UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
Form 10-K

(Mark one)

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

For the fiscal year ended October 27, 2019

or

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

For the transition period from to

Commission file number 000-06920

Applied Materials, Inc.
(Exact name of registrant as specified in its charter)

Delaware	**94-1655526**
(State or other jurisdiction of incorporation or organization)	*(I.R.S. Employer Identification No.)*

3050 Bowers Avenue
P.O. Box 58039
Santa Clara, California 95052-8039
(Address of principal executive offices)

(408) 727-5555
(Registrant's telephone number, including area code)

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

Title of Each Class	Trading Symbol	Name of Each Exchange on Which Registered
Common Stock, par value $.01 per share	AMAT	The NASDAQ Stock Market LLC

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). Yes No ☐

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

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

		Accelerated filer	☐
Large 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

Aggregate market value of the voting stock held by non-affiliates of the registrant as of April 28, 2019, based upon the closing sale price reported by the NASDAQ Global Select Market on that date: 41677858958

Number of shares outstanding of the registrant's Common Stock, $.01 par value, as of December 6, 2019:915,304,098

DOCUMENTS INCORPORATED BY REFERENCE:

Portions of Part III will be provided in accordance with Instruction G(3) to Form 10-K no later than February 24, 2020.

Caution Regarding Forward-Looking Statements

This Annual Report on Form 10-K of Applied Materials, Inc. and its subsidiaries, including “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in Item 7, contains forward-looking statements that involve a number of risks and uncertainties.

Examples of forward-looking statements include those regarding Applied’s future financial or operating results, customer demand and spending, end-use demand, market and industry trends and outlooks, cash flows and cash deployment strategies, declaration of dividends, share repurchases, business strategies and priorities, costs and cost controls, products, competitive positions, management’s plans and objectives for future operations, research and development, strategic acquisitions and investments, including the proposed acquisition of Kokusai Electric Corporation (Kokusai Electric), growth opportunities, restructuring activities, backlog, working capital, liquidity, investment portfolio and policies, taxes, supply chain, manufacturing, properties, legal proceedings and claims, and other statements that are not historical facts, as well as their underlying assumptions. Forward-looking statements may contain words such as “may,” “will,” “should,” “could,” “would,” “expect,” “plan,” “anticipate,” “believe,” “estimate,” “intend,” “potential” and “continue,” the negative of these terms, or other comparable terminology. All forward-looking statements are subject to risks and uncertainties and other important factors, including those discussed in Part I, Item 1A, “Risk Factors,” below and elsewhere in this report. These and many other factors could affect Applied’s future financial condition and operating results and could cause actual results to differ materially from expectations based on forward-looking statements made in this document or elsewhere by Applied or on its behalf. Forward-looking statements are based on management’s estimates, projections and expectations as of the date hereof, and Applied undertakes no obligation to revise or update any such statements.

The following information should be read in conjunction with the Consolidated Financial Statements and the accompanying Notes to Consolidated Financial Statements included in this report.

APPLIED MATERIALS, INC.

FORM 10-K FOR THE FISCAL YEAR ENDED OCTOBER 27, 2019

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PART I

Item 1: *Business*

Incorporated in 1967, Applied Materials, Inc. (Applied) is a Delaware corporation. A global company with a broad set of capabilities in materials engineering, Applied provides manufacturing equipment, services and software to the semiconductor, display and related industries. With its diverse technology capabilities, Applied delivers products and services that improve device performance, yield and cost. Applied's customers include manufacturers of semiconductor chips, liquid crystal and organic light-emitting diode (OLED) displays, and other electronic devices. These customers may use what they manufacture in their own end products or sell the items to other companies for use in advanced electronic components. Applied's fiscal year ends on the last Sunday in October.

Applied operates in three reportable segments: Semiconductor Systems, Applied Global Services, and Display and Adjacent Markets. A summary of financial information for each reportable segment is found in Note 16 of Notes to Consolidated Financial Statements. A discussion of factors that could affect operations is set forth under "Risk Factors" in Item 1A, which is incorporated herein by reference.

Semiconductor Systems

Applied's Semiconductor Systems segment develops, manufactures and sells a wide range of manufacturing equipment used to fabricate semiconductor chips, also referred to as integrated circuits (ICs). The Semiconductor Systems segment includes semiconductor capital equipment used for many steps of the chip making process including the transfer of patterns into device structures, transistor and interconnect fabrication, metrology, inspection and review, and packaging technologies for connecting finished IC die. Applied's patterning systems and technologies address challenges resulting from shrinking pattern dimensions and the growing complexity in vertical stacking found in today's most advanced semiconductor devices. Applied's transistor and interconnect products and technologies enable continued device scaling of 3D transistors. Applied's metrology, inspection and review systems' imaging capabilities and algorithms employ optical and e-beam technologies to meet the most advanced technical demands, such as self-aligned double and quad patterning, extreme ultraviolet layers, measurement-intensive optimal proximity correction mask qualification, and new 3D architectures. Applied's packaging technologies address challenges resulting from the increasing integration of multiple IC dies in a single package. Applied delivers leading-edge capabilities that enable chipmakers to establish accurate statistical process control, ramp up production runs rapidly, and achieve consistently high production yields. The majority of Applied's new equipment sales are to leading integrated device manufacturers and foundries worldwide.

Technologies	Product(s)
Epitaxy Epitaxy (or epi) is a technique for growing silicon (e.g. silicon with another element) as a uniform crystalline structure on a wafer to form high quality material for the device circuitry. Epi technology is used in device transistors to enhance chip speed.	Centura RP Epi
Ion Implant Ion implantation is a key technology for forming transistors and is used many times during chip fabrication. During ion implantation, wafers are bombarded by a beam of electrically-charged ions, called dopants, which can change the electrical properties of the exposed semiconductor material.	VIISta Systems
Oxidation/Nitridation Applied’s systems provide critical oxidation steps - like memory gate oxide, shallow trench isolation and liner oxide - for advanced device scaling.	Vantage, Radiance and Centura Systems
Rapid Thermal Processing (RTP) RTP is used primarily for annealing, which modifies the properties of deposited films. Applied’s single-wafer RTP systems are also used for growing high quality oxide and oxynitride films.	Vantage Systems
Physical Vapor Deposition (PVD) PVD is used to deposit high quality metal films. Applications include metal gate, silicides, contact liner/barrier, interconnect copper barrier seed and metal hard mask.	Endura Systems
Chemical Vapor Deposition (CVD) CVD is used to deposit dielectric and metal films on a wafer. During the CVD process, gases that contain atoms of the material to be deposited react on the wafer surface, forming a thin film of solid material.	Endura, Centura and Producer Systems
Chemical Mechanical Planarization (CMP) CMP is used to planarize a wafer surface, a process that allows subsequent photolithography patterning and material deposition steps to occur with greater accuracy, resulting in more uniform film layers with minimal thickness variations.	Reflexion Systems
Electrochemical Deposition (ECD) ECD is a process by which metal atoms from a chemical fluid (an electrolyte) are deposited on the surface of an immersed object.	Raider and Nokota Platforms
Atomic Layer Deposition (ALD) ALD technology enables ultra thin film growth of either a conducting or insulating material with uniform coverage in nanometer-sized structures.	Olympia System
Etch Etching is used many times throughout the IC manufacturing process to selectively remove material from the surface of a wafer. Applied offers systems for etching dielectric, metal, and silicon films to meet the requirements of advanced processing.	Centris and Producer Systems
Selective Removal Selective removal is a new etch technology intended to remove a material of a particular composition without damaging materials of different composition that coexist on the wafer.	Producer Systems
Metrology and Inspection Metrology and inspection tools are used to locate, measure, and analyze defects and features on the wafer during various stages of the fabrication processes. Applied enables customers to characterize and control critical dimension (CD) and defect issues, especially at advanced generation technology nodes.	SEMVision G7 Defect Analysis PROVision eBeam Inspection UVision 8 Inspection VeritySEM 5i Metrology Aera4 Mask Inspection

Applied Global Services

The Applied Global Services (AGS) segment provides integrated solutions to optimize equipment and fab performance and productivity, including spares, upgrades, services, remanufactured earlier generation equipment and factory automation software for semiconductor, display and other products. Customer demand for products and services is fulfilled through a global distribution system more than 100 locations and trained service engineers located in close proximity to customer sites in more than a dozen countries to support over 42,500 installed Applied semiconductor, display and other manufacturing systems worldwide. Applied offers the following general types of services and products under the Applied Global Services segment.

AGS Solutions and Technology

Technology-enabled Services

A comprehensive service product portfolio that combines service technology and tool specific performance commitments in order to optimize customer factory productivity.

Fab Consulting

Experts using advanced analytical tools to solve production problems that have the greatest impact on customer fab productivity.

Supply Chain Assurance Programs

Spare parts product portfolio offers options to balance inventory, cost and risk to efficiently meet fab requirements.

Subfab Equipment

Applied SubFab solutions lower costs, save energy, reduce environmental impact, and meet Environmental Protection Agency reporting regulations for greenhouse gas emissions.

Legacy Equipment

Comprehensive 200mm equipment and upgrades portfolio to address a full spectrum of production needs and extend tool lifetime. Applied 200mm equipment supports market inflections and new technology for a broad variety of devices including analog, power, and MEMS.

Automation Software

Applied SmartFactory automation software portfolio coordinates and streamlines every aspect of a factory-the processes, equipment and people-to provide competitive advantage to customers.

Display and Adjacent Markets

The Display and Adjacent Markets segment is comprised of products for manufacturing liquid crystal displays (LCDs), organic light-emitting diodes (OLEDs), and other display technologies for TVs, monitors, laptops, personal computers (PCs), electronic tablets, smart phones, and other consumer-oriented devices as well as equipment for processing flexible substrates. While similarities exist between the technologies utilized in semiconductor and display fabrication, the most significant differences are in the size and composition of the substrate. Substrates used to manufacture display panels and other devices are typically glass, although newer flexible materials are entering the market. Display and Adjacent Markets industry growth depends primarily on consumer demand for increasingly larger and more advanced TVs and high resolution displays for mobile devices as well as new form factors, including thin, light, curved and flexible displays, and new applications such as augmented and virtual reality. The Display and Adjacent Markets segment offers a variety of technologies and products, including:

Display and Adjacent Markets Technologies	Product(s)
Array Test LCD display substrates are inspected at many stages of production to maximize yield, minimize scrap, optimize equipment utilization, and monitor manufacturing processes. At the completion of the array stage, the performance of the millions of individual pixels on each display is tested.	Electron Beam Array Tester
Defect Review Defects are identified during inspection steps and reviewed by a scanning electron microscope and other analyses to determine defect root cause and composition.	Electron Beam Review (EBR)
Chemical Vapor Deposition (CVD) During CVD processing, gases containing atoms or molecules are introduced into the process chamber. The gases form reactive radicals or ions, which undergo chemical reactions to form thin films on the heated substrate.	AKT PECVD Systems
Physical Vapor Deposition (PVD) PVD is used to deposit high quality films of metals, alloys, transparent conductors and semiconductors. In Display, these films are used for contact, interconnect, transparent electrodes and transistor materials in TFT-LCD and OLED display backplanes, as well as for transparent electrodes in color filters and touch panels.	AKT Aristo and PiVot Systems
Flexible Technologies Flexible coating systems utilize physical vapor deposition, thermal evaporation, chemical vapor deposition, and e-beam technology to deposit thin layers of metal onto flexible substrates.	TopBeam, TopMet, TopCoil and SmartWeb Systems

Backlog

Applied manufactures systems to meet demand represented by order backlog and customer commitments. Backlog consisted of: (1) orders for which written authorizations have been accepted, or shipment has occurred but revenue has not been recognized; and (2) contractual service revenue and maintenance fees.

Backlog by reportable segment as of October 27, 2019 and October 28, 2018 was as follows:

	2019		2018	
	(In millions, except percentages)			
Semiconductor Systems	$ 2,925	45 %	$ 2,479	41 %
Applied Global Services	2,073	32 %	1,751	29 %
Display and Adjacent Markets	1,453	23 %	1,836	30 %
Corporate and Other	22	— %	26	— %
Total	$ 6,473	100 %	$ 6,092	100 %

Of the total backlog as of October 27, 2019, approximately 12% is not reasonably expected to be filled within the next 12 months.

Applied’s backlog on any particular date is not necessarily indicative of actual sales for any future periods, due to the potential for customer changes in delivery schedules or order cancellations. Customers may delay delivery of products or cancel orders prior to shipment, subject to possible cancellation penalties. Delays in delivery schedules or a reduction of backlog during any particular period could have a material adverse effect on Applied’s business and results of operations.

Manufacturing, Raw Materials and Supplies

Applied’s worldwide manufacturing activities consist primarily of assembly, integration and test of various proprietary and commercial parts, components and subassemblies that are used to manufacture systems. Applied has implemented a distributed manufacturing model under which manufacturing and supply chain activities are conducted in various countries, including Germany, Israel, Italy, Singapore, Taiwan, the United States and other countries in Asia. Applied uses qualified vendors, including contract manufacturers, to supply parts, services and product support.

Although Applied makes reasonable efforts to assure that parts are available from multiple qualified suppliers, this is not always possible. Accordingly, some key parts may be obtained from only a qualified single supplier or a limited group of qualified suppliers. Applied seeks to reduce costs and to lower the risks of manufacturing and service interruptions by selecting and qualifying alternate suppliers for parts; monitoring the financial condition of key suppliers; maintaining appropriate inventories of parts; qualifying new parts on a timely basis; and ensuring quality and performance of parts.

Research, Development and Engineering

Applied’s long-term growth strategy requires continued development of new materials engineering capabilities, including products and platforms that enable expansion into new and adjacent markets. Applied’s significant investments in research, development and engineering (RD&E) must generally enable it to deliver new products and technologies before the emergence of strong demand, thus allowing customers to incorporate these products into their manufacturing plans during early-stage technology selection. Applied works closely with its global customers and ecosystem partners to design systems and processes that meet planned technical and production requirements.

Applied’s product development and engineering organizations are located primarily in the United States, as well as in Canada, China, Europe, India, Israel, Singapore and Taiwan. In addition, certain outsourced RD&E activities, process support and customer demonstrations are performed in the United States, India, China, Singapore and Taiwan.

Marketing and Sales

Because of the highly technical nature of its products, Applied markets and sells products worldwide almost entirely through a direct sales force.

Applied has operations in many countries, with some of its business activities concentrated in certain geographic areas, and global and regional economic conditions can impact the company's business and financial results. Applied's business is based on capital equipment investments by major semiconductor, display and other manufacturers, and is subject to significant variability in customer demand for Applied's products. Customers' expenditures depend on many factors, including: general economic conditions; anticipated market demand and pricing for semiconductors, display technologies and other electronic devices; the development of new technologies; customers' factory utilization; capital resources and financing; and government policies and incentives. In addition, a significant driver in the semiconductor and display industries has been end-demand for mobile consumer products, which has been characterized by seasonality that impacts the timing of customer investments in manufacturing equipment and, in turn, Applied's business.

Information on net sales to unaffiliated customers and long-lived assets attributable to Applied's geographic regions is included in Note 16 of Notes to Consolidated Financial Statements. The following companies accounted for at least 10 percent of Applied's net sales in each fiscal year, which were for products and services in multiple reportable segments.

	2019	2018	2017
Samsung Electronics Co., Ltd.	*	13%	23%
Taiwan Semiconductor Manufacturing Company Limited	14%	*	16%
Intel Corporation	12%	11%	*

* Less than 10%

Competition

The industries in which Applied operates are highly competitive and characterized by rapid technological change. Applied's ability to compete generally depends on its ability to commercialize its technology in a timely manner, continually improve its products, and develop new products that meet constantly evolving customer requirements. Significant competitive factors include technical capability and differentiation, productivity, cost-effectiveness and the ability to support a global customer base. The importance of these factors varies according to customers' needs, including product mix and respective product requirements, applications, and the timing and circumstances of purchasing decisions. Substantial competition exists in all areas of Applied's business. Competitors range from small companies that compete in a single region, which may benefit from policies and regulations that favor domestic companies, to global, diversified companies. Applied's ability to compete requires a high level of investment in RD&E, marketing and sales, and global customer support activities. Management believes that many of Applied's products have strong competitive positions.

The competitive environment for each segment is described below.

The semiconductor industry is driven by demand for advanced electronic products, including smartphones and other mobile devices, servers, personal computers, automotive devices, storage, and other products. The growth of data and emerging end-market drivers such as artificial intelligence, augmented and virtual reality, the Internet of Things and smart vehicles are also creating new opportunities for the industry. As a result, products within the Semiconductor Systems segment are subject to significant changes in customer requirements, including transitions to smaller dimensions, increasingly complex chip architectures, new materials and an increasing number of applications. While certain existing technologies may be adapted to new requirements, some applications create the need for an entirely different technological approach. The rapid pace of technological change can quickly diminish the value of current technologies and products and create opportunities for existing and new competitors. Applied offers a variety of technologically-differentiated products that must continuously evolve to satisfy customers' requirements to compete effectively in the marketplace. Applied allocates resources among its numerous product offerings and therefore may decide not to invest in an individual product to the same degree as competitors who specialize in fewer products. There are a number of competitors serving the semiconductor manufacturing equipment industry, which has experienced increasing consolidation. Some of these competitors offer a single product line and others offer multiple product lines, and range from suppliers serving a single region to global, diversified companies.

Products and services within the Applied Global Services segment complement Semiconductor Systems and Display and Adjacent Markets segments' products in markets that are characterized by demanding worldwide service requirements and a diverse group of numerous competitors. To compete effectively, Applied offers products and services to improve tool performance, lower overall cost of ownership, and increase yields and productivity of customers' fab operations. Significant competitive factors include productivity, cost-effectiveness, and the level of technical service and support. The importance of these factors varies according to customers' needs and the type of products or services offered.

Products in the Display and Adjacent Markets segment are generally subject to strong competition from a number of major competitors primarily in Asia. Applied holds established market positions with its technically-differentiated LCD and OLED manufacturing solutions for PECVD, color filter PVD, PVD array, PVD touch panel, and TFT array testing, although its market position could change quickly due to customers' evolving requirements. Important factors affecting the competitive position of Applied's Display and Adjacent Markets products include: industry trends, Applied's ability to innovate and develop new products, and the extent to which Applied's products are technically-differentiated, as well as which customers within a highly concentrated customer base are making capital equipment investments and Applied's existing position at these customers.

Patents and Licenses

Applied's competitive position significantly depends upon its research, development, engineering, manufacturing and marketing capabilities, as well as its patent position. Protection of Applied's technology assets through enforcement of its intellectual property rights, including patents, is important. Applied's practice is to file patent applications in the United States and other countries for inventions that it considers significant. Applied has approximately 13,300 patents in the United States and other countries, and additional applications are pending for new inventions. Although Applied does not consider its business materially dependent upon any one patent, the rights of Applied and the products made and sold under its patents, taken as a whole, are a significant element of its business. In addition to its patents, Applied possesses other intellectual property, including trademarks, know-how, trade secrets, and copyrights.

Applied enters into patent and technology licensing agreements with other companies when it is determined to be in its best interest. Applied pays royalties under existing patent license agreements for the use, in several of its products, of certain patented technologies. Applied also receives royalties from licenses granted to third parties. Royalties received from or paid to third parties have not been material to Applied's consolidated results of operations.

In the normal course of business, Applied periodically receives and makes inquiries regarding possible patent infringement. In responding to such inquiries, it may become necessary or useful for Applied to obtain or grant licenses or other rights. However, there can be no assurance that such licenses or rights will be available to Applied on commercially reasonable terms, or at all. If Applied is not able to resolve or settle claims, obtain necessary licenses on commercially reasonable terms, or successfully prosecute or defend its position, Applied's business, financial condition and results of operations could be materially and adversely affected.

Environmental Matters

Applied maintains a number of environmental, health, and safety programs that are primarily preventative in nature. As part of these programs, Applied regularly monitors ongoing compliance with applicable laws and regulations. In addition, Applied has trained personnel to conduct investigations of any environmental, health, or safety incidents, including, but not limited to, spills, releases, or possible contamination.

Compliance with federal, state and local environmental, health and safety laws and regulations, including those regulating the discharge of materials into the environment, remedial agreements, and other actions relating to the environment have not had, and are not expected to have, a material effect on Applied's capital expenditures, competitive position, financial condition, or results of operations.

The most recent report on Applied's environmental, health and safety activities can be found in Applied's latest Corporate Social Responsibility (CSR) Report on its website at http://www.appliedmaterials.com//files/2018_csr.pdf. The CSR Report is updated periodically. This website address is intended to be an inactive textual reference only. None of the information on, or accessible through, Applied's website is part of this Form 10-K or is incorporated by reference herein.

Employees

At October 27, 2019, Applied employed approximately 22,000 regular employees. In the high-technology industry, competition for highly-skilled employees is intense. Applied believes that its future success is highly dependent upon its continued ability to attract, retain and motivate qualified employees.

Executive Officers of the Registrant

The following table and notes set forth information about Applied's executive officers:

Name of Individual	Position
Gary E. Dickerson(1)	President, Chief Executive Officer
Ginetto Addiego(2)	Senior Vice President, Engineering, Operations and Quality
Daniel J. Durn(3)	Senior Vice President, Chief Financial Officer
Steve Ghanayem(4)	Senior Vice President, New Markets and Alliances Group
Thomas F. Larkins(5)	Senior Vice President, General Counsel
Omkaram Nalamasu(6)	Senior Vice President, Chief Technology Officer
Prabu Raja(7)	Senior Vice President, Semiconductor Products Group
Ali Salehpour(8)	Senior Vice President, Services, Display and Flexible Technology
Charles Read(9)	Corporate Vice President, Corporate Controller and Chief Accounting Officer

(1) Mr. Dickerson, age 62, was named President of Applied in June 2012 and appointed Chief Executive Officer and a member of the Board of Directors in September 2013. Before joining Applied, he served as Chief Executive Officer and a director of Varian Semiconductor Equipment Associates, Inc. (Varian) from 2004 until its acquisition by Applied in November 2011. Prior to Varian, Mr. Dickerson served 18 years with KLA-Tencor Corporation (KLA-Tencor), a supplier of process control and yield management solutions for the semiconductor and related industries, where he held a variety of operations and product development roles, including President and Chief Operating Officer. Mr. Dickerson started his semiconductor career in manufacturing and engineering management at General Motors' Delco Electronics Division and then AT&T Technologies.

(2) Dr. Addiego, age 60, has been Senior Vice President, Engineering, Operations and Quality since June 2015. He served as Senior Vice President, Engineering from March 2014 to June 2015. He previously worked at Applied from 1996 to 2005, leading various product groups as well as global organizations, including Global Operations, Facilities and Real Estate, Foundation Engineering, and Information Technology. From March 2011 to March 2014, Dr. Addiego was President and Chief Operating Officer of Ultra Clean Technology Corp., a public company listed on Nasdaq and a supplier of critical subsystems for the semiconductor capital equipment, medical device, energy, research, and flat panel industries. From February 2005 to March 2011, Dr. Addiego worked at Novellus Systems, Inc., a provider of advanced process equipment for the semiconductor industry, where he served as Executive Vice President of Corporate Global Operations responsible for Central Engineering, Facilities, Real Estate, Human Resources and Information Technology, and as Chief Administrative Officer.

(3) Mr. Durn, age 53, has been Senior Vice President and Chief Financial Officer of Applied since August 2017. Previously, Mr. Durn was Executive Vice President and Chief Financial Officer of NXP Semiconductors N.V., a semiconductor manufacturer (NXP), from December 2015 to August 2017. Mr. Durn served as Senior Vice President of Finance and Chief Financial Officer of Freescale Semiconductor, Inc., from June 2014 until its merger with NXP in December 2015. Prior to Freescale, Mr. Durn was Chief Financial Officer and Executive Vice President of Finance and Administration at GlobalFoundries, a semiconductor foundry, which he joined in December 2011.

(4) Mr. Ghanayem, age 54, has been Senior Vice President, New Markets and Alliances Group of Applied since November 2017. He has served in various senior management, product development and operational roles since joining Applied in 1989, including Group Vice President and General Manager of the Transistor and Interconnect Group.

(5) Mr. Larkins, age 58, has been Senior Vice President, General Counsel of Applied since November 2012 and was Corporate Secretary from November 2012 to March 2018. Previously, Mr. Larkins was employed by Honeywell International Inc., a diversified global technology and manufacturing company, where he was Vice President, Corporate Secretary and Deputy General Counsel from 2002 until joining Applied. Mr. Larkins served in various other positions at Honeywell (formerly AlliedSignal) after joining the company in 1997.

(6) Dr. Nalamasu, age 61, has been Senior Vice President, Chief Technology Officer since June 2013, and President of Applied Ventures, LLC, Applied's venture capital arm, since November 2013. He had served as Group Vice President, Chief Technology Officer from January 2012 to June 2013, and as Corporate Vice President, Chief Technology Officer from January 2011 to January 2012. Upon joining Applied in June 2006 until January 2011, Dr. Nalamasu was an Appointed Vice President of Research and served as Deputy Chief Technology Officer and General Manager for the Advanced Technologies Group. From 2002 to 2006, Dr. Nalamasu was a NYSTAR distinguished professor of Materials Science and Engineering at Rensselaer Polytechnic Institute, where he also served as Vice President of Research from 2005 to 2006. Prior to Rensselaer, Dr. Nalamasu served in several leadership roles at Bell Laboratories.

(7) Dr. Raja, age 57, has been Senior Vice President, Semiconductor Products Group of Applied since November 2017. He previously served in various senior management, product development and operational roles since joining Applied in 1995, including Group Vice President and General Manager of the Patterning and Packaging Group.

(8) Mr. Salehpour, age 58, has been Senior Vice President, Services, Display and Flexible Technology since September 2013. He previously served as Group Vice President, General Manager Energy and Environmental Solutions and Display Business Groups, since joining Applied in November 2012. Prior to Applied, Mr. Salehpour worked at KLA-Tencor for 16 years, where he served as a Senior Vice President and General Manager, and worked for 10 years in senior management positions at Schlumberger Test Systems.

(9) Mr. Read, age 53, has been Corporate Vice President, Corporate Controller and Chief Accounting Officer of Applied since joining the Company in September 2013. Prior to Applied, Mr. Read worked at Brocade Communications Systems, Inc., a provider of semiconductor and software-based network solutions, since October 2002, where he most recently served as Vice President, Corporate Controller. Prior to Brocade, Mr. Read worked at KPMG LLP, an audit, tax and advisory firm, from 1996 to 2002.

Available Information

Applied's website is http://www.appliedmaterials.com. Applied makes available free of charge, on or through its website, its annual, quarterly and current reports, and any amendments to those reports, as soon as reasonably practicable after electronically filing such reports with, or furnishing them to, the SEC. The SEC's website, www.sec.gov, contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC. These website addresses are intended to be an inactive textual references only. None of the information on, or accessible through, these websites is part of this Form 10-K or is incorporated by reference herein.

Item 1A: *Risk Factors*

The following risk factors could materially and adversely affect Applied's business, financial condition or results of operations and cause reputational harm, and should be carefully considered in evaluating the Company and its business, in addition to other information presented elsewhere in this report.

The industries that Applied serves can be volatile and difficult to predict.

As a supplier to the global semiconductor and display and related industries, Applied is subject to variable industry conditions, since demand for manufacturing equipment and services can change depending on several factors, including the nature and timing of technology inflections and advances in fabrication processes, the timing and requirements of new and emerging technologies and market drivers, production capacity relative to demand for chips and display technologies, end-user demand, customers' capacity utilization, production volumes, access to affordable capital, consumer buying patterns and general economic conditions. Applied's industries historically have been cyclical, and are subject to volatility and sudden changes in customer requirements for new manufacturing capacity and advanced technology. These changes can affect the timing and amounts of customer investments in technology and manufacturing equipment and can have a significant impact on Applied's net sales, operating expenses, gross margins and net income. The amount and mix of capital equipment spending between different products and technologies can have a significant impact on the Company's results of operations.

To meet rapidly changing demand in the industries it serves, Applied must accurately forecast demand and effectively manage its resources and production capacity across its businesses, and may incur unexpected or additional costs to align its business operations. During periods of increasing demand for its products, Applied must have sufficient manufacturing capacity and inventory to meet customer demand; effectively manage its supply chain; attract, retain and motivate a sufficient number of qualified employees; and continue to control costs. During periods of decreasing demand, Applied must reduce costs and align its cost structure with prevailing market conditions; effectively manage its supply chain; and motivate and retain key employees. If Applied does not effectively manage these challenges during periods of changing demand, its business performance and results of operations may be adversely impacted. Even with effective allocation of resources and management of costs, during periods of decreasing demand, Applied's gross margins and earnings may be adversely impacted.

Applied is exposed to the risks of operating a global business.

Applied has product development, engineering, manufacturing, sales and other operations distributed throughout many countries, and some of its business activities are concentrated in certain geographic areas. Moreover, in fiscal 2019, approximately 87 percent of Applied's net sales were to customers in regions outside the United States. As a result of the global nature of its operations, Applied's business performance and results of operations may be adversely affected by a number of factors, including:

- uncertain global economic and political business conditions and demands;
- political and social attitudes, laws, rules, regulations and policies within countries that favor domestic companies over non-domestic companies, including customer- or government-supported efforts to promote the development and growth of local competitors;
- global trade issues and changes in and uncertainties with respect to trade policies, including the ability to obtain required import and export licenses, trade sanctions, tariffs, and international trade disputes;
- customer- or government-supported efforts to influence Applied to conduct more of its operations and sourcing in a particular country, such as Korea and China;
- variations among, and changes in, local, regional, national or international laws and regulations, including contract, intellectual property, cybersecurity, data privacy, labor, tax, and import/export laws, and the interpretation and application of such laws and regulations;
- ineffective or inadequate legal protection of intellectual property rights in certain countries;
- positions taken by governmental agencies regarding possible national commercial and/or security issues posed by international business operations;
- fluctuating raw material, commodity, energy and shipping costs;
- delays or restrictions in shipping materials or finished products between countries;
- geographically diverse operations and projects, and our ability to maintain appropriate business processes, procedures and internal controls, and comply with environmental, health and safety, anti-corruption and other regulatory requirements;

- supply chain interruptions, and service interruptions from utilities, transportation, data hosting or telecommunications providers, or other events beyond our control;
- failure to effectively manage a diverse workforce with different experience levels, languages, cultures, customs, business practices and worker expectations, and differing employment practices and labor issues;
- variations in the ability to develop relationships with local customers, suppliers and governments;
- fluctuations in interest rates and currency exchange rates, including the relative strength or weakness of the U.S. dollar against the Japanese yen, Israeli shekel, euro, Taiwanese dollar, Singapore dollar, Chinese yuan or Korean won;
- the need to provide sufficient levels of technical support in different locations around the world;
- performance of third party providers of outsourced functions, including certain engineering, software development, manufacturing, information technology and other activities;
- political instability, natural disasters, pandemics, social unrest, terrorism or acts of war in locations where Applied has operations, suppliers or sales, or that may influence the value chain of the industries that Applied serves;
- challenges in hiring and integration of an increasing number of workers in new countries;
- the increasing need for a mobile workforce to work in or travel to different regions; and
- uncertainties with respect to economic growth rates in various countries, including for the manufacture and sale of semiconductors and displays in the developing economies of certain countries.

International trade disputes could result in increases in tariffs and other trade restrictions and protectionist measures that could have an adverse impact on our operations.

We sell a significant majority of our products into countries outside of the United States including China, Taiwan and Korea. We also purchase a significant portion of equipment and supplies from suppliers outside of the United States. The United States and other countries have imposed and may continue to impose trade restrictions, and have also levied tariffs and taxes on certain goods. Increases in tariffs, additional taxes or other trade restrictions and retaliatory measures may increasingly impact end-user demand and customer investment in manufacturing equipment, increase our manufacturing costs, decrease margins, reduce the competitiveness of our products, or inhibit our ability to sell products or purchase necessary equipment and supplies, which could have a material adverse effect on our business, results of operations, or financial condition.

Certain international sales depend on our ability to obtain export licenses, and our inability to obtain such licenses could potentially limit our markets and impact our business. In addition, government authorities may impose conditions that require the use of local suppliers or partnerships with local companies, require the license or other transfer of intellectual property, or engage in other efforts to promote local businesses and local competitors, which could have a significant adverse impact on Applied's business. Many of these challenges are present in China and Korea, markets that represent a significant portion of Applied's current business as well as long-term growth opportunities.

Applied is exposed to risks associated with an uncertain global economy.

Uncertain global economic and business conditions, along with uncertainties and volatility in the financial markets, national debt and fiscal concerns in various regions, pose challenges to the industries in which Applied operates. Markets for semiconductors and displays depend largely on business and consumer spending and demand for electronic products. Economic uncertainty and related factors exacerbate negative trends in business and consumer spending and may cause certain Applied customers to push out, cancel, or refrain from purchasing for equipment or services, which may have an adverse impact on Applied's revenues, results of operations and financial condition. Uncertain market conditions, difficulties in obtaining capital, or reduced profitability may also cause some customers to scale back operations, exit businesses, merge with other manufacturers, or file for bankruptcy protection and potentially cease operations, which can also result in lower sales, additional inventory or bad debt expense for Applied. Economic and industry uncertainty may similarly affect suppliers, which could impair their ability to deliver parts and negatively affect Applied's ability to manage operations and deliver its products. These conditions may also lead to consolidation or strategic alliances among other equipment manufacturers, which could adversely affect Applied's ability to compete effectively.

Uncertain economic and industry conditions also make it more challenging for Applied to forecast its operating results, make business decisions, and identify and prioritize the risks that may affect its businesses, sources and uses of cash, financial condition and results of operations. If Applied does not appropriately manage its business operations in response to changing economic and industry conditions, it could have a significant negative impact on its business performance and financial condition. Applied may be required to implement additional cost reduction efforts, including restructuring activities, which may adversely affect Applied's ability to capitalize on opportunities. Even during periods of economic uncertainty or lower revenues, Applied must continue to invest in research and development and maintain a global business infrastructure to compete effectively and support its customers, which can have a negative impact on its operating margins and earnings.

Applied maintains an investment portfolio that is subject to general credit, liquidity, market and interest rate risks. The risks to Applied's investment portfolio may be exacerbated if financial market conditions deteriorate and, as a result, the value and liquidity of the investment portfolio, as well as returns on pension assets, could be negatively impacted and lead to impairment charges. Applied also maintains cash balances in various bank accounts globally in order to fund normal operations. If any of these financial institutions becomes insolvent, it could limit Applied's ability to access cash in the affected accounts, which could affect its ability to manage its operations.

Applied is exposed to risks associated with a highly concentrated customer base.

Applied's customer base is highly concentrated, and has become increasingly so as a result of continued consolidation. Applied's customer base is also geographically concentrated. A relatively limited number of manufacturers account for a substantial portion of Applied's business. As a result, the actions of even a single customer can expose Applied's business and results of operations to greater volatility. The mix and type of customers, and sales to any single customer, including as a result of changes in government policy, have varied and may vary significantly from quarter to quarter and from year to year, and have a significant impact on Applied's net sales, gross margins and net income. Applied's products are configured to customer specifications, and changing, rescheduling or canceling orders may result in significant, non-recoverable costs. If customers do not place orders, or they substantially reduce, delay or cancel orders, Applied may not be able to replace the business, which may have a significant adverse impact on its results of operations and financial condition. The concentration of Applied's customer base increases its risks related to the financial condition of its customers, and the deterioration in financial condition of a single customer or the failure of a single customer to perform its obligations could have a material adverse effect on Applied's results of operations and cash flow. To the extent its customers experience liquidity constraints, Applied may incur additional bad debt expense, which may have a significant impact on its results of operations. Major customers may also seek pricing, payment, intellectual property-related, or other commercial terms that are less favorable to Applied, which may have a negative impact on Applied's business, cash flow, revenue and gross margins.

Applied is exposed to risks as a result of ongoing changes in the various industries in which it operates.

The global semiconductor, display and related industries in which Applied operates are characterized by ongoing changes affecting some or all of these industries that impact demand for and the profitability of Applied's products and its consolidated results of operations, including:

- the nature, timing and degree of visibility of changes in end demand for electronic products, including those related to fluctuations in consumer buying patterns tied to seasonality or the introduction of new products, and the effects of these changes on customers' businesses and on demand for Applied's products;
- increasing capital requirements for building and operating new fabrication plants and customers' ability to raise the necessary capital;
- trade, regulatory or tax policies impacting the timing of customers' investment in new or expanded fabrication plants;
- differences in growth rates among the semiconductor, display and other industries in which Applied operates;
- the increasing importance of establishing, improving and maintaining strong relationships with customers;
- the increasing cost and complexity for customers to move from product design to volume manufacturing, which may slow the adoption rate of new manufacturing technology;
- the need for customers to continually reduce the total cost of manufacturing system ownership;
- the heightened importance to customers of system reliability and productivity and the effect on demand for fabrication systems as a result of their increasing productivity, device yield and reliability;
- manufacturers' ability to reconfigure and re-use fabrication systems which can reduce demand for new equipment;

- the increasing importance of, and difficulties in, developing products with sufficient differentiation to influence customers' purchasing decisions;
- requirements for shorter cycle times for the development, manufacture and installation of manufacturing equipment;
- price and performance trends for semiconductor devices and displays, and the corresponding effect on demand for such products;
- the increasing importance of the availability of spare parts to maximize the time that customers' systems are available for production;
- the increasing role for and complexity of software in Applied products; and
- the increasing focus on reducing energy usage and improving the environmental impact and sustainability associated with manufacturing operations.

Applied is exposed to risks as a result of ongoing changes specific to the semiconductor industry.

