

CADENCE DESIGN SYSTEMS INC

Form 10-K

February 10, 2017

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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 December 31, 2016

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 0-15867

CADENCE DESIGN SYSTEMS, INC.

(Exact name of registrant as specified in its charter)

Delaware

(State or Other Jurisdiction of
Incorporation or Organization)

00-0000000

(I.R.S. Employer
Identification No.)

2655 Seely Avenue, Building 5, San Jose, California 95134

(Address of Principal Executive Offices)

(Zip Code)

(408) 943-1234

(Registrant's Telephone Number, including Area Code)

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

Title of Each Class

Names of Each Exchange on which Registered

Common Stock, \$0.01 par value per share NASDAQ Global Select Market

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

None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes ☒ No ☐

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

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

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted 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 and post such files). Yes ☒ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K 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. ☐

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Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of “large accelerated filer,” “accelerated filer,” and “smaller reporting company” in Rule 12b-2 of the Exchange Act. (check one):

Large accelerated filer ☒ Accelerated filer ☐

Non-accelerated filer ☐ (Do not check if a smaller reporting company) Smaller reporting company ☐

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

The aggregate market value of the voting and non-voting common equity held by non-affiliates computed by reference to the price at which the common equity was last sold as of the last business day of the registrant’s most recently completed second fiscal quarter ended July 2, 2016 was approximately \$7,127,225,000.

On February 4, 2017, approximately 278,769,000 shares of the Registrant’s Common Stock, \$0.01 par value, were outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive proxy statement for Cadence Design Systems, Inc.’s 2017 Annual Meeting of Stockholders are incorporated by reference into Part III hereof.

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FOR THE FISCAL YEAR ENDED DECEMBER 31, 2016
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PART I.

Item 1. Business

This Annual Report on Form 10-K and the documents incorporated by reference in this Annual Report on Form 10-K contain statements that are not historical in nature, are predictive, or that depend upon or refer to future events or conditions or contain other forward-looking statements. Statements including, but not limited to, statements regarding the extent and timing of future revenues and expenses and customer demand, statements regarding the deployment of our products and services, statements regarding our reliance on third parties and other statements using words such as “anticipates,” “believes,” “could,” “estimates,” “expects,” “forecasts,” “intends,” “may,” “plans,” “projects,” “should,” “will” and words of similar import and the negatives thereof, constitute forward-looking statements. These statements are predictions based upon our current expectations about future events. Actual results could vary materially as a result of certain factors, including but not limited to those expressed in these statements. Important risks and uncertainties that could cause actual results to differ materially from those contained in the forward-looking statements include, but are not limited to, those identified in the “Proprietary Technology,” “Competition,” “Risk Factors,” “Critical Accounting Estimates,” “Results of Operations,” “Quantitative and Qualitative Disclosures About Market Risk” and “Liquidity and Capital Resources” sections contained in this Annual Report on Form 10-K and the risks discussed in our other Securities Exchange Commission, or SEC, filings.

We urge you to consider these factors carefully in evaluating the forward-looking statements contained in this Annual Report on Form 10-K. All subsequent written or oral forward-looking statements attributable to our company or persons acting on our behalf are expressly qualified in their entirety by these cautionary statements. The forward-looking statements included in this Annual Report on Form 10-K are made only as of the date of this Annual Report on Form 10-K. We do not intend, and undertake no obligation, to update these forward-looking statements.

Overview

We enable our customers to design electronic products. Our products and services are designed to give our customers a competitive edge in their development of electronic systems, integrated circuits, or ICs, electronic devices and increasingly sophisticated manufactured products, by optimizing performance, minimizing power consumption, shortening the time to bring their products to market and reducing their design, development and manufacturing costs. Our customers create and sell electronic products at differing levels of completeness. Our electronic systems customers deliver entire devices, such as smartphones, laptop computers, gaming systems, automobiles, servers, medical equipment and networking products. These systems companies internally develop, or externally purchase, the sub-components for their products, including printed circuit boards, or PCBs, which interconnect all of the hardware components, ICs, which are often referred to as computer chips, and software at various levels which runs on the hardware. Our semiconductor customers deliver ICs, which include subcategories, such as memory chips, systems-on-chip, or SoCs, analog chips, processors and other types of chips.

We offer software, hardware, services and reusable IC design blocks, which are commonly referred to as intellectual property, or IP. Systems customers use our offerings to develop and integrate software that is key to the functionality of their products, as well as to design their ICs and PCBs. Our semiconductor customers use our offerings to design, configure, analyze and verify ICs. Additionally, some customers license our IP, which accelerates their product development processes by providing pre-designed and verified circuit blocks for their ICs.

System Design Enablement, or SDE, is our overall strategy to provide the technologies necessary for our customers to develop a complete and functional electronic product. Our SDE strategy enables us to address the growing trends of electronic systems companies developing their own ICs as part of their end product systems, as well as semiconductor companies delivering greater portions of the systems into which their IC products are integrated. The development of electronic products, or their sub-components, is complex and requires many engineers using our solutions with specialized knowledge and skill. The rate of technical innovation in electronics is swift, long driven by a concept known as Moore’s Law, which more than 50 years ago predicted that the complexity of ICs would double about every 24 months. In order to make our customers successful, our products must handle this exponential growth rate in complexity, without requiring a corresponding increase in our customers’ costs. Historically, the industry that provided the tools used by IC engineers was referred to as Electronic Design Automation, or EDA. Today, our offerings include

and extend beyond EDA tools to include SDE.

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Our SDE solutions facilitate the electronic product creation process at four levels. First, our core EDA offerings enable engineers to complete tasks associated with the design, analysis and verification of ICs. Core EDA tools and services are specifically designed to meet the requirements of engineers who develop different types of ICs. The second level of SDE solutions is IP, which consists of design IP and verification IP, or VIP. Design IP is directly integrated into the IC by the customer as part of its development process. VIP consists of technologies and methodologies useful for verifying how design IP is integrated into the IC, but VIP does not become part of the IC product. The third level of SDE solutions is System Interconnect, and includes tools and services used for the design, analysis and verification of PCBs, as well as the packages that encapsulate the ICs for electrical and physical connection to the PCB. The fourth level of SDE solutions is System Integration, which includes the engineering tasks associated with designing and analyzing systems, verifying system functionality, combining software with hardware, or developing new software for an IC or system prior to its manufacture.

Business Drivers

Our products and services enable our customers to design complex and innovative electronic products, so demand for our products is driven by our customers' investment in new designs and products. New categories of electronic systems, such as augmented reality, virtual reality, internet-of-things, or IoT, deep learning and autonomous vehicle sub-systems represent a few of the areas for potential increased investment by our customers. Large and existing electronics categories, such as datacenter servers, smartphones and networking products continue to provide business opportunities for us as customers initiate new design projects. Conversely, the decline of previously vibrant categories, and the integration of previously separate capabilities into a single device, can potentially reduce our business opportunities. For example, digital cameras and navigation devices were once independent devices, and are now also available as features on a smartphone. Likewise, the laptop computer category has been negatively affected by the proliferation of mobile devices.

Underlying the requirements within any particular vertical market sector is the availability of rapidly improving IC manufacturing technology. In order for our customers to take advantage of such advancements, certain of our products must first be developed to exploit these new manufacturing capabilities. This dependency means that we must invest significantly in product research and development to keep pace with the latest manufacturing technology. The demand for new IC manufacturing technology directly impacts the demand for our newest products.

Another driver for our business is the differentiation, capabilities and benefits provided to our customers by our products. With the rapid pace of innovation comes the opportunity for our products to address key challenges associated with electronic product creation, such as power consumption, performance and cost. Our products have unique attributes that our customers value. In general, these attributes can be grouped into broader categories such as quality of results (in terms of power consumption, performance and chip area), engineering productivity, tool performance, new capabilities or methods and faster time-to-market. Our business opportunities are significantly enhanced when our offerings address these key factors.

Products and Product Strategy

Our strategy is to provide our customers with the ability to address the broad range of issues that arise as they develop electronic products. Our SDE solutions are comprised of products that are categorized according to the role they play in the electronic product design process. We combine our products and technologies into categories related to major design activities. The following table shows the relationship between our product categories and the SDE levels to which they relate.

Cadence Product Categories	System Design Enablement Levels			
	IC Development (Core IP EDA)	Integration	System Interconnect	System Integration
Functional Verification (including hardware for emulation and prototyping)	√	√	N/A	√
Digital IC Design and Signoff	√	√	N/A	√
Custom IC Design and Verification	√	√	N/A	N/A

System Interconnect and Analysis (PCB and IC package)	√	N/A	√	N/A
IP (includes design IP and VIP)	√	√	√	√

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Functional Verification, including Emulation and Prototyping Hardware

Functional verification products are used by our customers to efficiently and effectively verify that the circuitry or the software they have designed will perform as intended. Verification takes place before implementing or manufacturing the circuitry, significantly reducing the risk of discovering an error in the completed product. Our functional verification offering consists of three primary verification engines:

• JasperGold® formal verification platform

• Incisive® functional verification platform

• Palladium® verification computing platform

These engines are used for early bug detection, verification of block-level functionality, verification acceleration and emulation of system-level functionality, system-level power exploration, analysis and optimization and system-level prototyping for hardware/software co-verification. Our most recent emulation hardware offering--the Palladium Z1 enterprise emulation system--provides high throughput, capacity, datacenter reliability and workgroup productivity to enable global design teams to develop advanced hardware-software systems.

Also included in our functional verification offering are products that are used for verification planning and metric tracking, testbench automation, debugging and software-driven tests. These products enable our customers to coordinate verification activities across multiple teams and various specialists for verification planning and closure. VIP and accelerated VIP, which is used in emulation, are used across the suite of functional verification engines to verify the correct interaction with dozens of design IP interface protocols such as DDR, USB and PCI Express.

Digital IC Design and Signoff

Digital IC design offerings are used by our customers to create logical representations of a digital circuit or an IC that can be verified for correctness prior to implementation (please refer to the discussion under “Functional Verification, including Emulation and Prototyping Hardware” above). Once the logic is verified, the design representation is implemented, or converted to a format ready for silicon manufacturing, using additional software tools within this category. The manufacturing representation is also analyzed and verified. Our digital IC offerings include three major categories: logic design, physical implementation and signoff.

Our logic design offering is comprised of logic synthesis, test and equivalence checking capabilities and is typically used by customers to create and verify designs in conjunction with our functional verification capabilities. This offering provides chip planning, design, verification and test technologies and services to customers. The offering includes the Genus™ synthesis solution, a logic synthesis offering that provides fast throughput while also offering high quality results, the Stratus™ high-level synthesis solution for system-level synthesis, and the Joules™ RTL power solution, which delivers fast power analysis while preserving near-signoff accuracy. During the first quarter of fiscal 2016, we launched the Modus™ test solution, which reduces SoC test time.

Our physical implementation offering comprises tools used near the end of the design process, including place and route, signal integrity, optimization and multiple patterning preparation. The Innovus™ implementation system is a physical implementation offering that delivers fast design turnaround time while also delivering improved power, performance and area characteristics. This offering enables customers to address the technology challenges of the latest semiconductor advanced process nodes, create a physical representation of logic models and prepare a design for signoff.

Our signoff offering is comprised of tools used to signoff the design as ready for manufacture by a silicon foundry, which provides certification for this step. This offering includes Tempus™ timing analysis, Voltus™ power analysis and Quantus™ QRC extraction solutions, plus our Physical Verification System. Our design for manufacturing, or DFM, products are also included in our signoff offering and are used by customers to address manufacturing and yield issues as early in the product development process as possible.

Custom IC Design and Verification

Custom IC design and verification offerings are used by our customers to create schematic and physical representations of circuits down to the transistor level for analog, mixed-signal, custom digital, memory and radio frequency, or RF, designs. These representations are verified using simulation tools optimized for each type of design. The offering includes the design capture environment, simulation and IC layout capabilities within the Virtuoso custom design platform. Other tools in the custom IC portfolio are used to prepare the designs for manufacturing.

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In recent years, we have expanded our custom IC design and verification offerings with the addition of new products, including:

•Virtuoso Advanced Node

•Virtuoso Electrically Aware Design, or EAD

•Spectre® XPS FastSPICE Simulator

Virtuoso Advanced Node adds functionality to the base Virtuoso package to enable the use of three-dimensional transistors, or FinFETs, multiple patterning and other technologies required for advanced designs. Virtuoso EAD introduces a new time-saving paradigm that shortens the loop between design and verification by verifying designs as they are being created. Finally, Spectre XPS is a new Fast SPICE offering that speeds verification time over previously existing solutions.

System Interconnect and Analysis

Our System Interconnect and Analysis offerings are used by our customers to develop PCBs and IC packages. The capabilities in the Allegro® system interconnect design platform include PCB authoring and implementation, IC package and System-in-Package design and signal and power integrity analysis and PCB library design management and collaboration. Certain offerings also include the simulation capability within the Virtuoso custom design platform. Sigrity™ analysis tools have been integrated with our Allegro platform, enabling a comprehensive front-to-back flow for implementation and full signal and power integrity analysis for designs featuring high speed interface protocols. These offerings enable engineers who are responsible for the capture, layout and analysis of advanced PCB and IC packages to design high-performance electronic products across the domains of ICs, IC packages and PCBs, to increase functional density and to manage design complexity while reducing cost and time-to-market. The need for compact, high performance mobile, consumer and automotive design with advanced serial interconnect is driving technology evolution for our PCB offering. For mainstream PCB customers, where individual or small team productivity is a focus, we provide the OrCAD® family of offerings that is primarily marketed worldwide through a network of resellers.

IP

Our design IP offerings consist of pre-verified, customizable functional blocks, which customers integrate into their ICs to accelerate the development process and to reduce the risk of errors in the design process. We offer many types of design IP, including Tensilica® configurable digital signal processors, or DSPs, vertically targeted subsystems for audio/voice, baseband and vision/imaging applications, controllers and physical interfaces, or PHYs, for standard protocols and analog IP. We have significantly expanded our design IP portfolio in recent years through acquisitions and internal development.

We also offer a broad range of VIP and memory models, which model the expected behavior of many industry standard protocols when used with verification solutions and are complementary to our design IP offerings. Our VIP offerings are also used in system-level verification to model correct behavior of full systems interacting with their environments.

Product Arrangements

We primarily license our software using time-based licenses. Our time-based license arrangements offer customers the right to access and use all of the products delivered at the outset of an arrangement and updates throughout the entire term of the arrangement, which is generally two to three years, with no rights to return. Our updates provide for continued access to our evolving technology as our customers' designs migrate to more advanced nodes. In addition, certain time-based license arrangements include:

- the right for the customer to remix among the products delivered at the outset of the arrangement, so long as the cumulative contractual value of all products in use does not exceed the total license fee determined at the outset of the arrangement; and
- use of unspecified additional products that become commercially available during the term of the arrangement.

A small portion of our software is licensed under perpetual licenses, which does not include the right to use new technology. Payment terms for time-based licenses generally provide for payments to be made over the license period and payment terms for perpetual licenses generally are net 30 days.

Our emulation and prototyping hardware products are either sold or leased to our customers.

