employees. These components are determined using the projected unit credit actuarial cost method and are based on certain actuarial assumptions. The Company's accounting policy is to reflect in the projected benefit obligation all benefit changes to which the Company is committed as of the current valuation date; use a market-related value of assets to determine pension expense; amortize increases in prior service costs on a straight-line basis over the expected future service of active participants as of the date such costs are first recognized; and amortize cumulative actuarial gains and losses in excess of 10% of the larger of the market-related value of plan assets and the projected benefit obligation over the expected future service of active participants. Net actuarial (gains) losses that arose during the year were due to changes in the discount rate as well as differences between expected and actual return on plan assets.

Summary data for the U.S. Pension Plans, U.S. Retiree Healthcare Plan and Non-U.S. Pension Plans are presented in the following tables, using the measurement dates of December 31, 2019 and 2018, respectively.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The reconciliation of the projected benefit obligations for the plans at December 31, 2019 and 2018 is as follows (in thousands):

	2019			2018		
	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans
Projected benefit obligation, January 1	$ 972	$ 17,724	$ 93,722	$ 168,064	$ 17,121	$ 96,378
Service cost	—	499	4,339	568	566	5,368
Employee contributions	—	1,214	499	—	1,159	622
Interest cost	29	777	1,735	6,491	636	1,707
Actuarial (gains) losses	(32)	2,081	13,385	6,415	(621)	(2,274)
Benefits paid	—	(1,109)	(3,281)	(3,416)	(1,007)	(3,277)
Plan amendments	—	—	—	—	(130)	(44)
Plan settlements	(969)	—	(7,407)	(177,150)	—	(2,791)
Other plans	—	—	1,598	—	—	1,063
Currency impact	—	—	(1,224)	—	—	(3,030)
Projected benefit obligation, December 31	$ —	$ 21,186	$ 103,366	$ 972	$ 17,724	$ 93,722

The accumulated benefit obligations for the plans at December 31, 2019 and 2018 are as follows (in thousands):

	2019			2018		
	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans
Accumulated benefit obligation	$ —	**	$ 88,105	$ 972	**	$ 82,026

** Not applicable.

The reconciliation of the fair value of the plan assets at December 31, 2019 and 2018 is as follows (in thousands):

	2019			2018		
	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans
Fair value of plan assets, January 1	$ —	$ 11,080	$ 81,587	$ 171,373	$ 11,125	$ 74,990
Actual return on plan assets	—	2,140	6,237	2,555	(584)	1,070
Company contributions	969	448	6,103	6,625	387	10,778
Employee contributions	—	1,214	499	—	1,159	622
Plan settlements	(969)	—	(7,044)	(177,137)	—	—
Benefits paid	—	(1,109)	(3,281)	(3,416)	(1,007)	(3,277)
Other plans	—	—	82	—	—	—
Currency impact	—	—	(1,172)	—	—	(2,596)
Fair value of plan assets, December 31	$ —	$ 13,773	$ 83,011	$ —	$ 11,080	$ 81,587

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The summary of the funded status for the plans at December 31, 2019 and 2018 is as follows (in thousands):

	2019			2018		
	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans
Projected benefit obligation	$ —	$ (21,186)	$(103,366)	$ (972)	$ (17,724)	$(93,722)
Fair value of plan assets	—	13,773	83,011	—	11,080	81,587
Funded status	$ —	$ (7,413)	$ (20,355)	$ (972)	$ (6,644)	$(12,135)

The summary of the amounts recognized in the consolidated balance sheets for the plans at December 31, 2019 and 2018 is as follows (in thousands):

	2019			2018		
	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans
Long-term assets	$ —	$ —	$ 1,466	$ —	$ —	$ 3,284
Current liabilities	—	(448)	(4)	(972)	(387)	(1)
Long-term liabilities	—	(6,965)	(21,817)	—	(6,257)	(15,418)
Net amount recognized at December 31	$ —	$ (7,413)	$(20,355)	$ (972)	$ (6,644)	$(12,135)

For the Non-U.S. Pension Plans, all of the plans where the projected benefit obligation is in excess of plan assets also have an accumulated benefit obligation that is in excess of plan assets, with the exception of a defined benefit plan in Belgium which has a projected benefit obligation of $11 million, an accumulated benefit obligation of $6 million, and plan assets of $10 million at December 31, 2019. The summary of the Non-U.S. Pension Plans that have projected benefit obligations and accumulated benefit obligations in excess of plan assets at December 31, 2019 and 2018 is as follows (in thousands):

	2019	2018
Projected benefit obligation	$81,566	$60,359
Accumulated benefit obligations	$73,644	$56,029
Fair value of plan assets	$60,832	$44,940

The summary of the components of net periodic pension costs for the plans for the years ended December 31, 2019, 2018 and 2017 is as follows (in thousands):

	2019			2018			2017		
	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans
Service cost	$ —	$ 499	$ 4,339	$ 568	$ 566	$ 5,368	$ 450	$ 546	$ 5,082
Interest cost	29	777	1,735	6,491	636	1,707	6,829	618	1,518
Expected return on plan assets	—	(706)	(2,154)	(6,833)	(706)	(1,974)	(10,298)	(587)	(1,688)
Settlement loss	27	—	1,548	45,157	—	—	155	—	232
Net amortization:									
Prior service credit	—	(19)	(108)	—	(19)	(108)	—	—	(168)
Net actuarial loss	—	—	531	3,082	—	680	2,770	—	959
Net periodic pension cost (benefit)	$ 56	$ 551	$ 5,891	$48,465	$ 477	$ 5,673	$ (94)	$ 577	$ 5,935

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The summary of the changes in amounts recognized in other comprehensive income (loss) for the plans for the years ended December 31, 2019, 2018 and 2017 is as follows (in thousands):

	2019			2018			2017		
	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans
Prior service (cost) credit	$ —	$ —	$ —	$ —	$ 130	$ 44	$ —	$ —	$ (636)
Net gain (loss) arising during the year	32	(648)	(8,940)	(10,616)	(670)	4,088	8,879	13	1,609
Amortization:									
Prior service credit	—	(19)	(108)	—	(19)	(35)	—	—	(168)
Net loss	27	—	2,079	48,239	—	680	2,925	—	1,191
Other Plans	—	—	18	—	—	(354)	—	—	—
Currency impact	—	—	178	—	—	583	—	—	(2,033)
Total recognized in other comprehensive (loss) income	$ 59	$ (667)	$ (6,773)	$ 37,623	$ (559)	$ 5,006	$11,804	$ 13	$ (37)

The summary of the amounts included in accumulated other comprehensive loss in stockholders' (deficit) equity for the plans at December 31, 2019 and 2018 is as follows (in thousands):

	2019			2018		
	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans
Net actuarial loss	$ —	$ (731)	$(20,600)	$ (59)	$ (83)	$(13,987)
Prior service credit	—	93	506	—	112	666
Total	$ —	$ (638)	$(20,094)	$ (59)	$ 29	$(13,321)

The summary of the amounts included in accumulated other comprehensive loss expected to be included in next year's net periodic benefit cost for the plans at December 31, 2019 is as follows (in thousands):

	2019		
	U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans
Net actuarial loss	$ —	$ —	$ (1,541)
Prior service credit	—	19	158
Total	$ —	$ 19	$ (1,383)

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The plans' investment asset mix is as follows at December 31, 2019 and 2018:

	2019		2018	
	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans	U.S. Retiree Healthcare Plan	Non-U.S. Pension Plans
Equity securities	64%	6%	61%	7%
Debt securities	36%	21%	39%	18%
Cash and cash equivalents	0%	1%	0%	5%
Insurance contracts and other	0%	72%	0%	70%
Total	100%	100%	100%	100%

The plans' investment policies include the following asset allocation guidelines:

	U.S. Retiree Healthcare Plan		Non-U.S. Pension Plans
	Policy Target	Range	Policy Target
Equity securities	60%	30% - 90%	5%
Debt securities	35%	20% - 50%	20%
Cash and cash equivalents	0%	0% - 10%	10%
Insurance contracts and other	5%	0% - 10%	65%

The asset allocation policy for the U.S. Retiree Healthcare Plan was developed in consideration of the following long-term investment objectives: achieving a return on assets consistent with the investment policy, achieving portfolio returns which compare favorably with those of other similar plans, professionally managed portfolios and of appropriate market indexes and maintaining sufficient liquidity to meet the obligations of the plan. Within the equity portfolio of the U.S. Retiree Healthcare Plan, investments are diversified among market capitalization and investment strategy, and targets a 45% allocation of the equity portfolio to be invested in financial markets outside of the United States. The Company does not invest in its own stock within the U.S. Retiree Healthcare Plan's assets.