The largest proportion of Applied's consolidated net sales and profitability is derived from sales of manufacturing equipment in the Semiconductor Systems segment to the global semiconductor industry. In addition, a majority of the revenues of Applied Global Services is from sales to semiconductor manufacturers. The semiconductor industry is characterized by ongoing changes particular to this industry that impact demand for and the profitability of Applied's semiconductor manufacturing equipment and service products, including:

- the increasing frequency and complexity of technology transitions and inflections, and Applied's ability to timely and effectively anticipate and adapt to these changes;
- the increasing cost of research and development due to many factors, including shrinking geometries, the use of new materials, new and more complex device structures, more applications and process steps, increasing chip design costs, and the increasing cost and complexity of integrated manufacturing processes;
- the need to reduce product development time, despite the increasing difficulty of technical challenges;
- the growing number of types and varieties of semiconductors and number of applications across multiple substrate sizes;
- the increasing cost and complexity for semiconductor manufacturers to move more technically advanced capability and smaller geometries to volume manufacturing, and the resulting impact on the rates of technology transition and investment in capital equipment;
- challenges in generating organic growth given semiconductor manufacturers' levels of capital expenditures and the allocation of capital investment to market segments that Applied does not serve, such as lithography, or segments where Applied's products have lower relative market presence;
- the importance of increasing market positions in segments with growing demand;
- semiconductor manufacturer's ability to reconfigure and re-use equipment, and the resulting effect on their need to purchase new equipment and services;
- shorter cycle times between order placements by customers and product shipment require greater reliance on forecasting of customer investment, which may lead to inventory write-offs and manufacturing inefficiencies that decrease gross margin;
- competitive factors that make it difficult to enhance position, including challenges in securing development-tool-of-record (DTOR) and production-tool-of-record (PTOR) positions with customers;
- consolidation in the semiconductor industry, including among semiconductor manufacturers and among manufacturing equipment suppliers;
- shifts in sourcing strategies by computer and electronics companies, and manufacturing processes for advanced circuit technologies, that impact the equipment requirements of Applied's foundry customers;
- the concentration of new wafer starts in Korea and Taiwan, where Applied's service penetration and service-revenue-per-wafer-start have been lower than in other regions;
- investment in semiconductor manufacturing capabilities in China, which may be affected by changes in economic conditions and governmental policies in China and the United States;
- the increasing fragmentation of semiconductor markets, leading certain markets to become too small to support the cost of a new fabrication plant, while others require less technologically advanced products; and

- the growing importance of specialty markets (such as Internet of Things, communications, automotive, power and sensors) that use mature process technologies and have a low barrier to entry.

If Applied does not accurately forecast, and allocate appropriate resources and investment towards addressing, key technology changes and inflections, successfully develop and commercialize products to meet demand for new technologies, and effectively address industry trends, its business and results of operations may be adversely impacted.

Applied is exposed to risks as a result of ongoing changes specific to the display industry.

The global display industry historically has experienced considerable volatility in capital equipment investment levels, due in part to the limited number of display manufacturers, the concentrated nature of end-use applications, production capacity relative to end-use demand, and panel manufacturer profitability. Industry growth depends primarily on consumer demand for increasingly larger and more advanced TVs, and on demand for advanced smartphones and mobile device displays, which demand is highly sensitive to cost and improvements in technologies and features. The display industry is characterized by ongoing changes particular to this industry that impact demand for and the profitability of Applied's display products and services, including:

- the importance of new types of display technologies, such as organic light-emitting diode (OLED), low temperature polysilicon (LTPS) and metal oxide transistor backplanes, flexible displays, and new touch panel films;
- the increasing cost of research and development, and complexity of technology transitions and inflections, and Applied's ability to timely and effectively anticipate and adapt to these changes;
- the timing and extent of an expansion of manufacturing facilities in China, which may be affected by changes in local economic conditions and governmental policies in China, particularly in Asia and the United States;
- the importance of increasing market positions in products and technologies with growing demand;
- the rate of transition to larger substrate sizes for TVs and to new display technologies for TVs and mobile applications, and the resulting effect on capital intensity in the industry and on Applied's product differentiation, gross margin and return on investment; and
- fluctuations in customer spending quarter over quarter and year over year for display manufacturing equipment, concentration of display manufacturer customers and their ability to successfully commercialize new products and technologies, and uncertainty with respect to future display technology end-use applications and growth drivers.

If Applied does not successfully develop and commercialize products to meet demand for new and emerging display technologies, or if industry demand for display manufacturing equipment and technologies slows, Applied's business and its results of operations may be adversely impacted.

The industries in which Applied operates are highly competitive and subject to rapid technological and market changes.

Applied operates in a highly competitive environment in which innovation is critical, and its future success depends on many factors, including the development of new technologies and effective commercialization and customer acceptance of its equipment, services and related products, and its ability to increase its position in its current markets, expand into adjacent and new markets, and optimize operational performance. The development, introduction and support of a broadening set of products in a geographically diverse and competitive environment, and that may require greater collaboration with customers and other industry participants, have grown more complex and expensive over time. Furthermore, new or improved products may entail higher costs and lower profits, and may have unforeseen product design or manufacturing defects. To compete successfully, Applied must:

- identify and address technology inflections, market changes, competitor innovations, new applications, customer requirements and end-use demand in a timely and effective manner;
- develop new products and disruptive technologies, improve and develop new applications for existing products, and adapt products for use by customers in different applications and markets with varying technical requirements;
- differentiate its products from those of competitors, meet customers' performance specifications, appropriately price products, and achieve market acceptance;
- maintain operating flexibility to enable responses to changing markets, applications, customers and customer requirements;
- enhance its worldwide operations across its businesses to reduce cycle time, enable continuous quality improvement, reduce costs, and enhance design for manufacturability and serviceability;

- focus on product development and sales and marketing strategies that address customers' high value problems and strengthen customer relationships;
- effectively allocate resources between its existing products and markets, the development of new products, and expanding into new and adjacent markets;
- improve the productivity of capital invested in R&D activities;
- accurately forecast demand, work with suppliers and meet production schedules for its products;
- improve its manufacturing processes and achieve cost efficiencies across product offerings;
- adapt to changes in value offered by companies in different parts of the supply chain;
- qualify products for evaluation and volume manufacturing with its customers; and
- implement changes in its design engineering methodology to reduce material costs and cycle time, increase commonality of platforms and types of parts used in different systems, and improve product life cycle management.

If Applied does not successfully anticipate technology inflections, develop and commercialize new products and technologies, and respond to changes in customer requirements and market trends, its business performance and results of operations may be adversely impacted.

Applied is exposed to risks associated with business combinations, acquisitions, strategic investments and divestitures.

Applied engages in acquisitions of or investments in companies, technologies or products in existing, related or new markets for Applied. Business combinations, acquisitions and investments, such as the proposed acquisition of Kokusai Electric, involve numerous risks to Applied's business, financial condition and operating results, including but not limited to:

- inability to complete proposed transactions timely or at all due to the failure to obtain regulatory or other approvals, litigation or other disputes, and any ensuing obligation to pay a termination fee (which, in the case of the stock purchase agreement related to the proposed acquisition of Kokusai Electric, Applied will be obligated to pay in the amount of $154 million if such agreement is terminated under certain circumstances involving the failure to obtain required regulatory approvals);
- diversion of management's attention and disruption of ongoing businesses;
- the failure to realize expected revenues, gross and operating margins, net income and other returns from acquired businesses;
- requirements imposed by government regulators in connection with their review of a transaction, which may include, among other things, divestitures and restrictions on the conduct of Applied's existing business or the acquired business;
- following completion of acquisitions, ineffective integration of businesses, operations, systems, technologies, products or employees, changes in laws or regulations, including tax laws, or other factors, may impact the ability to realize anticipated synergies or other benefits;
- failure to commercialize technologies from acquired businesses or developed through strategic investments;
- dependence on unfamiliar supply chains or relatively small supply partners;
- inability to capitalize on characteristics of new markets that may be significantly different from Applied's existing markets and where competitors may have stronger market positions and customer relationships;
- failure to retain and motivate key employees of acquired businesses;
- the potential impact of the announcement or consummation of a proposed transaction on relationships with third parties;
- potential changes in Applied's credit rating, which could adversely impact the Company's access to and cost of capital;
- reductions in cash balances or increases in debt obligations to finance activities associated with a transaction, which increase interest expense, and reductions in cash balances, which reduce the availability of cash flow for general corporate or other purposes, including share repurchases and dividends;

- exposure to new operational risks, rules, regulations, worker expectations, customs and practices to the extent acquired businesses are located in regions where Applied has not historically conducted business;
- challenges associated with managing new, more diverse and more widespread operations, projects and people;
- inability to obtain and protect intellectual property rights in key technologies;
- inadequacy or ineffectiveness of an acquired company's internal financial controls, disclosure controls and procedures, cybersecurity, privacy policies and procedures, or environmental, health and safety, anti-corruption, human resource, or other policies or practices;
- impairment of acquired intangible assets and goodwill as a result of changing business conditions, technological advancements or worse-than-expected performance of the segment;
- the risk of litigation or claims associated with a proposed or completed transaction;
- unknown, underestimated or undisclosed commitments or liabilities; and
- the inappropriate scale of acquired entities' critical resources or facilities for business needs.

Applied also makes strategic investments in other companies, including companies formed as joint ventures, which may decline in value or not meet desired objectives. The success of these investments depends on various factors over which Applied may have limited or no control and, particularly with respect to joint ventures, requires ongoing and effective cooperation with strategic partners. In addition, new legislation, additional regulations or global economic or political conditions may affect or impair our ability to invest in certain countries or require us to obtain regulatory approvals to do so. The risks to Applied's strategic investment portfolio may be exacerbated by unfavorable financial market and macroeconomic conditions and, as a result, the value of the investment portfolio could be negatively impacted and lead to impairment charges.

Applied continually assesses the strategic fit of its businesses and may from time to time seek to divest portions of its business that are not deemed to fit with its strategic plan. Divestitures involve significant risks and uncertainties, such as ability to sell such businesses on satisfactory price and terms and in a timely manner (including long and costly sales processes and the possibility of lengthy and potentially unsuccessful attempts by a buyer to receive required regulatory approvals), or at all, disruption to other parts of the businesses and distraction of management, allocation of internal resources that would otherwise be devoted to completing strategic acquisitions, loss of key employees or customers, exposure to unanticipated liabilities (including, among other things, those arising from representations and warranties made to a buyer regarding the businesses) or ongoing obligations to support the businesses following such divestitures, and other adverse financial impacts.

Applied is exposed to risks associated with operating in jurisdictions with complex and changing tax laws.

Applied is subject to income taxes in the United States and foreign jurisdictions. Significant judgment is required to determine and estimate worldwide tax liabilities. Applied's provision for income taxes and effective tax rates could be affected by numerous factors, including changes in applicable tax laws, interpretations of applicable tax laws, amount and composition of pre-tax income in jurisdictions with differing tax rates, and valuation of deferred tax assets. On December 22, 2017, the U.S. government enacted the Tax Cuts and Jobs Act (Tax Act). On June 14, 2019, the U.S. government released regulations that significantly affect how the GILTI provision of the Tax Act is interpreted. As a result, Applied reversed a tax benefit of $96 million in the third quarter of fiscal 2019 that had been realized in the first half of fiscal 2019. An increase in Applied's provision for income taxes and effective tax rate could have a material adverse impact on Applied's results of operations and financial condition.

Consistent with the international nature of its business, Applied conducts certain manufacturing, supply chain, and other operations in Asia, bringing these activities closer to customers and reducing operating costs. In certain foreign jurisdictions, conditional reduced income tax rates have been granted to Applied. To obtain the benefit of these tax incentives, Applied must meet requirements relating to various activities. Applied's ability to realize benefits from these incentives could be materially affected if, among other things, applicable requirements are not met or Applied incurs net losses in these jurisdictions.

In addition, Applied is subject to examination by the Internal Revenue Service and other tax authorities, and from time to time amends previously filed tax returns. Applied regularly assesses the likelihood of favorable or unfavorable outcomes resulting from these examinations and amendments to determine the adequacy of its provision for income taxes, which requires estimates and judgments. Although Applied believes its tax estimates are reasonable, there can be no assurance that the tax authorities will agree with such estimates. Applied may have to engage in litigation to achieve the results reflected in the estimates, which may be time-consuming and expensive. There can be no assurance that Applied will be successful or that any final determination will not be materially different from the treatment reflected in Applied's historical income tax provisions and effective tax rates.

Applied's indebtedness and debt covenants could adversely affect its financial condition and business.

Applied has $5.4 billion in aggregate principal amount of senior unsecured notes outstanding. Under the indenture governing the senior unsecured notes, it may be required to offer to repurchase the notes at a price equal to 101% of the principal amount, plus accrued and unpaid interest, upon a change of control of Applied and a contemporaneous downgrade of the notes below investment grade. Applied also has in place a $1.5 billion revolving credit facility, and a $2.0 billion term loan facility to finance in part its planned acquisition of Kokusai Electric. While no amounts were outstanding under either credit agreement as of October 27, 2019, Applied may borrow amounts in the future under either or both of these agreements. Applied may also enter into new financing arrangements. Applied's ability to satisfy its debt obligations is dependent upon the results of its business operations and subject to other risks discussed in this section. Significant changes in Applied's credit rating or changes in the interest rate environment could have a material adverse consequence on Applied's access to and cost of capital for future financings, and financial condition. If Applied fails to satisfy its debt obligations, or comply with financial and other debt covenants, it may be in default and any borrowings may become immediately due and payable, and such default may also constitute a default under other of Applied's obligations. There can be no assurance that Applied would have sufficient financial resources or be able to arrange financing to repay any borrowings at such time.

Applied is exposed to risks associated with expanding into new and related markets and industries.

As part of its growth strategy, Applied must successfully expand into related or new markets and industries, either with its existing products or with new products developed internally, or those developed in collaboration with third parties, or obtained through acquisitions. Applied's ability to successfully expand its business into new and related markets and industries may be adversely affected by a number of factors, including:

- the need to devote additional resources to develop new products for, and operate in, new markets;
- the need to develop new sales and technical marketing strategies, cultivate relationships with new customers and meet different customer service requirements;
- differing rates of profitability and growth among multiple businesses;
- Applied's ability to anticipate demand, capitalize on opportunities, and avoid or minimize risks;
- the complexity of managing multiple businesses with variations in production planning, execution, supply chain management and logistics;
- the adoption of new business models, business processes and systems;
- the complexity of entering into and effectively managing strategic alliances or partnering opportunities;
- new materials, processes and technologies;
- the need to attract, motivate and retain employees with skills and expertise in these new areas;
- new and more diverse customers and suppliers, including some with limited operating histories, uncertain or limited funding, evolving business models or locations in regions where Applied does not have, or has limited, operations;
- new or different competitors with potentially more financial or other resources, industry experience and established customer relationships;
- entry into new industries and countries, with differing levels of government involvement, laws and regulations, and business, employment and safety practices;
- third parties' intellectual property rights; and
- the need to comply with, or work to establish, industry standards and practices.

In addition, Applied from time to time receives funding from United States and other government agencies for certain strategic development programs to increase its research and development resources and address new market opportunities. As a condition to this government funding, Applied is often subject to certain record-keeping, audit, intellectual property rights-sharing and/or other obligations.

Supply chain disruptions, manufacturing interruptions or delays, or the failure to accurately forecast customer demand, could affect Applied's ability to meet customer demand lead to higher costs, or result in excess or obsolete inventory.

Applied's business depends on its timely supply of equipment, services and related products that meet the rapidly changing technical and volume requirements of its customers, which depends in part on the timely delivery of parts, including components and subassemblies, from suppliers, including contract manufacturers. The inability to timely obtain sufficient quantities of parts can have an adverse impact on Applied's manufacturing operations and ability to meet customer demand for equipment, spares and services. Some key parts are subject to long lead-times or obtainable only from a single supplier or limited group of suppliers, and some sourcing or subassembly is provided by suppliers located in countries other than the countries where Applied conducts its manufacturing. Variable industry conditions and the volatility of demand for manufacturing equipment increase capital, technical, operational and other risks for Applied and for companies throughout its supply chain. These conditions may cause some suppliers to scale back operations, exit businesses, merge with other companies, or file for bankruptcy protection and possibly cease operations. Applied may also experience significant interruptions of its manufacturing operations, delays in its ability to deliver products or services, increased costs or customer order cancellations as a result of:

- the failure or inability to accurately forecast demand and obtain sufficient quantities of quality parts on a cost-effective basis;
- volatility in the availability and cost of materials;
- difficulties or delays in obtaining required import or export approvals;
- shipment delays due to transportation interruptions or capacity constraints;
- information technology or infrastructure failures, including those of a third party supplier or service provider; and
- natural disasters or other events beyond Applied's control (such as earthquakes, utility interruptions, tsunamis, hurricanes, typhoons, floods, storms or extreme weather conditions, fires, regional economic downturns, pandemics, social unrest, political instability, terrorism, or acts of war) in locations where it or its customers or suppliers have manufacturing, research, engineering or other operations.

If a supplier fails to meet Applied's requirements concerning quality, cost, protection of intellectual property, socially-responsible business practices, or other performance factors, Applied may transfer its business to alternative sources, which could entail manufacturing delays, additional costs, or other difficulties. If Applied is unable to meet its customers' demand for a prolonged period due to its inability to obtain certain parts or components, it could affect its ability to manage its operations, and have an adverse impact on Applied's business, results of operations and customer relationships. In addition, if Applied needs to rapidly increase its business and manufacturing capacity to meet increases in demand or expedited shipment schedules, this may exacerbate any interruptions in Applied's manufacturing operations and supply chain and the associated effect on Applied's working capital. Moreover, if actual demand for Applied's products is different than expected, Applied may purchase more/fewer parts than necessary or incur costs for canceling, postponing or expediting delivery of parts. If Applied purchases inventory in anticipation of customer demand that does not materialize, or if customers reduce or delay orders, Applied may incur excess inventory charges.

The ability to attract, retain and motivate key employees is vital to Applied's success.

Applied's success, competitiveness and ability to execute on its global strategies and maintain a culture of innovation depend in large part on its ability to attract, retain and motivate employees with key skills and experience. Achieving this objective may be difficult due to many factors, including fluctuations in global economic and industry conditions, management changes, Applied's organizational structure, increasing global competition for talent, the availability of qualified employees in the local and global markets, cost reduction activities (including workforce reductions and unpaid shutdowns), availability of career development opportunities, the ability to obtain necessary authorizations for workers to provide services outside their home countries, and the attractiveness of Applied's compensation and benefit programs, including its share-based programs. The loss or retirement of employees presents particular challenges to the extent they involve the departure of knowledgeable and experienced employees and the resulting need to identify and train existing or new workers to perform necessary functions, which may result in unexpected costs, reduced productivity, and/or difficulties with respect to internal processes and controls.

Applied is exposed to various risks related to protection and enforcement of intellectual property rights.

Applied's success depends in significant part on the protection of its patents, trade secrets, copyrights and other intellectual property rights. Infringement of Applied's rights by a third party, such as the unauthorized manufacture or sale of equipment or spare parts, could result in uncompensated lost market and revenue opportunities for Applied. Policing any unauthorized use of intellectual property is difficult and costly and Applied cannot be certain that the measures it has implemented will prevent misuse. Applied's ability to enforce its intellectual property rights is subject to litigation risks, as well as uncertainty as to the protection and enforceability of those rights in some countries. If Applied seeks to enforce its intellectual property rights, it may be subject to claims that those rights are invalid or unenforceable, and others may seek counterclaims against Applied, which could have a negative impact on its business. If Applied is unable to enforce and protect intellectual property rights, or if they are circumvented, invalidated, rendered obsolete by the rapid pace of technological change, it could have an adverse impact on its competitive position and business. In addition, changes in intellectual property laws or their interpretation may impact Applied's ability to protect and assert its intellectual property rights, increase costs and uncertainties in the prosecution of patent applications and enforcement or defense of issued patents, and diminish the value of Applied's intellectual property.

Third parties may also assert claims against Applied and its products. Claims that Applied's products infringe the rights of others, whether or not meritorious, can be expensive and time-consuming to defend and resolve, and may divert the efforts and attention of management and personnel. The inability to obtain rights to use third party intellectual property on commercially reasonable terms could have an adverse impact on Applied's business. In addition, Applied may face claims based on the theft or unauthorized use or disclosure of third-party trade secrets and other confidential business information. Any such incidents and claims could severely harm Applied's business and reputation, result in significant expenses, harm its competitive position, and prevent Applied from selling certain products, all of which could have a significant adverse impact on Applied's business and results of operations.

Applied is exposed to risks related to cybersecurity threats and incidents.

In the conduct of its business, Applied collects, uses, transmits and stores data on information technology systems, including systems owned and maintained by Applied or third party providers. These data include confidential information and intellectual property belonging to Applied or its customers or other business partners, as well as personally-identifiable information of individuals. All information systems are subject to disruption, breach or failure. Applied has experienced, and expects to continue to be subject to, cybersecurity threats and incidents ranging from employee error or misuse to individual attempts to gain unauthorized access to these information systems, to sophisticated and targeted measures known as advanced persistent threats, none of which have been material to the Company to date. Applied devotes significant resources to network security, data encryption and other measures to protect its systems and data from unauthorized access or misuse. However, depending on their nature and scope, cybersecurity incidents could result in business disruption; the misappropriation of intellectual property, and corruption or loss of confidential information and critical data (Applied's and that of third parties); reputational damage; litigation with third parties; diminution in the value of Applied's investment in research, development and engineering; data privacy issues; and increased cybersecurity protection and remediation costs. Compliance with, and changes to, laws and regulations concerning privacy and information security could result in significant expense, and any failure to comply could result in proceedings against Applied by regulatory authorities or other third parties.

Applied is exposed to various risks related to legal proceedings.

Applied from time to time is, and in the future may be involved in legal proceedings or claims regarding patent infringement, intellectual property rights, antitrust, environmental regulations, securities, contracts, product performance, product liability, unfair competition, misappropriation of trade secrets, employment, workplace safety, and other matters. Applied also on occasion receives notification from customers who believe that Applied owes them indemnification, product warranty or has other obligations related to claims made against such customers by third parties.

Legal proceedings and claims, whether with or without merit, and associated internal investigations, may be time-consuming and expensive to prosecute, defend or conduct; divert management's attention and other Applied resources; inhibit Applied's ability to sell its products; result in adverse judgments for damages, injunctive relief, penalties and fines; and negatively affect Applied's business. There can be no assurance regarding the outcome of current or future legal proceedings, claims or investigations.

The failure to successfully implement enterprise resource planning and other information systems changes could adversely impact Applied's business and results of operations.

Applied periodically implements new or enhanced enterprise resource planning and related information systems in order to better manage its business operations, align its global organizations and enable future growth. Implementation of new business processes and information systems requires the commitment of significant personnel, training and financial resources, and entails risks to Applied's business operations. If Applied does not successfully implement enterprise resource planning and related information systems improvements, or if there are delays or difficulties in implementing these systems, Applied may not realize anticipated productivity improvements or cost efficiencies, and may experience interruptions in service and operational difficulties, such as its ability to track orders, timely manufacture and ship products, project inventory requirements, effectively manage its supply chain and allocate human resources, aggregate financial data and report operating results, and otherwise effectively manage its business, all of which could result in quality issues, reputational harm, lost market and revenue opportunities, and otherwise adversely affect Applied's business, financial condition and results of operations.

Applied may incur impairment charges related to goodwill or long-lived assets.

Applied has a significant amount of goodwill and other acquired intangible assets related to acquisitions. Goodwill and purchased intangible assets with indefinite useful lives are not amortized, but are reviewed for impairment annually during the fourth quarter of each fiscal year, and more frequently when events or changes in circumstances indicate that the carrying value of an asset may not be recoverable. The review compares the fair value for each of Applied's reporting units to its associated carrying value, including goodwill. Factors that could lead to impairment of goodwill and intangible assets include adverse industry or economic trends, reduced estimates of future cash flows, declines in the market price of Applied common stock, changes in Applied's strategies or product portfolio, and restructuring activities. Applied's valuation methodology for assessing impairment requires management to make judgments and assumptions based on historical experience and projections of future operating performance. Applied may be required to record future charges to earnings during the period in which an impairment of goodwill or intangible assets is determined to exist.

Applied is subject to risks associated with environmental, health and safety regulations.

Applied is subject to environmental, health and safety regulations in connection with its global business operations, including but not limited to: regulations related to the development, manufacture, shipping and use of its products; handling, discharge, recycling and disposal of hazardous materials used in its products or in producing its products; the operation of its facilities; and the use of its real property. The failure or inability to comply with existing or future environmental and safety regulations could result in: significant remediation or other legal liabilities; the imposition of penalties and fines; restrictions on the development, manufacture, sale, shipment or use of certain of its products; limitations on the operation of its facilities or ability to use its real property; and a decrease in the value of its real property. Applied could be required to alter its manufacturing and operations and incur substantial expense in order to comply with environmental, health and safety regulations. Any failure to comply with these regulations could subject Applied to significant costs and liabilities that could adversely affect Applied's business, financial condition and results of operations.

Applied is exposed to various risks related to the global regulatory environment.

As a public company with global operations, Applied is subject to the laws of the United States and multiple foreign jurisdictions and the rules and regulations of various governing bodies, which may differ among jurisdictions, including those related to financial and other disclosures, accounting standards, corporate governance, intellectual property, tax, trade, antitrust, employment, immigration and travel regulations, privacy, and anti-corruption. Changing, inconsistent or conflicting laws, rules and regulations, and ambiguities in their interpretation and application create uncertainty and challenges, and compliance with laws, rules and regulations may be onerous and expensive, divert management time and attention from revenue-generating activities, and otherwise adversely impact Applied's business operations. Violations of law, rules and regulations could result in fines, criminal sanctions, restrictions on Applied's business, and damage to its reputation, and could have an adverse impact on its business operations, financial condition and results of operations.

Item 1B: ***Unresolved Staff Comments***

None.

Item 2: ***Properties***

Information concerning Applied's properties is set forth below:

(Square feet in thousands)	United States	Other Countries	Total
Owned	4,317	2,470	6,787
Leased	1,222	1,527	2,749
Total	5,539	3,997	9,536

Because of the interrelation of Applied's operations, properties within a country may be shared by the segments operating within that country. The Company's headquarters offices are in Santa Clara, California. Products in Semiconductor Systems are manufactured in Santa Clara, California; Austin, Texas; Gloucester, Massachusetts; Kalispell, Montana; Rehovot, Israel; and Singapore. Remanufactured equipment products in the Applied Global Services segment are produced primarily in Austin, Texas. Products in the Display and Adjacent Markets segment are manufactured in Alzenau, Germany and Tainan, Taiwan. Other products are manufactured in Treviso, Italy.

Applied also owns and leases offices, plants and warehouse locations in many locations throughout the world, including in Europe, Japan, North America (principally the United States), Israel, China, India, Korea, Southeast Asia and Taiwan. These facilities are principally used for manufacturing; research, development and engineering; and marketing, sales and customer support.

Applied also owns a total of approximately 269 acres of buildable land in Montana, Texas, California, Israel and Italy that could accommodate additional building space.

Applied considers the properties that it owns or leases as adequate to meet its current and future requirements. Applied regularly assesses the size, capability and location of its global infrastructure and periodically makes adjustments based on these assessments.

Item 3: ***Legal Proceedings***

The information set forth under “Legal Matters” in Note 15 of Notes to Consolidated Financial Statements is incorporated herein by reference.

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

None.

PART II

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

Market Information

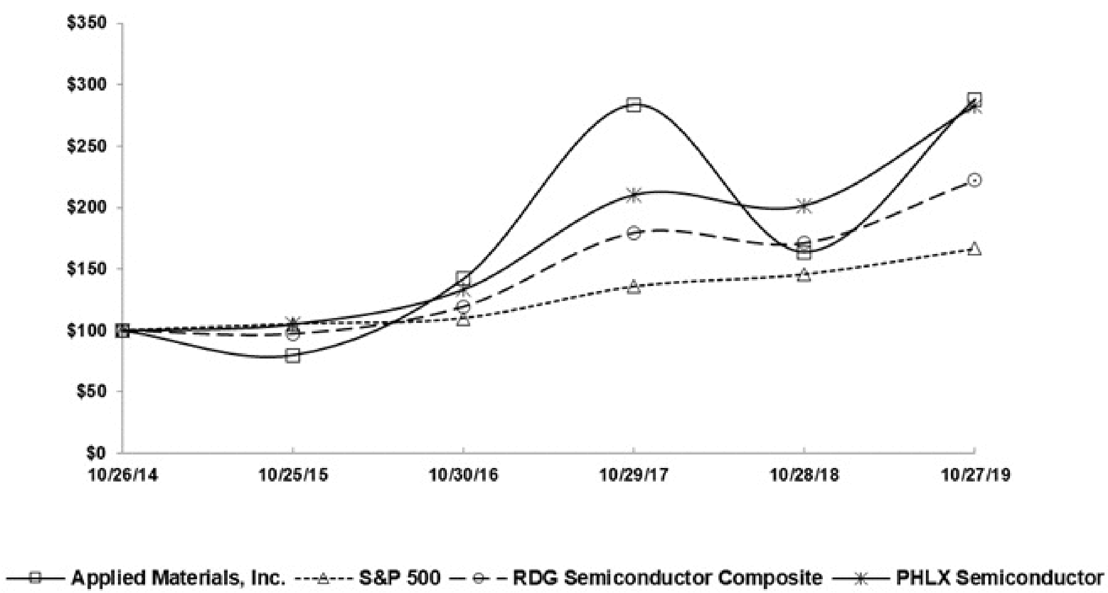
Applied's common stock is traded on the NASDAQ Global Select Market under the symbol AMAT. As of December 6, 2019, there were 2,859 registered holders of Applied common stock. Information regarding quarterly cash dividends declared on Applied Materials's common stock during fiscal 2019, 2018 and 2017 may be found under "Management's Discussion and Analysis of Financial Condition and Results of Operations - Financial Condition, Liquidity and Capital Resources".

Performance Graph

The performance graph below shows the five-year cumulative total stockholder return on Applied common stock during the period from October 26, 2014 through October 27, 2019. This is compared with the cumulative total return of the Standard & Poor's 500 Stock Index, the RDG Semiconductor Composite Index and the PHLX Semiconductor Index over the same period. In addition to the RDG Semiconductor Composite Index, Applied has added the PHLX Semiconductor Index, which Applied believes better represents overall semiconductor industry performance. The comparison assumes $100 was invested on October 26, 2014 in Applied common stock and in each of the foregoing indices and assumes reinvestment of dividends, if any. Dollar amounts in the graph are rounded to the nearest whole dollar. The performance shown in the graph represents past performance and should not be considered an indication of future performance.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN*

Among Applied Materials, Inc., the S&P 500 Index,
the RDG Semiconductor Composite Index and the PHLX Semiconductor Index



*Assumes $100 invested on 10/26/14 in stock or 10/31/14 in index, including reinvestment of dividends.
Indexes calculated on month-end basis.
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	10/26/2014	10/25/2015	10/30/2016	10/29/2017	10/28/2018	10/27/2019
Applied Materials	100.00	79.87	141.85	283.52	163.81	287.88
S&P 500 Index	100.00	105.20	109.94	135.93	145.91	166.81
RDG Semiconductor Composite Index	100.00	97.22	119.39	179.70	171.36	222.46
PHLX Semiconductor Index	100.00	105.26	133.38	210.24	201.66	282.62

Issuer Purchases of Equity Securities

The following table provides information as of October 27, 2019 with respect to the shares of common stock repurchased by Applied during the fourth quarter of fiscal 2019 pursuant to a publicly announced stock repurchase program approved by the Board of Directors in February 2018, which authorized up to an aggregate of $6.0 billion in repurchases.

Period	Total Number of Shares Purchased	Average Price Paid per Share	Aggregate Price Paid	Total Number of Shares Purchased as Part of Publicly Announced Programs	Maximum Dollar Value of Shares That May Yet be Purchased Under the Programs
			(In millions, except per share amounts)		
Month #1					
(July 29, 2019 to August 25, 2019)	2.5	$ 47.33	$ 119	2.5	$ 2,305
Month #2					
(August 26, 2019 to September 22, 2019)	3.3	$ 49.47	166	3.3	$ 2,139
Month #3					
(September 23, 2019 to October 27, 2019)	4.2	$ 51.45	215	4.2	$ 1,924
Total	10.0	$ 49.76	$ 500	10.0	

Item 6: *Selected Financial Data*

Applied adopted the authoritative guidance related to revenue recognition in the first quarter of fiscal 2019 using the full retrospective method. Applied also adopted authoritative guidance related to retirement benefits in the first quarter of fiscal 2019 using the retrospective method. The adoption of these guidance required restating fiscal years 2018 and 2017 results as presented below.

The following selected financial information has been derived from Applied's historical audited consolidated financial statements and should be read in conjunction with the consolidated financial statements and the accompanying notes for the corresponding fiscal years:

Fiscal Year(1)	2019	2018	2017	2016	2015
	(In millions, except percentages and per share amounts)				
Net sales	$ 14,608	$ 16,705	$ 14,698	$ 10,825	$ 9,659
Gross profit	$ 6,386	$ 7,517	$ 6,612	$ 4,511	$ 3,952
Gross margin	43.7 %	45.0 %	45.0 %	41.7 %	40.9 %
Research, development and engineering	$ 2,054	$ 2,022	$ 1,781	$ 1,540	$ 1,451
Operating income	$ 3,350	$ 4,491	$ 3,936	$ 2,152	$ 1,693
Operating margin	22.9 %	26.9 %	26.8 %	19.9 %	17.5 %
Income before income taxes	$ 3,269	$ 4,396	$ 3,816	$ 2,013	$ 1,598
Net income	$ 2,706	$ 3,038	$ 3,519	$ 1,721	$ 1,377
Earnings per diluted share	$ 2.86	$ 2.96	$ 3.25	$ 1.54	$ 1.12
Long-term debt	$ 4,713	$ 5,309	$ 5,304	$ 3,125	$ 3,342
Cash dividends declared per common share	$ 0.83	$ 0.70	$ 0.40	$ 0.40	$ 0.40
Total assets	$ 19,024	$ 17,633	$ 19,190	$ 14,570	$ 15,308

(1) Each fiscal year ended on the last Sunday in October. Fiscal 2019, 2018, 2017, and 2015 each contained 52 weeks, and fiscal 2016 contained 53 weeks.

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

Introduction

Management's Discussion and Analysis of Financial Condition and Results of Operations (MD&A) is intended to facilitate an understanding of Applied's business and results of operations. This MD&A should be read in conjunction with Applied's Consolidated Financial Statements and the accompanying Notes to Consolidated Financial Statements included elsewhere in this Form 10-K. The following discussion contains forward-looking statements and should also be read in conjunction with the cautionary statement set forth at the beginning of this Form 10-K. MD&A consists of the following sections:

- *Overview:* a summary of Applied's business and measurements
- *Results of Operations:* a discussion of operating results
- *Segment Information:* a discussion of segment operating results
- *Recent Accounting Pronouncements:* a discussion of new accounting pronouncements and its impact to Applied's consolidated financial statements
- *Financial Condition, Liquidity and Capital Resources:* an analysis of cash flows, sources and uses of cash
- *Off-Balance Sheet Arrangements and Contractual Obligations*
- *Critical Accounting Policies and Estimates:* a discussion of critical accounting policies that require the exercise of judgments and estimates
- *Non-GAAP Adjusted Results:* a presentation of results reconciling GAAP to non-GAAP adjusted measures

Overview

Applied provides manufacturing equipment, services and software to the semiconductor, display, and related industries. Applied's customers include manufacturers of semiconductor wafers and chips, liquid crystal and organic light-emitting diode (OLED) displays, and other electronic devices. These customers may use what they manufacture in their own end products or sell the items to other companies for use in advanced electronic components. Each of Applied's businesses is subject to variable industry conditions, as demand for manufacturing equipment and services can change depending on supply and demand for chips, display technologies, and other electronic devices, as well as other factors, such as global economic and market conditions, and the nature and timing of technological advances in fabrication processes.

Applied operates in three reportable segments: Semiconductor Systems, Applied Global Services, and Display and Adjacent Markets. A summary of financial information for each reportable segment is found in Note 16 of Notes to Consolidated Financial Statements. A discussion of factors that could affect Applied's operations is set forth under "Risk Factors" in Part I, Item 1A, which is incorporated herein by reference. Product development and manufacturing activities occur primarily in the United States, Europe, Israel, and Asia. Applied's broad range of equipment and service products are highly technical and are sold primarily through a direct sales force.

Applied's results are driven primarily by customer spending on capital equipment and services to support key technology transitions or to increase production volume in response to worldwide demand for semiconductors and displays. Spending by semiconductor customers, which include companies that operate in the foundry, logic and memory markets, is driven by demand for advanced electronic products, including smartphones and other mobile devices, servers, personal computers, automotive devices, storage, and other products. The growth of data and emerging end-market drivers such as artificial intelligence, augmented and virtual reality, the Internet of Things and smart vehicles are also creating new opportunities for the industry. As a result, products within the Semiconductor Systems segment are subject to significant changes in customer requirements, including transitions to smaller dimensions, increasingly complex chip architectures, new materials and an increasing number of applications. Demand for display manufacturing equipment spending depends primarily on consumer demand for increasingly larger and more advanced TVs as well as larger and higher resolution displays for next-generation mobile devices, and investments in new types of display technologies. While certain existing technologies may be adapted to new requirements, some applications create the need for an entirely different technological approach. The timing of customer investment in manufacturing equipment is also affected by the timing of next-generation process development and the timing of capacity expansion to meet end-market demand. In light of these conditions, Applied's results can vary significantly year-over-year, as well as quarter-over-quarter.

Applied's strategic priorities include developing products that help solve customers' challenges at technology inflections; expanding its served market opportunities in the semiconductor and display industries; and growing its services business. Applied's long-term growth strategy requires continued development of new materials engineering capabilities, including products and platforms that enable expansion into new and adjacent markets. Applied's significant investments in research, development and engineering must generally enable it to deliver new products and technologies before the emergence of strong demand, thus allowing customers to incorporate these products into their manufacturing plans during early-stage technology selection. Applied works closely with its global customers to design systems and processes that meet their planned technical and production requirements.

The following table presents certain significant measurements for the past three fiscal years:

				Change	
	2019	2018	2017	2019 over 2018	2018 over 2017
	(In millions, except per share amounts and percentages)				
Net sales	$ 14,608	$ 16,705	$ 14,698	$ (2,097)	$ 2,007
Gross margin	43.7 %	45.0 %	45.0 %	(1.3) points	— points
Operating income	$ 3,350	$ 4,491	$ 3,936	$ (1,141)	$ 555
Operating margin	22.9 %	26.9 %	26.8 %	(4.0) points	0.1 points
Net income	$ 2,706	$ 3,038	$ 3,519	$ (332)	$ (481)
Earnings per diluted share	$ 2.86	$ 2.96	$ 3.25	$ (0.10)	$ (0.29)

Fiscal 2019, 2018 and 2017 each contained 52 weeks.

Fiscal 2018 included a one-time expense related to the enactment of U.S. income tax law that reduced diluted earnings per share by $1.08.