We generally license our design IP under nonexclusive license agreements that provide usage rights for specific designs. In addition, for certain of our IP license agreements, we collect royalties as our customers ship their product that includes our IP to their customers.

For a further description of our license agreements, our emulation and prototyping hardware sale or lease agreements, revenue recognition policies and results of operations, please refer to the discussion under “Critical Accounting Estimates” under Part II, Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations.”

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Technical Support and Maintenance

Customer service and support is critical to the adoption and successful use of our products. We provide our customers with technical support and maintenance to facilitate their use of our software, hardware and IP solutions.

Services

We offer a number of services, including services related to methodology, education and hosted design solutions. These services may be sold separately or sold and performed in conjunction with the license, sale or lease of our products. As necessary, certain of our design services engineers are assigned to internal research and development projects associated with our design IP business.

As part of our services offerings, we design advanced ICs, develop custom IP and address industry design issues that may not be solved adequately by today's EDA technologies. This enables us to target and accelerate the development of new software technology and products to satisfy current and future design requirements.

We offer engineering services to collaborate with our customers in the design of complex ICs and the implementation of key design capabilities, including low power design, IC packaging and board design, functional verification, digital implementation, analog/mixed-signal design and system-level design. The customers for these services primarily consist of semiconductor and systems companies developing products for the consumer, communications, military, aerospace and computing markets. These ICs range from digital SoCs and analog and RF designs to complex mixed-signal ICs.

In delivering methodology services, we leverage our experience and knowledge of design techniques, our products, leading practices and different design environments to improve the productivity of our customers' engineering teams. Depending on the customers' projects and needs, we work with customers using outsourcing, consultative and collaborative offerings.

Our hosted design solutions enable us to deliver software-as-a-service, or SaaS, to those customers who do not have their own infrastructure. They also enable our engineering teams to assist our customers' teams located elsewhere in the world during the course of their design and engineering projects through a secure network infrastructure.

Our education services offerings can be customized and include training programs that are conducted via the internet or in a classroom setting. The content of these offerings ranges from the latest IC design techniques to methodologies for using the most recent features of our EDA products. The primary focus of education services is to accelerate our customers' path to productivity in the use of our products.

Third-Party Programs and Initiatives

In addition to our products, many customers use design tools that are provided by other EDA companies, as well as design IP available from multiple suppliers. We support the use of third-party design products and design IP through our Connections® program and through our participation in industry groups such as the Silicon Integration Initiative, or Si2, and Accellera System Initiative. We actively contribute to the development and deployment of industry standards.

Product and Maintenance and Services Revenue

Revenue, and revenue as a percentage of total revenue, from our product and maintenance and services offerings for the last three fiscal years were as follows:

	2016		2015		2014
	(In millions, except percentages)				
Product and maintenance	\$1,683.8	93 %	\$1,578.9	93 %	\$1,479.2 94 %
Services	132.3	7 %	123.2	7 %	101.8 6 %
Total revenue	\$1,816.1		\$1,702.1		\$1,581.0

Our revenue mix is such that approximately 90% of our revenue is recognized on a recurring basis over the contract life, and the remainder of the revenue is recognized up front, upon completion of delivery.

For an additional description of our product and maintenance and services revenue, see the discussion under "Results of Operations" under Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations." For our fiscal 2016 results of operations and our financial position as of December 31, 2016, see Part IV, Item 15, "Exhibits and Financial Statement Schedules."

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Backlog

Our backlog was approximately \$2.5 billion and \$2.3 billion as of December 31, 2016 and January 2, 2016, respectively. Our backlog as of December 31, 2016 consisted of the deferred revenue on our balance sheet and the remaining unbilled portion of fully executed arrangements with effective dates commencing no later than December 31, 2016 with revenue to be recognized thereafter, and included a variety of types, generally including, but not limited to:

- licenses for software products and IP;
- maintenance on software, hardware and IP products;
- bookings for the sale and lease of hardware products, including those that have expected delivery dates after December 31, 2016 but before April 1, 2017; and
- the undelivered portion of engineering services contracts.

The substantial majority of our backlog consists of customer contracts for which product and maintenance revenue is recognized on a recurring basis over the contract life. Historically, we have not experienced significant cancellations of our contracts with customers. For engineering services contracts in backlog, completion dates are occasionally rescheduled, delaying revenue recognition under those contracts beyond the original anticipated completion date. Changes in customer license types or payment terms also can affect the timing of revenue recognition. During fiscal 2016, approximately 70% of our revenue came from arrangements that were in backlog as of January 2, 2016. We expect approximately \$1.3 billion, or approximately 70% of our fiscal 2017 revenue, to come from arrangements that were in backlog as of December 31, 2016. The actual percentage of revenue coming from backlog during fiscal 2017 may change if our actual business levels in fiscal 2017 are different than our current expectations.

Marketing and Sales

We generally market our products and provide services to existing and prospective customers through a direct sales force consisting of sales people and applications engineers. Applications engineers provide technical pre-sales and post-sales support for our products. Due to the complexity of many of our products and the system design process, the sales cycle is generally long, requiring three to six months or more. During the sales cycle, our direct sales force generally provides technical presentations, product demonstrations and support for on-site customer evaluation of our solutions. We also promote our products and services through advertising, marketing automation, trade shows, public relations and the internet. We selectively utilize value-added resellers to broaden our reach and reduce cost of sales. Our OrCAD products and certain Allegro products are primarily marketed through these channels. With respect to international sales, we generally market and support our products and services through our subsidiaries. We also use a third-party distributor to license our software products and services to certain customers in Japan.

Research and Development

Our research and development expense was \$735.3 million during fiscal 2016, \$637.6 million during fiscal 2015 and \$603.0 million during fiscal 2014.

The primary areas of our research and development include the following:

- Functional Verification, including Emulation and Prototyping Hardware;
- Digital IC Design and Signoff;
- Custom IC Design and Verification;
- System Interconnect and Analysis; and
- IP.

Our future performance depends on our ability to innovate, commercialize newly developed solutions and enhance and maintain our current products. We must keep pace with our customers' technical developments, satisfy industry standards and meet our customers' increasingly demanding performance, productivity, quality and predictability requirements. Therefore, we expect to continue to invest in research and development.

Hardware Manufacturing and Software Distribution

The majority of our emulation and prototyping hardware, including all individual PCBs and custom ICs, is manufactured, assembled and tested by subcontractors before delivery to our customers. All assembly, system integration and testing of our Field-Programmable Gate Array, or FPGA, based prototyping products is done by our manufacturing partners before supplying them to us for qualification and testing before their incorporation into the

integrated product at our headquarters in San Jose, California.

Software and documentation are primarily distributed to customers by secure electronic delivery or on DVD.

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Proprietary Technology

Our success depends, in part, upon our proprietary technology. We generally rely on patents, copyrights, trademarks and trade secret laws, licenses and restrictive agreements to establish and protect our proprietary rights in technology and products. Many of our products include software or other intellectual property licensed from third parties. We may have to seek new licenses or renew existing licenses for third-party software and other intellectual property in the future. As part of performing engineering services for customers, our engineering services business uses certain software and other intellectual property licensed from third parties, including that of our competitors.

Competition

We compete in EDA most frequently with Synopsys, Inc. and Mentor Graphics Corporation, which is in the process of being acquired by Siemens AG, but also with numerous other EDA providers (such as Ansys, Inc., Zuken Ltd. and others offering “point solutions”), with manufacturers of electronic devices that have developed, acquired or have the capability to develop their own EDA products and with numerous electronics design and consulting companies. In the area of design IP, we compete with Synopsys, Inc., CEVA, Inc. and numerous other IP companies.

Certain competitive factors in the engineering services business differ from those of the products businesses. While we compete with other EDA companies in the engineering services business, our principal competitors include independent engineering service businesses. Many of these companies are also customers, and therefore use our product offerings in the delivery of their services or products.

Corporate Information

We were organized as a Delaware corporation in June 1988. Our headquarters is located at 2655 Seely Avenue, San Jose, California 95134. Our telephone number is (408) 943-1234. We use our website at www.cadence.com to communicate important information about our company, including news releases and financial information. Our website permits investors to subscribe to e-mail notification alerts when we post new material information on our website. We also make available on our investor relations webpage, free of charge, copies of our SEC filings and submissions as soon as reasonably practicable after electronically filing or furnishing such documents with the SEC. Stockholders may also request copies of these documents by writing to our Corporate Secretary at the address above. Information on our website is not incorporated by reference in this Annual Report on Form 10-K unless expressly noted.

International Operations

As of December 31, 2016, we had 55 sales offices, design centers and research and development facilities, approximately 70% of which are located outside of the United States. We primarily consider customer sales and support requirements, the availability of a skilled workforce, and costs and efficiencies, among other relative benefits, when determining what operations to locate internationally. For additional information relating to our international operations, including revenue and long-lived assets by geographic area, see Note 19 in the notes to consolidated financial statements. For risks related to our international operations, see the discussion under “The effect of foreign exchange rate fluctuations may adversely impact our financial condition” and “Risks associated with our international operations could seriously harm our financial condition” under Item 1A, “Risk Factors.”

Fiscal Year End

Our fiscal year ends on the Saturday closest to December 31. Fiscal 2016 and fiscal 2015 were 52-week years, whereas fiscal 2014 was a 53-week year. Revenue and expenses included in the results of operations for fiscal 2014 were impacted by the additional week.

Employees

As of December 31, 2016, we employed approximately 7,100 people.

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Executive Officers of the Registrant

The following table provides information regarding our executive officers as of February 10, 2017:

Name	Age	Positions and Offices
Lip-Bu Tan	57	President, Chief Executive Officer and Director
Geoffrey G. Ribar	58	Senior Vice President and Chief Financial Officer
Thomas P. Beckley	59	Senior Vice President, Research and Development
James J. Cowie	52	Senior Vice President, General Counsel and Secretary
Anirudh Devgan	47	Senior Vice President, Research and Development
Surendra Babu Mandava	58	Senior Vice President, Research and Development
Neil Zaman	48	Senior Vice President, Worldwide Field Operations

Our executive officers are appointed by the Board of Directors and serve at the discretion of the Board of Directors.

LIP-BU TAN has served as President and Chief Executive Officer of Cadence since January 2009. Mr. Tan has been a member of the Cadence Board of Directors since February 2004. In 1987, Mr. Tan founded Walden International, an international venture capital firm, and since that time has served as its Chairman. Mr. Tan serves as a director of Hewlett Packard Enterprise Company, Quantenna Communications, Inc. and Semiconductor Manufacturing International Corporation. Mr. Tan also serves as a director of Ambarella, Inc., but he will not stand for re-election to its board of directors at its 2017 annual meeting. Mr. Tan has a B.S. from Nanyang University in Singapore, an M.S. in nuclear engineering from the Massachusetts Institute of Technology and an M.B.A. from the University of San Francisco.

GEOFFREY G. RIBAR has served as Senior Vice President and Chief Financial Officer of Cadence since November 2010. Prior to joining Cadence, from May 2008 to October 2010, Mr. Ribar served as Chief Financial Officer of Telegent Systems, Inc., a semiconductor company. Mr. Ribar has served as Chief Financial Officer at other semiconductor companies, including SiRF Technology, Inc., Asyst Technology, Inc., Matrix Semiconductor, Inc. and nVidia Corporation. Mr. Ribar also held various positions, including Corporate Controller, at Advanced Micro Devices, Inc. Mr. Ribar has a B.S. in chemistry and an M.B.A. from the University of Michigan.

THOMAS P. BECKLEY has served as Senior Vice President, Research and Development of Cadence since September 2012. From April 2004 to September 2012, Mr. Beckley served as Corporate Vice President, Research and Development of Cadence. Prior to joining Cadence, Mr. Beckley served as President and Chief Executive Officer of Neoliner, Inc., a developer of auto-interactive and automated analog/RF tools and solutions for mixed-signal design that was acquired by Cadence in April 2004. Mr. Beckley has a B.S. in mathematics and physics from Kalamazoo College and an M.B.A. from Vanderbilt University.

JAMES J. COWIE has served as Senior Vice President and General Counsel of Cadence since April 2008 and Secretary of Cadence since May 2008. From August 2000 to March 2008, Mr. Cowie held several positions at Cadence, most recently as Corporate Vice President - Business Development, Associate General Counsel and Assistant Secretary. Mr. Cowie has an A.B. in economics from Duke University and a J.D. from Stanford Law School.

ANIRUDH DEVGAN has served as Senior Vice President, Research and Development of Cadence since November 2013. From May 2012 to November 2013, Dr. Devgan served as Corporate Vice President, Research and Development of Cadence. Prior to joining Cadence, from May 2005 to March 2012, Dr. Devgan served as Corporate Vice President and General Manager of the Custom Design Business Unit at Magma Design Automation Inc. Dr. Devgan has a B.Tech. in electrical engineering from the Indian Institute of Technology, Delhi, and an M.S. and Ph.D. in electrical and computer engineering from Carnegie Mellon University.

SURENDRA BABU MANDAVA has served as Senior Vice President, Research and Development of Cadence since January 2017. Prior to joining Cadence, Mr. Mandava served as Chief Executive Officer of Ineda Systems Inc., a low-power System-on-Chip solutions company, from November 2014 to July 2016, Vice President of Broadcom Corporation, a provider of semiconductor solutions, from November 2010 to December 2012, and President and then as Chief Executive Officer of Beceem Communications Inc., a semiconductor company, from December 2003 until it was acquired by Broadcom in November 2010. Mr. Mandava has a B.Tech. in electronics and communication engineering from the Regional Engineering College, Trichy, and a M.Tech. in electrical engineering and computer science from the Indian Institute of Technology, Kanpur.

NEIL ZAMAN has served as Senior Vice President, Worldwide Field Operations, since September 2015. From October 1999 to September 2015, Mr. Zaman held several positions at Cadence, most recently as Corporate Vice President, North America Field Operations. Prior to joining Cadence, Mr. Zaman held positions at Phoenix Technologies Ltd. and IBM Corporation. Mr. Zaman has a B.S. in Finance from California State University, Hayward.

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Item 1A. Risk Factors

Our operations and financial results are subject to various risks and uncertainties, including those described in the sections below, that could adversely affect our business, financial condition, results of operations, cash flows, and the trading price of our common stock.

Risks Related to Our Business

Uncertainty in the global economy in general, and any potential downturn in the semiconductor and electronics industries in particular, may negatively impact our business and reduce our bookings levels and revenue.

Purchases of our products and services are dependent upon the commencement of new design projects by IC manufacturers and electronics systems companies. The IC and electronics systems industries are cyclical and are characterized by constant and rapid technological change, rapid product obsolescence and price erosion, evolving standards, short product life cycles and wide fluctuations in product supply and demand.