Plan assets are measured at fair value using the following valuation techniques and inputs:

Level 1: The fair value of these types of investments is based on market and observable sources from daily quoted prices on nationally recognized securities exchanges.

Level 2: The fair value of these types of investments utilizes data points other than quoted prices in active markets that are observable either directly or indirectly.

Level 3: These bank and insurance investment contracts are issued by well-known, highly-rated companies. The fair value disclosed represents the present value of future cash flows under the terms of the respective contracts. Significant assumptions used to determine the fair value of these contracts include the amount and timing of future cash flows and counterparty credit risk.

There have been no changes in the above valuation techniques associated with determining the value of the plans' assets during the years ended December 31, 2019 and 2018.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The fair value of the Company's retirement plan assets are as follows at December 31, 2019 (in thousands):

	Total at December 31, 2019	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
U.S. Retiree Healthcare Plan:				
Mutual funds [a]	13,773	13,773	—	—
Total U.S. Retiree Healthcare Plan	13,773	13,773	—	—
Non-U.S. Pension Plans:				
Cash equivalents [b]	690	690	—	—
Mutual funds [c]	22,202	22,202	—	—
Bank and insurance investment contracts [d]	60,119	—	—	60,119
Total Non-U.S. Pension Plans	83,011	22,892	—	60,119
Total fair value of retirement plan assets	$ 96,784	$ 36,665	$ —	$ 60,119

The fair value of the Company's retirement plan assets are as follows at December 31, 2018 (in thousands):

	Total at December 31, 2018	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
U.S. Retiree Healthcare Plan:				
Mutual funds [e]	11,080	11,080	—	—
Total U.S. Retiree Healthcare Plan	11,080	11,080	—	—
Non-U.S. Pension Plans:				
Cash equivalents [b]	4,439	4,439	—	—
Mutual funds [f]	20,430	20,430	—	—
Bank and insurance investment contracts [d]	56,718	—	—	56,718
Total Non-U.S. Pension Plans	81,587	24,869	—	56,718
Total fair value of retirement plan assets	$ 92,667	$ 35,949	$ —	$ 56,718

(a) The mutual fund balance in the U.S. Retiree Healthcare Plan is invested in the following categories: 35% in the common stock of large-cap U.S. companies, 29% in the common stock of international growth companies and 36% in fixed income bonds of U.S. companies and the U.S. government.

(b) Primarily represents deposit account funds held with various financial institutions.

(c) The mutual fund balance in the Non-U.S. Pension Plans is primarily invested in the following categories: 57% in international bonds, 23% in the common stock of international companies and 20% in various other global investments.

(d) Amount represents bank and insurance guaranteed investment contracts.

(e) The mutual fund balance in the U.S. Retiree Healthcare Plan is invested in the following categories: 40% in the common stock of large-cap U.S. companies, 21% in the common stock of international growth companies and 39% in fixed income bonds of U.S. companies and the U.S. government.

(f) The mutual fund balance in the Non- U.S. Pension Plans is invested in the following categories: 56% in international bonds, 24% in the common stock of international companies and 20% in various other global investments.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

The following table summarizes the changes in fair value of the Level 3 retirement plan assets for the years ended December 31, 2019 and 2018 (in thousands):

	Insurance Guaranteed Investment Contracts
Fair value of assets, December 31, 2017	$ 51,963
Net purchases (sales) and appreciation (depreciation)	4,755
Fair value of assets, December 31, 2018	56,718
Net purchases (sales) and appreciation (depreciation)	3,401
Fair value of assets, December 31, 2019	$ 60,119

The weighted-average assumptions used to determine the benefit obligation in the consolidated balance sheets at December 31, 2019, 2018 and 2017 are as follows:

	2019		2018		2017	
	U.S.	Non-U.S.	U.S.	Non-U.S.	U.S.	Non-U.S.
Discount rate	3.42%	1.38%	4.40%	1.95%	3.94%	1.79%
Increases in compensation levels	**		**		**	
		2.83%		2.66%		2.43%

** Not applicable

The weighted-average assumptions used to determine the net periodic pension cost for the years ended December 31, 2019, 2018 and 2017 are as follows:

	2019		2018		2017	
	U.S.	Non-U.S.	U.S.	Non-U.S.	U.S.	Non-U.S.
Discount rate	4.41%	2.25%	3.96%	1.93%	4.28%	1.80%
Return on plan assets	6.25%	3.11%	4.35%	2.75%	6.53%	2.64%
Increases in compensation levels	**		**		**	
		3.20%		2.70%		2.63%

** Not applicable

To develop the expected long-term rate of return on assets assumption, the Company considered historical returns and future expectations for returns for each asset class, as well as the target asset allocation of the pension portfolio and historical expenses paid by the plan. A one-quarter percentage point increase in the assumed long-term rate of return on assets would decrease the Company's net periodic benefit cost by less than $1 million . A one-quarter percentage point increase in the discount rate would decrease the Company's net periodic benefit cost by less than $1 million .

During fiscal year 2020, the Company expects to contribute a total of approximately $3 million to $6 million to the Company's defined benefit plans. Estimated future benefit payments from the plans as of December 31, 2019 are as follows (in thousands):

	U.S. Retiree Healthcare Plans	Non-U.S. Pension Plans	Total
2020	$ 1,123	$ 2,723	$ 3,846
2021	1,209	4,746	5,955
2022	1,281	3,238	4,519
2023	1,376	2,749	4,125
2024	1,437	2,884	4,321
2025 - 2029	7,420	20,691	28,111

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

18 Business Segment Information

The accounting standards for segment reporting establish standards for reporting information about operating segments in annual financial statements and require selected information for those segments to be presented in interim financial reports of public business enterprises. They also establish standards for related disclosures about products and services, geographic areas and major customers. The Company's business activities, for which discrete financial information is available, are regularly reviewed and evaluated by the chief operating decision maker. As a result of this evaluation, the Company determined that it has two operating segments: Waters ™ and TA ™.

The Waters operating segment is primarily in the business of designing, manufacturing, selling and servicing LC and MS instruments, columns and other precision chemistry consumables that can be integrated and used along with other analytical instruments. The TA operating segment is primarily in the business of designing, manufacturing, selling and servicing thermal analysis, rheometry and calorimetry instruments. The Company's two operating segments have similar economic characteristics; product processes; products and services; types and classes of customers; methods of distribution; and regulatory environments. Because of these similarities, the two segments have been aggregated into one reporting segment for financial statement purposes. Please refer to the consolidated financial statements for financial information regarding the one reportable segment of the Company.