Customer investments in semiconductor and display manufacturing equipment and services continued to be the primary contributor of revenue during fiscal 2019. Semiconductor equipment customers continued to make strategic investments in new technology transitions. Spending by memory customers, compared to fiscal 2018, was lower as they delayed new capacity additions and lowered their fab utilization rates in response to excess industry supply and inventory levels. Foundry and logic spending increased year-over-year led by customer investments in both advanced and mature foundry-logic nodes. Overall semiconductor systems revenue for fiscal 2019 decreased as compared to the prior year. Despite the overall wafer fab equipment market being down in 2019, Applied saw modest growth in its services business as compared to the prior year. This was driven by an increase in the installed base of equipment and continued growth in revenues from long-term service agreements, offset by a weaker demand for transactional spares due to lower memory fab utilization. Applied's display and adjacent markets revenue declined during fiscal 2019 due to weak demand for display manufacturing equipment for mobile products and TVs.

Results of Operations

Net Sales

Net sales for the periods indicated were as follows:

	2019		2018		2017		Change 2019 over 2018	Change 2018 over 2017
	(In millions, except percentages)							
Semiconductor Systems	$ 9,027	62%	$ 10,577	63%	9,544	65%	(15)%	11 %
Applied Global Services	3,854	26%	3,754	22%	3,014	20%	3 %	25 %
Display and Adjacent Markets	1,651	11%	2,298	14%	2,042	14%	(28)%	13 %
Corporate and Other	76	1%	76	1%	98	1%	— %	(22)%
Total	$ 14,608	100%	$ 16,705	100%	$ 14,698	100%	(13)%	14 %

Net sales in fiscal 2019 compared to fiscal 2018 decreased primarily due to decreased customer investments in semiconductor and display manufacturing equipment. Net sales in fiscal 2018 compared to fiscal 2017 increased due to increased customer investments across all segments. The Semiconductor Systems segment continued to represent the largest contributor of net sales.

Net sales by geographic region, determined by the location of customers' facilities to which products were shipped, were as follows:

	2019		2018		2017		Change 2019 over 2018	Change 2018 over 2017
	(In millions, except percentages)							
China	$ 4,277	29%	$ 5,047	30%	$ 2,758	19%	(15)%	83 %
Korea	1,929	13%	3,539	21%	4,087	28%	(45)%	(13)%
Taiwan	2,965	20%	2,504	15%	3,369	23%	18 %	(26)%
Japan	2,198	15%	2,396	14%	1,519	10%	(8)%	58 %
Southeast Asia	548	4%	797	5%	625	4%	(31)%	28 %
Asia Pacific	11,917	81%	14,283	85%	12,358	84%	(17)%	16 %
United States	1,871	13%	1,413	9%	1,512	10%	32 %	(7)%
Europe	820	6%	1,009	6%	828	6%	(19)%	22 %
Total	$ 14,608	100%	$ 16,705	100%	$ 14,698	100%	(13)%	14 %

The changes in net sales in all regions in fiscal 2019 compared to fiscal 2018 primarily reflected changes in semiconductor and display manufacturing equipment spending and customer and product mix. The increase in net sales to customers in Taiwan and United States for fiscal 2019 compared the prior year was primarily due to increased investments in semiconductor manufacturing equipment. The decrease in net sales to customers in all other regions for fiscal 2019 compared to fiscal 2018 primarily reflected a decrease in investments in semiconductor and display manufacturing equipment.

The changes in net sales in all regions other than Korea for fiscal 2018 compared to fiscal 2017 primarily reflected changes in semiconductor equipment spending, including product and customer mix, and increased spending in semiconductor spares and services. The increase in net sales to customers in China also reflected increased investments in display manufacturing equipment. The decrease in net sales to customers in Korea primarily reflected decreased investments in display manufacturing equipment.

Gross Margin

Gross margins for the periods indicated were as follows:

	2019	2018	2017	Change 2019 over 2018	Change 2018 over 2017
Gross margin	43.7 %	45.0 %	45.0 %	(1.3) points	— points

Gross margin in fiscal 2019 decreased compared to fiscal 2018, primarily due to the decrease in net sales and unfavorable changes in customer and product mix. Gross margin in fiscal 2018 remained flat compared to fiscal 2017.

Gross margin during fiscal 2019, 2018 and 2017 included $89 million, $87 million and $69 million, respectively, of share-based compensation expense.

Research, Development and Engineering

Research, Development and Engineering (RD&E) expenses for the periods indicated were as follows:

	2019	2018	2017	Change 2019 over 2018	Change 2018 over 2017
			(In millions)		
Research, development and engineering	$ 2,054	$ 2,022	$ 1,781	$ 32	$ 241

Applied's future operating results depend to a considerable extent on its ability to maintain a competitive advantage in the equipment and service products it provides. Development cycles range from 12 to 36 months depending on whether the product is an enhancement of an existing product, which typically has a shorter development cycle, or a new product, which typically has a longer development cycle. Most of Applied's existing products resulted from internal development activities and innovations involving new technologies, materials and processes. In certain instances, Applied acquires technologies, either in existing or new product areas, to complement its existing technology capabilities and to reduce time to market.

Management believes that it is critical to continue to make substantial investments in RD&E to assure the availability of innovative technology that meets the current and projected requirements of its customers' most advanced designs. Applied has maintained and intends to continue its commitment to investing in RD&E in order to continue to offer new products and technologies.

Applied continued its RD&E investments across Semiconductor Systems and Display and Adjacent Markets on the development of new unit process systems and integrated materials solutions. Areas of investment include etch, inspection, patterning and other technologies to improve chip performance, power, area and cost. In Display and Adjacent Markets, RD&E investments were focused on expanding the company's market opportunity with new display technologies.

RD&E expenses increased slightly in fiscal 2019 compared to the prior year and increased in fiscal 2018 compared to fiscal 2017, primarily due to additional headcount and increased research and development spending in Semiconductor Systems and Display and Adjacent Market segments. These increases reflect Applied's ongoing investments in product development initiatives, consistent with the Company's growth strategy. Applied continued to prioritize existing RD&E investments in technical capabilities and critical research and development programs in current and new markets, with a focus on semiconductor technologies.

RD&E expense during fiscal 2019, 2018 and 2017 included $99 million, $96 million and $83 million, respectively, of share-based compensation expense.

Marketing and Selling

Marketing and selling expenses for the periods indicated were as follows:

	2019	2018	2017	Change 2019 over 2018	Change 2018 over 2017
			(In millions)		
Marketing and selling	$ 521	$ 521	$ 457	$ —	$ 64

Marketing and selling expenses remained flat in fiscal 2019 compared to fiscal 2018. Marketing and selling expenses increased in fiscal 2018 compared to fiscal 2017 primarily due to additional headcount.

Marketing and selling expenses for fiscal years 2019, 2018 and 2017 included $31 million, $31 million and $28 million, respectively, of share-based compensation expense.

General and Administrative

General and administrative (G&A) expenses for the periods indicated were as follows:

	2019	2018	2017	Change: 2019 over 2018	Change: 2018 over 2017
	(In millions)				
General and administrative	$ 461	$ 483	$ 438	$ (22)	$ 45

General and administrative expenses in fiscal 2019 decreased slightly compared to fiscal 2018 primarily due to lower variable compensation expenses. General and administrative expenses in fiscal 2018 increased compared to fiscal 2017 primarily due to additional headcount and unfavorable impact from foreign exchange fluctuation, partially offset by lower variable compensation expense.

G&A expenses during fiscal 2019, 2018 and 2017 included $44 million, $44 million and $40 million, respectively, of share-based compensation expense.

Interest Expense and Interest and Other Income (loss), net

Interest expense and interest and other income (loss), net for the periods indicated were as follows:

	2019	2018	2017	Change: 2019 over 2018	Change: 2018 over 2017
	(In millions)				
Interest expense	$ 237	$ 234	$ 198	$ 3	$ 36
Interest and other income, net	$ 156	$ 139	$ 78	$ 17	$ 61

Interest expenses incurred were primarily associated with the senior unsecured notes. Interest expense in fiscal 2019 remained relatively flat compared to the prior year. Interest expense increased slightly in fiscal 2018 compared to fiscal 2017 due to the issuance of senior unsecured notes in March 2017.

Interest and other income, net primarily includes interest earned on cash and investments, realized gains or losses on sales of securities and impairment of strategic investments. Effective the first quarter of fiscal 2019, unrealized gains and losses on investments classified as equity investments are recognized in other income (expense), net in the Consolidated Statement of Operations. Prior to the adoption of Accounting Standards Update (ASU) 2016-01 *Financial Instruments-Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities* in the first quarter of fiscal 2019, these unrealized gains and temporary losses were included within accumulated other comprehensive income (loss), net of any related tax effect. Interest and other income, net in fiscal 2019 increased compared to fiscal 2018 primarily driven by unrealized gains on equity investment securities. Interest and other income, net in fiscal 2018 increased compared to fiscal 2017 primarily driven by realized gains on sales of securities and higher interest income from investments.

Income Taxes

Provision for income taxes and effective tax rates for the periods indicated were as follows:

	2019	2018	2017	Change: 2019 over 2018	Change: 2018 over 2017
	(In millions, except percentages)				
Provision for income taxes	$ 563	$ 1,358	$ 297	$ (795)	$ 1,061
Effective income tax rate	17.2 %	30.9 %	7.8 %	(13.7)points	23.1 points

Applied’s provision for income taxes and effective tax rate are affected by the geographical composition of pre-tax income which includes jurisdictions with differing tax rates, conditional reduced tax rates and other income tax incentives. It is also affected by events that are not consistent from period to period, such as changes in income tax laws and the resolution of prior years’ income tax filings.

On December 22, 2017, the U.S. government enacted the Tax Cuts and Jobs Act (Tax Act). The Tax Act requires a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries payable over eight years. U.S. deferred tax assets and liabilities were subject to remeasurement due to the reduction of the U.S. federal corporate tax rate. The U.S. Securities and Exchange Commission issued Staff Accounting Bulletin No. 118, which provided guidance on accounting for the income tax effects of the Tax Act and a measurement period for companies to complete this accounting. Applied completed the accounting for the Tax Act during the measurement period, which ended one year after the enactment date of the Tax Act. Accounting for the remeasurement of deferred tax assets was completed in the fourth quarter of fiscal 2018, and the accounting for the transition tax was completed in the first quarter of fiscal 2019.

The Tax Act also includes provisions that impact Applied starting in fiscal 2019, including a provision designed to tax global intangible low-taxed income (GILTI). On June 14, 2019, the U.S. government released regulations that significantly affect how the GILTI provision of the Tax Act is interpreted. As a result, Applied reversed a tax benefit of $96 million in the third quarter of fiscal 2019 that had been realized in the first half of fiscal 2019. An accounting policy may be selected to treat GILTI temporary differences in taxable income either as a current-period expense when incurred (period cost method) or factor such amounts into the measurement of deferred taxes (deferred method). Applied has chosen the period cost method.

Applied’s effective tax rate for fiscal 2019 was lower than fiscal 2018 primarily due to tax expense of $1.1 billion in fiscal 2018 for the transition tax and remeasurement of deferred tax assets as a result of the Tax Act. Excluding the tax expense of $1.1 billion, the effective tax rate for fiscal 2019 was higher than fiscal 2018 primarily due to certain provisions in the Tax Act becoming effective in fiscal 2019, tax expense of $87 million in fiscal 2019 related to changes in uncertain tax positions and the excess tax benefit from share-based compensation in fiscal 2019 being $42 million less than the prior fiscal year.

The effective tax rate for fiscal 2018 was higher than fiscal 2017 primarily due to tax expense of $1.1 billion for the transition tax and remeasurement of deferred tax assets as a result of the Tax Act, partially offset by changes in the geographical composition of income, tax benefits from the lower U.S. federal corporate tax rate, adoption of authoritative guidance for share-based compensation, and the resolution of tax liabilities for uncertain tax positions. In addition, fiscal 2017 included tax benefits from the recognition of previously unrecognized foreign tax credits.

Segment Information

Applied reports financial results in three segments: Semiconductor Systems, Applied Global Services, and Display and Adjacent Markets. A description of the products and services, as well as financial data, for each reportable segment can be found in Note 16 of Notes to Consolidated Financial Statements.

The Corporate and Other category includes revenues from products, as well as costs of products sold, for fabricating solar photovoltaic cells and modules and certain operating expenses that are not allocated to its reportable segments and are managed separately at the corporate level. These operating expenses include costs for share-based compensation; certain management, finance, legal, human resource, and RD&E functions provided at the corporate level; and unabsorbed information technology and occupancy. In addition, Applied does not allocate to its reportable segments restructuring and asset impairment charges and any associated adjustments related to restructuring actions, unless these actions pertain to a specific reportable segment.

The results for each reportable segment are discussed below.

Semiconductor Systems Segment

The Semiconductor Systems segment is comprised primarily of capital equipment used to fabricate semiconductor chips. Semiconductor industry spending on capital equipment is driven by demand for advanced electronic products, including smartphones and other mobile devices, servers, personal computers, automotive devices, storage, and other products, and the nature and timing of technological advances in fabrication processes, and as a result is subject to variable industry conditions. Development efforts are focused on solving customers' key technical challenges in transistor, interconnect, patterning and packaging performance as devices scale to advanced technology nodes.

Customer investments in semiconductor manufacturing equipment continued to be the primary contributor of Applied's revenue during fiscal 2019. Semiconductor equipment customers continued to make strategic investments in new technology transitions. Spending by memory customers, compared to fiscal 2018, was lower as they delayed new capacity additions and lowered their fab utilization rates in response to excess industry supply and inventory levels. Foundry and logic spending increased year-over-year led by customer investments in both advanced and mature foundry-logic nodes. Overall semiconductor systems revenue for fiscal 2019 decreased as compared to the prior year.

Certain significant measures for the periods indicated were as follows:

				Change			
	2019	2018	2017	2019 over 2018		2018 over 2017	
	(In millions, except percentages and ratios)						
Net sales	$ 9,027	$ 10,577	$ 9,544	$ (1,550)	(15)%	$ 1,033	11 %
Operating income	$ 2,464	$ 3,441	$ 3,177	$ (977)	(28)%	$ 264	8 %
Operating margin	27.3 %	32.5 %	33.3 %	(5.2) points		(0.8) points	

Net sales for Semiconductor Systems by end use application for the periods indicated were as follows:

	2019	2018	2017
Foundry, logic and other	52 %	36 %	51 %
Dynamic random-access memory (DRAM)	22 %	27 %	15 %
Flash memory	26 %	37 %	34 %
	100 %	100 %	100 %

Net sales for fiscal 2019 decreased compared to fiscal 2018 primarily due to lower spending from memory customers, partially offset by increased spending from foundry, logic and other customers. Operating margin for fiscal 2019 decreased compared to the prior year, primarily reflecting lower net sales, unfavorable changes in customer and product mix. Five customers each accounted for at least 10 percent of this segment's net sales, and together they accounted for approximately 65 percent of this segment's net sales for fiscal 2019.

Net sales for fiscal 2018 increased compared to fiscal 2017 primarily due to higher spending from memory customers, partially offset by lower spending from foundry, logic and other customers. Although operating margin remained flat, operating income for fiscal 2018 increased compared to fiscal 2017 primarily due to favorable changes in product mix and higher net sales, partially offset by higher RD&E expenses.

The following region accounted for at least 30 percent of total net sales for the Semiconductor Systems segment for one or more of past three fiscal years:

	2019		2018		2017		Change 2019 over 2018		Change 2018 over 2017	
	(In millions, except percentages)									
Korea	$ 1,435	16 %	$ 2,883	27 %	$ 2,955	31 %	$ (1,448)	(50)%	$ (72)	(2)%

Applied Global Services Segment

The Applied Global Services segment provides integrated solutions to optimize equipment and fab performance and productivity, including spares, upgrades, services, certain remanufactured earlier generation equipment and factory automation software for semiconductor, display and solar products.

Demand for Applied Global Services' service solutions are driven by Applied's large and growing installed base of manufacturing systems, and customers' needs to shorten ramp times, improve device performance and yield, and optimize factory output and operating costs. Industry conditions that affect Applied Global Services' sales of spares and services are primarily characterized by increases in semiconductor manufacturers' wafer starts and continued strong utilization rates, growth of the installed base of equipment, growing service intensity of newer tools, and the company's ability to sell more comprehensive service agreements.

Certain significant measures for the periods indicated were as follows:

	2019	2018	2017	Change 2019 over 2018		Change 2018 over 2017	
	(In millions, except percentages and ratios)						
Net sales	$ 3,854	$ 3,754	$ 3,014	$ 100	3 %	$ 740	25 %
Operating income	$ 1,101	$ 1,102	$ 817	$ (1)	— %	$ 285	35 %
Operating margin	28.6 %	29.4 %	27.1 %	(0.8) points		2.3 points	

Net sales increased slightly in fiscal 2019 compared to the prior year primarily due to higher customer spending for comprehensive service agreements and legacy systems, partially offset by lower customer spending on semiconductor spares. Net sales increased in fiscal 2018 compared to fiscal 2017 primarily due to higher customer spending for spares and services. In fiscal 2019, two customers each accounted for at least 10 percent of this segment's net sales.

Operating income for fiscal 2019 remained flat compared to the prior year primarily due to higher net sales, partially offset by higher expenses related to an increase in headcount. Operating margin for fiscal 2019 decreased slightly compared to fiscal 2018 primarily due to an increase in headcount to support revenue growth. Operating income and operating margin for fiscal 2018 increased compared to the fiscal 2017, reflecting higher net sales partially offset by increased headcount to support business growth.

There was no single region that accounted for at least 30 percent of total net sales for the Applied Global Services segment for any of the past three fiscal years.

Display and Adjacent Markets Segment

The Display and Adjacent Markets segment encompasses products for manufacturing liquid crystal and OLED displays, and other display technologies for TVs, monitors, laptops, personal computers, electronic tablets, smart phones, and other consumer-oriented devices, equipment upgrades and flexible coating systems. The segment is focused on expanding its presence through technologically-differentiated equipment for manufacturing large-scale LCD TVs, OLEDs, low temperature polysilicon (LTPS), metal oxide, and touch panel sectors; and development of products that provide customers with improved performance and yields. Display industry growth depends primarily on consumer demand for increasingly larger and more advanced TVs as well as larger and higher resolution displays for next-generation mobile devices.

The market environment for Applied's Display and Adjacent Markets segment in fiscal 2019 was characterized by weak demand for display manufacturing equipment for mobile products and TVs, compared to fiscal 2018. In addition, uneven demand patterns in the Display and Adjacent Markets segment can cause significant fluctuations quarter-over-quarter, as well as year-over-year.

Certain significant measures for the periods presented were as follows:

	2019	2018	2017	Change 2019 over 2018		Change 2018 over 2017	
	(In millions, except percentages and ratios)						
Net sales	$ 1,651	$ 2,298	$ 2,042	$ (647)	(28)%	$ 256	13 %
Operating income	$ 294	$ 574	$ 585	$ (280)	(49)%	$ (11)	(2)%
Operating margin	17.8 %	25.0 %	28.6 %	(7.2) points		(3.6) points	

Net sales for fiscal 2019 decreased compared to fiscal 2018 primarily due to lower customer investments in mobile and TV display manufacturing equipment. Operating income and operating margin for fiscal 2019 decreased compared to fiscal 2018, reflecting lower net sales and unfavorable changes in customer and product mix. Four customers each accounted for at least 10 percent of this segment's net sales, and together they accounted for approximately 68 percent of net sales for this segment in fiscal 2019.

Net sales for fiscal 2018 increased compared to fiscal 2017 primarily due to higher customer investments in TV display manufacturing equipment. Operating income and operating margin for fiscal 2018 decreased slightly compared fiscal 2017, primarily due to higher RD&E spending and unfavorable product mix, offset by higher net sales.

The following regions accounted for at least 30 percent of total net sales for the Display and Adjacent Markets segment for one or more of the periods presented:

	2019		2018		2017		Change 2019 over 2018		Change 2018 over 2017	
	(In millions, except percentages)									
China	$ 1,469	89 %	$ 1,957	85 %	$ 978	48 %	$ (488)	(25)%	$ 979	100 %
Korea	$ 55	3 %	$ 151	7 %	$ 791	39 %	$ (96)	(64)%	$ (640)	(81)%

Recent Accounting Pronouncements

For a description of recent accounting pronouncements, including the expected dates of adoption and estimated effects, if any, on Applied's consolidated financial statements, see Note 1, "Summary of Significant Accounting Policies," of the Notes to Consolidated Financial Statements.

Financial Condition, Liquidity and Capital Resources

Applied's cash, cash equivalents and investments consist of the following:

	October 27, 2019	October 28, 2018
	(In millions)	
Cash and cash equivalents	$ 3,129	$ 3,440
Short-term investments	489	590
Long-term investments	1,703	1,568
Total cash, cash-equivalents and investments	$ 5,321	$ 5,598

Sources and Uses of Cash

A summary of cash provided by (used in) operating, investing, and financing activities is as follows:

	2019	2018	2017
		(In millions)	
Cash provided by operating activities	$ 3,247	$ 3,787	$ 3,789
Cash provided by (used in) investing activities	$ (443)	$ 571	$ (2,526)
Cash provided by (used in) financing activities	$ (3,115)	$ (5,928)	$ 341

In March 2016, the Financial Accounting Standards Board issued authoritative guidance that simplifies several aspects of the accounting for share-based payment transactions, including forfeitures, income tax, and classification on the statement of cash flows. Applied adopted this guidance in the first quarter of fiscal 2018. Upon adoption, Applied elected to apply the presentation requirements for cash flows related to excess tax benefits and employee taxes paid for withheld shares retrospectively. Adopting this guidance increased cash provided by operating activities by $180 million with corresponding net decreases in cash provided by financing activities for fiscal 2017.

Operating Activities

Cash from operating activities for fiscal 2019 was $3.2 billion, which reflects net income adjusted for the effect of non-cash charges and changes in working capital components. Non-cash charges included depreciation, amortization, share-based compensation and deferred income taxes. Cash provided from operating activities in fiscal 2019 decreased compared to fiscal 2018 due to lower net income, cash collections, change in income taxes payable and higher payments to suppliers, offset by a decrease in inventories. Cash provided from operating activities remained flat from fiscal 2017 to fiscal 2018 due to the increase in income taxes payable, offset by lower deferred revenue and higher increase in accounts receivable.

Applied has agreements with various financial institutions to sell accounts receivable and discount promissory notes from selected customers. Applied sells its accounts receivable without recourse. Applied, from time to time, also discounts letters of credit issued by customers through various financial institutions. The discounting of letters of credit depends on many factors, including the willingness of financial institutions to discount the letters of credit and the cost of such arrangements. Applied sold $1.5 billion, $1.6 billion and $746 million of accounts receivable during fiscal 2019, 2018 and 2017, respectively. Applied discounted letters of credit issued by customers of $48 million and $37 million in fiscal 2019 and 2018, respectively. There was no discounting of promissory notes in each of fiscal 2019 and 2018. Applied did not discount letters of credit issued by customers or discount promissory notes during fiscal 2017.

Applied's working capital was $5.8 billion at October 27, 2019 and $6.7 billion at October 28, 2018.

Days sales outstanding at the end of fiscal 2019, 2018 and 2017 was 61 days, 58 days, and 54 days, respectively. Days sales outstanding varies due to the timing of shipments and payment terms. The increase in days sales outstanding at the end of fiscal 2019 compared to the end of fiscal 2018 was primarily due to lower factoring of accounts receivable. The increase in days sales outstanding at the end of fiscal 2018 compared to the end of fiscal 2017 was primarily due to less favorable revenue linearity in fiscal 2018.

Investing Activities

Applied used $443 million and $2.5 billion of cash in investing activities in fiscal 2019 and 2017, respectively. Applied generated $571 million in cash from investing activities in fiscal 2018. Capital expenditures in fiscal 2019, 2018 and 2017 were $441 million, $622 million and $345 million, respectively. Capital expenditures in fiscal 2019 and 2018 were primarily for real property acquisitions and improvements in North America and Taiwan, as well as investments in demonstration, testing and laboratory tools. Capital expenditures in fiscal 2017 were primarily for demonstration and test equipment and laboratory tools in North America. Proceeds from sales and maturities of investments, net of purchase of investments were $26 million and $1.2 billion for fiscal 2019 and 2018, respectively. Purchases of investments, net of proceeds from sales and maturities of investments was $2.1 billion for fiscal 2017. Investing activities also included investments in technology to allow Applied to access new market opportunities or emerging technologies.

Applied's investment portfolio consists principally of investment grade money market mutual funds, U.S. Treasury and agency securities, municipal bonds, corporate bonds and mortgage-backed and asset-backed securities, as well as equity securities. Applied regularly monitors the credit risk in its investment portfolio and takes appropriate measures, which may include the sale of certain securities, to manage such risks prudently in accordance with its investment policies.

Financing Activities

Applied used $3.1 billion of cash in financing activities in fiscal 2019, consisting primarily of repurchases of common stock of $2.4 billion, cash dividends to stockholders of $771 million and tax withholding payments for vested equity awards of $86 million, offset by proceeds from common stock issuances of $145 million.

Applied used $5.9 billion of cash in financing activities in fiscal 2018, consisting primarily of repurchases of common stock of $5.3 billion, cash dividends to stockholders of $605 million and tax withholding payments for vested equity awards of $164 million, offset by proceeds from common stock issuances of $124 million.

Applied generated $341 million of cash from financing activities in fiscal 2017, consisting primarily of net proceeds received from the issuance of senior unsecured notes of $2.2 billion, proceeds from common stock issuance of $97 million, partially offset by cash used for repurchases of common stock of $1.2 billion, cash dividends to stockholders of $430 million and debt repayments of $205 million.

In September 2017, Applied's Board of Directors approved a common stock repurchase program authorizing up to $3.0 billion in repurchases. In February 2018, the Board of Directors approved a new common stock repurchase program authorizing up to an additional $6.0 billion in repurchases. At October 27, 2019, $1.9 billion remained available for future stock repurchases under this repurchase program.

During fiscal 2019, Applied's Board of Directors declared one quarterly cash dividend of $0.20 per share and three quarterly cash dividends of $0.21 per share. During fiscal 2018, Applied's Board of Directors declared one quarterly cash dividend of $0.10 per share and three quarterly cash dividends of $0.20 per share. During fiscal 2017, Applied's Board of Directors declared four quarterly cash dividends in the amount of $0.10 per share. Applied currently anticipates that cash dividends will continue to be paid on a quarterly basis, although the declaration of any future cash dividend is at the discretion of the Board of Directors and will depend on Applied's financial condition, results of operations, capital requirements, business conditions and other factors, as well as a determination by the Board of Directors that cash dividends are in the best interests of Applied's stockholders.

Applied has credit facilities for unsecured borrowings in various currencies of up to $1.6 billion, of which $1.5 billion is comprised of a committed revolving credit agreement with a group of banks that is scheduled to expire in September 2021. This agreement provides for borrowings in United States dollars at interest rates keyed to one of two rates selected by Applied for each advance and includes financial and other covenants with which Applied was in compliance at October 27, 2019. Remaining credit facilities in the amount of approximately $74 million are with Japanese banks. Applied's ability to borrow under these facilities is subject to bank approval at the time of the borrowing request, and any advances will be at rates indexed to the banks' prime reference rate denominated in Japanese yen.

In August 2019, Applied entered into a term loan credit agreement with a group of lenders. Under the agreement, the lenders have committed to make an unsecured term loan to Applied of up to $2.0 billion to finance in part Applied's planned acquisition of all outstanding shares of Kokusai Electric, to pay related transaction fees and expenses and for general corporate purposes. The commitments of the lenders to make the term loan will terminate if the transactions contemplated by the Share Purchase Agreement (SPA) are not consummated on or before June 30, 2020, which date may be extended by three months on two separate occasions if, on the applicable date, the only remaining conditions to closing relate to required regulatory approvals. The term loan, if advanced, will bear interest at one of two rates selected by Applied, plus an applicable margin, which varies according to Applied's public debt credit ratings, and must be repaid in full on the third anniversary of the funding date of the term loan.

No amounts were outstanding under any of these facilities at both October 27, 2019 and October 28, 2018, and Applied has not utilized these credit facilities.

In fiscal 2011, Applied established a short-term commercial paper program of up to $1.5 billion. At October 27, 2019 and October 28, 2018, Applied did not have any commercial paper outstanding, but may issue commercial paper notes under this program from time to time in the future.

In March 2017, Applied issued senior unsecured notes in the aggregate principal amount of $2.2 billion. Applied had senior unsecured notes in the aggregate principal amount of $5.4 billion outstanding as of October 27, 2019. The indentures governing these notes include covenants with which Applied was in compliance at October 27, 2019. In May 2017, Applied completed the redemption of the entire outstanding $200 million in principal amount of senior notes due in October 2017. See Note 11 of Notes to Consolidated Financial Statements for additional discussion of existing debt. Applied may seek to refinance its existing debt and may incur additional indebtedness depending on Applied's capital requirements and the availability of financing.

Others

On December 22, 2017, the U.S. government enacted the Tax Cuts and Jobs Act. The Tax Act requires a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries. For fiscal 2018, Applied realized tax expense of $1.1 billion associated with the Tax Act, primarily due to the transition tax. The transition tax expense is payable in installments over eight years, with eight percent due in each of the first five years starting with fiscal 2018. As of October 27, 2019, Applied has $938 million of total payments remaining, payable in installments in the next seven years. Before the Tax Act, U.S. income tax had not been provided for certain unrepatriated earnings that were considered indefinitely reinvested. Income tax is now provided for all unrepatriated earnings.

Although cash requirements will fluctuate based on the timing and extent of factors such as those discussed above, Applied's management believes that cash generated from operations, together with the liquidity provided by existing cash balances and borrowing capability, will be sufficient to satisfy Applied's liquidity requirements for the next 12 months. For further details regarding Applied's operating, investing and financing activities, see the Consolidated Statements of Cash Flows in this report.

For details on standby letters of credit and other agreements with banks, see Off-Balance Sheet Arrangements below.

Off-Balance Sheet Arrangements

In the ordinary course of business, Applied provides standby letters of credit or other guarantee instruments to third parties as required for certain transactions initiated by either Applied or its subsidiaries. As of October 27, 2019, the maximum potential amount of future payments that Applied could be required to make under these guarantee agreements was approximately $76 million. Applied has not recorded any liability in connection with these guarantee agreements beyond that required to appropriately account for the underlying transaction being guaranteed. Applied does not believe, based on historical experience and information currently available, that it is probable that any amounts will be required to be paid under these guarantee agreements.

Applied also has agreements with various banks to facilitate subsidiary banking operations worldwide, including overdraft arrangements, issuance of bank guarantees, and letters of credit. As of October 27, 2019, Applied has provided parent guarantees to banks for approximately $151 million to cover these arrangements.

Applied also has operating leases for various facilities. Total rent expense for fiscal 2019, 2018 and 2017 was $51 million, $50 million and $34 million, respectively.

Contractual Obligations

The following table summarizes Applied's contractual obligations as of October 27, 2019:

	Payments Due by Period				
Contractual Obligations	Total	Less Than 1 Year	1-3 Years	3-5 Years	More Than 5 Years
	(In millions)				
Debt obligations	$ 5,350	$ 600	$ 750	$ —	$ 4,000
Interest expense associated with debt obligations	2,918	219	374	342	1,983
Operating lease obligations	171	45	58	38	30
Income tax from change in U.S. tax laws[1]	938	82	163	234	459
Purchase obligations[2]	2,020	1,888	117	15	—
Other long-term liabilities[3,4]	20	—	2	2	16
Total	$ 11,417	$ 2,834	$ 1,464	$ 631	$ 6,488

1 Represents the transition tax liability associated with the deemed repatriation of accumulated foreign earnings as a result of the enactment of the Tax Cuts and Jobs Act into law on December 22, 2017.

2 Represents Applied's agreements to purchase goods and services consisting of Applied's outstanding purchase orders for goods and services.

3 Other long-term liabilities in the table do not include pension, post-retirement and deferred compensation plans due to the uncertainty in the timing of future payments. Applied evaluates the need to make contributions to its pension and post-retirement benefit plans after considering the funded status of the plans, movements in the discount rate, performance of the plan assets and related tax consequences. Payments to the plans would be dependent on these factors and could vary across a wide range of amounts and time periods. Payments for deferred compensation plans are dependent on activity by participants, making the timing of payments uncertain. Information on Applied's pension, post-retirement benefit and deferred compensation plans is presented in Note 13, Employee Benefit Plans, of the consolidated financial statements.

4 Applied's other long-term liabilities in the Consolidated Balance Sheets include deferred income tax liabilities, gross unrecognized tax benefits and related gross interest and penalties. As of October 27, 2019, the gross liability for unrecognized tax benefits that was not expected to result in payment of cash within one year was $489 million. Interest and penalties related to uncertain tax positions that were not expected to result in payment of cash within one year of October 27, 2019 was $50 million. At this time, Applied is unable to make a reasonably reliable estimate of the timing of payments due to uncertainties in the timing of tax audit outcomes; therefore, such amounts are not included in the above contractual obligation table.

Critical Accounting Policies and Estimates

The preparation of consolidated financial statements and related disclosures in conformity with accounting principles generally accepted in the United States of America requires management to make judgments, assumptions and estimates that affect the amounts reported. Note 1 of Notes to Consolidated Financial Statements describes the significant accounting policies used in the preparation of the consolidated financial statements. Certain of these significant accounting policies are considered to be critical accounting policies.

A critical accounting policy is defined as one that is both material to the presentation of Applied's consolidated financial statements and that requires management to make difficult, subjective or complex judgments that could have a material effect on Applied's financial condition or results of operations. Specifically, these policies have the following attributes: (1) Applied is required to make assumptions about matters that are highly uncertain at the time of the estimate; and (2) different estimates Applied could reasonably have used, or changes in the estimate that are reasonably likely to occur, would have a material effect on Applied's financial condition or results of operations.

Estimates and assumptions about future events and their effects cannot be determined with certainty. Applied bases its estimates on historical experience and on various other assumptions believed to be applicable and reasonable under the circumstances. These estimates may change as new events occur, as additional information is obtained and as Applied's operating environment changes. These changes have historically been minor and have been included in the consolidated financial statements as soon as they became known. In addition, management is periodically faced with uncertainties, the outcomes of which are not within its control and will not be known for prolonged periods of time. These uncertainties include those discussed in Part I, Item 1A, "Risk Factors." Based on a critical assessment of its accounting policies and the underlying judgments and uncertainties affecting the application of those policies, management believes that Applied's consolidated financial statements are fairly stated in accordance with accounting principles generally accepted in the United States of America, and provide a meaningful presentation of Applied's financial condition and results of operations.

Management believes that the following are critical accounting policies and estimates:

Revenue Recognition

Applied recognizes revenue when promised goods or services (performance obligations) are transferred to a customer in an amount that reflects the consideration to which Applied expects to be entitled in exchange for those goods or services. Applied performs the following five steps to determine when to recognize revenue: (1) identification of the contract(s) with customers, (2) identification of the performance obligations in the contract, (3) determination of the transaction price, (4) allocation of the transaction price to the performance obligations in the contract, and (5) recognition of revenue when, or as, a performance obligation is satisfied. Management uses judgment to identify performance obligations within a contract and to determine whether multiple promised goods or services in a contract should be accounted for separately or as a group. Judgment is also used in interpreting commercial terms and determining when transfer of control occurs. Moreover, judgment is used to estimate the contract's transaction price and allocate it to each performance obligation. Any material changes in the identification of performance obligations, determination and allocation of the transaction price to performance obligations, and determination of when transfer of control occurs to the customer, could impact the timing and amount of revenue recognition, which could have a material effect on Applied's financial condition and results of operations.

Warranty Costs

Applied provides for the estimated cost of warranty when revenue is recognized. Estimated warranty costs are determined by analyzing specific product, current and historical configuration statistics and regional warranty support costs. Applied's warranty obligation is affected by product and component failure rates, material usage and labor costs incurred in correcting product failures during the warranty period. As Applied's customer engineers and process support engineers are highly trained and deployed globally, labor availability is a significant factor in determining labor costs. The quantity and availability of critical replacement parts is another significant factor in estimating warranty costs. Unforeseen component failures or exceptional component performance can also result in changes to warranty costs. If actual warranty costs differ substantially from Applied's estimates, revisions to the estimated warranty liability would be required, which could have a material adverse effect on Applied's business, financial condition and results of operations.

Allowance for Doubtful Accounts

Applied maintains an allowance for doubtful accounts for estimated losses resulting from the inability of its customers to make required payments. This allowance is based on historical experience, credit evaluations, specific customer collection history and any customer-specific issues Applied has identified. Changes in circumstances, such as an unexpected material adverse change in a major customer's ability to meet its financial obligation to Applied or its payment trends, may require Applied to further adjust its estimates of the recoverability of amounts due to Applied, which could have a material adverse effect on Applied's business, financial condition and results of operations.

Inventory Valuation

Inventories are generally stated at the lower of cost or net realizable value, with cost determined on a first-in, first-out basis. The carrying value of inventory is reduced for estimated obsolescence by the difference between its cost and the estimated net realizable value based upon assumptions about future demand. Applied evaluates the inventory carrying value for potential excess and obsolete inventory exposures by analyzing historical and anticipated demand. In addition, inventories are evaluated for potential obsolescence due to the effect of known and anticipated engineering change orders and new products. If actual demand were to be substantially lower than estimated, additional adjustments for excess or obsolete inventory may be required, which could have a material adverse effect on Applied's business, financial condition and results of operations.

Goodwill and Intangible Assets

Applied reviews goodwill and intangible assets for impairment whenever events or changes in circumstances indicate that the carrying amount of these assets may not be recoverable, and also annually reviews goodwill and intangibles with indefinite lives for impairment. Intangible assets, such as purchased technology, are generally recorded in connection with a business acquisition. The value assigned to intangible assets is usually based on estimates and judgments regarding expectations for the success and life cycle of products and technology acquired. If actual product acceptance differs significantly from the estimates, Applied may be required to record an impairment charge to reduce the carrying value of the reporting unit to its estimated fair value.

To test goodwill for impairment, Applied first performs a qualitative assessment to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value. If it is concluded that this is the case, Applied then performs the two-step goodwill impairment test. Otherwise, the two-step goodwill impairment test is not required. Under the two-step goodwill impairment test, Applied would in the first step compare the estimated fair value of each reporting unit to its carrying value. If the carrying value of a reporting unit exceeds its estimated fair value, Applied would then perform the second step of the impairment test in order to determine the implied fair value of the reporting unit's goodwill. If Applied determines that the carrying value of a reporting unit's goodwill exceeds its implied fair value, Applied would record an impairment charge equal to the difference.