The IC and electronics systems industries have also experienced significant downturns in connection with, or in anticipation of, maturing product cycles of both these industries' and their customers' products. While spending on EDA products and services has grown in recent years, the current outlook for the semiconductor industry is uncertain and may result in a decrease in spending on EDA products and services, which are a part of our overall SDE offering. While we cannot predict global economic conditions, uncertainty about future political and economic conditions and future decline in consumer spending could negatively impact our customers' businesses, reducing the number of new chip designs and their overall research and development spending, including their spending on SDE products and services, and as a result decrease demand for our products. Decreased bookings for our products and services, customer bankruptcies, consolidation among our customers, or problems or delays with our hardware suppliers or with the supply or delivery of our hardware products could also adversely affect our ability to grow our business or adversely affect our future revenues and financial results. Our future business and financial results are subject to considerable uncertainty that could impact our stock price. If economic conditions deteriorate in the future, or, in particular, if semiconductor or electronics systems industry revenues do not grow or our suppliers of our hardware components and products are subject to problems or delays, our future revenues and financial results could be adversely affected. However, if economic conditions improve for our customers, the positive impact on our revenues and financial results may be deferred due to cautious customer research and development spending and our mix of licenses that result in recurring revenue.

Customer consolidation could affect our operating results.

There has been a trend toward customer consolidation in the semiconductor industry through business combinations, including mergers, asset acquisitions and strategic partnerships. As this trend continues, it could make us dependent on fewer customers who may be able to exert increased pressure on our prices and other contract terms and could increase the portion of our total sales concentration for any single customer. Customer consolidation activity could also reduce the demand for our products and services if such customers streamline research and development or operations, reduce purchases or delay purchasing decisions. These outcomes could negatively impact our financial condition.

Our failure to respond quickly to technological developments or customers' increasing technological requirements could make our products uncompetitive and obsolete.

The industries in which we compete experience rapid technology developments, rapid changes in industry standards and customer requirements, and frequent introductions and improvements of new products. Currently, the industries we serve are experiencing the following trends:

• changes in the design and manufacturing of ICs, including migration to advanced process nodes and the introduction of three-dimensional transistors, such as FinFETs, present major challenges to the semiconductor industry, particularly in IC design, design automation, design of manufacturing equipment, and the manufacturing process itself. With migration to advanced process nodes, the industry must adapt to more complex physics and manufacturing challenges such as the need to draw features on silicon that are many times smaller than the wavelength of light used to draw the features via lithography. Models of each component's electrical properties and behavior also become more complex as do requisite analysis, design, verification and manufacturing capabilities. Novel design tools and

methodologies must be invented and enhanced quickly to remain competitive in the design of electronics in the smallest nanometer ranges;

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the ability to design SoCs increases the complexity of managing a design that, at the lowest level, is represented by billions of shapes on fabrication masks. In addition, SoCs typically incorporate microprocessors and digital signal processors that are programmed with software, requiring simultaneous design of the IC and the related software embedded on the IC;

- with the availability of seemingly endless gate capacity, there is an increase in design reuse, or the combining of off-the-shelf design IP with custom logic to create ICs or SoCs. The unavailability of a broad range of high-quality design IP (including our own) that can be reliably incorporated into a customer's design with our software products and services could lead to reduced demand for our products and services;
- increased technological capability of the FPGA, which is a programmable logic chip, creates an alternative to IC implementation for some electronics companies. This could reduce demand for our IC implementation products and services;
- a growing number of low-cost engineering services businesses could reduce the need for some IC companies to invest in EDA products; and
- adoption of cloud computing technologies with accompanying new business models for an increasing number of SDE software categories.

If we are unable to respond quickly and successfully to these trends, we may lose our competitive position, and our products or technologies may become obsolete. To compete successfully, we must develop, acquire or license new products and improve our existing products and processes on a schedule that keeps pace with technological developments and the requirements for products addressing a broad spectrum of designers and designer expertise in our industries. We must provide frequent and relevant updates to our software products in order to provide substantial benefit to the customer throughout the license periods because of the rapid changes in our customer's industries. The market must also accept our new and improved products. Our hardware platforms must be enhanced periodically to reduce the likelihood that a competitor surpasses the capabilities we offer. Our introduction of new products could reduce the demand and revenue of our older products or affect their pricing. We must also be able to support a range of changing computer software, hardware platforms and customer preferences. A rapid transition to different business models associated with cloud computing technologies could result in reduced revenue. We cannot guarantee that we will be successful in keeping pace with all, or any, of the customer trends.

Competitive pressures may require us to reduce our pricing, which could have an adverse effect on our results of operations.

The highly competitive markets in which we do business can put pressure on us to reduce the prices of our software, emulation and prototyping hardware and IP. If our competitors offer deep discounts on certain products in an effort to recapture or gain market share or to sell other software or hardware products, we may then need to lower our prices or offer other favorable terms to compete successfully. Any such changes would be likely to reduce our profit margins and could adversely affect our operating results. Any substantial changes to our prices and pricing policies could cause revenues to decline or be delayed as our sales force implements and our customers adjust to the new pricing policies. Some of our competitors bundle products for promotional purposes or as a long-term pricing strategy or provide guarantees of prices and product implementations. These practices could, over time, significantly constrain the prices that we can charge for our products. If we cannot offset price reductions with a corresponding increase in the number of sales or with lower spending, then the reduced revenues resulting from lower prices could have an adverse effect on our results of operations.

Our System Design Enablement strategy requires the development or acquisition of products and expertise in new areas of technology. Our inability to develop or acquire these capabilities could impede our ability to address the technical requirements in technology segments which are expected to contribute to our growth.

Our SDE strategy is meant to increase our business among electronic systems companies, which are now designing their own ICs in addition to the complete end products of which they are a part. SDE is also meant to increase our business among semiconductor companies, which are increasing their contribution to the end products into which their ICs are incorporated. Part of this strategy involves addressing the needs of new categories of electronic systems, such as augmented reality, virtual reality, internet-of-things, or IoT, deep learning and autonomous vehicle sub-systems, where increased investment is expected by our customers. Each of these categories requires technologies and expertise

that are application-specific. If we are unable to develop or acquire the application-specific technologies and expertise necessary to address the requirements of these categories, it could impede our ability to expand our business in these categories and ultimately affect our future growth.

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We have experienced varied operating results, and our operating results for any particular fiscal period are affected by the timing of revenue recognition, particularly for our emulation and prototyping hardware and IP products.

Various factors affect our operating results, and some of them are not within our control. Our operating results for any period are affected by the timing of revenue recognition, particularly for our emulation and prototyping hardware and IP products. In addition, we have recorded net losses in the past and may record net losses in the future.

A substantial portion of the product revenue related to our hardware business and some of our IP offerings is recognized upon delivery, and our forecasted revenue results are based, in part, on our expectations of hardware and IP to be delivered in a particular quarter. Therefore, changes in hardware and IP bookings or deliveries relative to expectations will have a more immediate impact on our revenue than changes in software or services bookings, for which revenue is generally recognized over time.

In recent years, we made significant investments to expand our IP offerings through, among other things, research and development and acquisitions. As we continue to expand our IP offerings, a portion of the revenue related to our IP bookings will be deferred until we complete and deliver the licensed IP to our customers. As a result, costs related to the research and development of the IP may be incurred prior to the recognition of the related revenue.

Revenue related to our hardware and IP products is inherently difficult to predict because sales of our hardware and IP products depend on the commencement of new projects for the design and development of complex ICs and systems by our customers, our customers' willingness to expend capital to deploy our hardware or IP products in those projects and the availability of our hardware or IP products for delivery. Therefore, our hardware or IP sales may be delayed or may decrease if our customers delay or cancel projects because their spending is constrained or if there are problems or delays with the supply or delivery of our hardware or IP products or our hardware suppliers. Moreover, the hardware and IP markets are highly competitive, and our customers may choose to purchase a competitor's hardware or IP product based on cost, performance or other factors. These factors may result in lower revenue, which would have an adverse effect on our business, results of operations or cash flows.

Our software license mix is such that a substantial proportion of licenses require recurring revenue recognition, and we expect the license mix, combined with the modest growth in spending by our customers in the semiconductor sector, may make it difficult for us to rapidly increase our revenue in future fiscal periods. The timing of our revenue recognition may be deferred until payments become due and payable from customers with nonlinear payment terms or as cash is collected from customers with low credit ratings.

We plan our operating expenses based on forecasted revenue, expected business needs and other factors. These expenses and the effect of long-term commitments are relatively fixed in the short term. Bookings and the related revenue are harder to forecast in a difficult economic environment. If we experience a shortfall in bookings, our operating results could differ from our expectations because we may not be able to quickly reduce our expenses in response to short-term business changes.

The methods, estimates and judgments that we use in applying our accounting policies have a significant impact on our results of operations (see "Critical Accounting Estimates" under Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations"). Such methods, estimates and judgments are, by their nature, subject to substantial risks, uncertainties and assumptions, and factors may arise over time that may lead us to change our methods, estimates and judgments. Changes in those methods, estimates and judgments could significantly affect our results of operations.

Historical results of operations should not be viewed as reliable indicators of our future performance. If our revenue, operating results or business outlook for future periods fall short of the levels expected by us, securities analysts or investors, the trading price of our common stock could decline.

We have acquired and expect to acquire other companies and businesses and may not realize the expected benefits of these acquisitions.

We have acquired and expect to acquire other companies and businesses in order to expand our product offerings. Our future revenue growth and expansion of our business is dependent on our successful integration of our acquisitions.

We may incur significant costs in connection with potential transactions, including acquisitions that are not consummated. Potential and completed acquisitions involve a number of risks. If any of the following acquisition-related risks occur, our business, operating results or financial condition could be adversely impacted:

- the failure to realize anticipated benefits such as cost savings and revenue enhancements;
- overlapping customers and product sets that impact our ability to maintain revenue at historical rates;
- the failure to understand, compete and operate effectively in markets where we have limited experience;
- the failure to integrate and manage acquired products and businesses effectively;
- the failure to retain key employees of the acquired company or business;
- difficulties in combining previously separate companies or businesses into a single unit;
- the substantial diversion of management's attention from day-to-day business when evaluating and negotiating these transactions and integrating an acquired company or business;

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- the discovery, after completion of the acquisition, of unanticipated liabilities assumed from the acquired company, business or assets, such that we cannot realize the anticipated value of the acquisition;
- difficulties related to integrating the products of an acquired company or business in, for example, distribution, engineering, licensing models or customer support areas;

- unanticipated costs; or

- customer dissatisfaction with existing license agreements with us, possibly dissuading customers from licensing or buying products acquired by us after the expiration date of the existing license.

In a number of our completed acquisitions, we have agreed to make future payments, either in the form of employee retention bonuses or contingent purchase price payments, based on the performance of the acquired companies, businesses or the employees who joined us with the acquired companies or businesses. The performance goals pursuant to which these future payments may be made generally relate to the achievement by the acquired company or business, or by the employees who joined us with the acquired company or business, of certain specified bookings, revenue, run rate, product proliferation, product development or employee retention goals during a specified period following completion of the applicable acquisition. The specific performance goal levels and amounts and timing of employee bonuses or contingent purchase price payments vary with each acquisition. We may continue to use contingent purchase price payments in connection with acquisitions in the future and while we expect to derive value from an acquisition in excess of such contingent payment obligations, we may be required to make certain contingent payments without deriving the anticipated value.

Future acquisitions may involve issuances of stock as full or partial payment of the purchase price for the acquired company or business, grants of restricted stock, restricted stock units or stock options to employees of the acquired companies or businesses (which may be dilutive to existing stockholders), expenditure of substantial cash resources or the incurrence of a material amount of debt. These arrangements may impact our liquidity, financial position and results of operations or increase dilution of our stockholders' equity interests in the company.

We have invested and expect to continue to invest in research and development efforts for new and existing products and technologies and technical sales support. Such investments may affect our operating results, and, if the return on these investments is lower or develops more slowly than we expect, our revenue and operating results may suffer.

We have invested and expect to continue to invest in research and development for new and existing products, technologies and services in response to our customers' increasing technological requirements. Such investments may be in related areas, such as technical sales support. These investments may involve significant time, risks and uncertainties, including the risk that the expenses associated with these investments may affect our margins and operating results and that such investments may not generate sufficient revenues to offset liabilities assumed and expenses associated with these new investments. We believe that we must continue to invest a significant amount of time and resources in our research and development efforts and technical sales support to maintain and improve our competitive position. If we do not achieve the benefits anticipated from these investments, if the achievement of these benefits is delayed, or if a potential slowdown in "Moore's Law" occurs, which may reduce or slow the need for customers to upgrade or enhance their EDA products and design flows, our revenue and operating results may be adversely affected.

The competition in our industries is substantial, and we may not be able to continue to successfully compete in our industries.

The EDA industry, the commercial electronics engineering services industry and the IP industry are highly competitive. If we fail to compete successfully in these industries, it could seriously harm our business, operating results or financial condition. To compete in these industries, we must identify and develop or acquire innovative and cost-competitive EDA products, integrate them into platforms and market them in a timely manner. We may not be able to compete successfully in these industries. Factors that could affect our ability to compete successfully include:

- the development by others of competitive EDA products or platforms and engineering services, possibly resulting in a shift of customer preferences away from our products and services and significantly decreased revenue;
- aggressive pricing competition by some of our competitors may cause us to lose our competitive position, which could result in lower revenues or profitability and could adversely impact our ability to realize the revenue and profitability forecasts for our software or emulation and prototyping hardware systems products;

the challenges of advanced node design may lead some customers to work with more mature, less risky manufacturing processes that may reduce their need to upgrade or enhance their EDA products and design flows;

the challenges of developing (or acquiring externally developed) technology solutions, including hardware and IP offerings, that are adequate and competitive in meeting the rapidly evolving requirements of next-generation design challenges;

intense competition to attract acquisition targets, possibly making it more difficult for us to acquire companies or technologies at an acceptable price, or at all;

the low cost of entry in EDA;

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the combination of our EDA competitors or collaboration among many EDA companies to deliver more comprehensive offerings than they could individually; and

decisions by electronics manufacturers to perform engineering services or IP development internally, rather than purchase these services from outside vendors due to budget constraints or excess engineering capacity.

We compete in EDA most frequently with Synopsys, Inc. and Mentor Graphics Corporation, which is in the process of being acquired by Siemens AG, but also with numerous other EDA providers (such as Ansys, Inc., Zuken Ltd. and many others offering “point solutions”), with manufacturers of electronic devices that have developed, acquired or have the capability to develop their own EDA products, and with numerous electronics design and consulting companies. In the area of design IP, we compete with Synopsys, Inc., CEVA, Inc. and numerous other IP companies.

The effect of foreign exchange rate fluctuations may adversely impact our revenue, expenses, cash flows and financial condition.

We have significant operations outside the United States. Our revenue from international operations as a percentage of total revenue was approximately 54% during both fiscal 2016 and fiscal 2015 and 56% during fiscal 2014. We expect that revenue from our international operations will continue to account for a significant portion of our total revenue.

We also transact business in various foreign currencies. Volatility of foreign currencies in certain countries where we conduct business, most notably the Chinese renminbi, Japanese yen, European Union euro, British pound and Indian rupee have had and may in the future have an effect on our revenue or operating results.