Net sales for the Company's products and services are as follows for the years ended December 31, 2019, 2018 and 2017 (in thousands):

	2019	2018	2017
Product net sales:			
Waters instrument systems	$ 963,871	$1,000,625	$ 988,750
Chemistry consumables	412,018	400,287	372,157
TA instrument systems	191,300	204,081	191,442
Total product sales	1,567,189	1,604,993	1,552,349
Service net sales:			
Waters service	761,594	738,433	686,656
TA service	77,813	76,503	70,073
Total service sales	839,407	814,936	756,729
Total net sales	$2,406,596	$2,419,929	$2,309,078

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Net sales are attributable to geographic areas based on the region of destination. Geographic sales information is presented below for the years ended December 31, 2019, 2018 and 2017 (in thousands):

	2019	2018	2017
Net Sales:			
Asia:			
China	$ 439,557	$ 443,321	$ 387,059
Japan	180,707	173,357	167,258
Asia Other	318,848	305,613	308,300
Total Asia	939,112	922,291	862,617
Americas:			
United States	692,277	683,596	669,274
Americas Other	137,964	151,581	140,715
Total Americas	830,241	835,177	809,989
Europe	637,243	662,461	636,472
Total net sales	$2,406,596	$2,419,929	$2,309,078

None of the Company's individual customers accounts for more than 2 % of annual Company sales. Net sales by customer class are as follows for the years ended December 31, 2019, 2018 and 2017 (in thousands):

	2019	2018	2017
Pharmaceutical	$1,365,275	$1,365,731	$1,294,668
Industrial	719,377	737,144	721,088
Academic and governmental	321,944	317,054	293,322
Total net sales	$2,406,596	$2,419,929	$2,309,078

Net sales for the Company recognized at a point in time versus over time are as follows for the years ended December 31, 2019, 2018 and 2017 (in thousands):

	2019	2018	2017
Net sales recognized at a point in time:			
Instrument systems	$1,155,171	$1,204,706	$1,180,192
Chemistry consumables	412,018	400,287	372,157
Service sales recognized at a point in time (time & materials)	323,247	317,549	299,385
Total net sales recognized at a point in time	1,890,436	1,922,542	1,851,734
Net sales recognized over time:			
Service and software sales recognized over time (contracts)	516,160	497,387	457,344
Total net sales	$2,406,596	$2,419,929	$2,309,078

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

Long-lived assets information at December 31, 2019 and 2018 is presented below (in thousands):

	2019	2018	2017
Long-lived assets:			
United States	$ 276,891	$ 203,664	$ 186,344
Americas Other	1,929	1,680	1,720
Total Americas	278,820	205,344	188,064
Europe	116,734	118,513	136,440
Asia	21,788	19,226	24,774
Total long-lived assets	$ 417,342	$ 343,083	$ 349,278

The Other category includes Canada, Latin America and Puerto Rico. Long-lived assets exclude goodwill, other intangible assets and other assets.

19 Unaudited Quarterly Results

The Company's unaudited quarterly results are summarized below (in thousands, except per share data):

2019	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total
Net sales	$ 513,862	$ 599,162	$ 577,278	$ 716,294	$ 2,406,596
Costs and operating expenses:					
Cost of sales	221,031	249,546	241,055	299,068	1,010,700
Selling and administrative expenses	134,339	133,208	126,036	141,208	534,791
Research and development expenses	35,060	36,490	34,333	37,072	142,955
Purchased intangibles amortization	2,281	2,264	2,619	2,529	9,693
Total costs and operating expenses	392,711	421,508	404,043	479,877	1,698,139
Operating income	121,151	177,654	173,235	236,417	708,457
Other expense	(525)	(342)	(496)	(2,223)	(3,586)
Interest expense	(11,563)	(11,448)	(11,456)	(14,223)	(48,690)
Interest income	8,315	5,871	3,455	4,417	22,058
Income before income taxes	117,378	171,735	164,738	224,388	678,239
Provision for income taxes	8,392	27,325	26,605	23,719	86,041
Net income	$ 108,986	$ 144,410	$ 138,133	$ 200,669	$ 592,198
Net income per basic common share	1.52	2.09	2.09	3.15	8.76
Weighted-average number of basic common shares	71,704	68,989	66,226	63,795	67,627
Net income per diluted common share	1.51	2.08	2.07	3.12	8.69
Weighted-average number of diluted common shares and equivalents	72,415	69,494	66,768	64,348	68,166

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

2018	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total
Net sales	$ 530,670	$ 596,219	$ 578,021	$ 715,019	$ 2,419,929
Costs and operating expenses:					
Cost of sales	221,421	243,135	241,139	286,869	992,564
Selling and administrative expenses	130,407	136,645	126,997	142,853	536,902
Research and development expenses	34,480	35,644	35,173	38,106	143,403
Purchased intangibles amortization	1,659	1,602	2,114	2,337	7,712
Litigation provisions	(1,672)	—	924	322	(426)
Total costs and operating expenses	386,295	417,026	406,347	470,487	1,680,155
Operating income	144,375	179,193	171,674	244,532	739,774
Other income (expense)	346	(1,828)	(811)	(45,501)	(47,794)
Interest expense	(13,838)	(11,692)	(11,435)	(11,676)	(48,641)
Interest income	9,666	8,888	9,802	10,451	38,807
Income before income taxes	140,549	174,561	169,230	197,806	682,146
Provision for income taxes	28,598	18,884	28,216	12,654	88,352
Net income	$ 111,951	$ 155,677	$ 141,014	$ 185,152	$ 593,794
Net income per basic common share	1.42	2.00	1.84	2.48	7.71
Weighted-average number of basic common shares	78,883	77,833	76,575	74,802	76,992
Net income per diluted common share	1.40	1.98	1.83	2.46	7.65
Weighted-average number of diluted common shares and equivalents	79,715	78,438	77,136	75,345	77,618

The Company typically experiences an increase in sales in the fourth quarter, as a result of purchasing habits for capital goods of customers that tend to exhaust their spending budgets by calendar year end. Selling and administrative expenses are typically higher after the first quarter in each year as the Company's annual payroll merit increases take effect. Selling and administrative expenses will vary in the fourth quarter in relation to performance in the quarter and for the year.

In the first quarter of 2018, the Company resolved the case with a final settlement that resulted in a gain of $2 million (see Note 1 1). In the fourth quarter of 2018, the Company settled a pension plan obligation and recorded a $46 million charge, which consisted of a $6 million cash contribution to the plan and a $40 million non-cash charge related to the reversal of unrecognized actuarial losses recorded in accumulated other comprehensive income in the stockholders' equity (see Note 1 7).

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

None.

Item 9A: ***Controls and Procedures***

Evaluation of Disclosure Controls and Procedures

The Company's chief executive officer and chief financial officer (principal executive officer and principal financial officer), with the participation of management, evaluated the effectiveness of the Company's disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) as of the end of the period covered by this annual report on Form 10-K. Based on this evaluation, the Company's chief executive officer and chief financial officer concluded that the Company's disclosure controls and procedures were effective as of December 31, 2019 (1) to ensure that information required to be disclosed by the Company, including its consolidated subsidiaries, in the reports that it files or submits under the Exchange Act is accumulated and communicated to the Company's management, including its chief executive officer and chief financial officer, to allow timely decisions regarding the required disclosure and (2) to provide reasonable assurance that information required to be disclosed by the Company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms.

Management's Annual Report on Internal Control Over Financial Reporting

See Management's Report on Internal Control Over Financial Reporting in Item 8 on page 46 of this Form 10-K.

Report of the Independent Registered Public Accounting Firm

See the report of PricewaterhouseCoopers LLP in Item 8 beginning on page 47 of this Form 10-K.

Changes in Internal Control Over Financial Reporting

No change was identified in the Company's internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) during the quarter ended December 31, 2019 that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting.

Item 9B: Other Information

None.

PART III

Item 10: ***Directors, Executive Officers and Corporate Governance***

Information regarding the Company's directors and any material changes to the process by which security holders may recommend nominees to the Board of Directors is contained in the definitive proxy statement for the 2020 Annual Meeting of Stockholders under the headings "Election of Directors", "Directors Meetings and Board Committees", "Corporate Governance", "Report of the Audit Committee of the Board of Directors" and "Compensation of Directors and Executive Officers". Information regarding compliance with Section 16(a) of the Exchange Act is contained in the Company's definitive proxy statement for the 2020 Annual Meeting of Stockholders under the heading "Delinquent Section 16(a) Reports". Information regarding the Company's Audit Committee and Audit Committee Financial Expert is contained in the definitive proxy statement for the 2020 Annual Meeting of Stockholders under the headings "Report of the Audit Committee of the Board of Directors" and "Directors Meetings and Board Committees". Such information is incorporated herein by reference. Information regarding the Company's executive officers is contained in Part I of this Form 10-K.