Applied determines the fair value of each reporting unit based on a weighting of an income and a market approach. Applied bases the fair value estimates on assumptions that it believes to be reasonable but that are unpredictable and inherently uncertain. Under the income approach, Applied estimates the fair value based on discounted cash flow method.

The estimates used in the impairment testing are consistent with the discrete forecasts that Applied uses to manage its business, and considers any significant developments during the period. Under the discounted cash flow method, cash flows beyond the discrete forecasts are estimated using a terminal growth rate, which considers the long-term earnings growth rate specific to the reporting units. The estimated future cash flows are discounted to present value using each reporting unit's weighted average cost of capital. The weighted average cost of capital measures a reporting unit's cost of debt and equity financing weighted by the percentage of debt and equity in a reporting unit's target capital structure. In addition, the weighted average cost of capital is derived using both known and estimated market metrics, and is adjusted to reflect both the timing and risks associated with the estimated cash flows. The tax rate used in the discounted cash flow method is the median tax rate of comparable companies and reflects Applied's current international structure, which is consistent with the market participant perspective. Under the market approach, Applied uses the guideline company method which applies market multiples to forecasted revenues and earnings before interest, taxes, depreciation and amortization. Applied uses market multiples that are consistent with comparable publicly-traded companies and considers each reporting unit's size, growth and profitability relative to its comparable companies.

Management uses significant judgment when assessing goodwill for potential impairment, especially in emerging markets. Indicators of potential impairment include, but are not limited to, challenging economic conditions, an unfavorable industry or economic environment or other severe decline in market conditions. Such conditions could have the effect of changing one of the critical assumptions or estimates used for the fair value calculation, resulting in an unexpected goodwill impairment charge, which could have a material adverse effect on Applied's business, financial condition and results of operations. See Note 10 of Notes to Consolidated Financial Statements for additional discussion of goodwill impairment.

Income Taxes

Applied’s provision for income taxes and effective tax rate are affected by the geographical composition of pre-tax income which includes jurisdictions with differing tax rates, conditional reduced tax rates and other income tax incentives. It is also affected by events that are not consistent from period to period, such as changes to income tax laws and the resolution of prior years’ income tax filings.

Applied recognizes a current tax liability for the estimated amount of income tax payable on tax returns for the current fiscal year. Deferred tax assets and liabilities are recognized for the estimated future tax effects of temporary differences between the book and tax bases of assets and liabilities. Deferred tax assets are also recognized for net operating loss and tax credit carryforwards. Deferred tax assets are offset by a valuation allowance to the extent it is more likely than not that they are not expected to be realized.

Applied recognizes tax benefits from uncertain tax positions only if it is more likely than not that the tax position will be sustained upon examination by the taxing authorities based on the technical merits of the position. The tax benefits recognized from such positions are estimated based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement. Any changes in judgment related to uncertain tax positions are recognized in Applied’s provision for income taxes in the quarter in which such change occurs. Interest and penalties related to uncertain tax positions are recognized in Applied’s provision for income taxes.

The calculation of Applied’s provision for income taxes and effective tax rate involves significant judgment in estimating the impact of uncertainties in the application of complex tax laws. Resolution of these uncertainties in a manner inconsistent with Applied’s expectations could have an adverse material impact on Applied’s results of operations and financial condition.

Non-GAAP Adjusted Financial Results

Management uses non-GAAP adjusted financial measures to evaluate the Company’s operating and financial performance and for planning purposes, and as performance measures in its executive compensation program. Applied believes these measures enhance an overall understanding of its performance and investors’ ability to review the Company’s business from the same perspective as the Company’s management and facilitate comparisons of this period’s results with prior periods on a consistent basis by excluding items that management does not believe are indicative of Applied's ongoing operating performance.

The non-GAAP adjusted financial measures presented below are adjusted to exclude the impact of certain costs, expenses, gains and losses, including certain items related to mergers and acquisitions; restructuring charges and any associated adjustments; impairments of assets, or investments; gain or loss on sale of strategic investments; certain income tax items and other discrete adjustments. Additionally, fiscal 2019 and 2018 non-GAAP results exclude estimated discrete income tax expense items associated with recent U.S. tax legislation. Reconciliations of these non-GAAP measures to the most directly comparable financial measures calculated and presented in accordance with GAAP are provided in the financial tables presented below. There are limitations in using non-GAAP financial measures because the non-GAAP financial measures are not prepared in accordance with generally accepted accounting principles, may be different from non-GAAP financial measures used by other companies, and may exclude certain items that may have a material impact upon our reported financial results. The presentation of this additional information is not meant to be considered in isolation or as a substitute for the directly comparable financial measures prepared in accordance with GAAP.

The following tables present a reconciliation of the GAAP and non-GAAP adjusted consolidated results for the past three fiscal years:

APPLIED MATERIALS, INC.
UNAUDITED RECONCILIATION OF GAAP TO NON-GAAP ADJUSTED RESULTS

(In millions, except percentages)	**2019**	**2018**	**2017**
Non-GAAP Adjusted Gross Profit			
Reported gross profit - GAAP basis	$ 6,386	$ 7,517	$ 6,612
Certain items associated with acquisitions[1]	37	179	172
Non-GAAP adjusted gross profit	$ 6,423	$ 7,696	$ 6,784
Non-GAAP adjusted gross margin	44.0 %	46.1 %	46.2 %
Non-GAAP Adjusted Operating Income			
Reported operating income - GAAP basis	$ 3,350	$ 4,491	$ 3,936
Certain items associated with acquisitions[1]	55	197	191
Acquisition integration and deal costs	22	5	3
Other gains, losses or charges, net	—	—	(12)
Non-GAAP adjusted operating income	$ 3,427	$ 4,693	$ 4,118
Non-GAAP adjusted operating margin	23.5 %	28.1 %	28.0 %
Non-GAAP Adjusted Net Income			
Reported net income - GAAP basis[2]	$ 2,706	$ 3,038	$ 3,519
Certain items associated with acquisitions[1]	55	197	191
Acquisition integration and deal costs	22	5	3
Impairment (gain on sale) of strategic investments, net	(6)	(25)	(3)
Loss (gain) on strategic investments, net	(30)	—	—
Loss on early extinguishment of debt	—	—	5
Other gains, losses or charges, net	—	—	(12)
Income tax effect of changes in applicable U.S. tax laws[3]	(24)	1,112	—
Income tax effects related to amortization of intra-entity intangible asset transfers	62	—	—
Resolution of prior years' income tax filings and other tax items	95	(26)	(79)
Income tax effect of non-GAAP adjustments[4]	(5)	(7)	(14)
Non-GAAP adjusted net income	$ 2,875	$ 4,294	$ 3,610

1 These items are incremental charges attributable to completed acquisitions, consisting of amortization of purchased intangible assets.

2 Amounts for fiscal 2017 included the recognition of the previously unrecognized foreign tax credits.

3 Charges to income tax provision related to a one-time transition tax and a decrease in U.S. deferred tax assets as a result of the recent U.S. tax legislation.

4 Adjustment to provision for income taxes related to non-GAAP adjustments reflected in income before income taxes.

APPLIED MATERIALS, INC.
UNAUDITED RECONCILIATION OF GAAP TO NON-GAAP ADJUSTED RESULTS

(In millions, except per share amounts)	2019	2018	2017
Non-GAAP Adjusted Earnings Per Diluted Share			
Reported earnings per diluted share - GAAP basis	$ 2.86	$ 2.96	$ 3.25
Certain items associated with acquisitions	0.05	0.18	0.16
Acquisition integration and deal costs	0.02	—	—
Impairment (gain on sale) of strategic investments, net	—	(0.02)	—
Loss (gain) on strategic investments, net	(0.03)	—	—
Income tax effect of change in applicable U.S. tax laws	(0.03)	1.08	—
Income tax effects related to amortization of intra-entity intangible asset transfers	0.07	—	—
Other gains, losses or charges, net	—	—	(0.01)
Resolution of prior years' income tax filings and other tax items	0.10	(0.02)	(0.07)
Non-GAAP adjusted earnings per diluted share	$ 3.04	$ 4.18	$ 3.33
Weighted average number of diluted shares	945	1,026	1,084

The following table presents a reconciliation of the GAAP and non-GAAP adjusted segment results for the past three fiscal years:

APPLIED MATERIALS, INC.
UNAUDITED RECONCILIATION OF GAAP TO NON-GAAP ADJUSTED RESULTS

(In millions, except percentages)	2019	2018	2017
Semiconductor Systems Non-GAAP Adjusted Operating Income			
Reported operating income - GAAP basis	$ 2,464	$ 3,441	$ 3,177
Certain items associated with acquisitions[1]	43	183	184
Non-GAAP adjusted operating income	$ 2,507	$ 3,624	$ 3,361
Non-GAAP adjusted operating margin	27.8 %	34.3 %	35.2 %
AGS Non-GAAP Adjusted Operating Income			
Reported operating income - GAAP basis	$ 1,101	$ 1,102	$ 817
Certain items associated with acquisitions[1]	—	—	1
Acquisition integration costs	—	2	3
Non-GAAP adjusted operating income	$ 1,101	$ 1,104	$ 821
Non-GAAP adjusted operating margin	28.6 %	29.4 %	27.2 %
Display and Adjacent Markets Non-GAAP Adjusted Operating Income			
Reported operating income - GAAP basis	$ 294	$ 574	$ 585
Certain items associated with acquisitions[1]	12	14	5
Acquisition integration costs	1	1	—
Non-GAAP adjusted operating income	$ 307	$ 589	$ 590
Non-GAAP adjusted operating margin	18.6 %	25.6 %	28.9 %

1 These items are incremental charges attributable to completed acquisitions, consisting of amortization of purchased intangible assets.

Note: The reconciliation of GAAP and non-GAAP adjusted segment results above does not include certain revenues, costs of products sold and operating expenses that are reported within corporate and other and included in consolidated operating income.

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

Applied is exposed to interest rate risk related to its investment portfolio and debt issuances. Applied's investment portfolio includes fixed-income securities with a fair value of approximately $2.0 billion at October 27, 2019. These securities are subject to interest rate risk and will decline in value if interest rates increase. Based on Applied's investment portfolio at October 27, 2019, an immediate 100 basis point increase in interest rates would result in a decrease in the fair value of the portfolio of approximately $29 million. While an increase in interest rates reduces the fair value of the investment portfolio, Applied will not realize the losses in the consolidated statement of operations unless the individual fixed-income securities are sold prior to recovery or the loss is determined to be other-than-temporary. At October 27, 2019, the aggregate principal of long-term debt issued by Applied was $4.8 billion with an estimated fair values of $5.5 billion. A hypothetical decrease in interest rates of 100 basis points would result in an increase in the fair value of Applied's long-term debt issuances of approximately $549 million at October 27, 2019.

Certain operations of Applied are conducted in foreign currencies, such as Japanese yen, Israeli shekel, euro and Taiwanese dollar. Applied enters into currency forward exchange and option contracts to hedge a portion of, but not all, existing and anticipated foreign currency denominated transactions generally expected to occur within the next 24 months. Gains and losses on these contracts are generally recognized in income at the time that the related transactions being hedged are recognized. Because the effect of movements in currency exchange rates on currency forward exchange and option contracts generally offsets the related effect on the underlying items being hedged, these financial instruments are not expected to subject Applied to risks that would otherwise result from changes in currency exchange rates. Applied does not use derivative financial instruments for trading or speculative purposes.

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

The consolidated financial statements required by this Item are set forth on the pages indicated at Item 15(a).

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

None.

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

Disclosure Controls and Procedures

As of the end of the period covered by this report, management of Applied conducted an evaluation, under the supervision and with the participation of Applied's Chief Executive Officer and Chief Financial Officer, of the effectiveness of Applied's disclosure controls and procedures, as such term is defined in Rule 13a-15(e) of the Securities Exchange Act of 1934 (the Exchange Act). Based upon that evaluation, Applied's Chief Executive Officer and Chief Financial Officer concluded that Applied's disclosure controls and procedures were effective as of the end of the period covered by this report in ensuring that information required to be disclosed was recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and to provide reasonable assurance that information required to be disclosed by Applied in such reports is accumulated and communicated to the Company's management, including its Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

Management's Report on Internal Control over Financial Reporting

Applied's management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rule 13a-15(f) of the Exchange Act. Under the supervision and with the participation of Applied's Chief Executive Officer and Chief Financial Officer, management of Applied conducted an evaluation of the effectiveness of Applied's internal control over financial reporting based upon the framework in "Internal Control — Integrated Framework (2013)" issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on that evaluation, Applied's management concluded that Applied's internal control over financial reporting was effective as of October 27, 2019.

KPMG LLP, an independent registered public accounting firm, has audited the consolidated financial statements included in this Form 10-K and, as part of the audit, has issued a report, included herein, on the effectiveness of Applied's internal control over financial reporting as of October 27, 2019.

Changes in Internal Control over Financial Reporting

During the fourth quarter of fiscal 2019, there were no changes in the internal control over financial reporting that materially affected, or are reasonably likely to materially affect, Applied's internal control over financial reporting.

Inherent Limitations of Disclosure Controls and Procedures and Internal Control over Financial Reporting

It should be noted that any system of controls, however well designed and operated, can provide only reasonable, and not absolute, assurance that the objectives of the system will be met. In addition, the design of any control system is based in part upon certain assumptions about the likelihood of future events.

Item 9B: ***Other Information***

None

PART III

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

Except for the information regarding executive officers required by Item 401 of Regulation S-K (which is included in Part I, Item 1 of this Annual Report on Form 10-K, under “Executive Officers of the Registrant”) and code of ethics (which is set forth below), the information required by this item will be provided in accordance with Instruction G(3) to Form 10-K no later than February 24, 2020.

Applied has implemented the Standards of Business Conduct, a code of ethics with which every person who works for Applied and every member of the Board of Directors is expected to comply. If any substantive amendments are made to the Standards of Business Conduct or any waiver is granted, including any implicit waiver, from a provision of the code to Applied’s Chief Executive Officer, Chief Financial Officer or Chief Accounting Officer, Applied will disclose the nature of such amendment or waiver on its website or in a report on Form 8-K. The above information, including the Standards of Business Conduct, is available on Applied’s website under the Corporate Governance section at *http://www.appliedmaterials.com/company/investor-relations/governance.* This website address is intended to be an inactive, textual reference only. None of the materials on, or accessible through, this website is part of this report or is incorporated by reference herein.

Item 11: ***Executive Compensation***

The information required by this Item will be provided in accordance with Instruction G(3) to Form 10-K no later than February 24, 2020.

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

Except for the information regarding securities authorized for issuance under equity compensation plans (which is set forth below), the information required by this Item will be provided in accordance with Instruction G(3) to Form 10-K no later than February 24, 2020.

The following table summarizes information with respect to equity awards under Applied's equity compensation plans as of October 27, 2019:

Equity Compensation Plan Information

Plan Category	(a) Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights(1)	(b) Weighted Average Exercise Price of Outstanding Options, Warrants and Rights(2)	(c) Number of Securities Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Column(a))	
		(In millions, except prices)		
Equity compensation plans approved by security holders	19	$ 15.06	77	(3)
Equity compensation plans not approved by security holders	—	$ —	2	(4)
Total	19	$ 15.06	79	

(1) Includes only options, restricted stock units and performance shares outstanding under Applied's equity compensation plans, as no stock warrants or other rights were outstanding as of October 27, 2019.

(2) The weighted average exercise price calculation does not take into account any restricted stock units or performance shares.

(3) Includes 11 million shares of Applied common stock available for future issuance under the Applied Materials, Inc. Employees' Stock Purchase Plan. Of these 11 million shares, 1 million are subject to purchase during the purchase period in effect as of October 27, 2019.

(4) Includes 2 million shares of Applied common stock available for future issuance under the Applied Materials, Inc. Stock Purchase Plan for Offshore Employees. Of these 2 million shares, 1 million are subject to purchase during the purchase period in effect as of October 27, 2019.

Applied has the following equity compensation plans that have not been approved by stockholders:

Stock Purchase Plan for Offshore Employees. The Stock Purchase Plan for Offshore Employees (the Offshore ESPP) was adopted effective as of October 16, 1995 for the benefit of employees of Applied's participating affiliates. The Offshore ESPP provides for the grant of options to purchase shares of Applied common stock through payroll deductions pursuant to one or more offerings. The administrator of the Offshore ESPP (the Board of Directors of Applied or a committee appointed by the Board) determines the terms and conditions of all options prior to the start of an offering, including the purchase price of shares, the number of shares covered by the option and when the option may be exercised. All options granted as part of an offering must be granted on the same date. As of October 27, 2019, a total of 36 million shares have been authorized for issuance under the Offshore ESPP, and 2 million shares remain available for issuance.

Applied Materials Profit Sharing Scheme. The Applied Materials Profit Sharing Scheme was adopted effective July 3, 1996 to enable employees of Applied Materials Ireland Limited and its participating subsidiaries to purchase Applied common stock at 100% of fair market value on the purchase date. Under this plan, eligible employees may elect to forego a certain portion of their base salary and certain bonuses they have earned and that otherwise would be payable in cash to purchase shares of Applied common stock at full fair market value. Since the eligible employees pay full fair market value for the shares, there is no reserved amount of shares under this plan and, accordingly, the table above does not include any set number of shares available for future issuance under the plan.

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

The information required by this Item will be provided in accordance with Instruction G(3) to Form 10-K no later than February 24, 2020.

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

The information required by this Item will be provided in accordance with Instruction G(3) to Form 10-K no later than February 24, 2020.

PART IV

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

(a) The following documents are filed as part of this Annual Report on Form 10-K:

All other schedules are omitted because they are not applicable or the required information is shown in the Consolidated Financial Statements or Notes thereto.

Item 16: ***Form 10-K Summary***

None.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors and Stockholders
Applied Materials, Inc.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Applied Materials, Inc. and subsidiaries (the Company) as of October 27, 2019 and October 28, 2018, the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended October 27, 2019, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of October 27, 2019 and October 28, 2018, and the results of its operations and its cash flows for each of the years in the three-year period ended October 27, 2019, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of October 27, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated December 13, 2019 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Change in Accounting Principle

As discussed in note 1 to the consolidated financial statements, in 2019, the Company has changed its method of accounting for revenue due to the adoption of Financial Accounting Standards Board Accounting Standards Codification Topic 606, *Revenue from Contracts with Customers*, and its method of accounting for intra-entity transfer of assets other than inventory due to the adoption of the Accounting Standards Update (ASU) No. 2016-16, *Income Taxes: Intra-Entity Transfers of Assets Other Than Inventory*.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the 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. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the consolidated financial statements and (2) 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 matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Evaluation of net realizable value adjustments to inventories for excess or obsolescence

As discussed in notes 1 and 8 to the consolidated financial statements, the Company has inventories with a carrying value of $3,474 million as of October 27, 2019. The Company adjusts inventory carrying value for estimated excess or obsolescence equal to the difference between cost of inventory and the estimated net realizable value based upon assumptions about future demand and market conditions. If actual demand were to be substantially lower than estimated, there could be a significant adverse impact on the carrying value of inventories and results of operations.

We identified the evaluation of net realizable value adjustments to inventories for excess or obsolescence as a critical audit matter. Evaluation of the Company’s estimates regarding forecasted sales and inventory consumption involved a high degree of auditor judgment.

The primary procedures we performed to address this critical audit matter included the following. We tested certain internal controls over the Company’s process for determining net realizable value adjustments for inventory excess or obsolescence, including estimating forecasted sales and inventory consumption. We evaluated certain inventories for excess or obsolescence by comparing the Company’s sales and inventory consumption forecast to historical sales, historical inventory usage, known customer orders, and industry outlook reports. In addition, for certain inventories, we compared the Company’s historical estimates of net realizable value adjustments for excess and obsolescence to the actual physical inventory disposals to evaluate the Company’s ability to accurately estimate the net realizable value adjustments.

Evaluation of the fair value of the underlying intangible assets utilized to record the deferred tax asset

As discussed in note 1 to the consolidated financial statements, the Company adopted ASU No. 2016-16 in the current year and upon adoption recorded a deferred tax asset of $1.6 billion related to the estimated income tax effects of an intra-entity transfer of intangible assets. The recorded deferred tax asset involves significant judgment in estimating the fair value of the underlying intangible assets that are subject to amortization for tax purposes.

We identified the evaluation of the fair value of the underlying intangible assets utilized to record the deferred tax asset as a critical audit matter. There was a high degree of subjectivity in evaluating the valuation methodology and assumptions utilized by the Company in estimating the fair value of the underlying intangible assets utilized to record the deferred tax asset. These assumptions included the fair value of the Company’s operating assets, discount rate and comparable company benchmark ratios utilized to calculate the portion of market value attributable to the intangible assets.

The primary procedures we performed to address this critical audit matter included the following. We tested certain internal controls over the Company’s process to develop the assumptions used in the valuation, including the fair value of the Company’s operating assets, the discount rate, and comparable company benchmark ratios. We evaluated the fair value of the Company’s operating assets by comparing it to the Company’s market capitalization, adjusted for the fair value of the Company’s nonoperating assets and debt. We evaluated the comparable company benchmark rate by assessing comparable companies used by the Company in developing the assumption and testing the benchmark rate based on observable market information. We involved valuation professionals with specialized skills and knowledge, who assisted in:

- Evaluating the valuation methodology utilized by the Company
- Evaluating the discount rate by comparing it to a discount rate that was independently developed using observable market information.

/S/ KPMG LLP

KPMG LLP

We have served as the Company’s auditor since 2004.

Santa Clara, California
December 13, 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors and Stockholders
Applied Materials, Inc.:

Opinion on Internal Control Over Financial Reporting

We have audited Applied Materials, Inc. and subsidiaries' (the Company) internal control over financial reporting as of October 27, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of October 27, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of October 27, 2019 and October 28, 2018, the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended October 27, 2019, and the related notes (collectively, the consolidated financial statements), and our report dated December 13, 2019 expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting in Item 9A. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit 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 audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ KPMG LLP

KPMG LLP

Santa Clara, California
December 13, 2019

APPLIED MATERIALS, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS
(In millions, except per share amounts)

Fiscal Year	2019	2018	2017
Net sales	$ 14,608	$ 16,705	$ 14,698
Cost of products sold	8,222	9,188	8,086
Gross profit	6,386	7,517	6,612
Operating expenses:			
Research, development and engineering	2,054	2,022	1,781
Marketing and selling	521	521	457
General and administrative	461	483	438
Total operating expenses	3,036	3,026	2,676
Income from operations	3,350	4,491	3,936
Interest expense	237	234	198
Interest and other income, net	156	139	78
Income before income taxes	3,269	4,396	3,816
Provision for income taxes	563	1,358	297
Net income	$ 2,706	$ 3,038	$ 3,519
Earnings per share:			
Basic	$ 2.89	$ 3.00	$ 3.28
Diluted	$ 2.86	$ 2.96	$ 3.25
Weighted average number of shares:			
Basic	937	1,013	1,073
Diluted	945	1,026	1,084

See accompanying Notes to Consolidated Financial Statements.

APPLIED MATERIALS, INC.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(In millions)

Fiscal Year	2019	2018	2017
Net income	$ 2,706	$ 3,038	$ 3,519
Other comprehensive income (loss), net of tax:			
Change in unrealized gain (loss) on available-for-sale investments	21	(51)	23
Change in unrealized net loss on derivative instruments	(7)	4	7
Change in defined and postretirement benefit plans	(51)	(17)	21
Change in cumulative translation adjustments	(1)	—	—
Other comprehensive income (loss), net of tax	(38)	(64)	51
Comprehensive income	$ 2,668	$ 2,974	$ 3,570

See accompanying Notes to Consolidated Financial Statements.

APPLIED MATERIALS, INC.

CONSOLIDATED BALANCE SHEETS

(In millions, except per share amounts)

	October 27, 2019	October 28, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	$ 3,129	$ 3,440
Short-term investments	489	590
Accounts receivable, net	2,533	2,323
Inventories	3,474	3,721
Other current assets	581	530
Total current assets	10,206	10,604
Long-term investments	1,703	1,568
Property, plant and equipment, net	1,529	1,407
Goodwill	3,399	3,368
Purchased technology and other intangible assets, net	156	213
Deferred income taxes and other assets	2,031	473
Total assets	$ 19,024	$ 17,633
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Current portion of long-term debt	$ 600	$ —
Accounts payable and accrued expenses	2,511	2,721
Contract liabilities	1,336	1,201
Total current liabilities	4,447	3,922
Long-term debt	4,713	5,309
Income taxes payable	1,275	1,254
Other liabilities	375	303
Total liabilities	10,810	10,788
Commitments and contingencies (Note 15)		
Stockholders' equity:		
Preferred stock: $0.01 par value per share; 1 shares authorized; no shares issued	—	—
Common stock: $0.01 par value per share; 2,500 shares authorized; 916 and 967 shares outstanding at 2019 and 2018, respectively	9	10
Additional paid-in capital	7,595	7,274
Retained earnings	24,386	20,880
Treasury stock: 1,079 and 1,019 shares at 2019 and 2018, respectively	(23,596)	(21,194)
Accumulated other comprehensive loss	(180)	(125)
Total stockholders' equity	8,214	6,845
Total liabilities and stockholders' equity	$ 19,024	$ 17,633

See accompanying Notes to Consolidated Financial Statements.

APPLIED MATERIALS, INC.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(In millions)

	Common Stock		Additional Paid-In Capital	Retained Earnings (b)	Treasury Stock		Accumulated Other Comprehensive Income (Loss)	Total
	Shares	Amount			Shares	Amount		
Balance at October 30, 2016	1,078	$ 11	$ 6,809	$ 15,448	889	$ (14,740)	$ (115)	$ 7,413
Net income	—	—	—	3,519	—	—	—	3,519
Other comprehensive income, net of tax	—	—	—	—	—	—	51	51
Dividends	—	—	—	(428)	—	—	—	(428)
Share-based compensation	—	—	220	—	—	—	—	220
Issuance under stock plans, net of a tax benefit of $55 and other	10	—	27	—	—	—	—	27
Common stock repurchases	(28)	—	—	—	28	(1,172)	—	(1,172)
Balance at October 29, 2017	1,060	$ 11	$ 7,056	$ 18,539	917	$ (15,912)	$ (64)	$ 9,630
Adoption of new accounting standards (a)	—	—	—	(3)	—	—	3	—
Net income	—	—	—	3,038	—	—	—	3,038
Other comprehensive loss, net of tax	—	—	—	—	—	—	(64)	(64)
Dividends	—	—	—	(694)	—	—	—	(694)
Share-based compensation	—	—	258	—	—	—	—	258
Issuance under stock plans	9	—	(40)	—	—	—	—	(40)
Common stock repurchases	(102)	(1)	—	—	102	(5,282)	—	(5,283)
Balance at October 28, 2018	967	$ 10	$ 7,274	$ 20,880	1,019	$ (21,194)	$ (125)	$ 6,845
Adoption of new accounting standard (c)	—	—	—	1,570	—	—	(17)	1,553
Net income	—	—	—	2,706	—	—	—	2,706
Other comprehensive loss, net of tax	—	—	—	—	—	—	(38)	(38)
Dividends	—	—	—	(770)	—	—	—	(770)
Share-based compensation	—	—	263	—	—	—	—	263
Issuance under stock plans	9	—	58	—	—	—	—	58
Common stock repurchases	(60)	(1)	—	—	60	(2,402)	—	(2,403)
Balance at October 27, 2019	916	$ 9	$ 7,595	$ 24,386	1,079	$ (23,596)	$ (180)	$ 8,214

(a) - Represents the reclassification adjustment related to the early adoption of Accounting Standards Update (ASU) 2018-02 *Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income.*

(b) - Retained earnings balance as of October 30, 2016, October 29, 2017 and October 28, 2018 included increases of $196 million, $281 million and $6 million, respectively, related to the adoption of the standard related to revenue recognition.

(c) - Represents the adjustment related to the adoption of Accounting Standard Update (ASU) 2016-01 *Financial Instruments-Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities* and ASU 2016-16 Income Tax (Topic 740): *Intra-Entity Transfers of Assets Other Than Inventory* . See Note 1.

See accompanying Notes to Consolidated Financial Statements.

APPLIED MATERIALS, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS
(In millions)

Fiscal Year	2019	2018	2017
Cash flows from operating activities:			
Net income	$ 2,706	$ 3,038	$ 3,519
Adjustments required to reconcile net income to cash provided by operating activities:			
Depreciation and amortization	363	457	407
Deferred income taxes	49	71	(12)
Other	(19)	4	(9)
Share-based compensation	263	258	220
Changes in operating assets and liabilities, net of amounts acquired:			
Accounts receivable	(207)	16	(37)
Inventories	248	(1,014)	(809)
Other current and non-current assets	(86)	(199)	(156)
Accounts payable and accrued expenses	(247)	170	371
Contract liabilities	135	75	133
Income taxes payable	44	886	121
Other liabilities	(2)	25	41
Cash provided by operating activities	3,247	3,787	3,789
Cash flows from investing activities:			
Capital expenditures	(441)	(622)	(345)
Cash paid for acquisitions, net of cash acquired	(28)	(6)	(68)
Proceeds from sales and maturities of investments	1,940	3,276	2,743
Purchases of investments	(1,914)	(2,077)	(4,856)
Cash provided by (used in) investing activities	(443)	571	(2,526)
Cash flows from financing activities:			
Debt borrowings, net of issuance costs	—	—	2,176
Debt repayments	—	—	(205)
Proceeds from common stock issuances	145	124	97
Common stock repurchases	(2,403)	(5,283)	(1,172)
Tax withholding payments for vested equity awards	(86)	(164)	(125)
Payments of dividends to stockholders	(771)	(605)	(430)
Cash provided by (used in) financing activities	(3,115)	(5,928)	341
Increase (decrease) in cash and cash equivalents	(311)	(1,570)	1,604
Cash and cash equivalents — beginning of year	3,440	5,010	3,406
Cash and cash equivalents — end of year	$ 3,129	$ 3,440	$ 5,010
Supplemental cash flow information:			
Cash payments for income taxes	$ 522	$ 300	$ 194
Cash refunds from income taxes	$ 22	$ 63	$ 61
Cash payments for interest	$ 219	$ 219	$ 186

See accompanying Notes to Consolidated Financial Statements.

Note 1 Summary of Significant Accounting Policies

Principles of Consolidation and Basis of Presentation

The consolidated financial statements include the accounts of Applied Materials, Inc. and its subsidiaries (Applied or the Company) after elimination of intercompany balances and transactions. All references to a fiscal year apply to Applied's fiscal year which ends on the last Sunday in October. Fiscal 2019, 2018 and 2017 contained 52 weeks each. Each fiscal quarter of 2019, 2018 and 2017 contained 13 weeks.

Certain prior year amounts have been reclassified to conform to current year presentation.

At the beginning of the first quarter of fiscal 2019, Applied adopted the new revenue recognition standard using the full retrospective method. All financial statements and disclosures have been recast to comply with this new guidance. See "Recent Accounting Pronouncements - Accounting Standards Adopted" section below for further information.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make judgments, estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Actual results could differ materially from those estimates. On an ongoing basis, Applied evaluates its estimates, including those related to standalone selling price (SSP) related to revenue recognition, accounts receivable and sales allowances, fair values of financial instruments, inventories, intangible assets and goodwill, useful lives of intangible assets and property and equipment, fair values of share-based awards, and income taxes, among others. Applied bases its estimates on historical experience and on various other assumptions that are believed to be reasonable, the results of which form the basis for making judgments about the carrying values of assets and liabilities.

Cash Equivalents

All highly-liquid investments with a remaining maturity of three months or less at the time of purchase are considered to be cash equivalents. Cash equivalents consist primarily of investments in institutional money market funds.

Investments

All of Applied's investments, except equity investments held in privately-held companies, are classified as available-for-sale at the respective balance sheet dates. Investments classified as available-for-sale are measured and recorded at fair value with changes in fair value recorded in the accompanying Consolidated Statements of Operations. Interest earned on cash and investments, as well as realized gains and losses on sale of securities, are included in interest and other income, net in the Consolidated Statements of Operations.

Equity investments without readily determinable fair value are measured at cost, less impairment, adjusted by observable price changes. Adjustments resulting from impairments and observable prices changes will be recorded in the Consolidated Statements of Operations.

Allowance for Doubtful Accounts

Applied maintains an allowance for doubtful accounts for estimated losses resulting from the inability of its customers to make required payments. This allowance is based on historical experience, credit evaluations, specific customer collection history and any customer-specific issues Applied has identified. Changes in circumstances, such as an unexpected material adverse change in a major customer's ability to meet its financial obligation to Applied or its payment trends, may require Applied to further adjust its estimates of the recoverability of amounts due to Applied. Bad debt expense and any reversals are recorded in marketing and selling expenses in the Consolidated Statement of Operations.

Inventories

Inventories are stated at the lower of cost or net realizable value, with cost determined on a first-in, first-out (FIFO) basis. Applied adjusts inventory carrying value for estimated obsolescence equal to the difference between the cost of inventory and the estimated net realizable value based upon assumptions about future demand and market conditions. Applied fully writes down inventories and noncancelable purchase orders for inventory deemed obsolete. Applied performs periodic reviews of inventory items to identify excess inventories on hand by comparing on-hand balances to anticipated usage using recent historical activity as well as anticipated or forecasted demand. If estimates of customer demand diminish further or market conditions become less favorable than those projected by Applied, additional inventory adjustments may be required.

Property, Plant and Equipment

Property, plant and equipment is stated at cost. Depreciation is provided over the estimated useful lives of the assets using the straight-line method. Estimated useful lives for financial reporting purposes are as follows: buildings and improvements, 3 to 30 years; demonstration and manufacturing equipment, 3 to 5 years; software, 3 to 5 years; and furniture, fixtures and other equipment, 3 to 5 years. Land improvements are amortized over the shorter of 15 years or the estimated useful life. Leasehold improvements are amortized over the shorter of five years or the lease term.

Intangible Assets

Goodwill and indefinite-lived assets are not amortized, but are reviewed for impairment annually during the fourth quarter of each fiscal year and whenever events or changes in circumstances indicate that the carrying value of an asset may not be recoverable. Purchased technology and other intangible assets are presented at cost, net of accumulated amortization, and are amortized over their estimated useful lives of 1 to 15 years using the straight-line method.

Long-Lived Assets

Applied reviews long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount of these assets or asset group may not be recoverable. Applied assesses these assets for impairment based on estimated future cash flows from these assets.

Revenue Recognition from Contracts with Customers

Applied recognizes revenue when promised goods or services are transferred to a customer in an amount that reflects the consideration to which Applied expects to be entitled in exchange for those goods or services. Applied determines revenue recognition through the following five steps; (1) identification of the contract(s) with customers, (2) identification of the performance obligations in the contract, (3) determination of the transaction price, (4) allocation of the transaction price to the performance obligations in the contract, and (5) recognition of revenue when, or as, a performance obligation is satisfied.

Identifying the contract(s) with customers. Applied sells manufacturing equipment, services, and spare parts directly to its customers in the semiconductor, display, and related industries. The Company generally considers written documentation including, but not limited to, signed purchase orders, master agreements, and sales orders as contracts provided that collection is probable. Collectability is assessed based on the customer’s creditworthiness determined by reviewing the customer’s published credit and financial information, historical payment experience, as well as other relevant factors.

Identifying the performance obligations. Applied’s performance obligations include delivery of manufacturing equipment, service agreements, spare parts, installation, extended warranty and training. Applied’s service agreements are considered one performance obligation and may include multiple goods and services that Applied provides to the customer to deliver against a performance metric. Judgment is used to determine whether multiple promised goods or services in a contract should be accounted for separately or as a group.

Determine the transaction price. The transaction price for Applied’s contracts with customers may include fixed and variable consideration. Applied includes variable consideration in the transaction price to the extent that it is probable that a significant reversal of revenue will not occur when the uncertainty associated with the variable consideration is subsequently resolved.

Allocate the transaction price to the performance obligations. A contract’s transaction price is allocated to each distinct performance obligation identified within the contract. Applied generally estimates the standalone selling price of a distinct performance obligation based on historical cost plus an appropriate margin. For contracts with multiple performance obligations, Applied allocates the contract’s transaction price to each performance obligation using the relative standalone selling price of each distinct good or service in the contract.

Recognizing the revenue as performance obligations are satisfied. Applied recognizes revenue from equipment and spares parts at a point in time when Applied has satisfied its performance obligation by transferring control of the goods to the customer which typically occurs at shipment or delivery. Revenue from service agreements is recognized over time as customers receive the benefits of services.

The incremental costs to obtain a contract are not material.

Payment Terms. Payment terms vary by contract. Generally, the majority of payments are due within a certain number of days from shipment of goods or performance of service. The remainder is typically due upon customer technical acceptance. Applied typically receives deposits on future deliverables from customers in the Display and Adjacent Markets segment and, in certain instances, may also receive deposits from customers in the Applied Global Services segment. Applied's payment terms do not generally contain a significant financing component.

Shipping and Handling Costs

Applied accounts for shipping and handling activities related to contracts with customers as costs to fulfill our promise to transfer the associated products. Accordingly, amounts billed for shipping and handling costs are recorded as a component of net sales and costs as a component of cost of products sold.

Warranty

Applied provides for the estimated cost of warranty when revenue is recognized. Estimated warranty costs are determined by analyzing specific product, current and historical configuration statistics and regional warranty support costs. Applied's warranty obligation is affected by product and component failure rates, material usage and labor costs incurred in correcting product failures during the warranty period. If actual warranty costs differ substantially from Applied's estimates, revisions to the estimated warranty liability would be required.

Applied also sells extended warranty contracts to its customers which provide an extension of the standard warranty coverage period of up to 2 years. Applied receives payment at the inception of the contract and recognizes revenue ratably over the extended warranty coverage period, as the customer simultaneously receives and consumes the benefits of the extended warranty.

Sales and Value Added Taxes

Taxes collected from customers and remitted to governmental authorities are presented on a net basis in the Consolidated Statements of Operations.

Research, Development and Engineering Costs

Research, development and engineering costs are expensed as incurred.

Income Taxes

Applied recognizes a current tax liability for the estimated amount of income tax payable on tax returns for the current fiscal year. Deferred tax assets and liabilities are recognized for the estimated future tax effects of temporary differences between the book and tax bases of assets and liabilities. Deferred tax assets are also recognized for net operating loss and tax credit carryovers. Deferred tax assets are offset by a valuation allowance to the extent it is more likely than not that they are not expected to be realized.