Fluctuations in the rate of exchange between the U.S. dollar and the currencies of other countries where we conduct business could seriously affect our business, operating results or financial condition. For example, when a foreign currency declines in value relative to the U.S. dollar, it takes more of the foreign currency to purchase the same amount of U.S. dollars than before the change. If we price our products and services in the foreign currency, we receive fewer U.S. dollars than we did before the change. If we price our products and services in U.S. dollars, the decrease in value of the local currency results in an increase in the price for our products and services compared to those products of our competitors that are priced in local currency. This could result in our prices being uncompetitive in markets where business is transacted in the local currency. On the other hand, when a foreign currency increases in value relative to the U.S. dollar, it takes more U.S. dollars to purchase the same amount of the foreign currency. As we use the foreign currency to fund payroll costs and other operating expenses in our international operations, this results in an increase in operating expenses. Approximately 30% of our total costs and expenses are transacted in foreign currencies. Our attempts to reduce the effect of foreign currency fluctuations may be unsuccessful, and significant exchange rate movements may adversely impact our results of operations as expressed in U.S. dollars.

Our operating results could be adversely affected by an increase in our effective tax rate as a result of tax law changes, outcomes of current or future tax examinations, or by material differences between our forecasted and actual effective tax rates.

Our operations are subject to income and transaction taxes in the United States and in multiple foreign jurisdictions, with a significant amount of our foreign earnings generated by our subsidiaries organized in Ireland and Hungary.

Any significant change in our future effective tax rates could adversely impact our results of operations for future periods. Our future effective tax rates could be adversely affected by the following:

- changes in tax laws or the interpretation of such tax laws in the United States, Ireland, Hungary, the United Kingdom, China, South Korea, India or other international locations where we have operations;

- earnings being lower than anticipated in countries where we are taxed at lower rates as compared to the United States federal and state statutory tax rates;

- an increase in expenses not deductible for tax purposes;

- changes in the valuation allowance against our deferred tax assets;

- changes in judgment from the evaluation of new information that results in a recognition, derecognition or change in measurement of a tax position taken in a prior period;

- increases to interest or penalty expenses classified in the financial statements as income taxes;

- new accounting standards or interpretations of such standards;

- a change in our decision to indefinitely reinvest foreign earnings outside the United States; or

• results of examinations by the Internal Revenue Service, or IRS, state, and foreign tax or other governmental authorities.

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The IRS and other tax authorities regularly examine our income tax returns and other non-income tax returns, such as payroll, sales, use, value-added, net worth or franchise, property, goods and services, consumption, import, stamp, and excise taxes, in both the United States and foreign jurisdictions. The calculation of our provision for income taxes and our accruals for other taxes requires us to use significant judgment and involves dealing with uncertainties in the application of complex tax laws and regulations. In determining the adequacy of our provision for income taxes, we regularly assess the potential settlement outcomes resulting from income tax examinations. However, the final outcome of tax examinations, including the total amount payable or the timing of any such payments upon resolution of these issues, cannot be estimated with certainty. In addition, we cannot be certain that such amount will not be materially different from the amount that is reflected in our historical income tax provisions and accruals for other taxes. Should the IRS or other tax authorities assess additional taxes, penalties or interest as a result of a current or a future examination, we may be required to record charges to operations in future periods that could have a material impact on our results of operations, financial position or cash flows in the applicable period or periods.

Forecasts of our annual effective tax rate are complex and subject to uncertainty because our income tax position for each year combines the effects of estimating our annual income or loss, the mix of profits and losses earned by us and our subsidiaries in tax jurisdictions with a broad range of income tax rates, as well as benefits from available deferred tax assets, the impact of various accounting rules and results of tax audits. Forecasts of our annual effective tax rate do not include the anticipation of future tax law changes. In addition, we account for certain tax benefits from stock-based compensation in the period the stock compensation is settled, which may cause increased variability in our quarterly effective tax rates. If there were a material difference between forecasted and actual tax rates, then it could have a material impact on our results of operations.

Tax laws, regulations, and enforcement practices are evolving and may have a material adverse effect on our results of operations, cash flows and financial position.

Tax laws, regulations, and administrative practices in various jurisdictions are evolving and may be subject to significant changes due to economic, political, and other conditions. There are many transactions that occur during the ordinary course of business for which the ultimate tax determination is uncertain, and significant judgment is required in evaluating and estimating our provision and accruals for these taxes. Governments are increasingly focused on ways to increase tax revenues, particularly from multinational corporations, which may lead to an increase in audit activity and harsher positions taken by tax authorities. We are currently subject to tax audits in various jurisdictions, and these jurisdictions may assess additional tax liabilities against us.

The current U.S. administration and certain members of Congress have made public statements indicating that corporate tax reform is a priority. Changes to U.S. tax laws could materially affect the tax treatment of our domestic and foreign earnings. The Organisation for Economic Co-operation and Development, an international association of 34 countries, including the United States, released the final reports from its Base Erosion and Profit Shifting, or BEPS, Action Plans, which aim to standardize and modernize global tax policies. The BEPS Action Plans propose revisions to numerous tax rules, including country-by-country reporting, permanent establishment, hybrid entities and instruments, transfer pricing, and tax treaties. The BEPS Action Plans have been or are being enacted by countries where we have operations. The European Commission has conducted investigations in multiple countries focusing on whether local country tax rulings provide preferential tax treatment that violates European Union state aid rules and concluded that certain countries, including Ireland, have provided illegal state aid in certain cases.

Developments in relevant tax laws, regulations, administrative practices and enforcement practices could have a material adverse effect on our operating results, financial position and cash flows, including the need to obtain additional financing.

Our stock price has been subject to fluctuations and may continue to be subject to fluctuations.

The market price of our common stock has experienced fluctuations and may fluctuate or decline in the future, and as a result you could lose the value of your investment. The market price of our common stock may be affected by a number of factors, including:

- quarterly or annual operating or financial results or forecasts that fail to meet or are inconsistent with earlier projections or the expectations of our securities analysts or investors;
- changes in our forecasted bookings, revenue, earnings or operating cash flow estimates;

an increase in our debt or other liabilities;
market conditions in the IC, electronics systems and semiconductor industries;
announcements of a restructuring plan;
changes in management;
repurchases of shares of our common stock or changes to plans to repurchase shares of our common stock;
a gain or loss of a significant customer or market segment share;
litigation; and
announcements of new products or acquisitions of new technologies by us, our competitors or our customers.

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In addition, equity markets in general, and the equities of technology companies in particular, have experienced and may experience in the future, extreme price and volume fluctuations due to, among other factors, the actions of market participants or other actions outside of our control. Such price and volume fluctuations may adversely affect the market price of our common stock for reasons unrelated to our business or operating results.

Our future revenue is dependent in part upon our installed customer base continuing to license or buy products and purchase services.

Our installed customer base has traditionally generated additional new license, service and maintenance revenues. In future periods, customers may not necessarily license or buy additional products or contract for additional services or maintenance. Our customers, many of which are large semiconductor and systems companies, often have significant bargaining power in negotiations with us. Customer consolidation can reduce the total level of purchases of our software, hardware, IP and services, and in some cases, increase customers' bargaining power in negotiations with their suppliers, including us.

We could suffer serious harm to our business because of the infringement of our intellectual property rights by third parties or because of our infringement of the intellectual property rights of third parties.

There are numerous patents relating to our business and ecosystem. New patents are being issued at a rapid rate and are owned by EDA companies as well as entities and individuals outside the EDA industry, including parties whose income is primarily derived from infringement-related licensing and litigation. It is not always practicable to determine in advance whether a product or any of its components infringes the patent rights of others. As a result, from time to time, we may be compelled to respond to or prosecute intellectual property infringement claims to protect our rights or defend a customer's rights.

Intellectual property infringement claims, including contractual defense reimbursement obligations related to third-party claims against our customers, regardless of merit, could consume valuable management time, result in costly litigation or cause product shipment delays, all of which could seriously harm our business, operating results or financial condition. The risk of infringement and related indemnification claims associated with design IP products that are incorporated into a customer product broadly used by consumers may be higher than the risk associated with our software products. In settling these claims, we may be required to enter into royalty or licensing agreements with the third parties claiming infringement. These royalty or licensing agreements, if available, may not have terms favorable to us. Being compelled to enter into a license agreement with unfavorable terms could seriously harm our business, operating results or financial condition. Any potential intellectual property litigation could compel us to do one or more of the following:

- pay damages (including the potential for treble damages), license fees or royalties (including royalties for past periods) to the party claiming infringement;
- stop licensing products or providing services that use the challenged intellectual property;
- obtain a license from the owner of the infringed intellectual property to sell or use the relevant technology, which license may not be available on reasonable terms, or at all; or
- redesign the challenged technology, which could be time consuming and costly, or impossible.

If we were compelled to take any of these actions, our business or operating results may suffer.

If our security measures are breached, and an unauthorized party obtains access to customer data or our proprietary business information, our information systems may be perceived as being insecure, which could harm our business and reputation.

Our products and services involve the storage and transmission of our proprietary information and that of our customers. We have offices throughout the world, including key research and development facilities outside of the United States. Our operations are dependent upon the connectivity of our operations throughout the world. Despite our security measures, our information technology and infrastructure may be vulnerable to cyber attacks or breached, which could result in unauthorized disclosure of sensitive information and could significantly interfere with our business operations. Breaches of our security measures could expose us to a risk of loss or misuse of this information, litigation and potential liability. Because techniques used to obtain unauthorized access or to sabotage information systems change frequently and generally are not recognized until launched against a target, we may be unable to anticipate these techniques or to implement adequate preventive measures. In addition, if we select a vendor that uses

cyber storage of information as part of their service or product offerings, despite our attempts to validate the security of such services, our proprietary information may be misappropriated by third parties. In the event of an actual or perceived breach of our security, or the security of one of our vendors, the market perception of the effectiveness of our security measures could be harmed and we could suffer damage to our reputation or our business, or lose existing customers and our ability to obtain new customers.

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Risks associated with our international operations could adversely impact our financial condition.

A significant amount of our revenue is derived from our international operations, and we have offices throughout the world, including key research and development facilities outside of the United States. Our international operations may be subject to a number of risks, including:

- shifts in political, trade or other policies resulting from the results of certain elections or votes, such as the recent change in the United States administration and the United Kingdom referendum to withdraw from the European Union;
- the adoption or expansion of government trade restrictions, including tariffs and other trade barriers;
- limitations on repatriation of earnings;
- limitations on the conversion of foreign currencies;
- reduced protection of intellectual property rights in some countries;
- performance of national economies;
- longer collection periods for receivables and greater difficulty in collecting accounts receivable;
- difficulties in managing foreign operations;
- political and economic instability;
- unexpected changes in regulatory requirements;
- inability to continue to offer competitive compensation in certain growing regions;
- differing employment practices and labor issues;
- United States' and other governments' licensing requirements for exports, which may lengthen the sales cycle or restrict or prohibit the sale or licensing of certain products; and
- variations in costs or expenses associated with our international operations, including as a result of changes in foreign tax laws or devaluation of the U.S. dollar relative to other foreign currencies.

Some of our international research and development and other facilities are in parts of the world where there may be a greater risk of business interruption as a result of political instability, terrorist acts or military conflicts than businesses located domestically. Furthermore, this potential harm is exacerbated because damage to or disruptions at our international research and development facilities could have a more significant adverse effect on our ability to develop new or improve existing products than other businesses that may only have sales offices or other less critical operations abroad. We are not insured for losses or interruptions caused by acts of war. Furthermore, our operations are dependent upon the connectivity of our operations throughout the world. Activities that interfere with our international connectivity or operations, such as cyber hacking, the introduction of a virus into our computer systems, natural disasters, civil unrest or terrorism, could significantly interfere with our business operations.

In addition, internal controls, policies and procedures and employee training and compliance programs that we have implemented to deter prohibited practices may not prevent our employees, contractors or agents from violating or circumventing our policies and the laws and regulations applicable to our worldwide operations.

We depend upon our management team and key employees, and our failure to attract, train, motivate and retain management and key employees may make us less competitive and therefore harm our results of operations.

Our business depends upon the continued services, efforts and abilities of our senior management and other key employees. Competition for highly skilled executive officers and employees can be intense, particularly in geographic areas recognized as high technology centers such as the Silicon Valley area, where our principal offices are located, and in other locations where we maintain facilities. In addition, competition for qualified personnel, including software engineers, in the EDA, commercial electronics engineering services and IP industries has intensified. We may also experience increased compensation costs that are not offset by either improved productivity or higher sales. We may not be successful in recruiting new personnel and in retaining and motivating existing personnel. From time to time, there may be changes in our management team resulting from the hiring and departure of executive officers, and as a result, we may experience disruption to our business that may harm our operating results and our relationships with our employees, customers and suppliers may be adversely affected.

To attract, retain and motivate individuals with the requisite expertise, we may be required to grant large numbers of stock options or other stock-based incentive awards, which may be dilutive to existing stockholders and increase compensation expense, and pay significant base salaries and cash bonuses, which could harm our operating results.

The high cost of training new employees, not fully utilizing these employees, or losing trained employees to competing employers could also reduce our operating margins and harm our business or operating results.

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In addition, applicable rules and regulations require stockholder approval for new equity compensation plans and significant amendments to existing equity compensation plans (including increases in shares available for issuance under such plans), and prohibit publicly-traded companies from giving a proxy to vote on equity compensation plans unless the beneficial owner of the shares has given voting instructions. These rules and regulations could make it more difficult for us to grant equity compensation to employees in the future. To the extent that these regulations make it more difficult or expensive to grant equity compensation to employees, we may incur increased compensation costs or find it difficult to attract, retain and motivate employees, which could materially and adversely affect our business. We rely on our proprietary technology, as well as software and other intellectual property rights licensed to us by third parties, and we cannot assure you that the precautions taken to protect our rights will be adequate or that we will continue to be able to adequately secure such intellectual property rights from third parties.

Our success depends, in part, upon our proprietary technology. We generally rely on patents, copyrights, trademarks, trade secrets, licenses and restrictive agreements to establish and protect our proprietary rights in technology and products. Despite the precautions we may take to protect our intellectual property, third parties have tried in the past, and may try in the future, to challenge, invalidate or circumvent these safeguards. Our patents and other intellectual property rights may not provide us with sufficient competitive advantages. Patents may not be issued on any of our pending applications and our issued patents may not be sufficiently broad to protect our technology. Furthermore, the laws of foreign countries may not protect our proprietary rights in those countries to the same extent as applicable law protects these rights in the United States. The protection of our intellectual property may require the expenditure of significant financial and managerial resources. Moreover, the steps we take to protect our intellectual property may not adequately protect our rights, or deter or prevent third parties from infringing or misappropriating our proprietary rights.

Many of our products include software or other intellectual property licensed from third parties. We may have to seek new or renew existing licenses for such software and other intellectual property in the future. Our engineering services business holds licenses to certain software and other intellectual property owned by third parties, including that of our competitors. Our failure to obtain software, other intellectual property licenses or other intellectual property rights that are necessary or helpful for our business on favorable terms, or our need to engage in litigation over these licenses or rights, could seriously harm our business, operating results or financial condition.

We have substantial cash requirements in the United States, but a significant portion of our cash is held and generated outside of the United States, and if our cash available in the United States and the cash available under our revolving credit facility are insufficient to meet our operating expenses and debt repayment obligations in the United States, then we may be required to raise cash in ways that could negatively affect our financial condition, results of operations and the market price of our common stock.