The Company has adopted a Global Code of Business Conduct & Ethics (the "Code") that applies to all of the Company's employees (including its executive officers) and directors and that is in compliance with Item 406 of Regulation S-K. The Code has been distributed to all employees of the Company. In addition, the Code is available on the Company's website, www.waters.com , under the caption "Corporate Governance". The Company intends to satisfy the disclosure requirement regarding any amendment to, or waiver of a provision of, the Code applicable to any executive officer or director by posting such information on its website. The Company shall also provide to any person without charge, upon request, a copy of the Code. Any such request must be made in writing to the Secretary of the Company, c/o Waters Corporation, 34 Maple Street, Milford, MA 01757.

The Company's corporate governance guidelines and the charters of the audit committee, compensation committee, finance committee and nominating and corporate governance committee of the Board of Directors are available on the Company's website, www.waters.com , under the caption "Corporate Governance". The Company shall provide to any person without charge, upon request, a copy of any of the foregoing materials. Any such request must be made in writing to the Secretary of the Company, c/o Waters Corporation, 34 Maple Street, Milford, MA 01757.

Item 11: ***Executive Compensation***

This information is contained in the Company's definitive proxy statement for the 2020 Annual Meeting of Stockholders under the headings "Compensation of Directors and Executive Officers", "Compensation Committee Interlocks and Insider Participation" and "Compensation Committee Report". Such information is incorporated herein by reference.

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

Except for the Equity Compensation Plan information set forth below, this information is contained in the Company's definitive proxy statement for the 2020 Annual Meeting of Stockholders under the heading "Security Ownership of Certain Beneficial Owners and Management". Such information is incorporated herein by reference.

Equity Compensation Plan Information

The following table provides information as of December 31, 2019 about the Company's common stock that may be issued upon the exercise of options, warrants and rights under its existing equity compensation plans (in thousands):

	A	B	C
	Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights (1)	Weighted-Average Exercise Price of Outstanding Options, Warrants and Rights (1)	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (excluding securities reflected in column (A))
Equity compensation plans approved by security holders	1,861	$ 158.61	2,711
Equity compensation plans not approved by security holders	—	—	—
Total	1,861	$ 158.61	2,711

(1) Column (a) includes an aggregate of 406 shares of common stock to be issued upon settlement of restricted stock, restricted stock units and performance stock units. The weighted-average share price in column (b) does not take into account restricted stock, restricted stock units or performance stock units, which do not have an exercise price.

See Note 14, Stock-Based Compensation, in the Notes to Consolidated Financial Statements for a description of the material features of the Company's equity compensation plans.

Item 13: ***Certain Relationships and Related Transactions and Director Independence***

This information is contained in the Company's definitive proxy statement for the 2020 Annual Meeting of Stockholders under the headings "Directors Meetings and Board Committees", "Corporate Governance" and "Compensation of Directors and Executive Officers". Such information is incorporated herein by reference.

Item 14: ***Principal Accountant Fees and Services***

This information is contained in the Company's definitive proxy statement for the 2020 Annual Meeting of Stockholders under the headings "Ratification of Selection of Independent Registered Public Accounting Firm" and "Report of the Audit Committee of the Board of Directors". Such information is incorporated herein by reference.

PART IV

Item 15: ***Exhibits, Financial Statement Schedules***

(a) Documents filed as part of this report:

(1) Financial Statements:

The consolidated financial statements of the Company and its subsidiaries are filed as part of this Form 10-K and are set forth on pages 50 to 95. The report of PricewaterhouseCoopers LLP, an independent registered public accounting firm, dated February 25, 2020, is set forth beginning on page 47 of this Form 10-K.

(2) Exhibits:

Exhibit Number	Description of Document
3.1	Second Amended and Restated Certificate of Incorporation of Waters Corporation.(1)(P)
3.2	Certificate of Amendment of Second Amended and Restated Certificate of Incorporation of Waters Corporation, dated as of May 12, 1999.(3)
3.3	Certificate of Amendment of Second Amended and Restated Certificate of Incorporation of Waters Corporation, dated as of July 27, 2000.(4)
3.4	Certificate of Amendment of Second Amended and Restated Certificate of Incorporation of Waters Corporation, dated as of May 25, 2001.(5)
3.5	Amended and Restated Bylaws of Waters Corporation, dated as of December 5, 2017.(29)
4.1	Description of Registrant's Securities
10.1	Waters Corporation Retirement Plan.(2)(P)(*)
10.2	Waters Corporation 2003 Equity Incentive Plan.(6)(*)
10.3	First Amendment to the Waters Corporation 2003 Equity Incentive Plan.(7)(*)
10.4	Form of Director Stock Option Agreement under the Waters Corporation 2003 Equity Incentive Plan, as amended.(8)(*)
10.5	Form of Director Restricted Stock Agreement under the Waters Corporation 2003 Equity Incentive Plan, as amended.(8)(*)
10.6	Form of Executive Officer Stock Option Agreement under the Waters Corporation 2003 Equity Incentive Plan, as amended.(8)(*)
10.7	Second Amendment to the Waters Corporation 2003 Equity Incentive Plan.(9)(*)
10.8	Third Amendment to the Waters Corporation 2003 Equity Incentive Plan.(10)(*)
10.9	Amended and Restated Waters 401(k) Restoration Plan, effective January 1, 2008.(11)(*)
10.10	Change of Control/Severance Agreement, dated as of February 27, 2008, between Waters Corporation and Mark T. Beaudouin.(12)(*)
10.11	Change of Control/Severance Agreement, dated as of February 27, 2008, between Waters Corporation and Elizabeth B. Rae.(12)(*)
10.12	Change of Control/Severance Agreement, dated as of February 27, 2008, between Waters Corporation and Eugene G. Cassis.(21)(*)

Exhibit Number	Description of Document
10.13	Amended and Restated Waters Retirement Restoration Plan, effective January 1, 2008.(13)(*)
10.14	Amended and Restated Waters Corporation 1996 Non-Employee Director Deferred Compensation Plan, Effective January 1, 2008.(13)(*)
10.15	2014 Waters Corporation Management Incentive Plan.(21)(*)
10.16	Waters Corporation 2009 Employee Stock Purchase Plan.(14)(*)
10.17	Note Purchase Agreement, dated as of February 1, 2010, between Waters Corporation and the purchases named therein.(15)
10.18	First Amendment to the Note Purchase Agreement, dated as of February 1, 2010.(16)
10.19	Note Purchase Agreement, dated March 15, 2011, between Waters Corporation and the purchases named therein.(16)
10.20	Waters Corporation 2012 Equity Incentive Plan.(17)(*)
10.21	Form of Waters 2012 Stock Option Agreement - Executive Officers.(18)(*)
10.22	Form of Waters 2012 Stock Option Agreement - Directors.(18)(*)
10.23	Form of Waters 2012 Restricted Stock Agreement - Directors.(18)(*)
10.24	Form of Waters 2012 Restricted Stock Unit Agreement for Executive Officers - Five Year Vesting.(19)(*)
10.25	Form of Waters 2012 Restricted Stock Unit Agreement for Executive Officers - One Year Vesting.(19)(*)
10.26	Note Purchase Agreement, dated June 30, 2014, between Waters Corporation and the purchases named therein.(20)
10.27	Change of Control/Severance Agreement, dated as of April 1, 2015, between Waters Corporation and Michael F. Silveira.(22)(*)
10.28	President and Chief Executive Employment Agreement.(23)(*)
10.29	Change of Control/Severance Agreement, dated as of September 8, 2015, between Waters Corporation and Christopher J. O'Connell.(23)(*)
10.30	Note Purchase Agreement, dated as of May 12, 2016, between Waters Corporation and the purchasers named therein.(24)
10.31	Form of Waters 2012 Performance Stock Unit Award Agreement.(25)(*)
10.32	Senior Vice President and Chief Financial Officer Employment Agreement.(26)(*)
10.33	Change of Control/Severance Agreement, dated as of January 9, 2017, between Waters Corporation and Sherry L. Buck.(26)(*)
10.34	Form of Change of Control/Severance Agreement.(27)(*)
10.35	Employment Agreement, dated July 21, 2017, between Waters Corporation and Dr. Rohit Khanna.(28)(*)
10.36	Credit Agreement, dated as of November 30, 2017, among Waters Corporation, JPMorgan Chase Bank, N.A., JP Morgan Europe Limited and other Lenders party thereto.(30)
10.37	First Amendment to the Credit Agreement, dated as of November 30, 2017, among Waters Corporation, JPMorgan Chase Bank, N.A., JP Morgan Europe Limited and other Lenders party thereto.(31)