Applied recognizes tax benefits from uncertain tax positions only if it is more likely than not that the tax position will be sustained upon examination by the taxing authorities, based on the technical merits of the position. The tax benefits recognized from such positions are estimated based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement. Any changes in judgment related to uncertain tax positions are recognized in Applied's provision for income taxes in the quarter in which such change occurs. Interest and penalties related to uncertain tax positions are recognized in Applied's provision for income taxes.

Derivative Financial Instruments

Applied uses financial instruments, such as forward exchange and currency option contracts, to hedge a portion of, but not all, existing and anticipated foreign currency denominated transactions typically expected to occur within 24 months. The purpose of Applied's foreign currency management is to mitigate the effect of exchange rate fluctuations on certain foreign currency denominated revenues, costs and eventual cash flows. In certain cases, Applied also uses interest rate swap or lock agreements to hedge against the variability of cash flows due to changes in the benchmark interest rate of fixed rate debt. The terms of derivative financial instruments used for hedging purposes are generally consistent with the timing of the transactions being hedged. All of Applied's derivative financial instruments are recorded at fair value based upon quoted market prices for comparable instruments. For derivative instruments designated and qualifying as cash flow hedges, the effective portion of the gain or loss on these hedges is reported as a component of accumulated other comprehensive income (loss) in stockholders' equity, and is reclassified into earnings when the hedged transaction affects earnings. If the transaction being hedged fails to occur, or if a portion of any derivative is ineffective, the gain or loss on the associated financial instrument is recorded promptly in earnings. For derivative instruments used to hedge existing foreign currency denominated assets or liabilities, the gain or loss on these hedges is recorded promptly in earnings to offset the changes in the fair value of the assets or liabilities being hedged. Applied does not use derivative financial instruments for trading or speculative purposes.

Foreign Currencies

As of October 27, 2019, all of Applied's subsidiaries use the United States dollar as their functional currency. Accordingly, assets and liabilities of these subsidiaries are remeasured using exchange rates in effect at the end of the period, except for non-monetary assets, such as inventories and property, plant and equipment, which are remeasured using historical exchange rates. Foreign currency-denominated revenues and costs are remeasured using average exchange rates for the period, except for costs related to those balance sheet items that are remeasured using historical exchange rates. The resulting remeasurement gains and losses are included in general and administrative expenses in the Consolidated Statements of Operations as incurred.

Concentrations of Credit Risk

Financial instruments that potentially subject Applied to significant concentrations of credit risk consist principally of cash equivalents, investments, trade accounts receivable and derivative financial instruments used in hedging activities. Applied invests in a variety of financial instruments, such as, but not limited to, commercial paper, corporate and municipal bonds, United States Treasury and agency securities, and asset-backed and mortgage-backed securities, and, by policy, limits the amount of credit exposure with any one financial institution or commercial issuer. Applied is exposed to credit-related losses in the event of nonperformance by counterparties to derivative financial instruments, but does not expect any counterparties to fail to meet their obligations. In some instances, Applied has entered into security arrangements which require the counterparties to post collateral to further mitigate credit exposure. Applied performs ongoing credit evaluations of its customers' financial condition and generally requires no collateral to secure accounts receivable. Applied maintains an allowance reserve for potentially uncollectible accounts receivable based on its assessment of the collectability of accounts receivable. Applied regularly reviews the allowance by considering factors such as historical experience, credit quality, age of the accounts receivable balances, and current economic conditions that may affect a customer's ability to pay. In addition, Applied utilizes letters of credit to mitigate credit risk when considered appropriate.

Recent Accounting Pronouncements

Accounting Standards Adopted

*Revenue Recognition. I*n May 2014, the FASB issued authoritative guidance that requires revenue recognition to depict the transfer of promised goods or services to a customer in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services and requires certain additional disclosures. Applied adopted this authoritative guidance in the first quarter of fiscal 2019 using the full retrospective method, which required restating each prior reporting period presented. Refer to the Impacts to Previously Reported Results section below for the impact of the adoption of the standard to Applied's consolidated financial statements.

For all periods prior to the date of initial adoption of this standard, Applied elected to use the practical expedient pursuant to which Applied excluded disclosures of both transaction prices allocated to remaining performance obligations and when these performance obligations are expected to be recognized as revenue.

The most significant impact from the adoption of this standard is fewer constraints on revenue recognition upon shipment of manufacturing equipment.

Impacts to Previously Reported Results

Adoption of the standards related to revenue recognition and retirement benefits impacted Applied's Consolidated Statement of Operations for each of the fiscal years 2018 and 2017 as follows:

	2018				2017			
	As Previously Reported	Revenue Recognition Adjustment	Retirement Benefit Adjustment	As Adjusted	As Previously Reported	Revenue Recognition Adjustment	Retirement Benefit Adjustment	As Restated
	(In millions, except per share amounts)							
Net sales	$ 17,253	$ (548)	$ —	$ 16,705	$ 14,537	$ 161	$ —	$ 14,698
Cost of products sold	$ 9,436	$ (250)	$ 2	$ 9,188	$ 8,005	$ 76	$ 5	$ 8,086
Gross profit	$ 7,817	$ (298)	$ (2)	$ 7,517	$ 6,532	$ 85	$ (5)	$ 6,612
Research, development and engineering	$ 2,019	$ —	$ 3	$ 2,022	$ 1,774	$ —	$ 7	$ 1,781
Marketing and selling	$ 521	$ —	$ —	$ 521	$ 456	$ —	$ 1	$ 457
General and administrative	$ 481	$ —	$ 2	$ 483	$ 434	$ —	$ 4	$ 438
Interest and other income, net	$ 132	$ —	$ 7	$ 139	$ 61	$ —	$ 17	$ 78
Income before income taxes	$ 4,694	$ (298)	$ —	$ 4,396	$ 3,731	$ 85	$ —	$ 3,816
Provision for income taxes	$ 1,381	$ (23)	$ —	$ 1,358	$ 297	$ —	$ —	$ 297
Net income	$ 3,313	$ (275)	$ —	$ 3,038	$ 3,434	$ 85	$ —	$ 3,519
Earnings per share: basic	$ 3.27	$ (0.27)	$ —	$ 3.00	$ 3.20	$ 0.08	$ —	$ 3.28
Earnings per share: diluted	$ 3.23	$ (0.27)	$ —	$ 2.96	$ 3.17	$ 0.08	$ —	$ 3.25

Adoption of the retirement benefits standard did not have any impact on Applied's Consolidated Balance Sheet or Consolidated Statement of Cash Flows.

Adoption of the standard related to revenue recognition impacted Applied's Consolidated Balance Sheet at October 28, 2018 as follows:

	October 28, 2018		
	As Previously Reported	Adjustment	As Adjusted
	(In millions)		
Accounts receivable, net	$ 2,565	$ (242)	$ 2,323
Inventories	$ 3,722	$ (1)	$ 3,721
Other current assets	$ 430	$ 100	$ 530
Deferred income taxes and other assets	$ 470	$ 3	$ 473
Customer deposits and deferred revenue	$ 1,347	$ (1,347)	$ —
Contract liabilities	$ —	$ 1,201	$ 1,201
Retained earnings	$ 20,874	$ 6	$ 20,880

Adoption of the revenue recognition standard did not impact cash provided by or used in investing or financing activities in Applied's Consolidated Statement of Cash Flows for each of fiscal years 2018 and 2017 as follows. The adoption did not impact total cash provided by operating activities, however it impacted individual components of cash provided by operating activities for each of fiscal years 2018 and 2017 as follows:

	2018			2017		
	As Previously Reported	Adjustment	As Adjusted	As Previously Reported	Adjustment	As Adjusted
	(In millions)					
Cash flows from operating activities:						
Net income	$ 3,313	$ (275)	$ 3,038	$ 3,434	$ 85	$ 3,519
Adjustments required to reconcile net income to cash provided by operating activities:						
Deferred income taxes	$ 94	$ (23)	$ 71	$ (11)	$ (1)	$ (12)
Changes in operating assets and liabilities:						
Accounts receivables	$ (226)	$ 242	$ 16	$ (37)	$ —	$ (37)
Inventories	$ (792)	$ (222)	$ (1,014)	$ (879)	$ 70	$ (809)
Other current and non-current assets	$ (93)	$ (106)	$ (199)	$ (157)	$ 1	$ (156)
Accounts payable and accrued expenses	$ 179	$ (9)	$ 170	$ 370	$ 1	$ 371
Contract liabilities	$ (318)	$ 393	$ 75	$ 289	$ (156)	$ 133

Income Taxes: Intra-Entity Asset Transfers. In October 2016, the FASB issued authoritative guidance that changed the tax accounting for intra-entity transfers of assets other than inventory. After adoption, the income tax effect of intra-entity transfers is realized at the time of the transfer instead of over the life of the asset. Applied adopted this guidance in the first quarter of fiscal 2019 using a modified retrospective approach, resulting in a cumulative effect adjustment to retained earnings. Upon adoption, deferred tax assets increased by $1.6 billion related to the estimated income tax effects of future amortization of intra-entity intangible asset transfers, with an offset to retained earnings.

Financial Instruments: Classification and Measurement. In January 2016, the FASB issued authoritative guidance that requires equity investments that do not result in consolidation, and are not accounted for under the equity method, to be measured at fair value, and requires recognition of any changes in fair value in net income unless the investments qualify for a new measurement alternative. For financial liabilities measured at fair value, the change in fair value caused by a change in instrument-specific credit risk will be required to be presented separately in other comprehensive income. Applied adopted this standard in the first quarter of fiscal year 2019. Upon adoption, Applied elected to apply the measurement alternative for equity investments without readily determinable fair value. Under the alternative, Applied measures investments without readily determinable fair value at cost, less impairment, adjusted by observable price changes prospectively to all equity investments that exist as of adoption and will reassess at each reporting period whether an investment qualifies for the alternative. Adopting this standard required Applied to record a cumulative net increase to retained earnings of approximately $21 million with the corresponding $17 million decrease in accumulated other comprehensive income, net of tax, for the unrealized gains and losses associated with equity investments with readily determinable fair values, as the authoritative guidance is required to be adopted prospectively. Going forward, the impact of this new standard could result in volatility in Applied's Consolidated Statement of Operations.

*Fair Value Measurement: Changes to the Disclosure Requirements for Fair Value Measurement.*In August 2018, the FASB issued authoritative guidance that eliminates, amends, and adds disclosure requirements for fair value measurements. While the amended and new disclosure requirements primarily relate to Level 3 fair value measurements, the authoritative guidance also eliminates disclosure requirements related to the amount and reasons for transfer between Level 1 and Level 2 of fair value hierarchy, policy for timing of transfer between levels, and the valuation processes for Level 3 fair value measurements. Applied adopted this guidance in the fourth quarter of fiscal 2019 on a retrospective basis for the removal and amendment of certain disclosures, while the new disclosures requirements are to be applied prospectively at the effective date. The adoption of this guidance did not have an impact to Applied's consolidated financial statements.

Retirement Benefits. In March 2017, the FASB issued authoritative guidance which requires companies to present the service cost component of net benefit cost in the same line items in which they report compensation cost. The other components of net benefit cost are required to be presented in the income statement separately from the service cost component and outside a subtotal of income from operations, if one is presented. Applied adopted this guidance in the first quarter of fiscal 2019 on a retrospective basis. The adoption of this guidance resulted in reclassification of other components of net benefit costs outside of income from operations and did not have a significant impact on Applied’s consolidated financial statements.

Business Combinations. In January 2017, the FASB issued authoritative guidance that clarifies the definition of a business to help companies evaluate whether acquisition or disposal transactions should be accounted for as asset groups or as businesses. Applied adopted this guidance in the first quarter of fiscal 2019 on a prospective basis. The impact of the adoption depends on the facts and circumstances of future acquisition or disposal transactions.

Classification of Certain Cash Receipts and Cash Payments. In August 2016, the FASB issued authoritative guidance which addresses classification of certain cash receipts and cash payments related to the statement of cash flows. Effective in the first quarter of fiscal 2019, Applied adopted the authoritative guidance retrospectively. The adoption of this guidance did not have a significant impact and only impacts disclosures in Applied' s consolidated statements of cash flow.

Accounting Standards Not Yet Adopted

*Retirement Benefits: Changes to the Disclosure Requirements for Defined Benefit and other Postretirement Plans.*In August 2018, the FASB issued authoritative guidance that adds, removes, and clarifies disclosure requirements for defined benefit and other postretirement plans. This authoritative guidance will be effective for Applied in fiscal 2021 on a retrospective basis, with early adoption permitted. Applied is currently evaluating the effect of this new guidance on Applied’s consolidated financial statements.

Derivatives and Hedging. In August 2017, the FASB issued authoritative guidance that modifies the recognition and presentation of hedge accounting to better align an entity’s risk management strategies and financial reporting for hedging relationships. The authoritative guidance expands the application of hedge accounting for non-financial and financial risk components and eases certain hedge effectiveness assessment requirements. The authoritative guidance will be effective for Applied in the first quarter of fiscal 2020, with early adoption permitted. While the Company's evaluation of the impact of this new guidance is not complete, it is not currently expected to have a significant impact on Applied’s consolidated financial statements.

Receivables: Nonrefundable Fees and Other Costs. In March 2017, the FASB issued authoritative guidance that will shorten the amortization period for certain callable debt securities held at a premium to the earliest call date to more closely align with expectations incorporated in market pricing. This authoritative guidance will be effective for Applied in the first quarter of fiscal 2020 on a modified retrospective basis. While the Company's evaluation of the impact of this new guidance is not complete, it is not currently expected to have a significant impact on Applied’s consolidated financial statements.

Goodwill Impairment. In January 2017, the FASB issued authoritative guidance that simplifies the process required to test goodwill for impairment. The authoritative guidance will be effective for Applied in the first quarter of fiscal 2021. Early adoption is permitted. The adoption of this guidance is not expected to have a significant impact on Applied’s consolidated financial statements.

Financial Instruments: Credit Losses. In June 2016, the FASB issued authoritative guidance that modifies the impairment model for certain financial assets by requiring use of an expected loss methodology, which will result in more timely recognition of credit losses. The authoritative guidance will be effective for Applied in the first quarter of fiscal 2021. Early adoption is permitted beginning in the first quarter of fiscal 2020. Applied is currently evaluating the effect of this new guidance on Applied’s consolidated financial statements.

Leases. In February 2016, the FASB issued authoritative guidance for lease accounting, which requires lessees to recognize lease assets and liabilities on the balance sheet for certain lease arrangements that are classified as operating leases under the previous standard, and to provide for enhanced disclosures. The authoritative guidance should be applied using a modified retrospective approach. Applied currently anticipates adopting this guidance using the optional transition method by recognizing a cumulative-effect adjustment to the consolidated balance sheet at the beginning of fiscal year 2020 and will not adjust comparative prior periods. While the Company's evaluation of the impact of this new guidance is not complete, Applied currently expects that the primary impact of the new standard will be the recognition of right-of-use assets and lease liabilities of approximately $165 million on the Company's Consolidated Balance Sheets, mainly related to leases classified as operating leases. Applied is currently implementing changes to business processes and controls to support measurement and disclosure requirements under the new standard.

Note 2 Earnings Per Share

Basic earnings per share is determined using the weighted average number of common shares outstanding during the period. Diluted earnings per share is determined using the weighted average number of common shares and potential common shares (representing the dilutive effect of stock options, restricted stock units, and employee stock purchase plan shares) outstanding during the period. Applied's net income has not been adjusted for any period presented for purposes of computing basic or diluted earnings per share due to the Company's non-complex capital structure.

Fiscal Year	2019	2018	2017
	(In millions, except per share amounts)		
Numerator:			
Net income	$ 2,706	$ 3,038	$ 3,519
Denominator:			
Weighted average common shares outstanding	937	1,013	1,073
Effect of dilutive stock options, restricted stock units and employee stock purchase plan shares	8	13	11
Denominator for diluted earnings per share	945	1,026	1,084
Basic earnings per share	$ 2.89	$ 3.00	$ 3.28
Diluted earnings per share	$ 2.86	$ 2.96	$ 3.25
Potentially dilutive securities	3	—	—

Potentially dilutive securities attributable to outstanding stock options and restricted stock units are excluded from the calculation of diluted earnings per share where the combined exercise price and average unamortized fair value are greater than the average market price of Applied common stock, and therefore their inclusion would be anti-dilutive. Prior to the adoption of Accounting Standards Update (ASU) 2016-09 *Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting* in the first quarter of fiscal 2018, the assumed tax benefits upon the exercise of options and vesting of restricted stock units were also included in this calculation.

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Note 3 Cash, Cash Equivalents and Investments

Summary of Cash, Cash Equivalents and Investments

The following tables summarize Applied's cash, cash equivalents and investments by security type:

October 27, 2019	Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
		(In millions)		
Cash	$ 1,071	$ —	$ —	$ 1,071
Cash equivalents:				
Money market funds	1,677	—	—	1,677
U.S. Treasury and agency securities	4	—	—	4
Commercial paper, corporate bonds and medium-term notes	377	—	—	377
Total Cash equivalents	2,058	—	—	2,058
Total Cash and Cash equivalents	$ 3,129	$ —	$ —	$ 3,129
Short-term and long-term investments:				
U.S. Treasury and agency securities	$ 336	$ 1	$ —	$ 337
Non-U.S. government securities*	10	—	—	10
Municipal securities	402	4	—	406
Commercial paper, corporate bonds and medium-term notes	642	5	—	647
Asset-backed and mortgage-backed securities	631	4	—	635
Total fixed income securities	2,021	14	—	2,035
Publicly traded equity securities	8	40	3	45
Equity investments in privately-held companies	105	10	3	112
Total equity investments	113	50	6	157
Total short-term and long-term investments	$ 2,134	$ 64	$ 6	$ 2,192
Total Cash, Cash equivalents and Investments	$ 5,263	$ 64	$ 6	$ 5,321

* Includes agency debt securities guaranteed by Canada.

October 28, 2018	Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
		(In millions)		
Cash	$ 1,489	$ —	$ —	$ 1,489
Cash equivalents:				
Money market funds	1,599	—	—	1,599
Commercial paper, corporate bonds and medium-term notes	352	—	—	352
Total Cash equivalents	1,951	—	—	1,951
Total Cash and Cash equivalents	$ 3,440	$ —	$ —	$ 3,440
Short-term and long-term investments:				
U.S. Treasury and agency securities	$ 335	$ —	$ 2	$ 333
Non-U.S. government securities*	10	—	—	10
Municipal securities	399	—	4	395
Commercial paper, corporate bonds and medium-term notes	705	—	3	702
Asset-backed and mortgage-backed securities	595	—	4	591
Total fixed income securities	2,044	—	13	2,031
Publicly traded equity securities	17	25	4	38
Equity investments in privately-held companies	89	—	—	89
Total equity investments	106	25	4	127
Total short-term and long-term investments	$ 2,150	$ 25	$ 17	$ 2,158
Total Cash, Cash equivalents and Investments	$ 5,590	$ 25	$ 17	$ 5,598

* Includes agency debt securities guaranteed by Canada.

Maturities of Investments

The following table summarizes the contractual maturities of Applied’s investments at October 27, 2019:

	Cost	Estimated Fair Value
	(In millions)	
Due in one year or less	$ 419	$ 420
Due after one through five years	971	981
No single maturity date**	744	791
Total	$ 2,134	$ 2,192

** Securities with no single maturity date include publicly-traded and privately-held equity securities, and asset-backed and mortgage-backed securities.

Gains and Losses on Investments

Gross realized gains and losses on sales of investments for each fiscal year were as follows:

	2019	2018	2017
		(In millions)	
Gross realized gains	$ 10	$ 29	$ 14
Gross realized losses	$ 2	$ 3	$ 1

At October 27, 2019, gross unrealized losses related to Applied's debt investment portfolio were not material.Applied regularly reviews its debt investment portfolio to identify and evaluate investments that have indications of possible impairment. Factors considered in determining whether an unrealized loss is considered to be temporary, or other-than-temporary and therefore impaired, include: the length of time and extent to which fair value has been lower than the cost basis; the financial condition, credit quality and near-term prospects of the investee; and whether it is more likely than not that Applied will be required to sell the security prior to recovery.

Applied determined that the gross unrealized losses on its marketable fixed income securities at October 27, 2019, October 28, 2018 and October 29, 2017 were temporary in nature and therefore it did not recognize any impairment of its marketable fixed income securities for fiscal 2019, 2018 or 2017. During fiscal 2019, 2018 and 2017, Applied determined that certain of its equity investments were impaired and, accordingly, recognized impairment charges of $ 1 million, $5 million and $10 million, respectively. These impairment charges are included in interest and other income, net in the Consolidated Statement of Operations.

Unrealized gains and losses on investments classified as equity investments are recognized in other income (expense), net in the Consolidated Statement of Operations. Prior to the adoption of Accounting Standards Update (ASU) 2016-01 *Financial Instruments-Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities* in the first quarter of fiscal 2019, these unrealized gains and temporary losses were included within accumulated other comprehensive income (loss), net of any related tax effect.

The components of gain (loss) on equity investments for fiscal 2019 were as follows:

	2019
	(In millions)
Publicly traded equity securities	
Unrealized gain	$ 28
Unrealized loss	(5)
Gain on sales	2
Loss on sales	—
Equity investments in privately-held companies	
Unrealized gain	13
Unrealized loss	(6)
Gain on sales	5
Loss on sales or impairment	(1)
Total gain on equity investments, net	$ 36

Note 4 Fair Value Measurements

Applied’s financial assets are measured and recorded at fair value on a recurring basis, except for equity investments in privately-held companies. These equity investments are generally accounted for under the measurement alternative, defined as cost, less impairments, adjusted for subsequent observable price changes and are periodically assessed for impairment when events or circumstances indicate that a decline in value may have occurred. Applied’s nonfinancial assets, such as goodwill, intangible assets, and property, plant and equipment, are recorded at cost and are assessed for impairment whenever events or changes in circumstances indicate that the carrying value of an asset may not be recoverable.

Fair Value Hierarchy

Applied uses the following fair value hierarchy, which prioritizes the inputs to valuation techniques used to measure fair value into three levels and bases the categorization within the hierarchy upon the lowest level of input that is available and significant to the fair value measurement:

- Level 1 — Quoted prices in active markets for identical assets or liabilities;
- Level 2 — Inputs other than Level 1 that are observable, either directly or indirectly, such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities; and
- Level 3 — Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

Applied’s investments consist primarily of debt securities that are classified as available-for-sale and recorded at their fair values. In determining the fair value of investments, Applied uses pricing information from pricing services that value securities based on quoted market prices and models that utilize observable market inputs. In the event a fair value estimate is unavailable from a pricing service, Applied generally obtains non-binding price quotes from brokers. Applied then reviews the information provided by the pricing services or brokers to determine the fair value of its short-term and long-term investments. In addition, to validate pricing information obtained from pricing services, Applied periodically performs supplemental analysis on a sample of securities. Applied reviews any significant unanticipated differences identified through this analysis to determine the appropriate fair value. As of October 27, 2019, substantially all of Applied’s available-for-sale, short-term and long-term investments were recognized at fair value that was determined based upon observable inputs.

Applied’s equity investments with readily determinable values consist of publicly traded equity securities. Upon adoption of ASU 2016-01, these investments are measured at fair value using quoted prices for identical assets in an active market and the changes in fair value of these equity investments are recognized in the Consolidated Statements of Operations. Applied adopted the standard in the first quarter of fiscal 2019 using a modified retrospective transition method and reclassified the unrealized gains on these equity investments of $21 million to retained earnings as a cumulative-effect adjustment on the consolidated balance sheets.

Investments with remaining effective maturities of 12 months or less from the balance sheet date are classified as short-term investments. Investments with remaining effective maturities of more than 12 months from the balance sheet date are classified as long-term investments.

Assets Measured at Fair Value on a Recurring Basis

Financial assets (excluding cash balances) measured at fair value on a recurring basis are summarized below:

	October 27, 2019			October 28, 2018		
	Level 1	Level 2	Total	Level 1	Level 2	Total
	(In millions)					
Assets:						
Available-for-sale debt security investments						
Money market funds	$ 1,677	$ —	$ 1,677	$ 1,599	$ —	$ 1,599
U.S. Treasury and agency securities	323	18	341	297	36	333
Non-U.S. government securities	—	10	10	—	10	10
Municipal securities	—	406	406	—	395	395
Commercial paper, corporate bonds and medium-term notes	—	1,024	1,024	—	1,054	1,054
Asset-backed and mortgage-backed securities	—	635	635	—	591	591
Total available-for-sale debt security investments	$ 2,000	$ 2,093	$ 4,093	$ 1,896	$ 2,086	$ 3,982
Equity investments with readily determinable values						
Publicly traded equity securities	$ 45	$ —	$ 45	$ 38	$ —	$ 38
Total equity investments with readily determinable values	$ 45	$ —	$ 45	$ 38	$ —	$ 38
Total	$ 2,045	$ 2,093	$ 4,138	$ 1,934	$ 2,086	$ 4,020

Applied did not have any financial assets measured at fair value on a recurring basis within Level 3 fair value measurements as of October 27, 2019 or October 28, 2018.

Assets and Liabilities Measured at Fair Value on a Non-recurring Basis

Applied's equity investments without readily determinable values consist of equity investments in privately-held companies. Upon adoption of ASU 2016-01, Applied elected the measurement alternative, defined as cost, less impairments, adjusted for subsequent observable price changes on a prospective basis for certain equity investments without readily determinable fair values and is required to account for any subsequent observable changes in fair value within the statements of operations. Applied adopted the guidance prospectively, effective October 29, 2018, and there was no impact to Applied's consolidated financial statements. Prior to the adoption of ASU 2016-01, these investments were generally accounted for under the cost method of accounting. These investments are periodically assessed for impairment when an event or circumstance indicates that a decline in value may have occurred.

During fiscal 2019, 2018 and 2017, Applied determined that certain of its equity investments were impaired and, accordingly, recognized impairment charges of $1 million, $5 million and $10 million, respectively.

Other

The carrying amounts of Applied's financial instruments, including cash and cash equivalents, accounts receivable, notes payable - short term, and accounts payable and accrued expenses, approximate fair value due to their short maturities. At October 27, 2019, the aggregate principal amount of long-term debt was $4.8 billion, and estimated fair value was $5.5 billion. At October 28, 2018, the aggregate principal and estimated fair value amounts of long-term debt were both $5.4 billion. The estimated fair value of long-term debt is determined by Level 2 inputs and is based primarily on quoted market prices for the same or similar issues. See Note 11 of the Notes to the Consolidated Financial Statements for further detail of existing debt.

Note 5 Derivative Instruments and Hedging Activities

Derivative Financial Instruments

Applied conducts business in a number of foreign countries, with certain transactions denominated in local currencies, such as the Japanese yen, euro, Israeli shekel and Taiwanese dollar. Applied uses derivative financial instruments, such as forward exchange contracts and currency option contracts, to hedge certain forecasted foreign currency denominated transactions expected to occur typically within the next 24 months. The purpose of Applied's foreign currency management is to mitigate the effect of exchange rate fluctuations on certain foreign currency denominated revenues, costs and eventual cash flows. The terms of currency instruments used for hedging purposes are generally consistent with the timing of the transactions being hedged.

Applied does not use derivative financial instruments for trading or speculative purposes. Derivative instruments and hedging activities, including foreign currency exchange and interest rate contracts, are recognized on the balance sheet at fair value. Changes in the fair value of derivatives that do not qualify for hedge treatment, as well as the ineffective portion of any hedges, are recognized currently in earnings. All of Applied's derivative financial instruments are recorded at their fair value in other current assets or in accounts payable and accrued expenses.

Hedges related to anticipated transactions are designated and documented at the inception of the hedge as cash flow hedges and foreign exchange derivatives are typically entered into once per month. Cash flow hedges are evaluated for effectiveness quarterly. The effective portion of the gain or loss on these hedges is reported as a component of AOCI in stockholders' equity and is reclassified into earnings when the hedged transaction affects earnings. The majority of the after-tax net income or loss related to foreign exchange derivative instruments included in AOCI at October 27, 2019 is expected to be reclassified into earnings within 12 months. Changes in the fair value of currency forward exchange and option contracts due to changes in time value are excluded from the assessment of effectiveness. Both ineffective hedge amounts and hedge components excluded from the assessment of effectiveness are recognized in earnings. If the transaction being hedged is no longer probable to occur, or if a portion of any derivative is deemed to be ineffective, Applied promptly recognizes the gain or loss on the associated financial instrument in earnings. The amount recognized due to discontinuance of cash flow hedges that were probable not to occur by the end of the originally specified time period were not significant for fiscal years 2019, 2018 and 2017.

Additionally, forward exchange contracts are generally used to hedge certain foreign currency denominated assets or liabilities. These derivatives are typically entered into once per month and are not designated for hedge accounting treatment. Accordingly, changes in the fair value of these hedges are recorded in earnings to offset the changes in the fair value of the assets or liabilities being hedged.

The fair values of foreign exchange derivative instruments at October 27, 2019 and October 28, 2018 were not material.

The effects of derivative instruments and hedging activities on the Consolidated Statements of Operations were as follows:

Derivatives in Cash Flow Hedging Relationships	Location of Gain or (Loss)	Effective Portion: Gain or (Loss)	Effective Portion: Gain or (Loss) Reclassified from AOCI into Income	Ineffective Portion and Amount Excluded from Effectiveness Testing: Gain or (Loss) Recognized in Income
			(In millions)	
2019				
Foreign exchange contracts	AOCI	$ (14)	$ —	$ —
Foreign exchange contracts	Cost of products sold	—	2	15
Foreign exchange contracts	General and administrative	—	(3)	(6)
Interest rate contracts	Interest expense	—	(3)	—
Total		$ (14)	$ (4)	$ 9
2018				
Foreign exchange contracts	AOCI	$ 3	$ —	$ —
Foreign exchange contracts	Cost of products sold	—	4	19
Foreign exchange contracts	General and administrative	—	(3)	(7)
Interest rate contracts	Interest expense	—	(3)	—
Total		$ 3	$ (2)	$ 12
2017				
Foreign exchange contracts	AOCI	$ 35	$ —	$ —
Foreign exchange contracts	Cost of products sold	—	7	(3)
Foreign exchange contracts	General and administrative	—	7	(2)
Interest rate contracts	AOCI	(14)	—	—
Interest rate contracts	Interest expense	—	(3)	—
Total		$ 21	$ 11	$ (5)

Derivatives Not Designated as Hedging Instruments	Location of Gain or (Loss) Recognized in Income	Amount of Gain or (Loss) Recognized in Income: 2019	2018	2017
			(In millions)	
Foreign exchange contracts	General and administrative	$ (8)	$ (5)	$ 39
Total		$ (8)	$ (5)	$ 39

Credit Risk Contingent Features

If Applied's credit rating were to fall below investment grade, it would be in violation of credit risk contingent provisions of the derivative instruments discussed above, and certain counterparties to the derivative instruments could request immediate payment on derivative instruments in net liability positions. The aggregate fair value of all derivative instruments with credit-risk related contingent features that were in a net liability position was immaterial as of October 27, 2019 and October 28, 2018.

Entering into derivative contracts with banks exposes Applied to credit-related losses in the event of the banks' nonperformance. However, Applied's exposure is not considered significant.

Note 6 Accounts Receivable, Net

Applied has agreements with various financial institutions to sell accounts receivable and discount promissory notes from selected customers. Applied sells its accounts receivable without recourse. Applied, from time to time, also discounts letters of credit issued by customers through various financial institutions. The discounting of letters of credit depends on many factors, including the willingness of financial institutions to discount the letters of credit and the cost of such arrangements.

Applied sold $1.5 billion, $1.6 billion and $746 million of accounts receivable during fiscal 2019, 2018 and 2017, respectively. Applied discounted letters of credit issued by customers of $48 million and $37 million in fiscal 2019 and 2018, respectively. There was no discounting of promissory notes in each of fiscal 2019 and 2018. Applied did not discount letters of credit issued by customers or discount promissory notes during fiscal 2017. Financing charges on the sale of receivables and discounting of letters of credit are included in interest expense in the accompanying Consolidated Statements of Operations and were not material for all years presented.

Accounts receivable are presented net of allowance for doubtful accounts of $30 million and $33 million at October 27, 2019 and October 28, 2018, respectively. Changes in allowance for doubtful accounts in each fiscal year were as follows:

	2019	2018	2017
		(In millions)	
Beginning balance	$ 33	$ 34	$ 51
Provision	—	—	—
Deductions[1]	(3)	(1)	(17)
Ending balance	$ 30	$ 33	$ 34

[1] Fiscal 2019, 2018 and 2017 deductions primarily represent releases of allowance for doubtful accounts credited to expense as a result of an overall lower risk profile of Applied's customers and cash collections.

Applied sells its products principally to manufacturers within the semiconductor and display industries. While Applied believes that its allowance for doubtful accounts is adequate and represents its best estimate as of October 27, 2019, it continues to closely monitor customer liquidity and industry and economic conditions, which may result in changes to Applied's estimates.

Note 7 Contract Balances

Contract assets primarily result from receivables for goods transferred to customers where payment is conditional upon technical sign off and not just the passage of time. Contract liabilities consist of unsatisfied performance obligations related to advance payments received and billings in excess of revenue recognized. Applied's contract assets and liabilities are reported in a net position on a contract-by-contract basis at the end of each reporting period.

Contract assets are generally classified as current and included in Other Current Assets in the Consolidated Balance Sheets. Contract liabilities are classified as current or non-current based on the timing of when performance obligations will be satisfied and associated revenue is expected to be recognized.

Contract balances at the end of each reporting period were as follows:

	October 27, 2019	October 28, 2018
	(In millions)	
Contract assets	$ 108	$ 99
Contract liabilities	$ 1,336	$ 1,201

The increase in contract assets during fiscal 2019, was primarily due to goods transferred to customers where payment was conditional upon technical sign off, offset by the reclassification of contract assets to net accounts receivable upon meeting conditions to the right to payment.

During fiscal 2019, Applied recognized revenue of approximately $859 million related to contract liabilities at October 28, 2018. This reduction in contract liabilities was offset by new billings for products and services for which there were unsatisfied performance obligations to customers and revenue had not yet been recognized as of October 27, 2019.

There were no impairment losses recognized on Applied's accounts receivables and contract assets during fiscal 2019.

As of October 27, 2019, the amount of remaining unsatisfied performance obligations on contracts with an original estimated duration of one year or more was approximately $868 million, of which approximately 42% is expected to be recognized within 12 months and the remainder is expected to be recognized within the following 24 months thereafter. Applied has elected the available practical expedient to exclude the value of unsatisfied performance obligations for contracts with an original expected duration of one year or less.

Note 8 Balance Sheet Detail

	October 27, 2019	October 28, 2018
	(In millions)	
Inventories		
Customer service spares	$ 1,245	$ 989
Raw materials	802	1,020
Work-in-process	575	505
Finished goods	852	1,207
	$ 3,474	$ 3,721

Included in finished goods inventory is $13 million at October 27, 2019 and $19 million at October 28, 2018, of newly-introduced systems at customer locations where the sales transaction did not meet Applied's revenue recognition criteria as set forth in Note 1. Finished goods inventory includes $318 million and $350 million of evaluation inventory at October 27, 2019 and October 28, 2018, respectively.

	October 27, 2019	October 28, 2018
	(In millions)	
Other Current Assets		
Prepaid income taxes and income taxes receivable	$ 96	$ 40
Prepaid expenses and other	485	490
	$ 581	$ 530

	Useful Life	October 27, 2019	October 28, 2018
	(In years)	(In millions)	
Property, Plant and Equipment, Net			
Land and improvements		$ 254	$ 245
Buildings and improvements	3-30	1,590	1,448
Demonstration and manufacturing equipment	3-5	1,505	1,282
Furniture, fixtures and other equipment	3-5	602	634
Construction in progress		120	203
Gross property, plant and equipment		4,071	3,812
Accumulated depreciation		(2,542)	(2,405)
		$ 1,529	$ 1,407

Depreciation expense was $306 million, $258 million and $214 million for fiscal 2019, 2018 and 2017 respectively.

	October 27, 2019	October 28, 2018
	(In millions)	
Deferred Income Taxes and Other Assets		
Non-current deferred income taxes	$ 1,766	$ 225
Income tax receivables and other assets	265	248
	$ 2,031	$ 473

	October 27, 2019	October 28, 2018
	(In millions)	
Accounts Payable and Accrued Expenses		
Accounts payable	$ 958	$ 996
Compensation and employee benefits	559	639
Warranty	196	208
Dividends payable	192	193
Income taxes payable	160	136
Other accrued taxes	55	112
Interest payable	38	38
Other	353	399
	$ 2,511	$ 2,721

	October 27, 2019	October 28, 2018
	(In millions)	
Other Liabilities		
Defined and postretirement benefit plans	$ 212	$ 177
Other	163	126
	$ 375	$ 303

Note 9 Business Combinations

Kokusai Electric Corporation

On June 30, 2019, Applied entered into a Share Purchase Agreement (SPA) to acquire all outstanding shares of Kokusai Electric Corporation (Kokusai Electric) for $2.2 billion in cash, subject to certain post-closing adjustments. Kokusai Electric is a leading company in providing high-productivity batch processing systems and services for memory, foundry and logic customers. These systems complement Applied's portfolio of single-wafer processing systems. Following the close of the transaction, Kokusai Electric will operate as a business unit of Applied's Semiconductor Systems segment and continue to be based in Tokyo, with technology and manufacturing centers in Toyama, Japan and Cheonan, Korea. The transaction is subject to regulatory approvals and other customary closing conditions.

Note 10 Goodwill, Purchased Technology and Other Intangible Assets

Goodwill and Purchased Intangible Assets

Applied's methodology for allocating the purchase price relating to purchase acquisitions is determined through established and generally accepted valuation techniques. Goodwill is measured as the excess of the purchase price over the sum of the amounts assigned to tangible and identifiable intangible assets acquired less liabilities assumed. Applied assigns assets acquired (including goodwill) and liabilities assumed to one or more reporting units as of the date of acquisition. Typically, acquisitions relate to a single reporting unit and thus do not require the allocation of goodwill to multiple reporting units. If the products obtained in an acquisition are assigned to multiple reporting units, the goodwill is distributed to the respective reporting units as part of the purchase price allocation process.

Goodwill and purchased intangible assets with indefinite useful lives are not amortized, but are reviewed for impairment annually during the fourth quarter of each fiscal year and whenever events or changes in circumstances indicate that the carrying value of an asset may not be recoverable. The process of evaluating the potential impairment of goodwill and intangible assets requires significant judgment, especially in emerging markets. Applied regularly monitors current business conditions and considers other factors including, but not limited to, adverse industry or economic trends, restructuring actions and lower projections of profitability that may impact future operating results.