We have significant operations outside the United States. As of December 31, 2016, approximately 63% of our cash, cash equivalents and short-term investments balance was held by subsidiaries outside the United States, with the remainder of the balance held by us or our subsidiaries in the United States. We believe that the combination of our U.S. cash, cash equivalents, future U.S. operating cash flows, cash available under our revolving credit facility and other cash that may be accessible to us on attractive terms are sufficient to meet our ongoing U.S. operating expenses and debt repayment obligations. However, if these sources of cash were insufficient to meet our future funding obligations in the United States, we could be required to seek funding sources on less attractive terms, which could negatively impact our results of operations, financial position and the market price of our common stock.

Litigation could adversely affect our financial condition or operations.

We currently are, and in the future may be, involved in various disputes and litigation that arise in the ordinary course of business. These include disputes and lawsuits related to intellectual property, including customer indemnification, mergers and acquisitions, licensing, contracts, distribution arrangements and employee relations matters. For information regarding the litigation matters in which we are currently engaged, please refer to the discussion under Part I, Item 3, “Legal Proceedings” and Note 11 in the notes to consolidated financial statements. We cannot provide any assurances that the final outcome of these lawsuits or any other proceedings that may arise in the future will not have a material adverse effect on our business, operating results, financial condition or cash flows. Litigation can be time consuming and expensive and could divert management’s time and attention from our business, which could have

a material adverse effect on our revenues and operating results.

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Errors or defects in our products and services could expose us to liability and harm our business.

Our customers use our products and services in designing and developing products that involve a high degree of technological complexity, each of which has its own specifications. Because of the complexity of the systems and products with which we work, some of our products and designs can be adequately tested only when put to full use in the marketplace. As a result, our customers or their end users may discover errors or defects in our software or the systems we design, or the products or systems incorporating our design and intellectual property may not operate as expected. Errors or defects could result in:

- loss of customers;
- loss of market share;
- damage to our reputation;
- failure to attract new customers or achieve market acceptance;
- diversion of development resources to resolve the problem;
- loss of or delay in revenue;
- increased service costs; and
- liability for damages.

Our operating results and revenue could be adversely affected by customer payment delays, customer bankruptcies and defaults or modifications of licenses.

Occasionally, our customers file for bankruptcy or request to modify license terms. If our customers experience adversity in their business, they may delay or default on their payment obligations to us, file for bankruptcy or modify or cancel plans to license our products. For instance, if our customers are not successful in generating sufficient cash or are precluded from securing financing, they may not be able to pay, or may delay payment of, accounts receivable that are owed to us, although these obligations are generally not cancelable. Our customers' inability to fulfill payment obligations, in turn, may adversely affect our revenue and cash flow. Additionally, our customers have, in the past, sought, and may, in the future, seek, to renegotiate pre-existing contractual commitments. Payment defaults by our customers or significant reductions in existing contractual commitments could have a material adverse effect on our financial condition and operating results.

The long sales cycle of our products and services may cause our operating results to fluctuate unexpectedly.

Generally, we have a long sales cycle that can extend up to six months or longer. The complexity and expense associated with our products and services generally require a lengthy customer education, evaluation and approval process. Consequently, we may incur substantial expenses and devote significant management effort and expense to develop potential relationships that do not result in agreements or revenue and may prevent us from pursuing other opportunities.

In addition, sales of our products and services have been and may in the future be delayed if customers delay approval or commencement of projects because of:

- the timing of customers' competitive evaluation processes; or
- customers' budgetary constraints and budget cycles.

Long sales cycles for hardware products subject us to a number of significant risks over which we have limited control, including insufficient, excess or obsolete inventory, variations in inventory valuation and fluctuations in quarterly operating results.

Our reported financial results may be adversely affected by changes in United States generally accepted accounting principles, and we may incur significant costs to adjust our accounting systems and processes to comply with significant changes.

United States generally accepted accounting principles, or U.S. GAAP, are subject to interpretation by the Financial Accounting Standards Board, or FASB, the SEC and various bodies formed to promulgate and interpret appropriate accounting principles. We are also subject to evolving rules and regulations of the countries in which we do business. The FASB is currently working together with the International Accounting Standards Board, or IASB, on several projects to further align accounting principles and facilitate more comparable financial reporting between companies that are required to follow U.S. GAAP under SEC regulations and those that are required to follow IFRS outside of the United States. These efforts by the FASB and IASB may result in different accounting principles under U.S.

GAAP that could have a significant effect on our reported financial results for us in areas including, but not limited to, principles for recognizing revenue and accounting for leases. For information regarding new accounting standards, please refer to Part II, Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations” under the heading “New Accounting Standards.”

In addition, we may need to significantly change our customer contracts, accounting systems and processes when we adopt future or proposed changes in accounting principles noted above. The cost and effect of these changes may negatively impact our results of operations during the periods of transition.

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Our restructuring plans may not result in the benefits we have anticipated, possibly having a negative effect on our future operating results.

In recent fiscal years, we have initiated restructuring plans in an effort to reallocate or decrease costs by reducing our workforce and by consolidating facilities. We incur substantial costs to implement restructuring plans, and our restructuring activities may subject us to litigation risks and expenses. Our past restructuring plans do not provide any assurance that additional restructuring plans will not be required or implemented in the future. In addition, our restructuring plans may have other consequences, such as attrition beyond our planned reduction in workforce, a negative effect on employee morale and productivity or our ability to attract highly skilled employees. Our competitors may also use our restructuring plans to seek to gain a competitive advantage over us. As a result, our restructuring plans may affect our revenue and other operating results in the future.

Failure to obtain export licenses could harm our business by rendering us unable to ship products and transfer our technology outside of the United States.

We must comply with regulations of the United States and of certain other countries in shipping our products and transferring our technology outside the United States and to foreign nationals. Any significant future difficulty in complying with these regulations could harm our business, operating results or financial condition.

If we become subject to unfair hiring claims, we could be prevented from hiring needed employees, incur liability for damages and incur substantial costs in defending ourselves.

When companies in our industry lose employees to competitors, they frequently claim that these competitors have engaged in unfair hiring practices or that the employment of these persons would involve the disclosure or use of trade secrets. These claims could prevent us from hiring employees or cause us to incur liability for damages. We could also incur substantial costs in defending ourselves or our employees against these claims, regardless of their merits.

Defending ourselves from these claims could also divert the attention of our management away from our operations.

Anti-takeover defenses in our certificate of incorporation and bylaws and certain provisions under Delaware law could prevent an acquisition of our company or limit the price that investors might be willing to pay for our common stock.

Our certificate of incorporation and bylaws and certain provisions of the Delaware General Corporation Law that apply to us could make it difficult for another company to acquire control of our company. For example:

Our certificate of incorporation allows our Board of Directors to issue, at any time and without stockholder approval, preferred stock with such terms as it may determine. No shares of preferred stock are currently outstanding. However, the rights of holders of any of our preferred stock that may be issued in the future may be superior to the rights of holders of our common stock.

Section 203 of the Delaware General Corporation Law generally prohibits a Delaware corporation from engaging in any business combination with a person owning 15% or more of its voting stock, or who is affiliated with the corporation and owned 15% or more of its voting stock at any time within three years prior to the proposed business combination, for a period of three years from the date the person became a 15% owner, unless specified conditions are met.

All or any one of these factors could limit the price that certain investors would be willing to pay for shares of our common stock and could allow our Board of Directors to resist, delay or prevent an acquisition of our company, even if a proposed transaction were favored by a majority of our independent stockholders.

The investment of our cash in money market funds is subject to risks that may cause losses and affect the liquidity of these investments.

Our investments include various money market funds. Weakened financial markets have at times adversely impacted the general credit, liquidity, market prices and interest rates for these and other types of investments. Additionally, changes in monetary policy by the Federal Open Market Committee and concerns about the rising U.S. government debt level may cause a decrease in the purchasing power of the U.S. dollar and adversely affect our investment portfolio. The financial market and monetary risks associated with our investment portfolio may have a material adverse effect on our financial condition, liquidity, results of operations or cash flows.

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We depend on sole suppliers for certain hardware components and contract manufacturers for production of our emulation and prototyping hardware products, making us vulnerable to supply disruption and price fluctuation. We depend on sole suppliers for certain hardware components and contract manufacturers for production of our emulation and prototyping hardware products. Our reliance on sole suppliers and contract manufacturers could result in product delivery problems and delays and reduced control over product pricing and quality. Though we prefer to have multiple sources to procure certain key components, in some cases it is not practical or feasible to do so. We may suffer a disruption in the supply of certain hardware components if we are unable to purchase sufficient components on a timely basis or at all for any reason. Any supply or manufacturing disruption, including delay in delivery of components by our suppliers or products by our manufacturers, or the bankruptcy or shutdown of our suppliers or manufacturers, could delay our production process and prevent us from delivering completed hardware products to customers or from supplying new evaluation units to customers, which could have a negative impact on our revenue and operating results.

We are subject to evolving corporate governance and public disclosure regulations that impact compliance costs and risks of noncompliance.

We are subject to changing rules and regulations promulgated by a number of governmental and self-regulatory organizations, including the SEC, NASDAQ, and the FASB. These rules and regulations continue to evolve in scope and complexity, and many new requirements have been created in response to laws enacted by Congress, making compliance more difficult and uncertain. The increase in costs to comply with such evolving rules and regulations, as well as any risk of noncompliance, could adversely impact us.

Conflict minerals regulations may cause us to continue to incur additional expenses and may adversely impact our ability to conduct our business.

In August 2012, the SEC adopted new rules establishing disclosure and reporting requirements regarding the use of certain minerals referred to as “conflict minerals” in products. These rules require us to determine, disclose and report whether or not such minerals in our products originate from the Democratic Republic of the Congo or adjoining countries. We have incurred, and expect to continue to incur, costs to comply with these rules, including costs associated with conducting due diligence on our supply chain and fulfilling our reporting requirements, and we may incur costs related to changes to our products, processes or sources of supply. In addition, these rules could affect the availability of certain minerals used in the manufacture of our emulation and prototyping hardware products and IP boards, or the Covered Products, and thus impact our ability to source, at competitive prices, certain materials that are used in the Covered Products. Finally, our customers may prefer to purchase products from vendors who claim that all minerals in their products are conflict-free, and our revenues may be harmed or we may face reputational challenges if we are unable to verify that our Covered Products are conflict-free.

Our business is subject to the risk of earthquakes and other natural disasters.

Our corporate headquarters, including certain of our research and development operations and certain of our distribution facilities, is located in the Silicon Valley area of Northern California, a region known to experience seismic activity. If significant seismic activity were to occur, our operations may be interrupted, which could adversely impact our business and results of operations.

Our other offices in the United States and in other countries around the world may be adversely impacted by natural disasters. If a natural disaster occurs at or near any of our offices, our operations may be interrupted, which could adversely impact our business and results of operations. If a natural disaster impacts a significant number of our customers, our business and results of operations could be adversely impacted.

Risks Related to Our Securities and Indebtedness

Our debt obligations expose us to risks that could adversely affect our business, operating results or financial condition, and could prevent us from fulfilling our obligations under such indebtedness.

We have a substantial level of debt. As of December 31, 2016, we had total outstanding indebtedness of \$693.5 million. We also had the ability to borrow an additional \$200.0 million under our revolving credit facility, with the right to request increased capacity up to an additional \$150.0 million upon the receipt of lender commitments, for total maximum borrowings of \$400.0 million under our revolving credit facility. Subject to the limits contained in the credit agreement governing our revolving credit facility, the indenture that governs the 4.375% Senior Notes due

2024, or the 2024 Notes, and our other debt instruments, we may be able to incur substantial additional debt from time to time to finance working capital, capital expenditures, investments or acquisitions, share repurchases or for other purposes. If we do so, the risks related to our high level of debt could intensify. Specifically, our high level of debt could have important consequences, including the following:

- making it more difficult for us to satisfy our obligations to service our debt as described above;

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limiting our ability to obtain additional financing to fund future working capital, capital expenditures, acquisitions or other general corporate requirements;
 requiring a substantial portion of our cash flows to be dedicated to debt service payments instead of other purposes, thereby reducing the amount of cash flows available for working capital, capital expenditures, acquisitions and other general corporate purposes;
 utilizing large portions of our U.S. cash to service our debt obligations because those payments are made in the United States, which may require us to repatriate cash from outside the United States and incur unanticipated or unfavorable tax expenses;
 increasing our vulnerability to general adverse economic and industry conditions;
 exposing us to the risk of increased interest rates as certain of our borrowings, including borrowings under our revolving credit facility, are at variable rates of interest;
 limiting our flexibility in planning for and reacting to changes in the industry in which we compete;
 placing us at a disadvantage compared to other, less leveraged competitors and competitors that have greater access to capital resources; and
 increasing our cost of borrowing.

At the option of the holders of our outstanding notes, we may, under certain circumstances, be required to repurchase such notes.

Under the terms of our 2024 Notes, we may be required to repurchase for cash such notes prior to their maturity in connection with the occurrence of certain significant corporate events. Specifically, we are required to offer to repurchase such notes upon a “change of control triggering event” (as defined in the indenture related to such notes), such as a change of control accompanied by certain downgrades in the credit ratings of such notes. The repayment obligations under such notes may have the effect of discouraging, delaying or preventing a takeover of our company. If we were required to pay the 2024 Notes prior to their scheduled maturity, it could have a significant negative impact on our cash and liquidity and could impact our ability to invest financial resources in other strategic initiatives. The terms of the agreements governing our revolving credit facility and 2019 Term Loan and the indenture governing our 2024 Notes restrict our current and future operations, particularly our ability to respond to changes or to take certain actions.

The agreements governing our revolving credit facility and 2019 Term Loan contain a number of restrictive covenants that impose significant operating and financial restrictions on us and may limit our ability to engage in acts that may be in our long-term best interest, including restrictions on our ability to:

- pay dividends or make other distributions or repurchase or redeem capital stock;
- prepay, redeem or repurchase certain debt;
- issue certain preferred stock or similar equity securities;
- make certain investments;
- incur liens;
- incur additional indebtedness and guarantee indebtedness;
- enter into sale and leaseback transactions;
- enter into transactions with affiliates;
- alter the businesses we conduct;
- enter into agreements restricting our subsidiaries’ ability to pay dividends;
- and
- consolidate, merge or sell all or substantially all of our assets.

In addition, the restrictive covenants in the agreements governing our revolving credit facility and 2019 Term Loan require us to maintain specified financial ratios and satisfy other financial condition tests. Our ability to meet those financial ratios and tests can be affected by events beyond our control, and we may be unable to meet them.

A breach of the covenants or restrictions under the agreements governing our revolving credit facility and 2019 Term Loan could result in an event of default under the applicable indebtedness. Such a default may allow the creditors to accelerate the related debt and may result in the acceleration of any other debt to which a cross-acceleration or cross-default provision applies. In addition, an event of default under the credit agreement governing our revolving

credit facility would permit the lenders under our revolving credit facility to terminate all commitments to extend further credit under that facility. In the event our lenders or note holders accelerate the repayment of our borrowings, we and our subsidiaries may not have sufficient assets to repay that indebtedness. As a result of these restrictions, we may be:

- limited in how we conduct our business;

- unable to raise additional debt or equity financing to operate during general economic or business downturns; or

- unable to compete effectively or to take advantage of new business opportunities.