Exhibit Number	Description of Document
10.38	Second Amendment to the Note Purchase Agreement, dated as of February 1, 2010.(31)
10.39	First Amendment to the Note Purchase Agreement, dated as of March 15, 2011.(31)
10.40	First Amendment to the Note Purchase Agreement, dated as of June 30, 2014.(31)
10.41	First Amendment to the Note Purchase Agreement, dated as of May 12, 2016.(31)
10.42	Note Purchase Agreement, dated as of September 12, 2019, between Waters Corporation and the purchasers named therein.(32)
10.43	Form of Performance Stock Unit Award Agreement under the Waters Corporation 2012 Equity Incentive Plan(*)
21.1	Subsidiaries of Waters Corporation.
23.1	Consent of PricewaterhouseCoopers LLP, an independent registered public accounting firm.
31.1	Chief Executive Officer Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Chief Financial Officer Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1	Chief Executive Officer Certification Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.(**)
32.2	Chief Financial Officer Certification Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.(**)
101	The following materials from Waters Corporation's Annual Report on Form 10-K for the year ended December 31, 2019, formatted in iXBRL (Inline eXtensible Business Reporting Language): (i) the Consolidated Balance Sheets, (ii) the Consolidated Statements of Operations, (iii) the Consolidated Statements of Comprehensive Income, (iv) the Consolidated Statements of Cash Flows, (v) the Consolidated Statements of Stockholders' Equity (Deficit) and (vi) Notes to Consolidated Financial Statements.
104	Cover Page Interactive Date File (formatted in iXBRL and contained in Exhibit 101).

(1) Incorporated by reference to the Registrant's Report on Form 10-K dated March 29, 1996 (File No. 001-14010).

(2) Incorporated by reference to the Registrant's Registration Statement on Form S-1 (File No. 333-96934).

(3) Incorporated by reference to the Registrant's Report on Form 10-Q dated August 11, 1999 (File No. 001-14010).

(4) Incorporated by reference to the Registrant's Report on Form 10-Q dated August 8, 2000 (File No. 001-14010).

(5) Incorporated by reference to the Registrant's Report on Form 10-K dated March 28, 2002 (File No. 001-14010).

(6) Incorporated by reference to the Registrant's Report on Form S-8 dated November 20, 2003 (File No. 333-110613).

(7) Incorporated by reference to the Registrant's Report on Form 10-K dated March 12, 2004 (File No. 001-14010).

(8) Incorporated by reference to the Registrant's Report on Form 10-Q dated November 10, 2004 (File No. 001-14010).

(9) Incorporated by reference to the Registrant's Report on Form 10-Q dated August 5, 2005 (File No. 001-14010).

(10) Incorporated by reference to the Registrant's Report on Form 10-K dated March 1, 2007 (File No. 001-14010).

(11) Incorporated by reference to the Registrant's Report on Form 10-Q dated November 2, 2007 (File No. 001-14010).

(12) Incorporated by reference to the Registrant's Report on Form 10-K dated February 29, 2008 (File No. 001-14010).

(13) Incorporated by reference to the Registrant's Report on Form 10-K dated February 27, 2009 (File No. 001-14010).

(14) Incorporated by reference to the Registrant's Report on Form S-8 dated July 10, 2009 (File No. 333-160507).

(15) Incorporated by reference to the Registrant's Report on Form 10-K dated February 26, 2010 (File No. 001-14010).

(16) Incorporated by reference to the Registrant's Report on Form 10-Q dated May 6, 2011 (File No. 001-14010).

(17) Incorporated by reference to the Registrant's Report on Form S-8 dated September 5, 2012 (File No. 333-183721).

(18) Incorporated by reference to the Registrant's Report on Form 8-K dated December 11, 2012 (File No. 001-14010).

(19) Incorporated by reference to the Registrant's Report on Form 8-K dated December 11, 2013 (File No. 001-14010).

(20) Incorporated by reference to the Registrant's Report on Form 10-Q dated August 1, 2014 (File No. 001-14010).

(21) Incorporated by reference to the Registrant's Report on Form 10-K dated February 27, 2015 (File No. 001-14010).

(22) Incorporated by reference to the Registrant's Report on Form 10-Q dated May 8, 2015 (File No. 001-14010).

(23) Incorporated by reference to the Registrant's Report on Form 10-Q dated August 7, 2015 (File No. 001-14010).

(24) Incorporated by reference to the Registrant's Report on Form 10-Q dated August 5, 2016 (File No. 001-14010).

(25) Incorporated by reference to the Registrant's Report on Form 8-K dated December 15, 2016 (File No. 001-14010).

(26) Incorporated by reference to the Registrant's Report on Form 10-K dated February 24, 2017 (File No. 001-14010).

(27) Incorporated by reference to the Registrant's Report on Form 8-K dated March 27, 2017 (File No. 001-14010).

(28) Incorporated by reference to the Registrant's Report on Form 10-Q dated November 3, 2017 (File No. 001-14010).

(29) Incorporated by reference to the Registrant's Report on Form 8-K dated December 8, 2017 (File No. 001-14010).

(30) Incorporated by reference to the Registrant's Report on Form 10-K dated February 27, 2018 (File No. 001-14010).

(31) Incorporated by reference to the Registrant's Report on Form 10-K/A dated March 1, 2019 (File No. 001-14010).

(32) Incorporated by reference to the Registrant's Report on Form 8-K dated September 16, 2019 (File No. 001-14010).

(P) Paper Filing

(*) Management contract or compensatory plan required to be filed as an Exhibit to this Form 10-K.

(**) This exhibit shall not be deemed "filed" for purposes of Section 18 of the Exchange Act, or otherwise subject to the liability of that section, nor shall it be deemed incorporated by reference into any filing under the Securities Act of 1933, as amended, or the Exchange Act, whether made before or after the date hereof and irrespective of any general incorporation language in any filing, except to the extent the Company specifically incorporates it by reference.

(b) See Item 15 (a) (3) above.

Item 16: *Form 10-K Summary*

The optional summary in Item 16 has not been included in this Form 10-K.

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.

WATERS CORPORATION

/s/ SHERRY L. BUCK
Sherry L. Buck
Senior Vice President and Chief Financial Officer

Date: February 25, 2020

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed by the following persons on behalf of the registrant and in the capacities indicated on February 25, 2020.

/s/ CHRISTOPHER J. O'CONNELL Christopher J. O'Connell	Chairman of the Board of Directors and Chief Executive Officer (principal executive officer)
/s/ SHERRY L. BUCK Sherry L. Buck	Senior Vice President and Chief Financial Officer (principal financial officer) (principal accounting officer)
/s/ LINDA BADDOUR Linda Baddour	Director
/s/ DR. MICHAEL J. BERENDT Dr. Michael J. Berendt	Director
/s/ EDWARD CONARD Edward Conard	Director
/s/ DR. LAURIE H. GLIMCHER Dr. Laurie H. Glimcher	Director
/s/ GARY HENDRICKSON Gary Hendrickson	Director
/s/ CHRISTOPHER A. KUEBLER Christopher A. Kuebler	Director
/s/ FLEMMING ORNSKOV Flemming Ornskov	Director
/s/ JOANN A. REED JoAnn A. Reed	Director
/s/ THOMAS P. SALICE Thomas P. Salice	Director

Exhibit 4.1

DESCRIPTION OF REGISTRANT'S SECURITIES REGISTERED PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934

The following description of our common stock is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to our Second Amended and Restated Certificate of Incorporation, as amended (our "Certificate"), and our Amended and Restated Bylaws (our "Bylaws"), each of which has been filed with the Securities and Exchange Commission as an exhibit to this Annual Report on Form 10-K or incorporated by reference therein. The summary below is also qualified by provisions of applicable law.