To test goodwill for impairment, Applied first performs a qualitative assessment to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value. If it is concluded that this is the case, Applied then performs the two-step goodwill impairment test. Otherwise, the two-step goodwill impairment test is not required. Under the two-step goodwill impairment test, Applied would in the first step compare the estimated fair value of each reporting unit to its carrying value. Applied determines the fair value of each of its reporting units based on a weighting of income and market approaches. If the carrying value of a reporting unit exceeds its fair value, Applied would then perform the second step of the impairment test in order to determine the implied fair value of the reporting unit's goodwill. If Applied determines that the carrying value of a reporting unit's goodwill exceeds its implied fair value, Applied would record an impairment charge equal to the difference.

As of October 27, 2019, Applied's reporting units include Semiconductor Products Group and Imaging and Process Control Group, which combine to form the Semiconductor Systems reporting segment, Applied Global Services, and Display and Adjacent Markets.

In the fourth quarter of fiscal 2019, Applied performed a qualitative assessment to test goodwill for all of its reporting units for impairment. Applied determined that it was more likely than not that each of its reporting units' fair values exceeded their respective carrying values and that it was not necessary to perform the two-step goodwill impairment test for any of its reporting units.

The evaluation of goodwill and intangible assets for impairment requires the exercise of significant judgment. In the event of future changes in business conditions, Applied will be required to reassess and update its forecasts and estimates used in future impairment analyses. If the results of these future analyses are lower than current estimates, a material impairment charge may result at that time.

Details of goodwill were as follows:

	October 27, 2019	October 28, 2018
	(In millions)	
Semiconductor Systems	$ 2,182	$ 2,151
Applied Global Services	1,018	1,018
Display and Adjacent Markets	199	199
Carrying amount	$ 3,399	$ 3,368

During fiscal 2019, the increase in goodwill was primarily due to acquisitions completed in the second quarter of fiscal 2019, which were not significant to Applied's results of operations.

A summary of Applied's purchased technology and intangible assets is set forth below:

	October 27, 2019	October 28, 2018
	(In millions)	
Purchased technology, net	$ 71	$ 109
Intangible assets - finite-lived, net	85	104
	$ 156	$ 213

Finite-Lived Purchased Intangible Assets

Applied amortizes purchased intangible assets with finite lives using the straight-line method over the estimated economic lives of the assets, ranging from1 to 15 years.

Applied evaluates long-lived assets for impairment whenever events or changes in circumstances indicate the carrying value of an asset group may not be recoverable. Applied assesses the fair value of the assets based on the amount of the undiscounted future cash flow that the assets are expected to generate and recognizes an impairment loss when estimated undiscounted future cash flow expected to result from the use of the asset, plus net proceeds expected from disposition of the asset, if any, are less than the carrying value of the asset. When Applied identifies an impairment, Applied reduces the carrying value of the group of assets to comparable market values, when available and appropriate, or to its estimated fair value based on a discounted cash flow approach.

Intangible assets, such as purchased technology, are generally recorded in connection with a business acquisition. The value assigned to intangible assets is usually based on estimates and judgments regarding expectations for the success and life cycle of products and technology acquired. Applied evaluates the useful lives of its intangible assets each reporting period to determine whether events and circumstances require revising the remaining period of amortization. In addition, Applied reviews intangible assets for impairment when events or changes in circumstances indicate their carrying value may not be recoverable. Management considers such indicators as significant differences in actual product acceptance from the estimates, changes in the competitive and economic environments, technological advances, and changes in cost structure.

Details of finite-lived intangible assets were as follows:

	October 27, 2019			October 28, 2018		
	Purchased Technology	Other Intangible Assets	Total	Purchased Technology	Other Intangible Assets	Total
	(In millions)					
Gross carrying amount:						
Semiconductor Systems	$ 1,449	$ 252	$ 1,701	$ 1,449	$ 252	$ 1,701
Applied Global Services	33	44	77	33	44	77
Display and Adjacent Markets	163	38	201	163	38	201
Corporate and Other	—	9	9	—	9	9
Gross carrying amount	$ 1,645	$ 343	$ 1,988	$ 1,645	$ 343	$ 1,988
Accumulated amortization:						
Semiconductor Systems	$ (1,400)	$ (168)	$ (1,568)	$ (1,375)	$ (150)	$ (1,525)
Applied Global Services	(30)	(44)	(74)	(29)	(44)	(73)
Display and Adjacent Markets	(144)	(37)	(181)	(132)	(36)	(168)
Corporate and Other	—	(9)	(9)	—	(9)	(9)
Accumulated amortization	$ (1,574)	$ (258)	$ (1,832)	$ (1,536)	$ (239)	$ (1,775)
Carrying amount	$ 71	$ 85	$ 156	$ 109	$ 104	$ 213

Details of amortization expense for each fiscal year by segment were as follows:

	2019	2018	2017
	(In millions)		
Semiconductor Systems	$ 43	$ 184	$ 185
Applied Global Services	1	1	1
Display and Adjacent Markets	13	14	7
Total	$ 57	$ 199	$ 193

Amortization expense for each fiscal year was charged to the following categories:

	2019	2018	2017
	(In millions)		
Cost of products sold	$ 38	$ 180	$ 173
Research, development and engineering	1	1	1
Marketing and selling	18	18	19
Total	$ 57	$ 199	$ 193

As of October 27, 2019, future estimated amortization expense is expected to be as follows:

	Amortization Expense
	(In millions)
2020	$ 52
2021	39
2022	24
2023	11
2024	10
Thereafter	20
Total	$ 156

Note 11 Borrowing Facilities and Debt

Applied has credit facilities for unsecured borrowings in various currencies of up to $1.6 billion, of which $1.5 billion is comprised of a committed revolving credit agreement with a group of banks that is scheduled to expire in September 2021. This agreement provides for borrowings in United States dollars at interest rates keyed to one of various benchmark rates selected by Applied for each advance, plus a margin based on Applied's public debt rating and includes financial and other covenants. Remaining credit facilities in the amount of approximately $74 million are with Japanese banks. Applied's ability to borrow under these facilities is subject to bank approval at the time of the borrowing request, and any advances will be at rates indexed to the banks' prime reference rate denominated in Japanese yen.

In August 2019, Applied entered into a term loan credit agreement with a group of lenders. Under the agreement, the lenders have committed to make an unsecured term loan to Applied of up to $2.0 billion to finance in part Applied's planned acquisition of all outstanding shares of Kokusai Electric, to pay related transaction fees and expenses and for general corporate purposes. The commitments of the lenders to make the term loan will terminate if the transactions contemplated by the SPA are not consummated on or before June 30, 2020, which date may be extended by three months on two separate occasions if, on the applicable date, the only remaining conditions to closing relate to required regulatory approvals. The term loan, if advanced, will bear interest at one of two rates selected by Applied, plus an applicable margin, which varies according to Applied's public debt credit ratings, and must be repaid in full on the third anniversary of the funding date of the term loan.

No amounts were outstanding under any of these facilities at both October 27, 2019 and October 28, 2018, and Applied has not utilized these credit facilities. In fiscal 2011, Applied established a short-term commercial paper program of up to $1.5 billion. At October 27, 2019 and October 28, 2018, Applied did not have any commercial paper outstanding.

Debt outstanding as of October 27, 2019 and October 28, 2018 was as follows:

	Principal Amount			
	October 27, 2019	October 28, 2018	Effective Interest Rate	Interest Pay Dates
	(In millions)			
Current portion of long-term debt:				
2.625% Senior Notes Due 2020	$ 600	$ —	2.640%	April 1, October 1
Total current portion of long-term debt	600	—		
Long-term debt:				
2.625% Senior Notes Due 2020	—	600	2.640%	April 1, October 1
4.300% Senior Notes Due 2021	750	750	4.326%	June 15, December 15
3.900% Senior Notes Due 2025	700	700	3.944%	April 1, October 1
3.300% Senior Notes Due 2027	1,200	1,200	3.342%	April 1, October 1
5.100% Senior Notes Due 2035	500	500	5.127%	April 1, October 1
5.850% Senior Notes Due 2041	600	600	5.879%	June 15, December 15
4.350% Senior Notes Due 2047	1,000	1,000	4.361%	April 1, October 1
	4,750	5,350		
Total unamortized discount	(10)	(11)		
Total unamortized debt issuance costs	(27)	(30)		
Total long-term debt	4,713	5,309		
Total debt	$ 5,313	$ 5,309		

Note 12 Stockholders' Equity, Comprehensive Income and Share-Based Compensation

Accumulated Other Comprehensive Income (Loss)

Changes in the components of accumulated other comprehensive income (AOCI), net of tax, were as follows:

	Unrealized Gain (Loss) on Investments, Net	Unrealized Gain (Loss) on Derivative Instruments Qualifying as Cash Flow Hedges	Defined and Postretirement Benefit Plans	Cumulative Translation Adjustments	Total
			(In millions)		
Balance at October 30, 2016	$ 30	$ (18)	$ (141)	$ 14	(115)
Other comprehensive income (loss) before reclassifications	24	13	29	—	66
Amounts reclassified out of AOCI	(1)	(6)	(8)	—	(15)
Other comprehensive income (loss), net of tax	23	7	21	—	51
Balance at October 29, 2017	$ 53	$ (11)	$ (120)	$ 14	$ (64)
Adoption of new accounting standards (a)	5	(2)	—	—	3
Other comprehensive income (loss) before reclassifications	(66)	5	(23)	—	(84)
Amounts reclassified out of AOCI	15	(1)	6	—	20
Other comprehensive income, net of tax	(51)	4	(17)	—	(64)
Balance at October 28, 2018	$ 7	$ (9)	$ (137)	$ 14	$ (125)
Adoption of new accounting standards (b)	(17)	—	—	—	(17)
Other comprehensive income (loss) before reclassifications	22	(10)	(57)	(1)	(46)
Amounts reclassified out of AOCI	(1)	3	6	—	8
Other comprehensive income (loss), net of tax	21	(7)	(51)	(1)	(38)
Balance at October 27, 2019	$ 11	$ (16)	$ (188)	$ 13	$ (180)

(a) - Represents the reclassification adjustment related to the early adoption of Accounting Standards Update (ASU) 2018-02 *Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income.*

(b) - Represents the reclassification adjustment related to the adoption of Accounting Standard Update (ASU) 2016-01 *Financial Instruments-Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities* in the first quarter of fiscal 2019. See Note 1.

The tax effects on net income of amounts reclassified from AOCI for the fiscal years 2019, 2018 and 2017 were not material.

Stock Repurchase Programs

In February 2018, the Board of Directors approved a common stock repurchase program authorizing up to an aggregate of $6.0 billion in repurchases. At October 27, 2019, $1.9 billion remained available for future stock repurchases under this repurchase program.

The following table summarizes Applied's stock repurchases for each fiscal year:

	2019	2018	2017
	(In millions, except per share amounts)		
Shares of common stock repurchased	60	102	28
Cost of stock repurchased	$ 2,403	$ 5,283	$ 1,172
Average price paid per share	$ 39.86	$ 51.55	$ 42.08

Applied records treasury stock purchases under the cost method using the first-in, first-out (FIFO) method. Upon reissuance of treasury stock, amounts in excess of the acquisition cost are credited to additional paid in capital. If Applied reissues treasury stock at an amount below its acquisition cost and additional paid in capital associated with prior treasury stock transactions is insufficient to cover the difference between the acquisition cost and the reissue price, this difference is recorded against retained earnings.

Dividends

During fiscal 2019, Applied's Board of Directors declared one quarterly cash dividend of $0.20 per share and three quarterly cash dividends of $0.21 per share. During fiscal 2018, Applied's Board of Directors declared one quarterly cash dividend of $0.10 per share and three quarterly cash dividends of $0.20 per share. During fiscal 2017, Applied's Board of Directors declared four quarterly cash dividends in the amount of $0.10 per share. Dividends paid during fiscal 2019, 2018 and 2017 amounted to $771 million, $605 million and $430 million, respectively. Applied currently anticipates that cash dividends will continue to be paid on a quarterly basis, although the declaration of any future cash dividend is at the discretion of the Board of Directors and will depend on Applied's financial condition, results of operations, capital requirements, business conditions and other factors, as well as a determination by the Board of Directors that cash dividends are in the best interests of Applied's stockholders.

Share-Based Compensation

Applied has a stockholder-approved equity plan, the Employee Stock Incentive Plan, which permits grants to employees of share-based awards, including stock options, restricted stock, restricted stock units, performance shares and performance units. In addition, the plan provides for the automatic grant of restricted stock units to non-employee directors and permits the grant of share-based awards to non-employee directors and consultants. Share-based awards made under the plan may be subject to accelerated vesting under certain circumstances in the event of a change in control of Applied. Applied also has two Employee Stock Purchase Plans, one generally for United States employees and a second for employees of international subsidiaries (collectively, ESPP), which enable eligible employees to purchase Applied common stock.

Applied recognized share-based compensation expense related to equity awards and ESPP shares. The effect of share-based compensation on the results of operations and the related tax benefits for each fiscal year were as follows:

	2019	2018	2017
		(In millions)	
Cost of products sold	$ 89	$ 87	$ 69
Research, development, and engineering	99	96	83
Marketing and selling	31	31	28
General and administrative	44	44	40
Total share-based compensation	$ 263	$ 258	$ 220
Income tax benefits recognized	$ 37	$ 45	$ 60

The cost associated with share-based awards that are subject solely to time-based vesting requirements, less expected forfeitures, is recognized over the awards' service period for the entire award on a straight-line basis. The cost associated with performance-based equity awards is recognized for each tranche over the service period based on an assessment of the likelihood that the applicable performance goals will be achieved.

At October 27, 2019, Applied had $379 million in total unrecognized compensation expense, net of estimated forfeitures, related to grants of share-based awards and shares issued under Applied's ESPP, which will be recognized over a weighted average period of 2.4 years. At October 27, 2019, there were 66 million shares available for grants of share-based awards under the Employee Stock Incentive Plan, and an additional 13 million shares available for issuance under the ESPP.

Stock Options

Stock options are rights to purchase, at future dates, shares of Applied common stock. The exercise price of each stock option equals the fair market value of Applied common stock on the date of grant. Options typically vest over three to four years, subject to the grantee's continued service with Applied through the scheduled vesting date, and expire no later than seven years from the grant date. There were no stock options granted during fiscal 2019, 2018 and 2017. Outstanding stock options at the end of fiscal 2019 were not material to the consolidated financial statements.

Restricted Stock Units, Restricted Stock, Performance Shares and Performance Units

Restricted stock units are converted into shares of Applied common stock upon vesting on a one-for-one basis. Restricted stock has the same rights as other issued and outstanding shares of Applied common stock except these shares generally have no right to dividends and are held in escrow until the award vests. Performance shares and performance units are awards that result in a payment to a grantee, generally in shares of Applied common stock on a one-for-one basis, if performance goals and/or other vesting criteria established by the Human Resources and Compensation Committee of Applied's Board of Directors are achieved or the awards otherwise vest. Restricted stock units, restricted stock, performance shares and performance units typically vest over three to four years and vesting is usually subject to the grantee's continued service with Applied and, in some cases, achievement of specified performance goals. The compensation expense related to the service-based awards is determined using the fair market value of Applied common stock on the date of the grant, and the compensation expense is recognized over the vesting period.

During fiscal 2017, 2018 and 2019, certain executive officers were granted awards that are subject to the achievement of specified performance goals (performance-based awards).

Performance-based awards granted in fiscal 2017 and 2018

Certain awards require the achievement of positive adjusted operating profit and vest ratably overthree years. Other awards require the achievement of targeted levels of adjusted operating profit margin and wafer fabrication equipment market share, and the number of shares that may vest in full after three years ranges from 0% to 200% of the target amount.

The fair value of these awards is estimated on the date of grant. If the performance goals are achieved as of the end of the performance period, the awards will vest, provided that the grantee remains employed by Applied through each applicable vesting date. If the performance goals are not achieved, no compensation expense is recognized and any previously recognized compensation expense is reversed. The expected cost is based on the awards that are probable to vest and is reflected over the service period and reduced for estimated forfeitures.

Performance-based awards granted in fiscal 2019

Certain awards are subject to the achievement of targeted levels of adjusted operating margin and total shareholder return (TSR) relative to a peer group, comprised of companies in the Standard & Poor's 500 Index. Each metric will be weighted 50% and will be measured over a three-year period. The number of shares that may vest in full after three years ranges from 0% to 200% of the target amount. The awards become eligible to vest only if performance goals are achieved and will vest only if the grantee remains employed by Applied through each applicable vesting date, subject to a qualifying retirement based on age and years of service. The awards provide for a partial payout based on actual performance at the conclusion of the three-year performance period in the event of a qualifying retirement.

The fair value of the portion of the awards subject to targeted levels of adjusted operating margin is estimated on the date of grant. If the performance goals are not achieved as of the end of the performance period, no compensation expense is recognized and any previously recognized compensation expense is reversed. The expected cost is based on the awards that are probable to vest and is reflected over the service period and reduced for estimated forfeitures.

The fair value of the portion of the awards subject to targeted levels of TSR is estimated on the date of grant using a Monte Carlo simulation model. Compensation expense is recognized based upon the assumption of 100% achievement of the TSR goal and will not be reversed even if the threshold level of TSR is never achieved, and is reflected over the service period and reduced for estimated forfeitures.

A summary of the changes in restricted stock units, restricted stock, performance shares and performance units outstanding under Applied's equity compensation plans is presented below:

	Shares	Weighted Average Grant Date Fair Value	Weighted Average Remaining Contractual Term	Aggregate Intrinsic Value
	(In millions, except per share amounts)			
Non-vested restricted stock units, restricted stock, performance shares and performance units at October 30, 2016	25	$ 18.28	2.3 years	$ 718
Granted	8	$ 31.79		
Vested	(10)	$ 16.50		
Canceled	(1)	$ 21.25		
Non-vested restricted stock units, restricted stock, performance shares and performance units at October 29, 2017	22	$ 23.96	2.2 years	$ 1,239
Granted	6	$ 50.62		
Vested	(9)	$ 22.15		
Canceled	(1)	$ 30.19		
Non-vested restricted stock units, restricted stock, performance shares and performance units at October 28, 2018	18	$ 32.64	2.0 years	$ 600
Granted	8	$ 36.00		
Vested	(7)	$ 28.41		
Canceled	(1)	$ 34.59		
Non-vested restricted stock units, restricted stock, performance shares and performance units at October 27, 2019	18	$ 35.78	2.1 years	$ 985
Non-vested restricted stock units, restricted stock, performance shares and performance units expected to vest	17	$ 35.31	1.9 years	$ 934

At October 27, 2019, 1.6 million additional performance-based awards could be earned based upon achievement of certain levels of specified performance goals.

Employee Stock Purchase Plans

Under the ESPP, substantially all employees may purchase Applied common stock through payroll deductions at a price equal to85 percent of the lower of the fair market value of Applied common stock at the beginning or end of each 6-month purchase period, subject to certain limits. Applied issued4 million shares in fiscal 2019 and 3 million shares in each of fiscal 2018 and 2017, under the ESPP. Compensation expense is calculated using the fair value of the employees' purchase rights under the Black-Scholes model. Underlying assumptions used in the model are outlined in the following table:

	2019	2018	2017
ESPP:			
Dividend yield	1.99 %	1.68 %	0.99 %
Expected volatility	35.5 %	34.4 %	26.3 %
Risk-free interest rate	2.21 %	2.09 %	0.92 %
Expected life (in years)	0.5	0.5	0.5
Weighted average estimated fair value	$10.61	$12.02	$9.14

Note 13 Employee Benefit Plans

Employee Bonus Plans

Applied has various employee bonus plans. A discretionary bonus plan provides for the distribution of a percentage of pre-tax income to Applied employees who are not participants in other performance-based incentive plans, up to a maximum percentage of eligible compensation. Other plans provide for bonuses to Applied's executives and other key contributors based on the achievement of profitability and/or other specified performance criteria. Charges under these plans for fiscal 2019, 2018 and 2017 were $292 million, $382 million and $449 million, respectively.

Employee Savings and Retirement Plan

Applied's Employee Savings and Retirement Plan (the 401(k) Plan) is qualified under Sections 401(a) and (k) of the Internal Revenue Code (the Code). Eligible employees may make salary deferral and catch-up contributions under the 401(k) Plan on a pre-tax basis and on a Roth basis, subject to an annual dollar limit established by the Code. Applied matches 100% of participant salary and/or Roth deferral contributions up to the first3% of eligible contribution and then 50% of every dollar between 4% and 6% of eligible contribution. Applied does not make matching contributions on any catch-up contributions made by participants. Plan participants who were employed by Applied or any of its affiliates became 100% vested in their Applied matching contribution account balances. Applied's matching contributions under the 401(k) Plan were approximately $ 49 million for fiscal 2019, $45 million for fiscal 2018 and $38 million for fiscal 2017.

Defined Benefit Pension Plans of Foreign Subsidiaries and Other Post-Retirement Benefits

Several of Applied's foreign subsidiaries have defined benefit pension plans covering substantially all of their eligible employees. Benefits under these plans are typically based on years of service and final average compensation levels. The plans are managed in accordance with applicable local statutes and practices. Applied deposits funds for certain of these plans with insurance companies, pension trustees, government-managed accounts, and/or accrues the expense for the unfunded portion of the benefit obligation on its Consolidated Financial Statements. Applied's practice is to fund the various pension plans in amounts sufficient to meet the minimum requirements as established by applicable local governmental oversight and taxing authorities. Depending on the design of the plan, local custom and market circumstances, the liabilities of a plan may exceed the qualified plan assets. The differences between the aggregate projected benefit obligations and aggregate plan assets of these plans have been recorded as liabilities by Applied and are included in other liabilities and accrued expenses in the Consolidated Balance Sheets.

Through December 31, 2017, Applied also sponsored a U.S. post-retirement plan that provided covered medical and vision benefits to certain eligible retirees. An eligible retiree also could elect coverage for an eligible spouse or domestic partner who was not eligible for Medicare. Coverage ended entirely for all participants when the plan terminated on December 31, 2017. In addition, Applied also has a post-retirement benefit plan as a result of the acquisition of Varian. Applied's liability under these post-retirement plans, which was included in other liabilities in the Consolidated Balance Sheets, were immaterial at each of October 27, 2019 and October 28, 2018.

A summary of the changes in benefit obligations and plan assets, which includes post-retirement benefits, for each fiscal year is presented below:

	2019	2018	2017
	(In millions, except percentages)		
Change in projected benefit obligation			
Beginning projected benefit obligation	$ 524	$ 506	$ 495
Service cost	11	12	13
Interest cost	10	11	10
Plan participants' contributions	1	1	2
Actuarial (gain) loss	84	24	(35)
Curtailments, settlements and special termination benefits	(1)	(1)	(1)
Foreign currency exchange rate changes	(5)	(16)	34
Benefits paid	(8)	(12)	(12)
Plan amendments and business combinations	1	(1)	—
Ending projected benefit obligation	$ 617	$ 524	$ 506
Ending accumulated benefit obligation	$ 578	$ 490	$ 472
Range of assumptions to determine benefit obligations			
Discount rate	0.5% - 3.1%	0.6% - 3.1%	0.5% - 3.4%
Rate of compensation increase	2.3% - 3.6%	2.4% - 3.5%	2.2% - 3.5%
Change in plan assets			
Beginning fair value of plan assets	$ 365	$ 361	$ 310
Return on plan assets	30	17	18
Employer contributions	27	11	16
Plan participants' contributions	1	1	2
Foreign currency exchange rate changes	(5)	(12)	28
Divestitures, settlements and business combinations	(1)	(1)	(1)
Benefits paid	(8)	(12)	(12)
Ending fair value of plan assets	$ 409	$ 365	$ 361
Funded status	$ (208)	$ (159)	$ (145)
Amounts recognized in the consolidated balance sheets			
Noncurrent asset	$ 5	$ 19	$ 17
Current liability	(1)	(1)	(1)
Noncurrent liability	(212)	(177)	(161)
Total	$ (208)	$ (159)	$ (145)
Estimated amortization from accumulated other comprehensive loss into net periodic benefit cost over the next fiscal period			
Actuarial loss	$ 12	$ 8	$ 6
Prior service credit	—	(1)	(4)
Total	$ 12	$ 7	$ 2
Amounts recognized in accumulated other comprehensive loss			
Net actuarial loss	$ 226	$ 161	$ 141
Prior service credit	—	(2)	(4)
Total	$ 226	$ 159	$ 137
Plans with projected benefit obligations in excess of plan assets			
Projected benefit obligation	$ 424	$ 365	$ 326
Fair value of plan assets	$ 211	$ 186	$ 142
Plans with accumulated benefit obligations in excess of plan assets			
Accumulated benefit obligation	$ 385	$ 331	$ 293
Fair value of plan assets	$ 211	$ 186	$ 142

	2019	2018
Plan assets — allocation		
Equity securities	36 %	47 %
Debt securities	45 %	32 %
Insurance contracts	9 %	10 %
Other investments	10 %	10 %
Cash	— %	1 %

The following table presents a summary of the ending fair value of the plan assets:

	October 27, 2019				October 28, 2018			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
	(In millions)							
Equity securities	$ 90	$ —	$ —	$ 90	$ 86	$ —	$ —	$ 86
Debt securities	70	—	—	70	19	—	—	19
Insurance contracts	—	—	36	36	—	—	36	36
Other investments	—	14	—	14	—	14	—	14
Cash	—	—	—	—	2	—	—	2
Total assets at fair value	$ 160	$ 14	$ 36	210	$ 107	$ 14	$ 36	157
Assets measured at net asset value				199				208
Total				$ 409				$ 365

The following table presents the activity in Level 3 instruments for each fiscal year:

	2019	2018
	(In millions)	
Balance, beginning of year	$ 36	$ 38
Actual return on plan assets:		
Relating to assets still held at reporting date	(3)	(1)
Purchases, sales, settlements, net	4	—
Currency impact	(1)	(1)
Balance, end of year	$ 36	$ 36

Applied’s investment strategy for its defined benefit plans is to invest plan assets in a prudent manner, maintaining well-diversified portfolios with the long-term objective of meeting the obligations of the plans as they come due. Asset allocation decisions are typically made by plan fiduciaries with input from Applied’s international pension committee. Applied’s asset allocation strategy incorporates a sufficient equity exposure in order for the plans to benefit from the expected better long-term performance of equities relative to the plans’ liabilities. Applied retains investment managers, where appropriate, to manage the assets of the plans. Performance of investment managers is monitored by plan fiduciaries with the assistance of local investment consultants. The investment managers make investment decisions within the guidelines set forth by plan fiduciaries. Risk management practices include diversification across asset classes and investment styles, and periodic rebalancing toward target asset allocation ranges. Investment managers may use derivative instruments for efficient portfolio management purposes. Plan assets do not include any of Applied’s own equity or debt securities.

A summary of the components of net periodic benefit costs and the weighted average assumptions used for net periodic benefit cost calculations for each fiscal year is presented below:

	2019	2018	2017
	(In millions, except percentages)		
Components of net periodic benefit cost			
Service cost	$ 11	$ 12	$ 13
Interest cost	10	11	10
Expected return on plan assets	(20)	(20)	(18)
Amortization of actuarial loss and prior service credit	7	3	(10)
Settlement and curtailment loss	—	—	—
Net periodic benefit cost (income)	$ 8	$ 6	$ (5)
Weighted average assumptions			
Discount rate	1.98 %	2.16 %	1.88 %
Expected long-term return on assets	5.40 %	5.41 %	5.38 %
Rate of compensation increase	2.74 %	2.66 %	2.69 %

Asset return assumptions are derived based on actuarial and statistical methodologies, from analysis of long-term historical data relevant to the country in which each plan is in effect and the investments applicable to the corresponding plan. The discount rate for each plan was derived by reference to appropriate benchmark yields on high quality corporate bonds, allowing for the approximate duration of both plan obligations and the relevant benchmark yields.

Future expected benefit payments for the pension plans and the post-retirement plan over the next ten fiscal years are as follows:

	Benefit Payments
	(In millions)
2020	$ 12
2021	11
2022	12
2023	12
2024	12
2025-2029	83
	$ 142

Company contributions to these plans for fiscal 2020 are expected to be approximately $10 million.

Executive Deferred Compensation Plans

Applied sponsors two unfunded deferred compensation plans, the Executive Deferred Compensation Plan (Predecessor EDCP) and the 2016 Deferred Compensation Plan (2016 DCP) (formerly known as the 2005 Executive Deferred Compensation Plan), under which certain employees may elect to defer a portion of their following year's eligible earnings. The Predecessor EDCP was frozen as of December 31, 2004 such that no new deferrals could be made under the plan after that date and the plan would qualify for "grandfather" relief under Section 409A of the Code. The Predecessor EDCP participant accounts continue to be maintained under the plan and credited with deemed interest. The 2016 DCP was originally implemented by Applied effective as of January 1, 2005, and amended and restated as of October 12, 2015, and is intended to comply with the requirements of Section 409A of the Code. In addition, Applied also sponsors a non-qualified deferred compensation plan as a result of the acquisition of Varian. Amounts payable for all plans, including accrued deemed interest, totaled $123 million and $92 million at October 27, 2019 and October 28, 2018, respectively, which were included in other liabilities in the Consolidated Balance Sheets.

Note 14 Income Taxes

The components of income before income taxes for each fiscal year were as follows:

	2019	2018	2017
		(In millions)	
U.S.	$ 363	$ 389	$ 510
Foreign	2,906	4,007	3,306
	$ 3,269	$ 4,396	$ 3,816

The components of the provision for income taxes for each fiscal year were as follows:

	2019	2018	2017
		(In millions)	
Current:			
U.S.	$ 240	$ 1,021	$ 64
Foreign	260	117	236
State	12	22	9
	512	1,160	309
Deferred:			
U.S.	8	151	(11)
Foreign	46	57	(7)
State	(3)	(10)	6
	51	198	(12)
	$ 563	$ 1,358	$ 297

A reconciliation between the statutory U.S. federal income tax rate and Applied's actual effective income tax rate for each fiscal year is presented below:

	2019	2018	2017
Tax provision at U.S. statutory rate	21.0 %	23.4 %	35.0 %
Changes in U.S. tax law	—	25.3	—
Effect of foreign operations taxed at various rates	(5.9)	(15.6)	(25.3)
Changes in prior years' unrecognized tax benefits	2.6	(0.9)	0.1
Resolutions of prior years' income tax filings	(0.1)	0.2	(1.8)
Research and other tax credits	(1.1)	(0.8)	(0.7)
Other	0.7	(0.7)	0.5
	17.2 %	30.9 %	7.8 %

On December 22, 2017, the U.S. government enacted the Tax Cuts and Jobs Act (Tax Act). The Tax Act requires a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries payable over eight years. U.S. deferred tax assets and liabilities were subject to remeasurement due to the reduction of the U.S. federal corporate tax rate. The U.S. Securities and Exchange Commission issued Staff Accounting Bulletin No. 118, which provided guidance on accounting for the income tax effects of the Tax Act and a measurement period for companies to complete this accounting. Applied completed the accounting for the Tax Act during the measurement period, which ended one year after the enactment date of the Tax Act. Accounting for the remeasurement of deferred tax assets was completed in the fourth quarter of fiscal 2018, and the accounting for the transition tax was completed in the first quarter of fiscal 2019.

The Tax Act also includes provisions that impact Applied starting in fiscal 2019, including a provision designed to tax global intangible low-taxed income (GILTI). On June 14, 2019, the U.S. government released regulations that significantly affect how the GILTI provision of the Tax Act is interpreted. As a result, Applied reversed a tax benefit of $96 million in the third quarter of fiscal 2019 that had been realized in the first half of fiscal 2019. An accounting policy may be selected to treat GILTI temporary differences in taxable income either as a current-period expense when incurred (period cost method) or factor such amounts into the measurement of deferred taxes (deferred method). Applied has chosen the period cost method.

Before the Tax Act, U.S. income tax had not been provided for certain unrepatriated earnings that were considered indefinitely reinvested. Income tax is now provided for all unrepatriated earnings.

The effective tax rate for fiscal 2019 was lower than fiscal 2018 primarily due to tax expense of $1.1 billion in fiscal 2018 for the transition tax and remeasurement of deferred tax assets as a result of the Tax Act. Excluding the tax expense of $ 1.1 billion, the effective tax rate for fiscal 2019 was higher than fiscal 2018 primarily due to certain provisions in the Tax Act becoming effective in fiscal 2019, tax expense of $ 87 million in fiscal 2019 related to changes in uncertain tax positions and the excess tax benefit from share-based compensation in fiscal 2019 being $42 million less than the prior fiscal year.

The effective tax rate for fiscal 2018 was higher than fiscal 2017 primarily due to tax expense of $1.1 billion for the transition tax and remeasurement of deferred tax assets as a result of the Tax Act, partially offset by changes in the geographical composition of income, tax benefits from the lower U.S. federal corporate tax rate, adoption of authoritative guidance for share-based compensation, and the resolution of tax liabilities for uncertain tax positions. In addition, fiscal 2017 included tax benefits from the recognition of previously unrecognized foreign tax credits.

In the reconciliation between the statutory U.S. federal income tax rate and the effective income tax rate, the effect of foreign operations taxed at various rates represents the difference between an income tax provision at the U.S. federal statutory income tax rate and the recorded income tax provision, with the difference expressed as a percentage of worldwide income before income taxes. This effect is substantially related to the tax effect of pre-tax income in jurisdictions with lower statutory tax rates. The foreign operations with the most significant effective tax rate impact are in Singapore. The statutory tax rate for fiscal 2018 for Singapore is 17%. Applied has been granted conditional reduced tax rates that expire in fiscal 2025, excluding potential renewal and subject to certain conditions with which Applied expects to comply. The tax benefit arising from these tax rates was $167 million for fiscal 2019 or $0.18 per diluted share.

Deferred tax assets and liabilities are recognized for the estimated future tax effects of temporary differences between the book and tax bases of assets and liabilities. Deferred tax assets are also recognized for net operating loss and tax credit carryovers. Deferred tax assets are offset by a valuation allowance to the extent it is more likely than not that they are not expected to be realized. The components of deferred income tax assets and liabilities were as follows:

	October 27, 2019	October 28, 2018
	(In millions)	
Deferred tax assets:		
Allowance for doubtful accounts	$ 8	$ 8
Inventory reserves and basis difference	117	117
Installation and warranty reserves	11	7
Intangible assets	1,472	—
Accrued liabilities	15	20
Deferred revenue	36	12
Tax credits	264	236
Deferred compensation	98	79
Share-based compensation	36	37
Other	58	45
Gross deferred tax assets	2,115	561
Valuation allowance	(257)	(230)
Total deferred tax assets	1,858	331
Deferred tax liabilities:		
Fixed assets	(65)	(48)
Intangible assets	—	(38)
Undistributed foreign earnings	(38)	(32)
Total deferred tax liabilities	(103)	(118)
Net deferred tax assets	$ 1,755	$ 213

The following table presents a summary of non-current deferred tax assets and liabilities:

	October 27, 2019	October 28, 2018
	(In millions)	
Non-current deferred tax asset	$ 1,766	$ 225
Non-current deferred tax liability	(11)	(12)
	$ 1,755	$ 213

A valuation allowance is recorded to reflect the estimated amount of net deferred tax assets that may not be realized. Changes in the valuation allowance in each fiscal year were as follows:

	2019	2018	2017
		(In millions)	
Beginning balance	$ 230	$ 227	$ 207
Increases	27	8	20
Decreases	—	(5)	—
Ending balance	$ 257	$ 230	$ 227

At October 27, 2019, Applied has state research and development tax credit carryforwards of $264 million, including $252 million of credits that are carried over until exhausted and $11 million that are carried over for 15 years and begin to expire in fiscal 2029. It is more likely than not that all tax credit carryforwards, net of valuation allowance, will be utilized.

Applied maintains liabilities for uncertain tax positions. These liabilities involve considerable judgment and estimation and are continuously monitored based on the best information available. Gross unrecognized tax benefits are classified as non-current income taxes payable or as a reduction in deferred tax assets. A reconciliation of the beginning and ending balances of gross unrecognized tax benefits in each fiscal year is as follows:

	2019	2018	2017
		(In millions)	
Beginning balance of gross unrecognized tax benefits	$ 374	$ 391	$ 320
Settlements with tax authorities	(1)	(152)	(42)
Lapses of statutes of limitation	(2)	(37)	(15)
Increases in tax positions for current year	33	91	95
Increases in tax positions for prior years	441	83	33
Decreases in tax positions for prior years	—	(2)	—
Ending balance of gross unrecognized tax benefits	$ 845	$ 374	$ 391

The increases in tax positions for prior years of $441 million for fiscal 2019 include the effect of adoption of Accounting *Standard Update 2016-16 Income Tax (Topic 740): Intra-Entity Transfers of Assets Other Than Inventory* (See Note 1). Tax expense for interest and penalties on unrecognized tax benefits for fiscal 2019, 2018 and 2017 was $24 million, $12 million and $17 million, respectively. The income tax liability for interest and penalties for fiscal 2019, 2018 and 2017 was $50 million, $26 million and $46 million, respectively, and was classified as non-current income taxes payable.

Included in the balance of unrecognized tax benefits for fiscal 2019, 2018 and 2017 are $758 million, $294 million, and $284 million, respectively, of tax benefits that, if recognized, would affect the effective tax rate.

In fiscal 2019, Applied paid an immaterial amount as a result of settlements with tax authorities. In fiscal 2018, Applied paid $158 million, including interest and penalties, as a result of a settlement in Israel for fiscal 2011 through fiscal 2015 resulting in the recognition of a tax expense of $6 million. In fiscal 2017, Applied paid $29 million, including interest and penalties, as a result of a settlement in Italy for fiscal 2011 resulting in the recognition of a tax expense of $6 million.

Applied's tax returns remain subject to examination by taxing authorities. These include U.S. returns for fiscal 2015 and later years, and foreign tax returns for fiscal 2010 and later years.

The timing of the resolution of income tax examinations, as well as the amounts and timing of various tax payments that may be part of the settlement process, is highly uncertain. This could cause fluctuations in Applied's financial condition and results of operations. Applied continues to have ongoing negotiations with various taxing authorities throughout the year.

Note 15 Warranty, Guarantees, Commitments and Contingencies

Leases

Applied leases some of its facilities and equipment under non-cancelable operating leases and has options to renew most leases, with rentals to be negotiated. Total rent expense for fiscal 2019, 2018 and 2017, was $51 million, $50 million and $34 million, respectively.