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The indenture governing our 2024 Notes also contains certain restrictive covenants that impose operating and financial restrictions on us and may limit our ability to engage in acts that may be in our long-term best interest, including restrictions on our ability to incur liens and to enter into sale and leaseback transactions.

These restrictions may affect our ability to grow in accordance with our strategy. In addition, our financial results, our substantial indebtedness and our credit ratings could adversely affect the availability and terms of our financing.

We may not be able to generate sufficient cash to service all of our indebtedness and may be forced to take other actions to satisfy our obligations under our indebtedness, which may not be successful.

Our ability to make scheduled payments on or refinance our debt obligations depends on our financial condition and operating performance, which are subject to prevailing economic and competitive conditions and to certain financial, business, legislative, regulatory and other factors beyond our control. We may be unable to maintain a level of cash flows from operating activities sufficient to permit us to pay the principal, premium, if any, and interest on our indebtedness.

If our cash flows and capital resources are insufficient to fund our debt service obligations, we could face substantial liquidity problems and could be forced to reduce or delay investments and capital expenditures or to dispose of material assets or operations, seek additional debt or equity capital or restructure or refinance our indebtedness. We may not be able to effect any such alternative measures, if necessary, on commercially reasonable terms or at all and, even if successful, those alternative actions may not allow us to meet our scheduled debt service obligations. The agreements governing our revolving credit facility and 2019 Term Loan restrict our ability to dispose of assets and use the proceeds from those dispositions and may also restrict our ability to raise debt or equity capital to be used to repay other indebtedness when it becomes due. We may not be able to consummate those dispositions or to obtain proceeds in an amount sufficient to meet any debt service obligations then due.

In addition, we conduct a substantial portion of our operations through our subsidiaries, none of which are currently guarantors of our indebtedness. Accordingly, repayment of our indebtedness is dependent on the generation of cash flow by our subsidiaries and their ability to make such cash available to us, by dividend, debt repayment or otherwise. Unless they become guarantors of our indebtedness, our subsidiaries do not have any obligation to pay amounts due on our indebtedness or to make funds available for that purpose. Our subsidiaries may not be able to, or may not be permitted to, make distributions to enable us to make payments in respect of our indebtedness. Each subsidiary is a distinct legal entity, and, under certain circumstances, legal and contractual restrictions may limit our ability to obtain cash from our subsidiaries. While the agreements governing our revolving credit facility and 2019 Term Loan limit the ability of our subsidiaries to incur consensual restrictions on their ability to pay dividends or make other intercompany payments to us, these limitations are subject to qualifications and exceptions. In the event that we do not receive distributions from our subsidiaries, we may be unable to make required principal and interest payments on our indebtedness.

Our inability to generate sufficient cash flows to satisfy our debt obligations, or to refinance our indebtedness on commercially reasonable terms or at all, would materially and adversely affect our financial position and results of operations and our ability to satisfy our debt obligations.

If we cannot make scheduled payments on our debt, we will be in default and holders of our debt could declare all outstanding principal and interest to be due and payable, the lenders under our revolving credit facility could terminate their commitments to loan money and we could be forced into bankruptcy or liquidation. In addition, a material default on our indebtedness could suspend our eligibility to register securities using certain registration statement forms under SEC guidelines that permit incorporation by reference of substantial information regarding us, potentially hindering our ability to raise capital through the issuance of our securities and increasing our costs of registration. Despite our current level of indebtedness, we and our subsidiaries may incur substantially more debt. This could further exacerbate the risks to our financial condition described above.

We and our subsidiaries may incur significant additional indebtedness in the future. Although the agreements governing our revolving credit facility and 2019 Term Loan contain restrictions on the incurrence of additional indebtedness, these restrictions are subject to a number of qualifications and exceptions, and the additional indebtedness incurred in compliance with these restrictions could be substantial. If we incur any additional indebtedness that ranks equally with the 2024 Notes, then subject to any collateral arrangements we may enter into,

the holders of that debt will be entitled to share ratably in any proceeds distributed in connection with any insolvency, liquidation, reorganization, dissolution or other winding up of our company.

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Our variable rate indebtedness subjects us to interest rate risk, which could cause our debt service obligations to increase significantly.

Borrowings under our revolving credit facility and 2019 Term Loan are at variable rates of interest and expose us to interest rate risk. If interest rates were to increase, our debt service obligations on our variable rate indebtedness would increase even though the amount borrowed remained the same, and our net income and cash flows, including cash available for servicing our indebtedness, would correspondingly decrease. Assuming all loans were fully drawn, we were to fully exercise our right to increase borrowing capacity under our revolving credit facility and we made no prepayments on our 2019 Term Loan, each quarter point change in interest rates would result in an approximately \$1.8 million change in annual interest expense on our indebtedness under our revolving credit facility and 2019 Term Loan. In the future, we may enter into interest rate swaps that involve the exchange of floating for fixed rate interest payments in order to reduce interest rate volatility. However, we may not maintain interest rate swaps with respect to all of our variable rate indebtedness, and any swaps we enter into may not fully mitigate our interest rate risk.

Various factors could increase our future borrowing costs or reduce our access to capital, including a lowering or withdrawal of the ratings assigned to our 2024 Notes by rating agencies.

We may in the future seek additional financing for a variety of reasons, and our future borrowing costs and access to capital could be affected by factors including the condition of the debt and equity markets, the condition of the economy generally, prevailing interest rates, our level of indebtedness and our business and financial condition. In addition, the 2024 Notes currently have an investment grade rating, and any rating assigned could be lowered or withdrawn entirely by a rating agency if, in that rating agency's judgment, future circumstances relating to the basis of the rating, such as adverse changes, so warrant. Consequently, real or anticipated changes in our credit ratings will generally affect the market value of the 2024 Notes. Any future lowering of the ratings of the 2024 Notes likely would make it more difficult or more expensive for us to obtain additional debt financing.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

We own land and buildings at our headquarters located in San Jose, California. We also own buildings in India. As of December 31, 2016, the total square footage of our owned buildings was approximately 1,010,000.

We lease additional facilities in the United States and various other countries. We sublease certain of these facilities where space is not fully utilized or has been impacted as part of our restructuring plans.

We believe that these facilities are adequate for our current needs and that suitable additional or substitute space will be available as needed to accommodate any expansion of our operations.

Item 3. Legal Proceedings

From time to time, we are involved in various disputes and litigation that arise in the ordinary course of business.

These include disputes and lawsuits related to intellectual property, indemnification obligations, mergers and acquisitions, licensing, contracts, distribution arrangements and employee relations matters. At least quarterly, we review the status of each significant matter and assesses its potential financial exposure. If the potential loss from any claim or legal proceeding is considered probable and the amount or the range of loss can be estimated, we accrue a liability for the estimated loss. Legal proceedings are subject to uncertainties, and the outcomes are difficult to predict. Because of such uncertainties, accruals are based on our judgments using the best information available at the time. As additional information becomes available, we reassess the potential liability related to pending claims and litigation matters and may revise estimates.

Item 4. Mine Safety Disclosures

Not applicable.

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PART II.

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

Common Stock Market Price

Our common stock is traded on the NASDAQ Global Select Market under the symbol CDNS. We have not paid any cash dividends on our common stock in the past, and we do not plan to pay cash dividends in the foreseeable future. As described in Note 3 of the notes to consolidated financial statements, our revolving credit facility restricts certain payments, including dividends and share repurchases. As of February 4, 2017, we had 599 registered stockholders and 37,821 beneficial owners of our common stock.

The following table sets forth the high and low sales prices for our common stock for each fiscal quarter in the two-year period ended December 31, 2016:

2016	High	Low
Fourth Quarter	\$28.00	\$24.15
Third Quarter	26.24	23.83
Second Quarter	25.49	22.79
First Quarter	23.75	18.32

2015

Fourth Quarter	\$23.30	\$19.35
Third Quarter	21.86	18.13
Second Quarter	20.51	17.77
First Quarter	18.86	16.52

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Stockholder Return Performance Graph

The following graph compares the cumulative 5-year total stockholder return on our common stock relative to the cumulative total return of the NASDAQ Composite index and the S&P 400 Information Technology index. The graph assumes that the value of the investment in our common stock and in each index on December 31, 2011 (including reinvestment of dividends) was \$100 and tracks it each year thereafter on the last day of our fiscal year through December 31, 2016 and, for each index, on the last day of the calendar year.

	12/31/2011	12/29/2012	12/28/2013	1/3/2015	1/2/2016	12/31/2016
Cadence Design Systems, Inc.	100.00	129.23	133.94	181.06	200.10	242.50
NASDAQ Composite	100.00	116.41	165.47	188.69	200.32	216.54
S&P 400 Information Technology	100.00	118.41	165.38	170.50	178.74	219.65

The stock price performance included in this graph is not necessarily indicative of future stock price performance.

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Issuer Purchases of Equity Securities

In July 2015, our Board of Directors approved an 18-month plan to repurchase shares of our common stock of up to an aggregate of \$1.2 billion, beginning in the third quarter of fiscal 2015. This plan concluded in the fourth quarter of fiscal 2016. As of December 31, 2016, there were no remaining authorizations to repurchase shares of our common stock.

In January 2017, our Board of Directors authorized a new program to repurchase shares of our common stock in the open market with a value of up to \$525.0 million in the aggregate. The actual timing and amount of repurchases will be subject to business and market conditions, corporate and regulatory requirements, acquisition opportunities and other factors.

The following table presents repurchases made and shares surrendered by employees to satisfy income tax withholding obligations during the three months ended December 31, 2016:

Period	Total Number of Shares Purchased ⁽¹⁾	Average Price Paid Per Share ⁽²⁾	Total Number of Shares Purchased as Part of Publicly Announced Plan or Program	Maximum Dollar Value of Shares Authorized for Repurchase Under Publicly Announced Plan or Program ⁽¹⁾ (In millions)
October 2, 2016 – November 5, 2016	3,442,224	\$ 25.71	3,416,164	\$ 152.2
November 6, 2016 – December 3, 2016	2,957,407	\$ 25.82	2,942,470	\$ 76.2
December 4, 2016 – December 31, 2016	2,973,740	\$ 25.76	2,956,811	\$ —
Total	9,373,371	\$ 25.76	9,315,445	

⁽¹⁾ Shares purchased that were not part of our publicly announced repurchase programs represent employee surrender of shares of restricted stock to satisfy employee income tax withholding obligations due upon vesting, and do not reduce the dollar value that may yet be purchased under our publicly announced repurchase programs.

⁽²⁾ The weighted average price paid per share of common stock does not include the cost of commissions.

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Item 6. Selected Financial Data-Unaudited

The following selected consolidated financial data should be read in conjunction with our consolidated financial statements and the notes thereto and the information contained in Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations.” Historical results are not necessarily indicative of future results. The notes below the table are provided for comparability purposes due to adoptions of accounting pronouncements or to describe significant transactions that may not occur frequently.

	2016	2015	2014	2013	2012
	(In millions, except per share amounts)				
Revenue	\$1,816.1	\$1,702.1	\$1,580.9	\$1,460.1	\$1,326.4
Income from operations	244.9	285.4	206.6	189.0	211.7
Net income ^{(1) (2)}	203.1	252.4	158.9	164.2	439.9
Net income per share-diluted ^{(1) (2)}	0.70	0.81	0.52	0.56	1.57
Total assets ^{(3) (4)}	2,096.9	2,345.5	3,209.6	2,428.6	2,287.0
Debt ^{(3) (4)}	693.5	343.3	691.2	324.8	447.0
Stockholders’ equity ^{(4) (5) (6)}	741.8	1,376.1	1,333.6	1,156.1	915.2

⁽¹⁾ During fiscal 2012, we recorded a \$219.6 million benefit for income taxes due to the release of a substantial portion of the United States deferred tax asset valuation allowance and a \$36.7 million benefit for income taxes due to the effective settlement of the State of California Franchise Tax Board, or FTB, examination of our California income tax returns for the tax years 2001 through 2003.

⁽²⁾ During fiscal 2013, we recorded a \$33.7 million benefit for income taxes from the release of an uncertain tax position, including related interest and penalties, and a \$5.9 million tax benefit from the retroactive enactment of the fiscal 2012 United States federal research tax credit.

⁽³⁾ During fiscal 2015, we settled the outstanding principal amount of the 2015 Notes. In connection with the 2015 Notes we received proceeds of \$530.6 million from the 2015 Notes Hedges, which fully offset the additional cash payments associated with the 2015 Notes Embedded Conversion Derivative.

⁽⁴⁾ During fiscal 2016, we adopted new accounting standards that required retrospective adjustments to our consolidated balance sheet as of January 3, 2015. For additional information on new accounting standards, see Note 2 in the notes to consolidated financial statements under the heading “Recently Adopted Accounting Standards.”

⁽⁵⁾ During fiscal 2016, we repurchased shares of our common stock for a total cost of \$960.3 million. For additional information regarding share repurchases, see the discussion under Part II, Item 5, “Issuer Purchases of Equity Securities.”

⁽⁶⁾ We have never declared or paid any cash dividends on our common stock.

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

The following discussion should be read in conjunction with the consolidated financial statements and notes thereto included elsewhere in this Annual Report on Form 10-K and with Part I, Item 1A, "Risk Factors." Please refer to the cautionary language at the beginning of Part I of this Annual Report on Form 10-K regarding forward-looking statements.

Business Overview

We continue to focus on executing our system design enablement strategy to deliver the tools necessary for our customers to develop complete and functional electronic products. Our growing core electronic design automation business is at the heart of our strategy and is complemented by our business in intellectual property, system interconnect and analysis, system level design and hardware-software development.

Our business serves customers that are driven by end-user demand for electronics systems, integrated circuits and devices that are smaller, use less power and provide more functionality. We must keep pace with our customers' technical developments, satisfy industry standards and meet our customers' increasingly demanding performance, productivity, quality and predictability requirements. We offer innovative solutions to help our customers meet these demands and our future performance depends on our ability to innovate, commercialize newly developed solutions and enhance and maintain our current products.

We have identified certain items that management uses as performance indicators to manage our business, including revenue, certain elements of operating expenses and cash flow from operations, and we describe these items further below under the headings "Results of Operations" and "Liquidity and Capital Resources."

Results of Operations

Financial results for fiscal 2016, as compared to fiscal 2015 and 2014, reflect the following:

- increased product and maintenance revenue, primarily because of increased demand for our emulation and prototyping hardware and digital IC product offerings;
- continued investment in research and development activities focused on creating and enhancing our products to maintain the pace of innovation required by our customers;
- increased stock-based compensation included in operating expenses; and
- restructuring activities.

Our fiscal year ends on the Saturday closest to December 31. Fiscal 2016 and fiscal 2015 were 52-week years, whereas fiscal 2014 was a 53-week year. Revenue and expenses included in the results of operations for fiscal 2014 were impacted by the additional week.

Revenue

We primarily generate revenue from licensing our software and IP, selling or leasing our emulation and prototyping hardware technology, providing maintenance for our software, hardware and IP, providing engineering services and earning royalties generated from the use of our IP. The timing of our revenue is significantly affected by the mix of software, hardware and IP products generating revenue in any given period and whether the revenue is recognized in a recurring manner over multiple periods or up front, upon completion of delivery.