General

Under our Certificate, we have authority to issue up to 400,000,000 shares of common stock, par value $0.01 per share. Our common stock is registered under Section 12 of the Securities Exchange Act of 1934, as amended, and is listed on the New York Stock Exchange under the symbol "WAT."

The rights, preferences and privileges of holders of common stock are subject to the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

Voting Rights

Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. Our Bylaws provide that a nominee for director will be elected by the affirmative vote of a majority of the votes cast with respect to such nominee; however, if the number of nominees exceeds the number of directors to be elected, the directors will be elected by affirmative vote of a plurality of the votes cast.

Dividend Rights

Subject to the rights of holders of any outstanding shares of preferred stock, holders of our common stock are entitled to receive dividends, if any, as may be declared from time to time by our board of directors (the "Board of Directors") in its discretion out of funds legally available for the payment of dividends.

Liquidation Rights

Subject to the rights of holders of any outstanding shares of preferred stock, holders of our common stock will share ratably in all assets legally available for distribution to out stockholders in the event of dissolution.

Anti-takeover Effects of the Delaware General Corporation Law and Our Certificate of Incorporation and Bylaws

Our Certificate and our Bylaws contain certain provisions that may discourage, delay, or prevent a change in our management or control over us. We expect that these provisions, which are summarized below, will discourage coercive takeover practices or inadequate takeover bids. These provisions are also designed to encourage persons seeking to acquire control of us to first negotiate with the Board of Directors, which we believe may result in an improvement of the terms of any such acquisition in favor of our stockholders. However, they may also discourage acquisitions that some stockholders may favor.

No Stockholder Action by Written Consent

Our Certificate provides that any action required or permitted to be taken by our stockholders must be effected at a duly called annual or special meeting of stockholders and may not be effected by written consent in lieu of a meeting.

Special Meeting of Stockholders and Advance Notice Requirements for Stockholder Proposals

Our Certificate and Bylaws provide that a special meeting of our stockholders may only be called by the Board of Directors, the Chairman of the Board of Directors or our President and Chief Executive Officer, or by the Chairman of the Board of Directors, our President and Chief Executive Officer or our Secretary at the request in writing of stockholders holding at least fifty percent (50%) of the number of shares of stock outstanding and entitled to vote at such meeting.

Our Bylaws set forth advance notice procedures for stockholder proposals to be brought before an annual meeting of the stockholders, including the nomination of directors, or any special meeting of the stockholders called for the purpose of electing directors. Stockholders at an annual meeting may only consider proposals (a) specified in the notice of meeting (or any supplement thereto) given by or at the direction of the Board of Directors (or any duly authorized committee thereof), (b) otherwise properly brought before the annual meeting by or at the direction of the Board of Directors (or any duly authorized committee thereof) or (c) otherwise properly brought before the annual meeting by any stockholder of the Corporation (i) who is a stockholder of record on the date of the giving of the notice required by our Bylaws and on the record date for the determination or stockholders entitled to vote at such annual meeting and (ii) who complies with the notice procedures set forth in our Bylaws. To be timely, a stockholder's notice must be received at our principal executive offices not less than 60 not more than 90 days prior to the date of the annual meeting; provided, however, that in the event that less than 70 days notice or prior public disclosure of the date of the annual meeting is given to stockholders, notice by the stockholder in order to be timely must be received no later than the close of business on the tenth day following the day on which such notice of the date of the annual meeting was mailed or such public disclosure of the annual meeting was made, whichever occurs first.

Nominations of persons for election to our Board of Directors may be made at any annual meeting of stockholders, or at any special meeting of stockholders called for the purpose of electing directors, (a) by or at the direction of the Board of Directors (or any duly authorized committee thereof) or (b) by any stockholder of the Corporation (i) who is a stockholder of record on the date of the giving of the notice required by our Bylaws and on the record date for the determination of stockholders entitled to vote at such meeting and (ii) who complies with the notice procedures set forth in our Bylaws. To be timely, a stockholder's notice must be received at our principal executive offices (a) in the case of an annual meeting, not less than 60 not more than 90 days prior to the date of the annual meeting; provided, however, that in the event that less than 70 days notice or prior public disclosure of the date of the annual meeting is given to stockholders, notice by the stockholder in order to be timely must be received no later than the close of business on the tenth day following the day on which such notice of the date of the annual meeting was mailed or such public disclosure of the annual meeting was made, whichever occurs first, and (b) in the case of a special meeting of stockholders called for the purpose of electing directors, not later than the close of business on the tenth day following the day on which notice of the date of the special meeting was mailed or public disclosure of the date of the special meeting was made, whichever occurs first.

These provisions could have the effect of delaying until the next stockholder meeting any stockholder actions that are favored by the holders of a majority of our outstanding voting securities.

Requirements for Removal and Interim Election of Directors

The stockholders may, at any special meeting the notice of which states that it is called for that purpose, remove, with or without cause, any director and fill the vacancy, provided that if any director was elected by the holders of any class of stock voting separately as a class under the provisions of the Certificate, such director may be removed and the vacancy filled only by the holders of that class of stock voting separately as a class. Vacancies caused by any such removal and not filled by the stockholders at the meeting at which such removal was made, or any vacancy caused by the death or resignation of any director or for any other reason, and any newly created directorship resulting from any increase in the authorized number of directors, may be filled by the affirmative vote of a majority of the directors then in office, even if less than a quorum, and any director so elected to fill any such vacancy or newly created directorship will hold office until his successor is elected and qualified or until his earlier death, resignation or removal.

In the case of the resignation of a director, a majority of the directors then in office, including those who have so resigned, will have power to fill such vacancy and the vote will take effect when such resignation becomes

effective, and each director so chosen will hold office until his successor is elected and qualified or until his earlier death, resignation or removal.

Amendment to Certificate of Incorporation and Bylaws

Our Bylaws may be amended or repealed, or new bylaws may be adopted, by our Board of Directors at any regular or special meeting by the affirmative vote of a majority of all of the members of the Board of Directors, provided, in the case of any special meeting at which all of the members of the Board of Directors are not present, that the notice of such meeting shall have stated that the amendment of the Bylaws was one of the purposes of the meeting. Our Bylaws may be altered, amended or repealed and other bylaws may be adopted by the holders of a majority of the total outstanding stock of the Corporation entitled to vote at any annual meeting or special meeting, provided, in the case of any special meeting, that notice of such proposed alteration, amendment, repeal or adoption is included in the notice of the meeting.

Any provision of our Certificate may be amended or repealed from time to time and at any time in the manner prescribed by the laws of the state of Delaware. The Delaware General Corporation Law (the "DGCL") provides generally that the affirmative vote of a majority of the outstanding stock entitled to vote on amendments to a corporation's certificate of incorporation or bylaws is required to approve such amendment.

Exclusive Jurisdiction of Certain Actions

Unless we consent in writing to the selection of an alternative forum, our Bylaws require that the Court of Chancery of the State of Delaware, to the fullest extent permitted by law, be the sole and exclusive forum for (a) any derivative action or proceeding brought on our behalf, (b) any action asserting a claim of breach of fiduciary duty owed by, or other wrongdoing by, any of our directors, officers, employees or agents to us or to our stockholders, creditors or other constituents, (c) any action asserting a claim arising pursuant to any provision of the DGCL or our Certificate or Bylaws, (d) any action to interpret, apply, enforce or determine the validity of our Certificate or Bylaws or (e) any action asserting a claim governed by the internal affairs doctrine. Although we believe this provision benefits the company by providing increased consistency in the application of Delaware law in the types of lawsuits to which it applies, the provision may have the effect of discouraging lawsuits against our directors, officers, employees or agents.