As of October 27, 2019, future minimum lease payments are expected to be as follows:

Fiscal	Lease Payments (In millions)
2020	$ 45
2021	34
2022	24
2023	21
2024	17
Thereafter	30
	$ 171

Warranty

Changes in the warranty reserves during each fiscal year were as follows:

	2019	2018	2017
		(In millions)	
Beginning balance	$ 208	$ 206	$ 153
Provisions for warranty	148	175	173
Changes in reserves related to preexisting warranty	7	3	1
Consumption of reserves	(167)	(176)	(121)
Ending balance	$ 196	$ 208	$ 206

Applied products are generally sold with a warranty for a 12-month period following installation. The provision for the estimated cost of warranty is recorded when revenue is recognized. Parts and labor are covered under the terms of the warranty agreement. The warranty provision is based on historical experience by product, configuration and geographic region. Quarterly warranty consumption is generally associated with sales that occurred during the preceding four quarters, and quarterly warranty provisions are generally related to the current quarter's sales.

Guarantees

In the ordinary course of business, Applied provides standby letters of credit or other guarantee instruments to third parties as required for certain transactions initiated by either Applied or its subsidiaries. As of October 27, 2019, the maximum potential amount of future payments that Applied could be required to make under these guarantee agreements was approximately $76 million. Applied has not recorded any liability in connection with these guarantee agreements beyond that required to appropriately account for the underlying transaction being guaranteed. Applied does not believe, based on historical experience and information currently available, that it is probable that any amounts will be required to be paid under these guarantee agreements.

Applied also has agreements with various banks to facilitate subsidiary banking operations worldwide, including overdraft arrangements, issuance of bank guarantees, and letters of credit. As of October 27, 2019, Applied has provided parent guarantees to banks for approximately $151 million to cover these arrangements.

Legal Matters

From time to time, Applied receives notification from third parties, including customers and suppliers, seeking indemnification, litigation support, payment of money or other actions by Applied in connection with claims made against them. In addition, from time to time, Applied receives notification from third parties claiming that Applied may be or is infringing or misusing their intellectual property or other rights. Applied also is subject to various other legal proceedings and claims, both asserted and unasserted, that arise in the ordinary course of business.

Although the outcome of the above-described matters, claims and proceedings cannot be predicted with certainty, Applied does not believe that any will have a material effect on its consolidated financial condition or results of operations.

Note 16 Industry Segment Operations

Applied's three reportable segments are: Semiconductor Systems, Applied Global Services, and Display and Adjacent Markets. As defined under the accounting literature, Applied's chief operating decision-maker has been identified as the President and Chief Executive Officer, who reviews operating results to make decisions about allocating resources and assessing performance for the entire Company. Segment information is presented based upon Applied's management organization structure as of October 27, 2019 and the distinctive nature of each segment. Future changes to this internal financial structure may result in changes to Applied's reportable segments.

The Semiconductor Systems reportable segment includes semiconductor capital equipment for etch, rapid thermal processing, deposition, chemical mechanical planarization, metrology and inspection, wafer packaging, and ion implantation.

The Applied Global Services segment provides integrated solutions to optimize equipment and fab performance and productivity, including spares, upgrades, services, certain remanufactured earlier generation equipment and factory automation software for semiconductor, display and other products.

The Display and Adjacent Markets segment includes products for manufacturing liquid crystal displays (LCDs), organic light-emitting diodes (OLEDs), equipment upgrades and flexible coating systems and other display technologies for TVs, personal computers, smart phones, and other consumer-oriented devices.

Each operating segment is separately managed and has separate financial results that are reviewed by Applied's chief operating decision-maker. Each reportable segment contains closely related products that are unique to the particular segment. Segment operating income is determined based upon internal performance measures used by Applied's chief operating decision-maker. The chief operating decision-maker does not evaluate operating segments using total asset information.

Applied derives the segment results directly from its internal management reporting system. The accounting policies Applied uses to derive reportable segment results are substantially the same as those used for external reporting purposes. Management measures the performance of each reportable segment based upon several metrics including orders, net sales and operating income. Management uses these results to evaluate the performance of, and to assign resources to, each of the reportable segments.

The Corporate and Other category includes revenues from products, as well as costs of products sold, for fabricating solar photovoltaic cells and modules, and certain operating expenses that are not allocated to its reportable segments and are managed separately at the corporate level. These operating expenses include costs related to share-based compensation; certain management, finance, legal, human resources, and research, development and engineering functions provided at the corporate level; and unabsorbed information technology and occupancy. In addition, Applied does not allocate to its reportable segments restructuring and asset impairment charges and any associated adjustments related to restructuring actions, unless these actions pertain to a specific reportable segment. Segment operating income also excludes interest income/expense and other financial charges and income taxes. Management does not consider the unallocated costs in measuring the performance of the reportable segments.

Information for each reportable segment for and as of the end of each fiscal year were as follows:

	Net Sales	Operating Income (Loss)	Depreciation/ Amortization	Capital Expenditures	Accounts Receivable	Inventories
	(In millions)					
2019:						
Semiconductor Systems	$ 9,027	$ 2,464	$ 202	$ 168	$ 1,543	$ 1,703
Applied Global Services	3,854	1,101	25	47	790	1,535
Display and Adjacent Markets	1,651	294	22	43	246	214
Corporate and Other	76	(509)	114	183	(46)	22
Total	$ 14,608	$ 3,350	$ 363	$ 441	$ 2,533	$ 3,474
2018:						
Semiconductor Systems	$ 10,577	$ 3,441	$ 303	$ 168	$ 1,597	$ 2,215
Applied Global Services	3,754	1,102	21	33	630	1,243
Display and Adjacent Markets	2,298	574	20	39	142	246
Corporate and Other	76	(626)	113	382	(46)	17
Total	$ 16,705	$ 4,491	$ 457	$ 622	$ 2,323	$ 3,721
2017:						
Semiconductor Systems	$ 9,544	$ 3,177	$ 286	$ 150	$ 1,626	$ 1,638
Applied Global Services	3,014	817	15	21	564	762
Display and Adjacent Markets	2,042	585	12	17	190	279
Corporate and Other	98	(643)	94	157	(42)	28
Total	$ 14,698	$ 3,936	$ 407	$ 345	$ 2,338	$ 2,707

Net sales for Semiconductor Systems by end use application for the periods indicated were as follows:

	2019	2018	2017
Foundry, logic and other	52 %	36 %	51 %
Dynamic random-access memory (DRAM)	22 %	27 %	15 %
Flash memory	26 %	37 %	34 %
	100 %	100 %	100 %

The reconciling items included in Corporate and Other were as follows:

	2019	2018	2017
	(In millions)		
Unallocated net sales	$ 76	$ 76	$ 98
Unallocated cost of products sold and expenses	(322)	(444)	(521)
Share-based compensation	(263)	(258)	(220)
Total	$ (509)	$ (626)	$ (643)

For geographical reporting, revenue by geographic location is determined by the location of customers' facilities to which products were shipped. Long-lived assets consist primarily of property, plant and equipment and are attributed to the geographic location in which they are located. Net sales and long-lived assets by geographic region for and as of each fiscal year were as follows:

	2019	2018	2017
		(In millions)	
Net sales:			
United States	$ 1,871	$ 1,413	$ 1,512
China	4,277	5,047	2,758
Korea	1,929	3,539	4,087
Taiwan	2,965	2,504	3,369
Japan	2,198	2,396	1,519
Europe	820	1,009	828
Southeast Asia	548	797	625
Total outside United States	12,737	15,292	13,186
Consolidated total	$ 14,608	$ 16,705	$ 14,698

	October 27, 2019	October 28, 2018
	(In millions)	
Long-lived assets:		
United States	$ 1,539	$ 1,414
China	20	13
Korea	24	21
Taiwan	56	29
Japan	16	9
Europe	28	50
Southeast Asia	23	25
Total outside United States	167	147
Consolidated total	$ 1,706	$ 1,561

The following customers accounted for at least 10 percent of Applied's net sales in each fiscal year, which were for products and services in multiple reportable segments:

	2019	2018	2017
Samsung Electronics Co., Ltd.	*	13 %	23 %
Taiwan Semiconductor Manufacturing Company Limited	14 %	*	16 %
Intel Corporation	12 %	11 %	*

* Less than 10%

Note 17 Unaudited Quarterly Consolidated Financial Data

	Fiscal Quarter				
	First	Second	Third	Fourth	Fiscal Year
	(In millions, except per share amounts)				
2019:					
Net sales	$ 3,753	$ 3,539	$ 3,562	$ 3,754	$ 14,608
Gross profit	$ 1,665	$ 1,530	$ 1,557	$ 1,634	$ 6,386
Net income	$ 771	$ 666	$ 571	$ 698	$ 2,706
Earnings per diluted share	$ 0.80	$ 0.70	$ 0.61	$ 0.75	$ 2.86
2018:					
Net sales	$ 4,205	$ 4,579	$ 4,162	$ 3,759	$ 16,705
Gross profit	$ 1,940	$ 2,056	$ 1,864	$ 1,657	$ 7,517
Net income	$ 165	$ 1,100	$ 1,016	$ 757	$ 3,038
Earnings per diluted share	$ 0.15	$ 1.06	$ 1.01	$ 0.77	$ 2.96

INDEX TO EXHIBITS

These Exhibits are numbered in accordance with the Exhibit Table of Item 601 of Regulation S-K:

		Incorporated by Reference			
Exhibit No.	**Description**	**Form**	**File No.**	**Exhibit No.**	**Filing Date**
3.1	Certificate of Incorporation of Applied Materials, Inc., as amended and restated through March 10, 2009	10-Q	000-06920	3.1	6/3/2009
3.2	Certificate of Designation, Preferences and Rights of the Terms of the Series A Junior Participating Preferred Stock dated as of July 9, 1999	10-Q	000-06920	3(i)(a)	9/14/1999
3.3	Amended and Restated Bylaws of Applied Materials, Inc., amended as of December 8, 2015	8-K	000-06920	3.1	12/11/2015
4.1	Indenture, dated June 8, 2011, by and between Applied Materials, Inc. and U.S. Bank National Association, as Trustee	8-K	000-06920	4.1	6/10/2011
4.2	First Supplemental Indenture, dated June 8, 2011, by and between Applied Materials, Inc. and U.S. Bank National Association, as Trustee	8-K	000-06920	4.2	6/10/2011
4.3	Second Supplemental Indenture, dated September 24, 2015, by and between Applied Materials, Inc. and U.S. Bank National Association, as Trustee	8-K	000-06920	4.1	9/24/2015
4.4	Third Supplemental Indenture, dated March 31, 2017, by and between Applied Materials, Inc. and U.S. Bank National Association, as Trustee	8-K	000-06920	4.1	3/31/2017
4.5	Description of Registrant's Securities Registered Under Section 12 of the Securities Exchange Act of 1934†				
10.1	Form of Indemnification Agreement between Applied Materials, Inc. and Non-Employee Directors	10-K	000-06920	10.44	1/31/2000
10.2	Form of Indemnification Agreement between Applied Materials, Inc. and certain of its officers	10-K	000-06920	10.46	1/31/2000
10.3	Applied Materials, Inc. Profit Sharing Scheme (Ireland)	S-8	333-45011	4.1	1/27/1998
10.4*	Applied Materials, Inc. amended and restated Relocation Policy	8-K	000-06920	10.46	10/31/2005
10.5*	Applied Materials Inc. Employee Financial Assistance Plan, amended and restated as of December 18, 2008	10-Q	000-06920	10.58	3/3/2009
10.6	Deed of Amendment to Applied Materials Profit Sharing Scheme, dated February 7, 2006, to amend Clause 20 of the Trust Deed thereunder	10-K	000-06920	10.48	12/12/2008
10.7	Deed of Amendment to Applied Materials Profit Sharing Scheme, dated February 7, 2006, to amend the definition of Eligible Employee in the First Schedule to the Trust Deed thereunder.	10-K	000-06920	10.49	12/12/2008
10.8*	Form of Restricted Stock Unit Agreement for use under the amended and restated Applied Materials, Inc. Employee Stock Incentive Plan	10-Q	000-06920	10.1	8/23/2018
10.9*	Form of Restricted Stock Unit Agreement for Nonemployee Directors for use under the amended and restated Applied Materials, Inc. Employee Stock Incentive Plan	10-Q	000-06920	10.4	5/24/2012
10.10*	Form of Performance Shares Agreement for use under the amended and restated Applied Materials, Inc. Employee Stock Incentive Plan	10-Q	000-06920	10.5	5/24/2012
10.11*	Form of Restricted Stock Agreement for use under the amended and restated Applied Materials, Inc. Employee Stock Incentive Plan	10-Q	000-06920	10.3	8/23/2012
10.12*	Applied Materials, Inc. Employees' Stock Purchase Plan, amended and restated effective October 28, 2019†				
10.13*	Offer Letter, dated August 14, 2013, between Applied Materials, Inc. and Gary E. Dickerson	10-Q	000-06920	10.2	8/22/2013

Exhibit No.	Description	Incorporated by Reference			
		Form	File No.	Exhibit No.	Filing Date
10.14*	Form of Non-Qualified Stock Option Agreement for Employees for use under the Applied Materials, Inc. Employee Stock Incentive Plan, as amended	10-Q	000-06920	10.4	8/22/2013
10.15*	Form of Performance Unit Agreement for use under the Applied Materials, Inc. Employee Stock Incentive Plan, as amended	10-Q	000-06920	10.2	2/20/2014
10.16*	Form of Letter of Understanding for Long-Term Assignment	10-K	000-06920	10.49	12/17/2014
10.17*	Applied Materials, Inc. Applied Incentive Plan, amended and restated effective October 27, 2014	10-Q	000-06920	10.4	2/19/2015
10.18*	Form of Performance Shares Agreement for fiscal 2015 performance-based equity awards for certain executive officers under the amended and restated Applied Materials, Inc. Employee Stock Incentive Plan	10-Q	000-06920	10.5	2/19/2015
10.19	Credit Agreement, dated as of September 3, 2015, among Applied Materials, Inc., JPMorgan Chase Bank, N.A., as administrative agent, and other lenders named therein	8-K	000-06920	10.1	9/9/2015
10.20	Extension Agreement, dated as of September 3, 2017, to Credit Agreement, dated as of September 3, 2015, among Applied Materials, Inc., JPMorgan Chase Bank, N.A., as administrative agent, and the lenders party thereto.	8-K	000-06920	10.1	9/5/2017
10.21*	Applied Materials, Inc. Stock Purchase Plan for Offshore Employees, amended and restated effective October 28, 2019				
10.22*	Applied Materials, Inc. 2016 Deferred Compensation Plan	10-K	000-06920	10.33	12/9/2015
10.23*	Applied Materials, Inc. Employee Stock Incentive Plan, as amended and restated effective March 9, 2017	10-Q	000-06920	10.1	5/25/2017
10.24*	Applied Materials, Inc. Senior Executive Bonus Plan, as amended and restated effective March 9, 2017	10-Q	000-06920	10.2	5/25/2017
10.25*	Amendment No. 1 to the Applied Materials, Inc. 2016 Deferred Compensation Plan	10-Q	000-06920	10.1	2/21/2019
10.26*	Second Amendment to the Applied Materials, Inc. 2016 Deferred Compensation Plan	10-Q	000-06920	10.2	2/21/2019
10.27*	Form of Performance Shares Agreement for members of the Executive Staff for use under the Applied Materials, Inc. Employee Stock Incentive Plan	10-Q	000-06920	10.3	2/21/2019
10.28*	Form of Restricted Stock Unit Agreement for members of the Executive Staff for use under the Applied Materials, Inc. Employee Stock Incentive Plan	10-Q	000-06920	10.4	2/21/2019
10.29*	Share Purchase Agreement, dated as of June 30, 2019, among Applied Materials, Inc., Kokusai Electric Corporation and KKR HKE Investment L.P.	8-K	000-06920	2.1	7/1/2019
10.30	Term Loan Credit Agreement, dated as of August 19, 2019, among Applied Materials, Inc., JPMorgan Chase Bank, N.A., as administrative agent, and other lenders named therein	8-K	000-06920	10.1	8/21/2019
10.31	Amendment No. 2, dated as of August 19, 2019, to Credit Agreement, dated as of September 3, 2015, among Applied Materials, Inc., JPMorgan Chase Bank, N.A., as administrative agent, and other lenders named therein	8-K	000-06920	10.2	8/21/2019
21	SubsiSubsidiaries of Applied Materials, Inc.†				
23	Consent of Independent Registered Public Accounting Firm, KPMG LLP†LP†				
24	Power of Attorney (included on the signature page of this Annual Report on Form 10-K)†				
31.1	Certification of Chief Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002†				

			Incorporated by Reference		
Exhibit No.	**Description**	**Form**	**File No.**	**Exhibit No.**	**Filing Date**
31.2	Certification of Chief Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002†				
32.1	Certification Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002‡				
32.2	Certification Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002‡				
101.INS	XBRL Instance Document‡				
101.SCH	XBRL Taxonomy Extension Schema Document‡				
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document‡				
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document‡				
101.LAB	XBRL Taxonomy Extension Label Linkbase Document‡				
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document‡				
104	Cover Page Interactive Data File (formatted as inline XBRL)				

* Indicates a management contract or compensatory plan or arrangement, as required by Item 15(a)(3).

† Filed herewith.

‡ Furnished herewith.

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.

APPLIED MATERIALS, INC.

By: /S/ GARY E. DICKERSON

Gary E. Dickerson

President, Chief Executive Officer

Dated: December 13, 2019

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Gary E. Dickerson, Daniel J. Durn and Thomas F. Larkins, jointly and severally, his or her attorneys-in-fact, each with the power of substitution, for him or her in any and all capacities, to sign any amendments to this Annual Report on Form 10-K, and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that each of said attorneys-in-fact, or his substitute or substitutes, may do or cause to be done by virtue hereof.

******

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

	Title	Date
/S/ GARY E. DICKERSON Gary E. Dickerson	President, Chief Executive Officer and Director (Principal Executive Officer)	December 13, 2019
/S/ DANIEL J. DURN Daniel J. Durn	Senior Vice President, Chief Financial Officer (Principal Financial Officer)	December 13, 2019
/S/ CHARLES W. READ Charles W. Read	Corporate Vice President, Corporate Controller and Chief Accounting Officer (Principal Accounting Officer)	December 13, 2019
/S/ THOMAS J. IANNOTTI Thomas J. Iannotti	Chairman of the Board	December 13, 2019
/S/ JUDY BRUNER Judy Bruner	Director	December 13, 2019
/S/ XUN CHEN Xun Chen	Director	December 13, 2019
/S/ AART J. DE GEUS Aart J. de Geus	Director	December 13, 2019
/S/ STEPHEN R. FORREST Stephen R. Forrest	Director	December 13, 2019
/S/ ALEXANDER A. KARSNER Alexander A. Karsner	Director	December 13, 2019
/S/ ADRIANNA C. MA Adrianna C. Ma	Director	December 13, 2019
/s/ YVONNE MCGILL Yvonne McGill	Director	December 13, 2019
/s/ SCOTT A. MCGREGOR Scott A. McGregor	Director	December 13, 2019
/S/ DENNIS D. POWELL Dennis D. Powell	Director	December 13, 2019

Exhibit 4.5

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

Applied Materials, Inc. ("we," "our," or the "Company") has one class of securities registered under Section 12 of the Securities Exchange Act of 1934, as amended: our common stock.

DESCRIPTION OF COMMON STOCK

The general terms and provisions of our common stock are summarized below. This summary does not purport to be complete and is subject to, and is qualified in its entirety by express reference to, the provisions of our Certificate of Incorporation, as amended (our "Charter"), and Amended and Restated Bylaws (our "Bylaws"), each of which is filed as an exhibit to the Annual Report on Form 10-K of which this Exhibit 4.5 is a part. We encourage you to read our Charter and Bylaws and the applicable provisions of the General Corporation Law of the State of Delaware (the "DGCL") for additional information.

Authorized Shares

Under our Charter, we have the authority to issue 2,500,000,000 shares of common stock, with a par value of $0.01 per share.

Voting Rights

Holders of our common stock are entitled to one vote per share on all matters voted on by our stockholders. Our common stock does not have cumulative voting rights.

Dividend Rights

The holders of our common stock are entitled to receive dividends when, as, and if declared by our board of directors out of legally available funds, subject to the rights of any then outstanding preferred stock.

Liquidation Rights

Upon a liquidation or dissolution of the Company, whether voluntary or involuntary, all shares of our common stock are entitled to share equally and ratably in the assets available for distribution to holders of common stock after payment of all of our prior obligations, subject to the rights of any then outstanding preferred stock.

Other Matters

All issued and outstanding shares of our common stock are fully paid and nonassessable. The holders of our common stock have no preemptive, conversion or exchange rights. There are no redemption or sinking fund provisions applicable to our common stock.

Certain Anti-Takeover Effects

Certain provisions of the DGCL and our Charter and Bylaws contain provisions that could have certain anti-takeover effects and may delay, deter or prevent a tender offer or takeover attempt that a stockholder might consider to be in its best interests, as discussed below:

Authorized but Unissued Shares. Subject to the requirements of The NASDAQ Stock Market LLC and other applicable law, our authorized but unissued shares of common stock may be available for future issuance without stockholder approval. We may use these additional shares for a variety of corporate purposes, including future public offerings to raise additional capital, corporate acquisitions and employee benefit plans. The existence of authorized but unissued shares of common stock could render more difficult or discourage an attempt to obtain control of us by means of a tender offer, takeover attempt or otherwise.

Undesignated Preferred Stock. Our Charter provides that our board of directors may issue up to 1,000,000 shares of preferred stock and fix the designations, powers, preferences and rights related to that preferred stock. Preferred stock could be issued by our board of directors to increase the number of outstanding shares making a takeover more difficult and expensive.

Advance Notice Requirements. Our Bylaws establish an advance notice procedure for stockholders seeking to nominate candidates for election to the board of directors or for proposing matters which can be acted upon at stockholders' meetings.

Special Meetings of Stockholders. Our Bylaws vest the power to call special meetings of stockholders in our board of directors, the chairman of our board of directors, our president or stockholders holding shares representing not less than 20% of our outstanding shares of common stock (subject to the procedures and other requirements set forth in our Bylaws).

No Stockholder Action by Written Consent. Our Charter prohibits stockholder action by written consent in lieu of a meeting.

Proxy Access. Our Bylaws contain provisions which provide that a stockholder, or group of up to 20 stockholders, that has owned continuously for at least three years shares of common stock representing an aggregate of at least 3% of the Company's outstanding shares of common stock, may nominate and include in the Company's proxy materials a specified number of director nominees, provided that the stockholder(s) and nominee(s) satisfy the requirements in our Bylaws. The maximum number of stockholder nominees is generally the greater of (x) two or (y) 20% of the total number of our directors in office as of the last day on which notice of a nomination may be delivered or, if such amount is not a whole number, the closest whole number below 20%.

No Cumulative Voting. Our Charter and Bylaws do not provide for cumulative voting on the election of directors.

Delaware Business Combination Statute. As a Delaware corporation, we are subject to Section 203 of the DGCL. In general, Section 203 of the DGCL provides that we may not engage in certain "business combinations" with any "interested stockholder" for a three-year period following the time that such stockholder becomes an interested stockholder unless:

- prior to such time, our board of directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- upon consummation of the transaction which resulted in the stockholder becoming an "interested stockholder," the interested stockholder owned at least 85% of our voting stock outstanding at the time the transaction commenced (excluding certain shares); or
- on or subsequent to such time, the business combination is approved by our board of directors and authorized at a meeting of stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock not owned by the interested stockholder.

Exhibit 4.5

Generally, a "business combination" includes a merger, asset or stock sale or other transaction resulting in a financial benefit to the interested stockholder. Subject to certain exceptions, an "interested stockholder" is a person who, together with that person's affiliates and

Listing

Our common stock is traded on The Nasdaq Stock Market LLC under the trading symbol "AMAT."

Exhibit 10.12

APPLIED MATERIALS, INC.

EMPLOYEES' STOCK PURCHASE PLAN

(Amended and Restated Effective as of October 28, 2019)

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APPLIED MATERIALS, INC.
EMPLOYEES' STOCK PURCHASE PLAN
(Amended and Restated Effective as of October 28, 2019)

Section 1
PURPOSE

Applied Materials, Inc. having established the Applied Materials, Inc. Employees' Stock Purchase Plan (the "Plan"), in order to provide eligible employees of the Company with the opportunity to purchase Common Stock through payroll deductions or, if payroll deductions are not permitted under local laws, through other means as specified by the Committee, hereby amends and restates the Plan in its entirety, effective as of October 28, 2019 as set forth herein. The Plan is intended to qualify as an employee stock purchase plan under Section 423(b) of the Code, although the Company makes no undertaking or representation to maintain such qualification.

SECTION 2
DEFINITIONS

2.1 "1934 Act" means the Securities Exchange Act of 1934, as amended. Reference to a specific Section of the 1934 Act or regulation thereunder shall include such Section or regulation, any valid regulation promulgated under such Section, and any comparable provision of any future legislation or regulation amending, supplementing or superseding such Section or regulation.

2.2 "Board" means the Board of Directors of the Company.

2.3 "Code" means the Internal Revenue Code of 1986, as amended. Reference to a specific Section of the Code or regulation thereunder shall include such Section or regulation, any valid regulation promulgated under such Section, and any comparable provision of any future legislation or regulation amending, supplementing or superseding such Section or regulation.

2.4 "Committee" shall mean the committee appointed by the Board to administer the Plan. Any member of the Committee may resign at any time by notice in writing mailed or delivered to the Secretary of the Company. Until otherwise determined by the Board, the Plan shall be administered by the Human Resources and Compensation Committee of the Board.

2.5 "Common Stock" means the common stock of the Company, $0.01 par value per share.

2.6 "Company" means Applied Materials, Inc., a Delaware corporation.

2.7 "Compensation" means a Participant's base salary or base hourly wages payable for standard hours, excluding any other type of compensation such as commissions, overtime, bonuses, allowances or shift differential. The Committee, in its discretion, may, on a uniform and nondiscriminatory basis or as otherwise permitted by Treasury Regulation Section 1.423-2(f), establish a different definition of Compensation prior to an Enrollment Date for all options to be granted on such Enrollment Date in an Offering.

2.8 "Eligible Employee" means every Employee of an Employer, except (a) any Employee who immediately after the grant of an option under the Plan, would own stock and/or hold outstanding options to purchase stock possessing five percent (5%) or more of the total combined voting power or value of all classes of stock of the Company or of any Subsidiary of the Company (including stock attributed to such Employee pursuant to Section 424(d) of the Code), or (b) as provided in this Section 2.8. The Committee, in its discretion, from time to time may, prior to an Enrollment Date for all options to be granted on such Enrollment Date in an Offering, determine on a uniform and nondiscriminatory basis or as otherwise permitted by Treasury Regulation Section 1.423-2 that an Employee shall not be an Eligible Employee if he or she: (1) has not completed the required length of service with the Company, if any, as such length may be determined by the Committee in its discretion (such length of required service not to exceed two (2) years), (2) customarily works not more than twenty (20) hours per week (or such lesser period of time as may be determined by the Committee in its discretion), (3) customarily works not more than five (5) months per calendar year (or such lesser period of time as may be determined by the Committee in its discretion), (4) is a highly compensated employee under Section 414(q) of the Code, (5) is a highly compensated employee under Section 414(q) of the Code with compensation above a certain level or who is an officer or subject to the disclosure requirements of Section 16(a) of the 1934 Act, provided any exclusion be applied with respect to an individual Offering in a manner complying with Treasury Regulation Section 1.423-2(e)(2)(ii). Further, and notwithstanding the foregoing, Employees who are citizens or residents of a non-U.S. jurisdiction (without regard to whether they also are citizens or residents of the United States or resident aliens (within the meaning of Section 7701(b)(1)(A) of the Code)) may be excluded from the Plan or an Offering if the participation of such Employees is prohibited under the laws of the applicable jurisdiction or if complying with the laws of the applicable jurisdiction would cause the Plan or an Offering to violate Section 423 of the Code. An Employee who otherwise is an Eligible Employee shall be treated as continuing to be such while the Employee is on sick leave or other leave of absence approved in writing by the Employer, except that if the period of leave exceeds three (3) months and the Employee's right to reemployment is not guaranteed by statute or contract, he or she shall cease to be an Eligible Employee on the date three (3) months and one (1) day following the start of such leave. Until and unless determined otherwise by the Committee, Eligible Employees shall exclude each Employee (other than as excluded by subsection (a) of this Section 2.8) of an Employer who is customarily employed by the Company and/or a Subsidiary to work less than or equal to twenty (20) hours per week or five (5) months per calendar year.

2.9 "Employee" means an individual who is a common-law employee of any Employer, whether such employee is so employed at the time the Plan is adopted or becomes so employed subsequent to the adoption of the Plan.

2.10 "Employer" or "Employers" means any one or all of the Company and those Subsidiaries which, with the consent of the Board or the Committee, have adopted the Plan or have been designated by the Board or the Committee in writing as an Employer for purposes of participation in the Plan. With respect to a particular Participant, Employer means the Company or Subsidiary, as the case may be, that directly employs the Participant.

2.11 "Enrollment Date" means such dates as may be determined by the Committee, in its discretion and on a uniform and nondiscriminatory basis, from time to time.

2.12 "Grant Date" means any date on which a Participant is granted an option under the Plan.

2.13 "Offering" means an offer under this Plan of an option that may be exercised during the period described in Section 5.2. For purposes of the Plan, all Eligible Employees will be deemed to participate in the same Offering unless the Committee otherwise determines that Eligible Employees of one or more Employers will be deemed to participate in separate Offerings, in which case the Offerings will be considered separate even if the dates of each such Offering are identical and the provisions of the Plan will separately apply to each Offering. To the extent permitted by Treasury Regulation Section 1.423-2(a)(1), the terms of each Offering need not be identical provided that the terms of the Plan and the Offering together satisfy Treasury Regulation Sections 1.423-2(a)(2) and (a)(3).

2.14 "Participant" means an Eligible Employee who (a) has become a Participant in the Plan pursuant to Section 4.1 and (b) has not ceased to be a Participant pursuant to Section 8 or Section 9.

2.15 "Plan" means the Applied Materials, Inc. Employees' Stock Purchase Plan, as set forth in this instrument and as hereafter amended from time to time.

2.16 "Purchase Date" means such dates on which each outstanding option granted under the Plan shall be exercised (except in such instance in which the Plan has been terminated), as may be determined by the Committee, in its discretion and on a uniform and nondiscriminatory basis from time to time prior to an Enrollment Date for all options to be granted on such Enrollment Date.

2.17 "Purchase Period" means the period beginning on such date as may be determined by the Committee, in its discretion and on a uniform and nondiscriminatory basis, and ending on a Purchase Date.

2.18 "Subsidiary" means any corporation in an unbroken chain of corporations beginning with the Company if each of the corporations other than the last corporation in the unbroken chain then owns stock possessing fifty percent (50%) or more of the total combined voting power of all classes of stock in one of the other corporations in such chain.

2.19 "Treasury Regulations" means the Treasury regulations of the Code. Reference to a specific Treasury Regulation or Section of the Code shall include such Treasury

Regulation or Section, any valid regulation promulgated under such Section, and any comparable provision of any future legislation or regulation amending, supplementing or superseding such Section or regulation.

SECTION 3

SHARES SUBJECT TO THE PLAN

3.1 Number Available. A maximum of 95,200,000 shares of Common Stock shall be available for issuance pursuant to the Plan. Shares issued under the Plan may be newly issued shares or treasury shares.

3.2 Adjustments. In the event of any reorganization, recapitalization, stock split, reverse stock split, stock dividend, spin off, combination of shares, merger, consolidation, offering of rights or other similar change in the capital structure of the Company, the Committee shall proportionately adjust the number, kind and purchase price of the shares available for purchase under the Plan, the per person share number limits on purchases and the purchase price and number of shares subject to any option under the Plan which has not yet been exercised.

SECTION 4

ENROLLMENT

4.1 Participation. Each Eligible Employee may elect to become a Participant by enrolling or re-enrolling in the Plan effective as of any Enrollment Date. In order to enroll, an Eligible Employee must complete, sign and submit to the Company an enrollment form in such form, manner and by such deadline as may be specified by the Committee from time to time, in its discretion and on a nondiscriminatory basis or as otherwise permitted by Treasury Regulation Section 1.423-2, and which may be in electronic form. Any Participant whose option expires and who has not withdrawn from the Plan shall be automatically re-enrolled in the Plan on the Enrollment Date immediately following the Purchase Date on which his or her option expires.

4.2 Payroll Withholding and Contribution. On his or her enrollment form, each Participant must elect to make Plan contributions via payroll withholding from his or her Compensation or, if payroll withholding is not permitted under local laws, via such other means as specified by the Committee to the extent permitted by Treasury Regulation Section 1.423-2. Pursuant to such procedures as the Committee may specify from time to time (which may be in electronic form), a Participant may elect to have withholding equal to, or otherwise contribute, a whole percentage from one percent (1%) to twenty-five percent (25%) (or such greater or lesser percentage or dollar amount that the Committee may establish from time to time, in its discretion and on a uniform and nondiscriminatory basis or as otherwise permitted by Treasury Regulation Section 1.423-2, for all options to be granted on any Enrollment Date in an Offering). Unless and until the Committee determines otherwise, no Participant may contribute more than $6,500 during any one Purchase Period. If permitted by the Committee, a Participant instead may elect to have a specific amount withheld or to contribute a specific amount, in dollars or in the applicable local currency, subject to such uniform and nondiscriminatory rules (or as otherwise permitted by Treasury Regulation Section 1.423-2) as the Committee in its discretion may specify. A Participant may elect to increase or decrease his or her rate of payroll withholding or contribution by submitting an election (which may be in electronic form) in accordance with, and if and to the extent permitted by, procedures established by the Committee from time to time, which may, if permitted by the Committee, include a decrease to zero percent (0%); provided, however, that unless determined otherwise by the Committee, a decrease to zero percent (0%) shall be deemed a withdrawal from the Plan. A Participant may stop his or her payroll withholding or contribution by submitting an election in accordance with and to the extent permitted by procedures as may be established by the Committee from time to time. In order to be effective as of a specific date, an enrollment election must be received by the Company no later than the deadline specified by the Committee, in its discretion and on a nondiscriminatory basis, from time to time. Any Participant who is automatically re-enrolled in the Plan shall be deemed to have elected to continue his or her payroll withholding or contributions at the percentage last elected by the Participant. Notwithstanding the foregoing, to the extent necessary to comply with Section 423(b)(8) of the Code and Section 5.3 of the Plan, the Company may automatically decrease a Participant’s payroll deductions to zero percent (0%) at any time during an option period. Under such circumstances, payroll deductions shall recommence at the rate provided in such Participant’s enrollment form at the beginning of the first Purchase Period which is scheduled to end in the following calendar year, unless terminated by the Participant as provided in Section 7 of the Plan.

SECTION 5

OPTIONS TO PURCHASE COMMON STOCK

5.1 Grant of Option. On each Enrollment Date on which the Participant enrolls or re-enrolls in the Plan, he or she shall be granted an option to purchase shares of Common Stock.

5.2 Duration of Option. Each option granted under the Plan shall expire on the earliest to occur of (a) the completion of the purchase of shares on the last Purchase Date occurring within 27 months of the Grant Date of such option, (b) such shorter option period as may be established by the Committee from time to time, in its discretion and on a uniform and nondiscriminatory basis or as otherwise permitted by Treasury Regulation Section 1.423-2, prior to an Enrollment Date for all options to be granted on such Enrollment Date, or (c) the date on which the Participant ceases to be such for any reason.

5.3 Number of Shares Subject to Option. The maximum number of shares available for purchase by each Participant under the option or on any given Purchase Date shall be established by the Committee from time to time prior to an Enrollment Date for all options to be granted on such Enrollment Date, subject to this Section 5.3. Unless and until otherwise determined by the Committee, a Participant may not purchase more than 1,000 shares of Common Stock (subject to adjustment in accordance with Section 3.2) on any given Purchase Date. Notwithstanding any contrary provision of the Plan, to the extent required under Section 423(b) of the Code, an option (taken together with all other options then outstanding under this Plan and under all other similar employee stock purchase plans of the Employers) shall not give the Participant the right to purchase stock of the Company or any Subsidiary at a rate which accrues in excess of $25,000 worth of stock (determined using the fair market value of a share of the stock on the Grant Date of each such option) for each calendar year in which such option is outstanding, in accordance with Treasury Regulation Section 1.423-2(a)(3)(vi).

5.4 Other Terms and Conditions. Each option shall be subject to the following additional terms and conditions:

(a) payment for shares purchased under the option shall be made only through payroll withholding under Section 4.2, unless payroll withholding is not permitted under local laws as determined by the Committee, in which case the Participant may contribute by such other means as specified by the Committee to the extent permitted by Treasury Regulation Section 1.423-2;

(b) purchase of shares upon exercise of the option shall be accomplished only in accordance with Section 6.1;

(c) the price per share under the option shall be determined as provided in Section 6.1, subject to adjustment pursuant to Section 3.2;

(d) the option in all respects shall be subject to such other terms and conditions as the Committee shall determine from time to time in its discretion (applied on a uniform and nondiscriminatory basis or as otherwise permitted by Treasury Regulation Section 1.423-2); and

(e) each option will be granted under the same Offering unless the Committee otherwise designates separate Offerings for the Eligible Employees of one or more Employers, in which case, each Participant's option will be granted under the Offering designated for the Eligible Employees of the Participant's Employer.

SECTION 6
PURCHASE OF SHARES

6.1 Exercise of Option. Subject to Section 6.2 and the limits established under Section 5.3, on each Purchase Date, the funds then credited to each Participant's account shall be used to purchase whole shares of Common Stock. Any cash remaining after whole shares of Common Stock have been purchased or that exceed the $25,000 cap described in Section 5.3 above, shall be refunded to the Participant without interest (except as otherwise required under local laws, in which case the Committee may determine that interest must be paid to all Participants in the relevant Offering in order to comply with Section 423 of the Code). The price per share of Common Stock of the shares purchased under any option granted under the Plan shall be determined by the Committee from time to time, in its discretion and on a uniform and nondiscriminatory basis or as otherwise permitted by Treasury Regulation Section 1.423-2, for all options to be granted on an Enrollment Date in an Offering. However, in no event shall the price be less than eighty-five percent (85%) of the lower of:

(a) the closing price per share of Common Stock on the Grant Date for such option on the Nasdaq Global Select Market; or

(b) the closing price per share of Common Stock on the Purchase Date on the Nasdaq Global Select Market.