Approximately 90% of our revenue is recurring in nature, and the remainder of the resulting revenue is recognized up front, upon completion of delivery. Recurring revenue includes revenue from our time-based software arrangements, certain IP license arrangements where revenue is recognized over multiple periods, services, royalties from certain IP arrangements, maintenance on perpetual software licenses and hardware, and operating leases of hardware. Upfront revenue is primarily generated by our sales of emulation and prototyping hardware and perpetual software and certain IP licenses. Our ability to maintain this mix in any single fiscal period may be impacted primarily by delivery of hardware and IP products to our customers.

For an additional description of the impact of emulation hardware sales on the timing of revenue recognition, see the discussion under the heading "Critical Accounting Estimates – Revenue Recognition."

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We believe our reported revenue and the amount of revenue recognized in future periods will depend on, among other things, the:

- competitiveness of our technology; and
- size, duration, timing, terms and type of:
 - contract renewals with existing customers;
 - additional sales to existing customers; and
 - sales to new customers.

Revenue by Year

The following table shows our revenue for fiscal 2016, 2015 and 2014 and the change in revenue between years:

	2016	2015	2014	Change 2016 vs. 2015	2015 vs. 2014	
(In millions, except percentages)						
Product and maintenance	\$1,683.8	\$1,578.9	\$1,479.2	\$104.9	7%	\$99.7 7 %
Services	132.3	123.2	101.8	9.1	7%	21.4 21 %
Total revenue	\$1,816.1	\$1,702.1	\$1,581.0	\$114.0	7%	\$121.1 8 %

Product and maintenance revenue increased during fiscal 2016, as compared to fiscal 2015, primarily because of an increase in revenue from our Palladium Z1 enterprise emulation system and our digital IC product offerings, offset by a reduction in revenue from our IP offerings. Product and maintenance revenue increased during fiscal 2015, as compared to fiscal 2014, due to increased demand for our software, emulation and prototyping hardware and IP offerings. Services revenue increased during fiscal 2016, as compared to fiscal 2015, primarily due to the timing of incremental revenue from certain customer agreements that was recognized at the completion of the contract when all specified deliverables were made available. Services revenue increased during fiscal 2015, as compared to fiscal 2014, due to increased demand for our service and IP offerings. Total revenue may fluctuate from period to period based on demand for, and our resources to fulfill, our services, emulation hardware and IP offerings.

No one customer accounted for 10% or more of total revenue during fiscal 2016, 2015 or 2014.

Revenue by Product Group

The following table shows the percentage of product and related maintenance revenue contributed by each of our five product groups and services during fiscal 2016, 2015 and 2014:

	2016	2015	2014
Functional Verification, including Emulation and Prototyping Hardware	25 %	23 %	22 %
Digital IC Design and Signoff	29 %	28 %	29 %
Custom IC Design	25 %	26 %	27 %
System Interconnect and Analysis	10 %	11 %	11 %
IP	11 %	12 %	11 %
Total	100%	100%	100%

As described in Note 2 in the notes to consolidated financial statements, certain of our licensing arrangements allow customers the ability to remix among software products. Additionally, we have arrangements with customers that include a combination of our products, with the actual product selection and number of licensed users to be determined at a later date. For these arrangements, we estimate the allocation of the revenue to product groups based upon the expected usage of our products. The actual usage of our products by these customers may differ and, if that proves to be the case, the revenue allocation in the table above would differ.

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Revenue by Geography

	2016	2015	2014	Change			
				2016 vs. 2015	2015 vs. 2014		
	(In millions, except percentages)						
United States	\$832.6	\$782.4	\$696.6	\$50.2	6 %	\$85.8	12 %
Other Americas	31.3	26.0	23.4	5.3	20 %	2.6	11 %
Asia	445.5	413.6	360.3	31.9	8 %	53.3	15 %
Europe, Middle East and Africa	346.7	316.7	328.7	30.0	9 %	(12.0)	(4)%
Japan	160.0	163.4	172.0	(3.4)	(2)%	(8.6)	(5)%
Total revenue	\$1,816.1	\$1,702.1	\$1,581.0	\$114.0	7 %	\$121.1	8 %

For the primary factors contributing to the increase in revenue for the United States, Other Americas, Asia, and Europe, Middle East and Africa during fiscal 2016, as compared to fiscal 2015, see the general description under “Revenue by Year” above. Revenue for Japan decreased during fiscal 2016, as compared to fiscal 2015, primarily due to difficult business conditions facing our Japanese customers.

For the primary factors contributing to the increase in revenue for the United States, Other Americas and Asia during fiscal 2015, as compared to fiscal 2014, see the general description under “Revenue by Year” above. Revenue for Europe, Middle East and Africa decreased during fiscal 2015, as compared to fiscal 2014, primarily due to a reduction of services revenue as we shifted our resources from design services to our IP offerings. Revenue for Japan decreased during fiscal 2015, as compared to fiscal 2014, primarily due to the continued depreciation of the Japanese yen as well as difficult business conditions facing our Japanese customers.

Most of our revenue is transacted in the United States dollar. However, certain revenue transactions are denominated in foreign currencies. For an additional description of how changes in foreign exchange rates affect our consolidated financial statements, see the discussion in Item 7A, “Quantitative and Qualitative Disclosures About Market Risk – Foreign Currency Risk.”

Revenue by Geography as a Percent of Total Revenue

	2016	2015	2014
United States	46 %	46 %	44 %
Other Americas	2 %	1 %	1 %
Asia	24 %	24 %	23 %
Europe, Middle East and Africa	19 %	19 %	21 %
Japan	9 %	10 %	11 %
Total	100 %	100 %	100 %

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Cost of Revenue

				Change					2015 vs.
	2016	2015	2014	2016 vs. 2015					2014
(In millions, except percentages)									
Product and maintenance	\$183.3	\$155.7	\$156.3	\$27.6	18	%	\$(0.6)	—	%
Services	73.2	82.8	67.4	(9.6)	(12)	%	15.4	23	%
Total cost of revenue	\$256.5	\$238.5	\$223.7	\$18.0	8	%	\$14.8	7	%

The following table shows cost of revenue as a percentage of related revenue for fiscal 2016, 2015 and 2014:

	2016	2015	2014
Product and maintenance	11 %	10 %	11 %
Services	55 %	67 %	66 %

Cost of Product and Maintenance

Cost of product and maintenance includes costs associated with the sale and lease of our emulation and prototyping hardware and licensing of our software and IP products, certain employee salary and benefits and other employee-related costs, cost of our customer support services, amortization of technology-related and maintenance-related acquired intangibles, costs of technical documentation and royalties payable to third-party vendors. Costs associated with our emulation and prototyping hardware products include materials, assembly, applicable reserves and overhead. These hardware manufacturing costs make our cost of emulation and prototyping hardware product higher, as a percentage of revenue, than our cost of software and IP products.

A summary of cost of product and maintenance for fiscal 2016, 2015 and 2014 is as follows:

				Change					2015 vs.
	2016	2015	2014	2016 vs. 2015					2014
(In millions, except percentages)									
Product and maintenance-related costs	\$140.9	\$115.2	\$119.4	\$25.7	22	%	\$(4.2)	(4)	%
Amortization of acquired intangibles	42.4	40.5	36.9	1.9	5	%	3.6	10	%
Total cost of product and maintenance	\$183.3	\$155.7	\$156.3	\$27.6	18	%	\$(0.6)	—	%

Cost of product and maintenance depends primarily on our hardware product sales in any given period. Cost of product and maintenance is also affected by employee salary and benefits and other employee-related costs, as well as the timing and extent to which we acquire intangible assets, acquire or license third-parties' intellectual property or technology and sell our products that include such acquired or licensed intellectual property or technology.

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The changes in product and maintenance-related costs were due to the following:

	Change	
	2016	2015
	vs.	vs.
	2015	2014
	(In millions)	
Emulation and prototyping hardware costs	\$28.0	\$(5.1)
Other items	(2.3)	0.9
	\$25.7	\$(4.2)

Emulation and prototyping hardware costs increased during fiscal 2016, as compared to fiscal 2015, primarily due to higher emulation hardware volume and an increase in charges for reserves on inventory during fiscal 2016 as we approach the end of the product life cycle of Palladium XP, a previous generation of our Palladium hardware platform. Emulation and prototyping hardware costs decreased during fiscal 2015, as compared to fiscal 2014, primarily because charges for inventory reserves were higher during fiscal 2014. Gross margins on our hardware products will fluctuate based on customer pricing strategies, product mix, product competition and product life cycle. Amortization of acquired intangibles included in cost of product and maintenance increased during fiscal 2016, as compared to fiscal 2015, primarily due to the increase in amortization of intangible assets associated with our fiscal 2016 acquisitions. Amortization of acquired intangibles included in cost of product and maintenance increased during fiscal 2015, as compared to fiscal 2014, primarily due to the increase in amortization of intangible assets associated with our fiscal 2014 acquisitions. For an additional description of our expected amortization of intangible assets, see Note 8 of the notes to consolidated financial statements.

Cost of Services

Cost of services primarily includes employee salary, benefits and other employee-related costs to perform work on revenue-generating projects, costs to maintain the infrastructure necessary to manage a services organization, and provisions for contract losses, if any. Cost of services will fluctuate from period to period based on our utilization of design services engineers on revenue-generating projects or on internal development projects. Cost of services decreased during fiscal 2016, as compared to fiscal 2015, and increased during fiscal 2015, as compared to fiscal 2014, primarily due to variation in the number of personnel dedicated to deliver and support our services and custom IP offerings.

Operating Expenses

Our operating expenses include marketing and sales, research and development and general and administrative expenses. Factors that cause our operating expenses to fluctuate include changes in the number of employees due to hiring and acquisitions, restructuring activities, foreign exchange rates, stock-based compensation and the impact of our variable compensation programs that are driven by overall operating results.

Many of our operating expenses are transacted in various foreign currencies. We recognize lower expenses in periods when the United States dollar strengthens in value against other currencies and we recognize higher expenses when the United States dollar weakens against other currencies. During fiscal 2016, as compared to fiscal 2015, we experienced a favorable impact on expenses as a result of the strengthening value of the United States dollar against other currencies. For an additional description of how changes in foreign exchange rates affect our consolidated financial statements, see the discussion in Item 7A, "Quantitative and Qualitative Disclosures About Market Risk – Foreign Currency Risk."

Our operating expenses for fiscal 2016, 2015 and 2014 were as follows:

	Change					2015 vs.	
	2016	2015	2014	2016 vs. 2015		2014	
	(In millions, except percentages)						
Marketing and sales	\$395.2	\$402.4	\$399.7	\$(7.2)	(2)%	\$2.7	1 %
Research and development	735.3	637.6	603.0	97.7	15 %	34.6	6 %
General and administrative	125.1	110.0	113.6	15.1	14 %	(3.6)	(3)%

\$1,255.6 \$1,150.0 \$1,116.3 \$105.6 9 % \$33.7 3 %

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Our operating expenses, as a percentage of total revenue, for fiscal 2016, 2015 and 2014 were as follows:

	2016	2015	2014
Marketing and sales	22 %	24 %	26 %
Research and development	40 %	38 %	38 %
General and administrative	7 %	6 %	7 %
Operating expenses	69 %	68 %	71 %

Marketing and Sales

The changes in marketing and sales expense were due to the following:

	Change	
	2016	2015
	vs.	vs.
	2015	2014
	(In millions)	
Salary, benefits and other employee-related costs	\$(6.3)	\$0.9
Professional services	(2.7)	2.8
Other items	1.8	(1.0)
	\$(7.2)	\$2.7

Salary, benefits and other employee-related costs decreased during fiscal 2016, as compared to fiscal 2015, primarily due to headcount reductions within our sales organization.

Research and Development

The changes in research and development expense were due to the following:

	Change	
	2016	2015
	vs.	vs.
	2015	2014
	(In millions)	
Salary, benefits and other employee-related costs	\$75.7	\$6.6
Stock-based compensation	14.3	6.6
Facilities and other infrastructure costs	9.9	8.9
Travel and professional development	3.2	1.7
Severance and other termination costs	—	(5.9)
Software license and maintenance costs	(0.5)	5.4
Professional services	(0.7)	2.4
Materials and other pre-production costs	(6.7)	10.0
Other items	2.5	(1.1)
	\$97.7	\$34.6

Costs included in research and development increased during fiscal 2016, as compared to fiscal 2015, primarily due to incremental investments in research and development as a result of additional hiring as well as headcount added from acquisitions. In addition, stock-based compensation included in research and development increased during fiscal 2016, as compared to fiscal 2015, and during fiscal 2015, as compared to fiscal 2014, because successive increases in the price of our common stock during fiscal 2016 and fiscal 2015 resulted in higher grant-date fair values for the mix of stock awards expensed in each of fiscal 2016 and fiscal 2015.

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General and Administrative

The changes in general and administrative expense were due to the following:

	Change	
	2016	2015
	vs.	vs.
	2015	2014
	(In millions)	
Salary, benefits and other employee-related costs	\$4.9	\$(0.6)
Acquisition-related costs	4.9	—
Stock-based compensation	2.6	0.4
Professional services	0.5	(5.5)
Other items	2.2	2.1
	\$15.1	\$(3.6)

Costs included in general and administrative increased during fiscal 2016, as compared to fiscal 2015, primarily due to increased headcount and merit adjustments for existing employees and costs associated with our fiscal 2016 acquisitions. Stock-based compensation included in general and administrative increased during fiscal 2016, as compared to fiscal 2015, and during fiscal 2015, as compared to fiscal 2014, primarily because successive increases in the price of our common stock during fiscal 2016 and fiscal 2015 resulted in higher grant-date fair values for the mix of stock awards expensed in each of fiscal 2016 and fiscal 2015.

Amortization of Acquired Intangibles

	Change				2015 vs.
	2016	2015	2014	2016 vs. 2015	2014
	(In millions, except percentages)				
Amortization of acquired intangibles	\$18.1	\$23.7	\$24.0	\$(5.6) (24)%	\$(0.3) (1)%

The changes in amortization of acquired intangibles were due to the following:

	Change	
	2016	2015
	vs.	vs.
	2015	2014
	(In millions)	
Increase due to additions of acquired intangibles	\$1.0	\$0.7
Decrease due to completed amortization of acquired intangibles	(6.6)	(1.0)
	\$(5.6)	\$(0.3)

Restructuring and Other Charges

We have initiated various restructuring plans in recent years to better align our resources with our business strategy. Because the restructuring charges and related benefits are derived from management's estimates made during the formulation of the restructuring plans, based on then-currently available information, our restructuring plans may not achieve the benefits anticipated on the timetable or at the level contemplated. Demand for our products and services and, ultimately, our future financial performance, is difficult to predict with any degree of certainty. Accordingly, additional actions, including further restructuring of our operations, may be required in the future.

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The following table presents restructuring and other charges (credits), net for our restructuring plans:

	Severance and Benefits	Excess Facilities	Other	Total
	(In millions)			
Fiscal 2016	\$40.4	\$ 0.6	\$—	\$41.0
Fiscal 2015	\$3.6	\$ 1.1	\$(0.2)	\$4.5
Fiscal 2014	\$8.0	\$(0.9)	\$3.2	\$10.3

For an additional description of our restructuring plans, see Note 12 in the notes to consolidated financial statements.