Authorized but Unissued Shares

The authorized but unissued shares of common stock and preferred stock are available for future issuance without stockholder approval, subject to any limitations imposed by the listing standards of the New York Stock Exchange. Our Board of Directors may issue shares of preferred stock in one or more series, to establish the number of shares to be included in each such series, and to fix the designations, powers, preferences, and rights of the share of each such series, and any qualifications limitations, or restrictions thereof. These additional shares may be used for a variety of corporate finance transactions, acquisitions and employee benefit plans. The existence of authorized but unissued common stock and preferred stock could make more difficult, or discourage an attempt to obtain control of us by means of a proxy contest, tender offer, merger, or otherwise.

WATERS CORPORATION
2012 EQUITY INCENTIVE PLAN

PERFORMANCE STOCK UNIT AWARD AGREEMENT

THIS AGREEMENT dated as of [ ] between Waters Corporation, a corporation organized under the laws of the State of Delaware (the "Company"), and [ ] (the "Participant" or "you"), an employee of Waters Corporation.

1. **Grant of Award**. Pursuant and subject to the Company's 2012 Equity Incentive Plan (as the same may be amended from time to time, the "Plan"), the Company hereby grants to the Participant an award (the "Award") consisting of a target number of [ ] Performance Units (the "Target Award" and such Performance Units, the "PSUs"). Each PSU represents the conditional right to receive, without payment but subject to the terms, conditions and limitations set forth in this Agreement and in the Plan, one share of the common stock, par value $.01 per share, of the Company (the "Stock"), subject to adjustment pursuant to Section 8 of the Plan in respect of transactions or events occurring after the date hereof. The percentage of the Target Award that may be earned by the Participant will be determined in accordance with Exhibit A hereto. The date of grant (the "Grant Date") of this Award is [ ].

2. **Earned PSUs**. The PSUs shall become "Earned PSUs" following the end of the Performance Period to the extent earned in accordance with the performance criteria set forth on Exhibit A (the "Performance Criteria"), subject to the Compensation Committee determining, in its sole discretion, the achievement of the Performance Criteria.

3. **Vesting of Earned PSUs; Termination of Employment**. No portion of the Award is vested as of the date hereof. The Earned PSUs (if any) shall vest in full on March 1, 2023 (the "Vesting Date"), subject to your continuous employment through this date, or such earlier time as set forth in Section 4 below. Notwithstanding the foregoing, in the event of a termination of your employment due to your Retirement after the first anniversary of the Performance Period Start Date (a "Qualifying Retirement") or your death, in either case, prior to the Vesting Date and prior to a Change of Control, the PSUs shall not terminate upon such termination and shall instead remain outstanding and eligible to become Earned PSUs in accordance with the terms of this Agreement and to vest on the Vesting Date. The number of Earned PSUs, if any, will be prorated based on the number of the days that have elapsed in the Performance Period from the Performance Period Start Date (as defined in Exhibit A) to the date of such termination of employment.

4. **Change of Control**. Notwithstanding anything contained in Section 9 of the Plan to the contrary:

(a) If, prior to the Performance Period End Date (as defined in Exhibit A), a Change of Control occurs, to the extent the PSUs are outstanding immediately prior to such Change of Control, the PSUs shall be deemed earned assuming the Performance Criteria have been achieved at target levels and the number of Earned PSUs shall be equal to the number of PSUs subject to the Target Award. The Earned PSUs shall continue to vest based solely on time and shall vest on the Vesting Date, subject to your remaining in continuous employment through such date, except as otherwise provided in Section 4(b)-(d) below.

(b) If (A) in connection with a Change of Control described in subsection (a) above the Earned PSUs are assumed or continued, or a new award is substituted for the Earned PSUs, by the acquiror or survivor (or an affiliate of the acquiror or survivor), (B) you remain continuously employed through the date of the Change of Control, and (C) your employment is terminated by the Company without Cause or by you for Good Reason, in either case, within eighteen (18) months following the Change of Control, the Earned PSUs will automatically vest in full upon such termination of employment.

(c) If, in connection with a Change of Control described in subsection (a) above, the Earned PSUs are not assumed or continued, or a new award is not substituted for the Earned PSUs, by the acquiror or survivor (or an affiliate of the acquiror or survivor), the Earned PSUs will automatically vest immediately prior to, but subject to the consummation of, the occurrence of such Change of Control and the Company shall deliver to you any shares in respect of Earned PSUs in a manner that will allow you to participate in the Change of Control on the same basis as other shareholders.

(d) In the event a Change of Control occurs following a termination of your employment due to a Qualifying Retirement or your death and prior to the Performance Period End Date, (i) the PSUs shall become Earned PSUs as provided for in Section 4(a) above (prorated, for the avoidance of doubt, in accordance with Section 3 above (based on the original Performance Period, without regard to the Change of Control)), (ii) the Earned PSUs will automatically vest in full immediately prior to, but subject to the consummation of, the occurrence of such Change of Control, and (iii) the Company shall deliver to you any shares in respect of Earned PSUs in a manner that will allow you to participate in the Change of Control on the same basis as other shareholders.

5. **Delivery of Shares**. Shares in respect of Earned PSUs that have become vested will be delivered to you as soon as practicable following vesting, but in any event no later than the March 15th following the date the Earned PSUs become vested hereunder (or any earlier date, after vesting, required to avoid characterization of this Award as non-qualified deferred compensation under Section 409A of the Code). In connection with the delivery of shares of Stock in respect of Earned PSUs, par value will be deemed paid for each share by past services rendered by you.

6. **Duration of Award and Termination of Employment.** This Award will expire upon the earlier of (i) the delivery of shares of Stock in respect of all vested and Earned PSUs granted pursuant to this Agreement or (ii) a termination of your employment with the Company and its Affiliates for any reason other than a Qualifying Retirement or death as provided in Section 3 above.

7. **Transfer of Awards**. You may not transfer this Award except by will or the laws of descent and distribution.

8. **Required Holding Period for Shares**. Any shares of Stock delivered to you in respect of Earned PSUs (after giving effect to the withholding of shares of Stock as contemplated by Section 12 below) may not be transferred, sold, hypothecated or otherwise disposed of for a period of [twelve (12)][1][twenty-four (24)][2] months following the Vesting Date; provided, however, that this restriction shall not apply following your death or in connection with or following a Change of Control.

9. **Incorporation of Plan Terms**. Except as expressly provided herein, this Award is granted subject to all of the applicable terms and provisions of the Plan, including but not limited to the provision for acceleration of vesting of this Award set forth in Section 8 (Adjustment Provisions) and the limitations on the Company's obligation to deliver shares of Stock upon settlement set forth in Section 10 (Settlement of Awards). Except as expressly provided herein, in the event of a conflict between the terms of this Agreement and the Plan, the terms of the Plan shall control.

10. **Definitions.** For purposes of this Award, the following terms have the following meanings:

1 Note to Draft: For all employees except CEO.

2 Note to Draft: For CEO.

(a) "Cause" shall mean, except as otherwise set forth in an employment or other individual agreement between you and the Company (it being understood that such other definition of "Cause" that is set forth in any such employment agreement or other individual Agreement shall control instead of this definition for so long as such employment agreement or other individual agreement is in effect):

(i) the conviction of you by a court of competent jurisdiction of, or the pleading of guilty or nolo contendere to, any felony or any crime involving moral turpitude;

(ii) gross negligence, breach of fiduciary duty, breach of any non-competition, non-solicitation or developments agreement or covenant in favor of the Company or material breach of any confidentiality agreement or covenant in favor of the Company;

(iii) you shall have willfully and continually failed to substantially perform your duties with the Company after a written demand for substantial performance is delivered by the Company, which demand specifically identifies the manner in which the Company believes that you have not substantially performed your duties pursuant to the disciplinary procedures of the Company, and such failure of substantial performance shall have continued for a period of thirty (30) days after such written demand;

(iv) you have been chronically absent from work (excluding vacations, illnesses or leaves of absences);

(v) the commission by you of an act of fraud, embezzlement or misappropriation against the Company; or

(vi) you shall have refused, after explicit notice, to obey any lawful resolution or direction by the Board which is consistent with your duties as an officer of the Company.