If a closing price is not available on the Grant Date or Purchase Date, then the closing price per share of Common Stock referred to in 6.1(a) and (b) above shall refer to the closing price per share of Common Stock on the first Nasdaq Global Select Market trading day immediately following the Grant Date or preceding the Purchase Date, respectively.

6.2 Delivery of Shares. As directed by the Committee in its sole discretion, shares purchased on any Purchase Date shall be delivered directly to the Participant or to a custodian or broker, if any, designated by the Committee to hold shares for the benefit of the Participants. As determined by the Committee from time to time, such shares shall be delivered as physical certificates or by means of a book entry system.

6.3 Exhaustion of Shares. If at any time the shares available under the Plan are over-enrolled, enrollments shall be reduced to eliminate the over-enrollment, as the Committee determines, which determination shall be on a uniform and nondiscriminatory manner. For example, the Committee may determine that such reduction method shall be “bottom up,” with the result that all option exercises for one share shall be satisfied first, followed by all exercises for two shares, and so on, until all available shares have been exhausted. Any funds that, due to over-enrollment, cannot be applied to the purchase of whole shares shall be refunded to the Participants without interest thereon, except as otherwise required under local laws (in which case the Committee may determine that interest must be paid to all Participants in the relevant Offering in order to comply with Section 423 of the Code).

6.4 Tax Withholding. Prior to the delivery of any shares purchased under the Plan (or at any other time that a taxable event related to the Plan occurs), the Company shall have the power and the right to deduct or withhold, or require a Participant to remit to the Company, an amount sufficient to satisfy all tax and social insurance liability obligations and requirements in connection with the options and shares purchased thereunder, if any, including, without limitation, all federal, state, and local taxes (including the Participant’s FICA obligation, if any) that are required to be withheld by the Company or the employing Subsidiary, the Participant’s and, to the extent required by the Company (or the employing Subsidiary), the Company’s (or the employing Subsidiary’s) fringe benefit tax liability, if any, associated with the grant, vesting, or sale of shares and any other Company (or employing Subsidiary) taxes the responsibility for which the Participant has agreed to bear with respect to such shares.

SECTION 7

WITHDRAWAL

A Participant may withdraw from the Plan by submitting a withdrawal form to the Company in such form and manner as the Committee may specify (which may be in electronic form). A withdrawal shall be effective only if it is received by the Company by the deadline specified from time to time by the Committee, in its discretion and on a uniform and nondiscriminatory basis or as otherwise permitted by Treasury Regulation Section 1.423-2. Unless otherwise determined by the Committee, when a withdrawal becomes effective, the

Participant's payroll contributions shall cease and all amounts then credited to the Participant's account shall be distributed to him or her, without interest thereon, except as otherwise required under local laws (in which case the Committee may determine that interest must be paid to all Participants in the relevant Offering in order to comply with Section 423 of the Code).

SECTION 8
CESSATION OF PARTICIPATION

A Participant shall cease to be a Participant immediately upon the cessation of his or her status as an Eligible Employee (for example, because of his or her termination of employment from all Employers for any reason), except that the Committee, in its discretion and on a uniform and nondiscriminatory basis, may permit an individual who has ceased to be an Eligible Employee to exercise his or her option on the next Purchase Date to the extent permitted by Code Section 423. As soon as practicable after such cessation, the Participant's payroll contributions shall cease and all amounts then credited to the Participant's account shall be distributed to him or her without interest thereon, except as otherwise required under local laws (in which case the Committee may determine that interest must be paid to all Participants in the relevant Offering in order to comply with Section 423 of the Code).

SECTION 9
DESIGNATION OF BENEFICIARY

9.1 Designation. Each Participant may, pursuant to such uniform and nondiscriminatory procedures (or as otherwise permitted by Treasury Regulation Section 1.423-2) as the Committee may specify in its discretion from time to time, designate one or more individuals to receive any amounts credited to the Participant's account at the time of his or her death ("Beneficiaries"). Notwithstanding any contrary provision of this Section 9, Sections 9.1 and 9.2 shall be operative only after, and for so long as, the Committee determines on a uniform and nondiscriminatory basis (or as otherwise permitted by Treasury Regulation Section 1.423-2) to permit the designation of Beneficiaries.

9.2 Changes. A Participant may designate different Beneficiaries or may revoke a prior Beneficiary designation at any time by delivering a new designation or revocation of a prior designation, as applicable, in like manner. Any designation or revocation shall be effective only if it is received by the Committee. However, when so received, the designation or revocation shall be effective as of the date the designation or revocation is executed, whether or not the Participant still is living, but without prejudice to the Committee on account of any payment made before the change is recorded. The last effective designation received by the Committee shall supersede all prior designations.

9.3 Failed Designations. If a Participant dies without having effectively designated a Beneficiary, or if no Beneficiary survives the Participant, the Participant's account shall be payable to his or her estate.

SECTION 10
ADMINISTRATION

10.1 Plan Administrator. The Plan shall be administered by the Committee. The Committee shall have the authority to control and manage the operation and administration of the Plan.

10.2 Actions by Committee. Each decision of a majority of the members of the Committee then in office shall constitute the final and binding act of the Committee. The Committee may act with or without a meeting being called or held and shall keep minutes of all meetings held and a record of all actions taken by written consent.

10.3 Powers of Committee. The Committee shall have all powers and discretion necessary or appropriate to administer the Plan and to control its operation in accordance with its terms, including, but not by way of limitation, the following discretionary powers:

(a) To interpret and determine the meaning and validity of the provisions of the Plan and the options and to determine any question arising under, or in connection with, the administration, operation or validity of the Plan or the options;

(b) To determine the form and manner for Participants to make elections under the Plan;

(c) To determine any and all considerations affecting the eligibility of any Employee to become a Participant or to remain a Participant in the Plan;

(d) To cause an account or accounts to be maintained for each Participant and establish rules for the crediting of contributions and/or shares to the account(s);

(e) To determine the time or times when, and the number of shares for which, options shall be granted;

(f) To establish and revise an accounting method or formula for the Plan;

(g) To designate a custodian or broker to receive shares purchased under the Plan and to determine the manner and form in which shares are to be delivered to the designated custodian or broker;

(h) To determine the status and rights of Participants and their Beneficiaries or estates;

(i) To employ such brokers, counsel, agents and advisers, and to obtain such broker, legal, clerical and other services, as it may deem necessary or appropriate in carrying out the provisions of the Plan;

(j) To establish, from time to time, rules for the performance of its powers and duties and for the administration of the Plan;

(k) To adopt such procedures and subplans as are necessary or appropriate to permit participation in the Plan by employees who are foreign nationals or employed outside of the United States;

(l) To determine that, to the extent permitted by Treasury Regulation Section 1.423-2(f), the terms of an option granted under the Plan or an Offering to citizens or residents of a non-U.S. jurisdiction (without regard to whether they also are citizens or residents of the United States or resident aliens (within the meaning of Section 7701(b)(1)(A) of the Code)) will be less favorable than the terms of options granted under the Plan or the same Offering to Employees resident in the United States;

(m) To designate separate Offerings for the Eligible Employees of one or more Employers, in which case the Offerings will be considered separate even if the dates of each such Offering are identical and the provisions of the Plan will separately apply to each Offering; and

(n) To delegate to any one or more of its members or to any other person including, but not limited to, employees of any Employer, severally or jointly, the authority to perform for and on behalf of the Committee one or more of the functions of the Committee under the Plan.

10.4 Decisions of Committee. All actions, interpretations, and decisions of the Committee shall be made in the sole discretion of the Committee and shall be conclusive and binding on all persons, and shall be given the maximum deference permitted by law.

10.5 Administrative Expenses. All expenses incurred in the administration of the Plan by the Committee, or otherwise, including legal fees and expenses, shall be paid and borne by the Employers, except any stamp duties or transfer taxes applicable to the purchase of shares may be charged to the account of each Participant. Any brokerage fees for the purchase of shares by a Participant shall be paid by the Company, but fees and taxes (including brokerage fees) for the transfer, sale or resale of shares by a Participant, or the issuance of physical share certificates, shall be borne solely by the Participant.

10.6 Eligibility to Participate. No member of the Committee who is also an employee of an Employer shall be excluded from participating in the Plan if otherwise eligible, but he or she shall not be entitled, as a member of the Committee, to act or pass upon any matters pertaining specifically to his or her own account under the Plan.

10.7 Indemnification. Each of the Employers shall, and hereby does, indemnify and hold harmless the members of the Committee and the Board, from and against any and all losses, claims, damages or liabilities, including attorneys’ fees and amounts paid, with the approval of the Board or the Committee, in settlement of any claim, arising out of or resulting from the implementation of a duty, act or decision with respect to the Plan, so long as such duty, act or decision does not involve gross negligence or willful misconduct on the part of any such individual.

SECTION 11
AMENDMENT, TERMINATION, AND DURATION

11.1 Amendment, Suspension, or Termination. The Board or the Committee, in its sole discretion, may amend, suspend or terminate the Plan, or any part thereof, at any time and for any reason. If the Plan is amended, suspended or terminated, the Board or the Committee, in its discretion, may elect to terminate all outstanding options either immediately or upon completion of the purchase of shares on the next Purchase Date (which, notwithstanding Section 2.16, may be sooner than originally scheduled, if determined by the Board or the Committee in its discretion), or may elect to permit options to expire in accordance with their terms (and participation to continue through such expiration dates). If the options are terminated prior to expiration, all amounts then credited to Participants' accounts that have not been used to purchase shares shall be returned to the Participants (without interest thereon, except as otherwise required under local laws, in which case the Committee may determine that interest must be paid to all Participants in the relevant Offering in order to comply with Section 423 of the Code) as soon as administratively practicable. Except as provided in Section 3.2 and this Section 11 hereof, no amendment may make any change in any option theretofore granted which adversely affects the rights of any Participant unless his or her consent is obtained. To the extent necessary to comply with Section 423 of the Code (or any successor rule or provision or any other applicable law, regulation or stock exchange rule), the Company shall obtain stockholder approval of any amendment in such a manner and to such a degree as required. In addition, an amendment will be subject to stockholder approval if the Committee or the Board, in their sole discretion, deems such amendment to be a material amendment, except with respect to such an amendment which will impact, in the aggregate, no more than five percent (5%) of the shares reserved for issuance under the Plan. The following amendments shall be deemed material amendments for purposes of the preceding sentence (i) material increases to the benefits accrued to Participants under the Plan; (ii) increases to the total number of securities that may be issued under the Plan; (iii) material modifications to the requirements for participation in the Plan, and (iv) the addition of a new provision allowing the Board or the Committee to lapse or waive restrictions at its discretion. The amendment, suspension, or termination of the Plan shall not, without the consent of the Participant, alter or impair any rights or obligations under any option theretofore granted to such Participant. No option may be granted during any period of suspension or after termination of the Plan. Without stockholder approval and without regard to whether any Participant rights may be considered to have been "adversely affected," the Committee shall be entitled to change the duration of an option, limit the frequency and/or number of changes in the amount withheld during the duration of an option, establish the exchange ratio applicable to amounts withheld in a currency other than U.S. dollars, permit payroll withholding in excess of the amount designated by a Participant in order to adjust for delays or mistakes in the Company's processing of properly completed withholding elections, establish reasonable waiting and adjustment periods and/or accounting and crediting procedures to ensure that amounts applied toward the purchase of Common Stock for each Participant properly correspond with amounts withheld from the Participant's Compensation, and establish such other limitations or procedures as the Committee determines in its sole discretion advisable which are consistent with the Plan.

Without regard to whether any Participant's rights may be considered to have been "adversely affected", in the event the Committee determines that the ongoing operation of the Plan may result in unfavorable financial accounting consequences, the Committee may, in its discretion and, to the extent necessary or desirable, modify or amend the Plan to reduce or eliminate such accounting consequence including, but not limited to:

(a) Amending the Plan to conform with the safe harbor definition under Statement of Financial Accounting Standards 123(R), including with respect to an option issued at the time of the amendment;

(b) Increasing or otherwise altering the exercise price for any option including an option issued at the time of the change in exercise price;

(c) Reducing the maximum percentage of Compensation that a Participant may elect to set aside as payroll deductions;

(d) Shortening the duration of any option so that the option ends on a new Purchase Date, including an option issued at the time of the Committee action; and

(e) Reducing the number of shares that may be purchased upon exercise of outstanding options.

Such modifications or amendments shall not require stockholder approval or the consent of any Participants.

11.2 Duration of the Plan. The Plan shall commence on the date specified herein, and subject to Section 11.1 (regarding the Board's and the Committee's right to amend or terminate the Plan), shall remain in effect thereafter.

SECTION 12
GENERAL PROVISIONS

12.1 Participation by Subsidiaries. One or more Subsidiaries of the Company may become participating Employers by adopting the Plan and obtaining approval for such adoption from the Board or the Committee. By adopting the Plan, a Subsidiary shall be deemed to agree to all of its terms, including, but not limited to, the provisions granting exclusive authority (a) to the Board and the Committee to amend the Plan, and (b) to the Committee to administer and interpret the Plan. An Employer may terminate its participation in the Plan at any time. The liabilities incurred under the Plan to the Participants employed by each Employer shall be solely the liabilities of that Employer, and no other Employer shall be liable for benefits accrued by a Participant during any period when he or she was not employed by such Employer.

12.2 Inalienability. In no event may either a Participant, a former Participant or his or her Beneficiary, spouse or estate sell, transfer, anticipate, assign, hypothecate, or otherwise dispose of any right or interest under the Plan; and such rights and interests shall not at any time be subject to the claims of creditors nor be liable to attachment, execution or other legal process. Accordingly, for example, a Participant's interest in the Plan is not transferable pursuant to a domestic relations order.

12.3 Severability. In the event any provision of the Plan shall be held illegal or invalid for any reason, the illegality or invalidity shall not affect the remaining parts of the Plan, and the Plan shall be construed and enforced as if the illegal or invalid provision had not been included.

12.4 Requirements of Law. The granting of options and the issuance of shares shall be subject to all applicable laws, rules, and regulations, and to such approvals by any governmental agencies or securities exchanges as the Committee may determine are necessary or appropriate.

12.5 Compliance with Rule 16b-3. Any transactions under this Plan with respect to officers, as defined in Rule 16a-1 promulgated under the 1934 Act, are intended to comply with all applicable conditions of Rule 16b-3. To the extent any provision of the Plan or action by the Committee fails to so comply, it shall be deemed null and void to the extent permitted by law and deemed advisable by the Committee. Notwithstanding any contrary provision of the Plan, if the Committee specifically determines that compliance with Rule 16b-3 no longer is required, all references in the Plan to Rule 16b-3 shall be null and void.

12.6 No Enlargement of Employment Rights. Neither the establishment or maintenance of the Plan, the granting of options, the purchase of shares, nor any action of any Employer or the Committee, shall be held or construed to confer upon any individual any right to be continued as an employee of the Employer nor, upon dismissal, any right or interest in any specific assets of the Employers other than as provided in the Plan. Each Employer expressly reserves the right to discharge any employee at any time, with or without cause.

12.7 Apportionment of Costs and Duties. All acts required of the Employers under the Plan may be performed by the Company for itself and its Subsidiaries, and the costs of the Plan may be equitably apportioned by the Committee among the Company and the other Employers. Whenever an Employer is permitted or required under the terms of the Plan to do or perform any act, matter or thing, it shall be done and performed by any officer or employee of the Employers who is thereunto duly authorized by the Employers.

12.8 Construction and Applicable Law. The Plan is intended to qualify as an "employee stock purchase plan" within the meaning of Section 423(b) of the Code. Any provision of the Plan which is inconsistent with Section 423(b) of the Code shall, without further act or amendment by the Company or the Committee, be reformed to comply with the requirements of Section 423(b). The provisions of the Plan shall be construed, administered and enforced in accordance with such Section and with the laws of the State of California, excluding California's conflict of laws' provisions.

12.9 Captions. The captions contained in and the table of contents prefixed to the Plan are inserted only as a matter of convenience, and in no way define, limit, enlarge or describe the scope or intent of the Plan nor in any way shall affect the construction of any provision of the Plan.

12.10 Use of Funds. Payroll withholdings and other contributions received or held by the Company under the Plan may be used by the Company for any corporate purpose, and the Company will not be obligated to segregate such payroll withholdings or other contributions except under Offerings in which applicable local law requires that such payroll withholdings or other contributions be segregated from the Company's general corporate funds and/or deposited with an independent third party for Participants in non-U.S. jurisdictions.

12.11 Automatic Transfer to Low Price Option Period. To the extent permitted by applicable laws and specified by the Committee in advance for particular option periods, if the fair market value of the Common Stock on any Enrollment Date is higher than the fair market value of the Common Stock on the first day of any later Purchase Period during the same option period, then all Participants in such option period shall be automatically withdrawn from such option period and automatically re-enrolled in the immediately following new option period.

Exhibit 10.21

APPLIED MATERIALS, INC.
STOCK PURCHASE PLAN
FOR OFFSHORE EMPLOYEES

(Amended and Restated Effective as of October 28, 2019)

1. INTRODUCTION

Applied Materials, Inc. (the "Corporation"), having established the Applied Materials, Inc. Stock Purchase Plan for Offshore Employees (the "Plan"), hereby amends and restates the Plan in its entirety, effective as of October 28, 2019, as set forth herein. The Plan is intended to encourage ownership of common stock of the Corporation by eligible employees of participating affiliates of the Corporation ("Eligible Employees") and to provide incentives for them to exert maximum efforts for the success of the Corporation. By extending to Eligible Employees the opportunity to acquire proprietary interests in the Corporation and to participate in its success, the Plan may be expected to benefit the Corporation and its shareholders by making it possible to attract and retain qualified employees.

2. DEFINITIONS

The following words and phrases shall have the following meanings unless a different meaning is plainly required by the context:

2.1 "Affiliate" means any direct or indirect subsidiary of the Corporation which has been designated by the Board as a subsidiary that participates in the Plan.

2.2 "Board" means the Board of Directors of the Corporation, as from time to time constituted.

2.3 "Common Stock" means the common stock of the Corporation.

2.4 "Committee" means the committee, if any, appointed by the Board (pursuant to Section 4.3) to administer the Plan or any part thereof.

2.5 "Corporation" means Applied Materials, Inc., a Delaware Corporation.

2.6 "Eligible Employee" means any natural person employed by an Affiliate who is eligible to participate in the Plan in accordance with Section 5.

2.7 "Grant Date" means the date specified by the Board for the granting of Options in an Offering (as defined in Section 6).

2.8 "Option" means an option to acquire Common Stock under the terms of this Plan.

2.9 “Participating Employee” means, with respect to each Offering, any Eligible Employee who has elected to participate in accordance with Section 7.

2.10 “Plan” means this Stock Purchase Plan for Offshore Employees, as amended from time to time.

2.11 “Plan Administrator” means the employee or employees of the Corporation or of an Affiliate selected by the Board to perform assigned duties in the administration of the Plan.

2.12 “Share” means a share of Common Stock.

3. SHARES SUBJECT TO THE PLAN

No more than 38,800,000 Shares may be issued upon the exercise of Options granted under the Plan, subject to adjustments as provided in Section 9, which may be unissued Shares, reacquired Shares, or Shares bought on the open market. If any Option which shall have been granted shall expire or terminate for any reason without having been exercised in full, the unpurchased Shares shall again become available for purposes of the Plan (unless the Plan shall have been terminated).

4. ADMINISTRATION

4.1 The Plan shall be administered by the Board except to the extent that the Board has delegated responsibility for the administration of the Plan as stated in Section 4.3.

4.2 The Board shall have the plenary power, subject to and within the limits of the express provisions of the Plan:

(a) To construe and interpret the Plan and Options granted under it, and to establish, amend and revoke rules and regulations for its administration. The Board, in the exercise of this power, shall generally determine all questions of policy and expediency that may arise, and may correct any defect, supply any omission or reconcile any inconsistency in the Plan or in any instrument associated with the Plan, in such manner and to such extent as the Board shall deem necessary to make the Plan fully effective; and

(b) To establish the terms of each Offering.

4.3 The Board, by resolution, may delegate responsibility for the administration of the Plan or any part thereof, to the Committee, which shall be composed of members of the Board. Until and unless otherwise determined by the Board, the Human Resources and Compensation Committee of the Board shall be the Committee under the Plan and shall have full, but non-exclusive, authority to administer the Plan in accordance with its terms. The Board may from time to time remove members from, or add members to, the Committee. Vacancies on the Committee, howsoever caused, shall be filled by the Board. To the extent that responsibility for the administration of the Plan is delegated to the Committee, the Committee shall have the powers theretofore possessed by the Board, and to the extent that the Committee has been authorized to act, all references in this Plan to the Board shall include the Committee, subject, however, to such resolutions, not inconsistent with the provisions of the Plan, as may be adopted by the Board from time to time. The Committee may delegate all or a portion of its authority to act to one or more employees of the Corporation or an Affiliate, and to the extent of such delegation, references in the Plan to the Committee shall include any such delegates. The Board at any time, by resolution, may revoke such delegation and re-vest in the Board all or any part of the responsibility for the administration of the Plan.

4.4 The Board may delegate to the Plan Administrator the responsibility to perform such duties as it deems appropriate in the administration of the Plan. To the extent that the Board has not delegated such duties to the Plan Administrator, all references in this Plan to the Plan Administrator shall include the Board, subject, however, to such resolutions, not inconsistent with the provisions of the Plan, as may be adopted by the Board from time to time.

5. ELIGIBILITY

The Board shall designate the Eligible Employees who shall be eligible to participate in any Offering.

6. OFFERINGS

During the term of the Plan, the Corporation will make one or more offerings in which Options to purchase Common Stock will be granted to Eligible Employees under the Plan ("Offering"). The terms and conditions of Options to be granted in any such Offering will be determined by the Board under Section 7. In connection with any Offering, if the number of Shares for which Eligible Employees elect to participate shall be greater than the Shares remaining available, the available Shares shall, at the end of the Offering, be allocated among the Participating Employees pro rata on the basis of the number of Shares for which each has elected to participate.

7. TERMS AND CONDITIONS OF OPTIONS

ɔject to the limitations herein contained, the Board shall determine the terms of Options in each Offering, all of which shall be granted on the Grant Date of such Offering.

ɛ Option price per Share for each Offering shall be as determined by the Board.

7.3 The expiration date of the Options granted under each Offering shall be determined by the Board on or prior to the Grant Date for such Offering.

7.4 All Eligible Employees to whom Options are granted shall be entitled to purchase the number of full Shares as shall be established by the Board at the Grant Date. Each Eligible Employee may elect to participate for less than the maximum number of Shares which he or she is entitled to purchase under his or her Option. If an Eligible Employee elects to participate for less than the maximum number of Shares which he or she is entitled to purchase, his or her Option shall at that time terminate and become void to the extent of the number of Shares for which he or she does not elect to participate.

7.5 Each Eligible Employee who desires to participate in an Offering shall elect to do so by completing and delivering to the Plan Administrator or a person designated by the Plan Administrator an enrollment form in such form, manner and by such deadline as may be prescribed by the Plan Administrator from time to time, in its discretion, and which may be in electronic form.

7.6 A Participating Employee shall exercise his or her Option by delivering notice of exercise to the Plan Administration or a person designated by the Plan Administrator at such time and in such form and manner as the Plan Administrator shall prescribe.

7.7 Upon exercise of an Option, full payment for the Shares subject to the Option shall be made in such form or manner as the Board shall fix.

7.8 The Board may (but is not required to) establish on such terms and conditions as it shall determine a payroll deduction system for the purchase of Shares covered by the Options hereunder. If there are payroll deductions under any Offering, the Corporation or an Affiliate shall maintain a payroll deduction account for each Participating Employee. The Board may (but is not required to) provide for interest at such rate as the Board shall determine to be credited to the payroll deduction accounts.

7.9 The Board shall establish rules, terms and conditions for each Offering governing the exercise of outstanding Options in the event of a Participating Employee’s termination of employment or change in employment status.

7.10 The Corporation will seek to obtain from each regulatory committee or agency having jurisdiction such authority as may be required to issue and sell Shares to satisfy Options granted under the Plan. Inability of the Corporation to obtain from any such regulatory commission or agency authority which counsel for the Corporation deems necessary for the lawful issuance and sale of its Common Stock to satisfy Options granted under the Plan, shall relieve the Corporation from any liability for failure to issue and sell Common Stock to satisfy such Options pending the time when such authority is obtained or is obtainable.

7.11 Neither a Participating Employee to whom an Option is granted under the Plan nor his or her transferee shall have any rights as a stockholder with respect to any Shares covered by his or her Option until the date of the issuance of a stock certificate (which may be by book entry) to him or her for such Shares.

7.12 Options granted under the Plan shall not be transferable, except by will or by the laws of descent and distribution, and may be exercised during the lifetime of a Participating Employee only by him or her.

7.13 Each Option granted under the Plan shall be evidenced by such instrument or documentation, if any, as the Board shall establish, which shall be dated the Grant Date and shall comply with and be subject to the terms and conditions of the Plan.

7.14 Nothing in the Plan or in any Option granted under the Plan shall confer on any Participating Employee any right to continue in the employ of the Corporation or any of its affiliates or to interfere in any way with the right of the Corporation or any of its affiliates to terminate his or her employment at any time.

7.15 Prior to the delivery of any Shares purchased under the Plan, the Corporation shall have the power and the right to deduct or withhold, or require a Participating Employee to remit to the Corporation, an amount sufficient to satisfy all tax and social insurance or social security liability obligations and requirements in connection with the Options and Shares purchased thereunder, if any, including, without limitation, all federal, state, and local taxes (including the Participating Employee’s FICA obligation, if any) that are required to be withheld by the Corporation or the employing Affiliate, the Participating Employee’s and, to the extent required by the Corporation (or the employing Affiliate), the Corporation’s (or the employing Affiliate’s) fringe benefit tax liability, if any, associated with the grant, vesting, or sale of Shares and any other Corporation (or employing Affiliate) taxes, the responsibility for which the Participating Employee has, or has agreed to bear, with respect to such Shares, and any other taxes or social insurance or social security liabilities or premiums the responsibility for which the Participating Employee has, or has agreed to bear, with respect to or in connection with the Options and Shares purchased thereunder.

8. FUNDS

Any amounts held by the Corporation or any Affiliate in payroll deduction accounts under the Plan may be used for any corporate purpose.

9. ADJUSTMENT IN NUMBER OF SHARES AND IN OPTION PRICE

In the event there is any change in the Common Stock through declarations of stock dividends or stock split-ups, recapitalizations resulting in stock split-ups, or combinations or exchanges of Shares or other securities of the Corporation, or otherwise, appropriate adjustments in the number of shares available for Options, as well as the shares subject to any Option and the Option price thereof, shall be made, provided that no fractional shares shall be subject to an Option and each Option shall be adjusted down to the nearest full share.

10. AMENDMENT OF THE PLAN

The Board at any time, and from time to time, may amend the Plan. If the Plan is amended, suspended or terminated, the Board, in its discretion, may elect to terminate all outstanding Options either immediately or upon completion of the purchase of Shares on the next scheduled exercise/purchase (which may be sooner than originally scheduled, if determined by the Board in its discretion), or may elect to permit Options to expire in accordance with their terms (and participation to continue through such expiration dates). If the Options are terminated prior to expiration, all amounts then credited to a Participating Employee's account that have not been used to purchase Shares shall be returned to the Participating Employee (without interest thereon, except as otherwise required under local laws) as soon as administratively practicable. Without stockholder approval and without regard to whether any Participating Employee's rights may be considered to have been "adversely affected," the Board shall be entitled to change the duration of an Option, limit the frequency and/or number of changes in the amount withheld during the duration of an Option, establish the exchange ratio applicable to amounts withheld in a currency other than U.S. dollars, permit payroll withholding in excess of the amount designated by a Participating Employee in order to adjust for delays or mistakes in the Corporation's or an Affiliate's processing of properly completed withholding elections, establish reasonable waiting and adjustment periods and/or accounting and crediting procedures to ensure that amounts applied toward the purchase of Common Stock for each Participating Employee properly correspond with amounts withheld from the Participating Employee's eligible compensation, and establish such other limitations or procedures as the Board determines in its sole discretion advisable which are consistent with the Plan.

Without regard to whether any Participating Employee's rights may be considered to have been "adversely affected," in the event the Board determines that the ongoing operation of the Plan may result in unfavorable financial accounting consequences, the Board may, in its discretion and, to the extent necessary or desirable, modify or amend the Plan to reduce or eliminate such accounting consequence including, but not limited to:

(a) Amending the Plan to conform to the safe harbor definition under U.S. Financial Accounting Standards Board Accounting Standards Codification (ASC) Topic 718, including with respect to an Option issued at the time of the amendment;

(b) Increasing or otherwise altering the exercise price for any Option, including an Option issued at the time of the change in exercise price;

(c) Reducing the maximum percentage of eligible compensation that a Participating Employee may elect to set aside as payroll deductions;

(d) Shortening the duration of any Option so that the Option ends on a new purchase/exercise date, including an Option issued at the time of the Board action; and

(e) Reducing the number of Shares that may be purchased upon exercise of outstanding Options.

Such modifications or amendments shall not require stockholder approval or the consent of any Participating Employees.

11. TERMINATION OR SUSPENSION OF THE PLAN

The Board may at any time suspend or terminate the Plan. No Offering shall be made under the Plan while it is suspended or after it is terminated.

Exhibit 21

SUBSIDIARIES OF APPLIED MATERIALS, INC.

As of October 27, 2019

LEGAL ENTITY NAME		PLACE OF INCORPORATION
AKT Japan, LLC		Delaware
AKT, Inc.	(1)	Japan
Applied Films Taiwan Co., Ltd.		Taiwan
Applied Materials (Holdings)	(2)	California
Applied Materials Asia-Pacific, LLC	(3)	Delaware
Applied Materials Canada, Inc.		Canada
Applied Materials Holdings S.à r.l.	(4)	Luxembourg
Applied Materials India Private Limited		India
Applied Materials Israel Ltd.	(5)	Israel
Applied Materials Netherlands B.V.	(6)	The Netherlands
Applied Materials SPVI, Inc.	(7)	Delaware
Applied Ventures, LLC	(8) (9)	Delaware
DFMSim, Inc.	(10)	Delaware
Semitool, Inc.		Montana
Varian Semiconductor Equipment Associates, Inc.	(11)	Delaware
(1) AKT, Inc. owns the following subsidiary:		
AKT America, Inc.		California
(2) Applied Materials (Holdings) owns the following subsidiary:		
Applied Materials UK Limited		California
(3) Applied Materials Asia-Pacific, LLC owns the following subsidiaries:		
Applied Materials (China) Holdings, Ltd.	(a)	P.R. China
Applied Materials (Shanghai) Co., Ltd.		P.R. China
Applied Materials China, Limited	(b)	Hong Kong
Applied Materials Taiwan, Ltd.		Taiwan
(4) Applied Materials Holdings S.à r.l. owns the following subsidiaries:		
Applied Materials Luxembourg 2 S.à r.l.		Luxembourg
Applied Materials U.S. Holdings LLC		Delaware
(5) Applied Materials Israel, Ltd. owns the following subsidiary:		
ICT Integrated Circuit Testing GmbH		Germany

LEGAL ENTITY NAME		PLACE OF INCORPORATION
(6) Applied Materials Netherlands B.V. owns the following subsidiaries:		
Applied Materials Belgium N.V.		Belgium
Applied Materials Deutschland Holding GmbH	(c)	Germany
Applied Materials France		France
Applied Materials GmbH		Germany
Applied Materials Ireland Limited		Ireland
Applied Materials Italia S.r.l.		Italy
Applied Materials Japan, Inc.	(d)	Japan
Applied Materials Korea Ltd.	(e)	Korea
Applied Materials Switzerland S.à r.l. in liquidation		Switzerland
(7) Applied Materials SPVI, Inc. owns the following subsidiary:		
Applied Materials SPV2, Inc.	(f)	Delaware
(8) Applied Ventures, LLC owns the following subsidiary:		
Applied Ventures Investment Management GP I, LLC	(g)	Delaware
(9) Applied Ventures, LLC owns 50% of the following subsidiary:		
Applied Ventures ITIC Innovation Fund GP, LLC	(h)	Delaware
(10) DFMSim, Inc. owns the following subsidiaries:		
DFMSim GmbH in Liquidation		Germany
DFMSim Software India Private Limited		India
(11) Varian Semiconductor Equipment Associates, Inc. owns the following subsidiary:		
Applied Materials South East Asia Pte. Ltd.	(g) (i)	Singapore
(a) Applied Materials (China) Holdings, Ltd. owns the following subsidiary:		
Applied Materials (Xi'an), Ltd.		P.R. China
(b) Applied Materials China, Limited. owns the following subsidiary:		
Applied Materials (China), Inc.		P.R. China
(c) Applied Materials Deutschland Holding GmbH owns the following subsidiaries:		
Applied Materials GmbH & Co. KG	(j)	Germany
Applied Materials Verwaltung GmbH		Germany
Mecatronix GmbH	(k)	Germany

LEGAL ENTITY NAME		PLACE OF INCORPORATION
(d) Applied Materials Japan, Inc. owns the following subsidiary:		
Sigmameltec Ltd.		Japan
(e) Applied Materials Korea Ltd. owns the following subsidiary:		
VNI Solution Co., Ltd.		Korea
(f) Applied Materials SPV2, Inc. owns a 50% interest in the following subsidiary:		
eLith LLC		Delaware
(g) Applied Ventures Investment Management GP I, LLC and Applied Materials South East Asia Pte. Ltd., collectively own 60% of the following subsidiary:		
Applied Ventures Innovation Fund I, L.P.		Delaware
(h) Applied Ventures ITIC Innovation Fund GP, LLC and Applied Materials, Inc. collectively own 50.5% of the following subsidiary:		
Applied Ventures ITIC Innovation Fund, L.P.		Delaware
(i) Applied Materials South East Asia Pte. Ltd. owns the followings subsidiaries:		
Applied Materials 1 LLC		Delaware
Applied Materials 1 LLC Luxembourg S. C. S.	(l)	Luxembourg
Applied Materials 2 LLC		Delaware
Applied Materials 2 LLC Luxembourg S. C. S.	(l)	Luxembourg
Applied Materials Philippines LLC		Nevada
BluPlanet Pte. Ltd. in liquidation		Singapore
DMO Systems Limited		Cayman Islands
MDLSoft LLC	(m)	Delaware
(j) Applied Materials GmbH & Co. KG owns the following subsidiary:		
Applied Materials WEB Coating GmbH		Germany
(k) Mecatronix GmbH owns the following subsidiary:		
Mecatronix Asia Ltd.		Korea
(l) Applied Materials 1 LLC Luxembourg S. C. S. and Applied Materials 2 LLC Luxembourg S. C. S. each partially own the following subsidiary:		
Applied Materials 2 LLC Luxembourg S. C. S. 3 S. C. S.	(n)	Luxembourg
(m) MDLSoft LLC owns the following subsidiary:		
MDLab S.r. l.		Italy
(n) Applied Materials 2 LLC Luxembourg S. C. S. 3 S. C. S. owns the following subsidiaries:		
Altin Limited		Hong Kong
Applied Materials Europe B. V.		The Netherlands
Applied Materials Singapore Technology Pte. Ltd.		Singapore
Varian Korea, Ltd.		Korea

Exhibit 23

Consent of Independent Registered Public Accounting Firm

The Board of Directors
Applied Materials, Inc.:

We consent to the incorporation by reference in the registration statements on Form S-8 (Nos. 333-35396; 333-116393; 333-143377; 333-157661; 333-181666; 333-185290; 333-211965; and 333-225578) and Form S-3ASR (333-225577) of Applied Materials, Inc. of our reports dated December 13, 2019, with respect to the consolidated balance sheets of Applied Materials, Inc. and subsidiaries as of October 27, 2019 and October 28, 2018, the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended October 27, 2019, and the related notes (collectively, the consolidated financial statements), and the effectiveness of internal control over financial reporting as of October 27, 2019, which reports appear in the October 27, 2019 annual report on Form 10-K of Applied Materials, Inc.

Our report dated December 13, 2019 refers to a change in the Company's methods of accounting for revenue and intra-entity transfers of assets other than inventory in 2019 due to the adoption of new accounting standards.

/s/ KPMG LLP
KPMG LLP

Santa Clara, California
December 13, 2019

EXHIBIT 31.1

CERTIFICATION

I, Gary E. Dickerson, certify that:

1. I have reviewed this Annual Report on Form 10-K of Applied Materials, Inc.;

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: December 13, 2019

/s/ GARY E. DICKERSON

Gary E. Dickerson

President, Chief Executive Officer

EXHIBIT 31.2

CERTIFICATION

I, Daniel J. Durn, certify that:

1. I have reviewed this Annual Report on Form 10-K of Applied Materials, Inc.;

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: December 13, 2019

/s/ DANIEL J. DURN

Daniel J. Durn

Senior Vice President, Chief Financial Officer

EXHIBIT 32.1

SARBANES-OXLEY ACT SECTION 906 CERTIFICATION

In connection with this Annual Report on Form 10-K of Applied Materials, Inc. for the fiscal year ended October 27, 2019, I, Gary E. Dickerson, President, Chief Executive Officer of Applied Materials, Inc., hereby certify pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

1. this Form 10-K for the fiscal year ended October 27, 2019 fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. the information contained in this Form 10-K for the fiscal year ended October 27, 2019 fairly presents, in all material respects, the financial condition and results of operations of Applied Materials, Inc. for the periods presented therein.

Date: December 13, 2019

/s/ GARY E. DICKERSON

Gary E. Dickerson

President, Chief Executive Officer

EXHIBIT 32.2

SARBANES-OXLEY ACT SECTION 906 CERTIFICATION

In connection with this Annual Report on Form 10-K of Applied Materials, Inc. for the fiscal year ended October 27, 2019, I, Daniel J. Durn, Senior Vice President, Chief Financial Officer of Applied Materials, Inc., hereby certify pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

1. this Form 10-K for the fiscal year ended October 27, 2019 fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. the information contained in this Form 10-K for the fiscal year ended October 27, 2019 fairly presents, in all material respects, the financial condition and results of operations of Applied Materials, Inc. for the periods presented therein.

Date: December 13, 2019

/s/ DANIEL J. DURN

Daniel J. Durn

Senior Vice President, Chief Financial Officer