(b) "Good Reason" shall mean, except as otherwise set forth in an employment or other individual agreement between you and the Company (it being understood that such other definition of "Good Reason" that is set forth in any such employment agreement or other individual agreement shall control instead of this definition for so long as such employment agreement or other individual agreement is in effect, the occurrence (without your express written consent) of one or more of the following events following a Change of Control, as the case may be:

(i) a material diminution in your authority, duties, responsibilities or reporting lines from your authority, duties, responsibilities or reporting lines immediately prior to the Change of Control;

(ii) a material reduction in your base salary (other than that which results in a base salary reduction of no more than ten percent (10%) in the aggregate from your highest base salary and is proportional to reductions of other senior executives) or target annual bonus opportunity;

(iii) a material change in your place of business (provided, however, that travel for business purposes consistent with past practices shall not be considered a change in the place of business for the purpose of this clause (iii)); or

(iv) a material breach by the Company of any agreement under which you provide services to the Company, or any plan of incentive compensation;

provided, that the occurrence of any of the events listed in clauses (i) through (iv) shall not constitute "Good Reason" (x) unless you shall have given notice of the event to the Company within ninety (90) days after it first existed, (y) the Company shall have failed to remedy the condition within thirty (30) days after the notice, and (z) you actually terminate employment within thirty (30) days after the expiration of the Company's cure period.

(c) "Retirement" shall mean your termination of employment (other than for Cause or your voluntary resignation at a time when Cause exists) (i) at any time after you have reached age sixty (60) with ten (10) years of service to the Company and its subsidiaries and (ii) with the intention of concluding your working or professional career.

11. **Miscellaneous**. This Agreement shall be construed and enforced in accordance with the laws of the State of Delaware, without regard to the conflict of laws principles thereof and shall be binding upon and inure to the benefit of any successor or assign of the Company and any executor, administrator, trustee, guardian, or other legal representative of you. Capitalized terms used but not defined herein shall have the meaning assigned under the Plan. This Agreement may be executed in one or more counterparts all of which together shall constitute but one instrument.

12. **Tax Consequences**. The Company makes no representation or warranty as to the tax treatment to you of your receipt or the vesting or settlement of this Award or upon your sale or other disposition of shares of Stock. You should rely on your own tax advisors for such advice. By accepting this Award, you hereby acknowledge and agree that the Company will hold back that number of whole shares of Stock otherwise deliverable to you under this Award having a Market Value sufficient to satisfy the statutory minimum withholding amount applicable to the shares delivered under this Award, with the Company accepting a payment in cash or by check to the extent of any withholding amounts not satisfied by such withholding of shares. Nothing in the preceding sentence shall be construed as relieving the you of any liability for satisfying your tax obligations with respect to this Award and you authorize the Company and its subsidiaries to withhold any such amounts from any amounts otherwise owed to you.

IN WITNESS WHEREOF, the parties have executed this Agreement as a sealed instrument as of the date first above written.

WATERS CORPORATION

By: Christopher J. O'Connell
Title: Chairman and Chief Executive Officer

EMPLOYEE
Electronic Signature of Participant

Exhibit 21.1

Waters Corporation and Subsidiaries
12/31/2019

- Waters Corporation (Delaware)
  - Waters Technologies Corporation (Delaware)
    - Environmental Resource Associates, Inc. (Colorado)
    - TA Instruments-Waters LLC (Delaware)
    - Waters AG (Switzerland)
    - Waters Australia PTY LTD. (Australia)
    - Waters India Pvt. Ltd.
    - Waters SA de CV (Mexico)
    - Waters SAS (France)
    - Waters Sverige AB (Sweden)
    - Waters Technologies do Brasil Ltda (Brazil)
    - Waters Global International Limited (Cayman) (1)
    - Waters Global Limited (UK) (1)
    - Waters Technologies International Limited (Cayman) (1)
    - Waters Asia Limited (Delaware)
      - Waters A/S (Denmark)
      - Waters Limited (Canada)
      - Waters China Ltd. (Hong Kong)
      - Waters Cromatografia SA (Spain)
      - Waters Korea Limited (Korea)
      - Waters NV (Belgium)
      - Waters Technologies (Beijing) Co. Ltd (China)
      - Waters Technologies (Shanghai) Ltd (China)
      - Waters Ges.MBH (Austria)
        - Waters Kft (Hungary)
        - Waters O.O.O. (Russia) (1)
        - Waters Sp.Zo.o (Poland)
      - Waters Pacific Pte Ltd. (Singapore)
        - Waters Analytical Instruments Sdn Bhd (Malaysia)
      - Waters Holdings LLC (Delaware)
        - Nihon Waters K.K. (Japan)
        - TA Instruments Japan, Inc. (Japan)
        - Waters SpA (Italy)
        - Waters European Investments LLC
          - Manchester International Limited
          - Melbourne International Limited
          - Milford International Limited
          - Waters Celtic Holdings Ltd. (Ireland)
            - Waters Chromatography Ireland Ltd. (Ireland)
            - Waters Technologies Ireland Ltd. (Ireland)
              - Waters Romania Srl
              - Waters GmbH (Germany)
          - Waters Luxembourg SARL (Luxembourg)
            - Waters (TC) Israel Ltd. (Israel)
            - Micromass Holdings Ltd. (UK)
              - ULSP BV (Netherlands)
              - Waters Chromatography BV (Netherlands)
              - Waters Chromatography Europe BV (Netherlands)
              - Waters Tech. LC-MS Unapessol Lda (Portugal)
              - Micromass Ltd. (UK)
                - PRA Europe Limited (UK) (1)
                - Waters Limited (UK)
                - Micromass UK Ltd. (UK)
                  - Waters Research Center Kft (Hungary)
                  - MPE Orbur Group Ltd. (UK)
                    - Midland Precision Equipment Co. Ltd. (UK)

All Subsidiaries are 100% owned unless otherwise indicated

(1) Dormant

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-18371, 333-81723, 333-60054, 333-92332, 333-110613, 333-137990, 333-160507, 333-183721) of Waters Corporation of our report dated February 25, 2020 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP
Boston, Massachusetts
February 25, 2020

CHIEF EXECUTIVE OFFICER CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Christopher J. O'Connell, certify that:

1. I have reviewed this annual report on Form 10-K of Waters Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

    c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 25, 2020

/s/ Christopher J. O'Connell

Christopher J. O'Connell
Chief Executive Officer

CHIEF FINANCIAL OFFICER CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Sherry L. Buck, certify that:

1. I have reviewed this annual report on Form 10-K of Waters Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

    c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 25, 2020

/s/ Sherry L. Buck

Sherry L. Buck
Chief Financial Officer

CHIEF EXECUTIVE OFFICER CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

The certification set forth below is hereby made solely for the purpose of satisfying the requirements of Section 906 of the Sarbanes-Oxley Act of 2002 and may not be relied upon or used for any other purposes.

In connection with the Annual Report of Waters Corporation (the "Company") on Form 10-K for the period ended December 31, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Christopher J. O'Connell, Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge: (1) the Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and (2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

A signed original of this written statement required by Section 906 or other document authenticating, acknowledging or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

Date: February 25, 2020

By: /s/ Christopher J. O'Connell
Christopher J. O'Connell
Chief Executive Officer

**CHIEF FINANCIAL OFFICER CERTIFICATION PURSUANT TO 18 U.S.C.
SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906
OF THE SARBANES-OXLEY ACT OF 2002**

The certification set forth below is hereby made solely for the purpose of satisfying the requirements of Section 906 of the Sarbanes-Oxley Act of 2002 and may not be relied upon or used for any other purposes.

In connection with the Annual Report of Waters Corporation (the "Company") on Form 10-K for the period ended December 31, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Sherry L. Buck, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge: (1) the Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and (2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

A signed original of this written statement required by Section 906 or other document authenticating, acknowledging or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

Date: February 25, 2020

By: /s/ Sherry L. Buck
Sherry L. Buck
Chief Financial Officer