Interest Expense

Interest expense for fiscal 2016, 2015 and 2014 was comprised of the following:

	2016	2015	2014
	(In millions)		
Contractual cash interest expense:			
2015 Notes	\$—	\$3.0	\$9.3
2019 Term Loan	5.6	—	—
2024 Notes	15.3	15.3	3.6
Revolving credit facility	1.6	0.5	0.7
Amortization of debt discount:			
2015 Notes	—	7.5	17.7
2024 Notes	0.1	0.1	—
Amortization of deferred financing costs:			
2015 Notes	—	1.0	2.4
2019 Term Loan	0.2	—	—
2024 Notes	0.5	0.5	0.1
Other	0.4	0.4	0.3
Total interest expense	\$23.7	\$28.3	\$34.1

For an additional description of our debt arrangements, see Note 3 in the notes to consolidated financial statements.

Income Taxes

The following table presents the provision for income taxes and the effective tax rate for fiscal 2016, 2015 and 2014:

	2016	2015	2014
	(In millions, except percentages)		
Provision for income taxes	\$34.1	\$15.2	\$22.1
Effective tax rate	14.4 %	5.7 %	12.2 %

During fiscal 2016, we adopted a new accounting standard related to the accounting for stock-based compensation that requires all income tax effects of stock-based awards to be recognized in our consolidated income statement as the awards vest or are settled. For further discussion regarding new accounting standards, see Note 2 in the notes to consolidated financial statements under the heading “Recently Adopted Accounting Standards.”

Our foreign earnings are generally subject to lower statutory tax rates than our United States earnings.

Our provision for income taxes for the fiscal year ended December 31, 2016 is primarily attributable to federal, state and foreign income taxes on our fiscal 2016 income and includes the tax benefit resulting from the permanent reinstatement of the United States research tax credit in December 2015. Our provision for income taxes for the fiscal year ended December 31, 2016 includes \$17.2 million of tax benefit related to stock-based compensation that vested or settled during the period.

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Our provision for income taxes for the fiscal year ended January 2, 2016 was primarily attributable to federal, state and foreign income taxes on our fiscal 2015 income, which was partially offset by \$13.8 million of tax benefit related to the effective settlement of a tax examination of a foreign subsidiary. Our provision for income taxes included a tax benefit of \$10.1 million resulting from the enactment of the United States research tax credit in December 2015.

Our provision for income taxes for the fiscal year ended January 3, 2015 primarily resulted from federal, state and foreign income taxes on our fiscal 2014 income. Our provision for income taxes included a tax benefit of \$8.1 million resulting from the enactment of the United States research tax credit in December 2014.

Our future effective tax rates may be materially impacted by tax amounts associated with our foreign earnings at rates different from the United States federal statutory rate, research credits, the tax impact of stock-based compensation, accounting for uncertain tax positions, business combinations, closure of statutes of limitations or settlement of tax audits, changes in valuation allowance and changes in tax law. A significant amount of our foreign earnings is generated by our subsidiaries organized in Ireland and Hungary. Our future effective tax rates may be adversely affected if our earnings were to be lower in countries where we have lower statutory tax rates or if we were to repatriate certain foreign earnings on which United States taxes have not been previously accrued. We currently expect that our fiscal 2017 effective tax rate will be similar to our fiscal 2016 effective tax rate. For additional discussion about how our effective tax rate could be affected by various risks, see Part I, Item 1A, "Risk Factors." For further discussion regarding our income taxes, see Note 10 in the notes to consolidated financial statements.

Liquidity and Capital Resources

	As of December 31, 2016	As of January 2, 2016	Change 2016 vs. 2015	Change 2015 vs. 2014
	(In millions)			
Cash, cash equivalents and short-term investments	\$468.3	\$ 711.2	\$1,022.6	\$(242.9)
Net working capital	\$116.5	\$ 427.9	\$458.6	\$(311.4)

Cash, Cash Equivalents and Short-term Investments

As of December 31, 2016, our principal sources of liquidity consisted of \$468.3 million of cash, cash equivalents and short-term investments, as compared to \$711.2 million as of January 2, 2016.

Our primary sources of cash, cash equivalents and short-term investments during fiscal 2016 were cash generated from operations, proceeds from borrowings, proceeds from the sale and maturity of available-for-sale securities, proceeds from the exercise of stock options and proceeds from stock purchases under our employee stock purchase plan.

Our primary uses of cash, cash equivalents and short-term investments during fiscal 2016 were payments related to salaries and benefits, repurchases of our common stock, other employee-related costs and operating expenses, payments on our revolving credit facility, purchases of property, plant and equipment, acquisitions, and tax payments. Approximately 63% of our cash, cash equivalents and short-term investments were held by our foreign subsidiaries as of December 31, 2016. Our intent is to indefinitely reinvest our earnings from certain foreign operations. We do not anticipate we will need to repatriate dividends from foreign operations that are indefinitely reinvested in order to fund our domestic operations. In the event that dividends from foreign operations that are currently indefinitely reinvested are needed to fund United States liquidity, we could be required to accrue and pay additional taxes in order to repatriate these funds. For further discussion regarding our income taxes, see Note 10 in the notes to consolidated financial statements.

We expect that current cash, cash equivalents and short-term investment balances, cash flows that are generated from operations and cash borrowings available under our revolving credit facility will be sufficient to meet our domestic and international working capital needs, and other capital and liquidity requirements, including acquisitions and share repurchases for at least the next 12 months.

Net Working Capital

Net working capital is comprised of current assets less current liabilities, as shown on our consolidated balance sheets. The decrease in our net working capital as of December 31, 2016, as compared to January 2, 2016, is primarily due to

a net decrease in cash, cash equivalents and short-term investments resulting from financing activities, including repurchases of our common stock.

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Cash Flows from Operating Activities

Cash flows from operating activities during fiscal 2016, 2015 and 2014 were as follows:

			Change	
			2016	2015
	2016	2015	2014	vs. 2015
				2015

(In millions)

Cash provided by operating activities \$444.9 \$378.2 \$316.7 \$66.7 \$61.5

Cash flows from operating activities include net income, adjusted for certain non-cash items, as well as changes in the balances of certain assets and liabilities. Our cash flows from operating activities are significantly influenced by business levels and the payment terms set forth in our customer agreements.

The increase in cash flows from operating activities during fiscal 2016, as compared to fiscal 2015, was primarily due to the timing of cash receipts from customers and disbursements made to vendors. The increase in cash flows from operating activities during fiscal 2015, as compared to fiscal 2014, was primarily due to improved profitability and the timing of cash receipts from customers and disbursements made to vendors.

We expect that cash flows from operating activities will fluctuate in future periods due to a number of factors, including our operating results, the timing of our billings, collections, disbursements and tax payments.

Cash Flows from Investing Activities

Cash flows provided by (used for) investing activities during fiscal 2016, 2015 and 2014 were as follows:

			Change	
			2016	2015
	2016	2015	2014	vs. 2015
				2015

(In millions)

Cash provided by (used for) investing activities \$1.4 \$(44.5) \$(198.0) \$45.9 \$153.5

The increase in cash flows provided by investing activities during fiscal 2016, as compared to fiscal 2015, was primarily due to an increase in proceeds resulting from the sale and maturity of our available-for-sale securities, partially offset by an increase in cash used for business combinations and asset acquisitions. The decrease in cash flows used for investing activities during fiscal 2015, as compared to fiscal 2014, was primarily due to the decrease in cash paid for business combinations because we did not complete any acquisitions during fiscal 2015. We expect to continue our investing activities, including purchasing property, plant and equipment, purchasing intangible assets, business combinations, purchasing software licenses, and making long-term equity investments.

Cash Flows from Financing Activities

Cash flows provided by (used for) financing activities during fiscal 2016, 2015 and 2014 were as follows:

			Change	
			2016	2015 vs.
	2016	2015	2014	2015
				2014

(In millions)

Cash provided by (used for) financing activities \$(592.7) \$(626.3) \$289.0 \$33.6 \$(915.3)

The decrease in cash used for financing activities during fiscal 2016, as compared to fiscal 2015, was primarily due to proceeds from the 2019 Term Loan and our revolving credit facility and a decrease in payments made to settle outstanding borrowings, offset by an increase in payments made to repurchase shares of our common stock. The increase in cash used for financing activities during fiscal 2015, as compared to fiscal 2014, was primarily due to payments made to settle the principal value of the 2015 Notes and an increase in payments made to repurchase shares of our common stock.

On January 28, 2016, we entered into a \$300.0 million three-year senior unsecured non-amortizing term loan facility due on January 28, 2019, or the 2019 Term Loan, with a group of lenders led by JPMorgan Chase Bank, N.A., as administrative agent. The 2019 Term Loan is unsecured. For additional information relating to the 2019 Term Loan,

see Note 3 in the notes to consolidated financial statements.

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Our revolving credit facility with a group of lenders led by Bank of America, N.A., as administrative agent, provided for borrowings up to \$250.0 million, with the right to request increased capacity up to an additional \$150.0 million upon the receipt of lender commitments, for total maximum borrowings of \$400.0 million. As of December 31, 2016, outstanding borrowings under the revolving credit facility were \$50.0 million. This revolving credit facility was replaced by a new revolving credit facility on January 30, 2017, as described below.

Other Factors Affecting Liquidity and Capital Resources**2024 Notes**

In October 2014, we issued \$350.0 million aggregate principal amount of 4.375% Senior Notes due October 15, 2024. We received net proceeds of \$342.4 million from the issuance of the 2024 Notes, net of a discount of \$1.4 million and issuance costs of \$6.2 million. Interest is payable in cash semi-annually. The 2024 Notes are unsecured and rank equal in right of payment to all of our existing and future senior indebtedness. The proceeds from the 2024 Notes are available for general corporate purposes, which may include the retirement of debt, working capital, capital expenditures, acquisitions and strategic transactions.

Revolving Credit Facility

On January 30, 2017, we entered into a five-year senior unsecured revolving credit facility with a group of lenders led by JPMorgan Chase Bank, N.A., as administrative agent, which replaced our existing revolving credit facility. The new credit facility provides for borrowings up to \$350.0 million, with the right to request increased capacity up to an additional \$250.0 million upon the receipt of lender commitments, for total maximum borrowings of \$600.0 million. The credit facility expires on January 28, 2022 and has no subsidiary guarantors. Any outstanding loans drawn under the credit facility are due at maturity on January 28, 2022. Outstanding borrowings may be paid at any time prior to maturity. For additional information relating to our new revolving credit facility, see Note 20 in the notes to consolidated financial statements.

Contractual Obligations

A summary of our contractual obligations as of December 31, 2016 is as follows:

	Payments Due by Period				
	Total	Less Than 1 Year	1-3 Years	3-5 Years	More Than 5 Years
(In millions)					
Operating lease obligations	\$91.0	\$20.7	\$31.6	\$16.5	\$22.2
Purchase obligations ⁽¹⁾	30.4	19.2	9.6	0.8	0.8
Long-term debt	650.0	—	300.0	—	350.0
Contractual interest payments	142.6	24.0	42.1	30.6	45.9
Current income tax payable	18.4	18.4	—	—	—
Other long-term contractual obligations ⁽²⁾	27.5	—	10.4	7.9	9.2
Total	\$959.9	\$82.3	\$393.7	\$55.8	\$428.1

(1) With respect to purchase obligations that are cancelable by us, this table includes the amount that would have been payable if we had canceled the obligation as of December 31, 2016 or the earliest cancellation date.

Included in other long-term contractual obligations are long-term income tax liabilities of \$14.4 million related to unrecognized tax benefits. Of the \$14.4 million, we estimate \$7.6 million will be paid or settled within 1 to 3 years and \$6.8 million within 3 to 5 years. The remaining portion of other long-term contractual obligations is primarily liabilities associated with defined benefit retirement plans and acquisitions.

Off-Balance Sheet Arrangements

As of December 31, 2016, we did not have any significant off-balance sheet arrangements, as defined in Item 303(a)(4)(ii) of SEC Regulation S-K.

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Critical Accounting Estimates

In preparing our consolidated financial statements, we make assumptions, judgments and estimates that can have a significant impact on our revenue, operating income and net income, as well as on the value of certain assets and liabilities on our consolidated balance sheets. We base our assumptions, judgments and estimates on historical experience and various other factors that we believe to be reasonable under the circumstances. Actual results could differ materially from these estimates under different assumptions or conditions. At least quarterly, we evaluate our assumptions, judgments and estimates, and make changes as deemed necessary.

We believe that the assumptions, judgments and estimates involved in the accounting for income taxes, revenue recognition, business combinations, intangible asset and goodwill impairments and fair value of financial instruments have the greatest potential impact on our consolidated financial statements; therefore, we consider these to be our critical accounting estimates. For information on our significant accounting policies, see Note 2 in the notes to consolidated financial statements.

Accounting for Income Taxes

We are subject to income taxes in the United States and numerous foreign jurisdictions. Significant judgment is required in evaluating and estimating our provision for these taxes. There are many transactions that occur during the ordinary course of business for which the ultimate tax determination is uncertain. Our provision for income taxes could be adversely affected by our earnings being lower than anticipated in countries where we have lower statutory rates and higher than anticipated in countries where we have higher statutory rates, losses incurred in jurisdictions for which we are not able to realize the related tax benefit, changes in foreign currency exchange rates, entry into new businesses and geographies and changes to our existing businesses, acquisitions and investments, changes in our deferred tax assets and liabilities including changes in our assessment of valuation allowances, changes in the relevant tax laws or interpretations of these tax laws, and developments in current and future tax examinations.

We only recognize the tax benefit of an income tax position if we judge that it is more likely than not that the tax position will be sustained, solely on its technical merits, in a tax audit including resolution of any related appeals or litigation processes. To make this judgment, we must interpret complex and sometimes ambiguous tax laws, regulations and administrative practices. If we judge that an income tax position meets this recognition threshold, then we must measure the amount of the tax benefit to be recognized by estimating the largest amount of tax benefit that has a greater than 50% cumulative probability of being realized upon settlement with a taxing authority that has full knowledge of all of the relevant facts. It is inherently difficult and subjective to estimate such amounts, as this requires us to determine the probability of various possible settlement outcomes. We must reevaluate our income tax positions on a quarterly basis to consider factors such as changes in facts or circumstances, changes in tax law, effectively settled issues under audit, the lapse of applicable statute of limitations, and new audit activity. Such a change in recognition or measurement would result in recognition of a tax benefit or an additional charge to the tax provision. For a more detailed description of our unrecognized tax benefits, see Note 10 in the notes to consolidated financial statements.

Revenue Recognition

We begin to recognize revenue when all of the following criteria are met:

- we have persuasive evidence of an arrangement with a customer;
- delivery has occurred;
- the fee for the arrangement is considered to be fixed or determinable at the outset of the arrangement; and
- collectibility of the fee is probable.

Significant judgment is involved in the determination of whether the facts and circumstances of an arrangement support that the fee for the arrangement is considered to be fixed or determinable and that collectibility of the fee is probable, and these judgments can affect the amount of revenue that we recognize in a particular reporting period. For contracts that do not include a substantial upfront payment, we consider a fee to be fixed or determinable if the arrangement has payment periods that are less than or equal to the term of the licenses and the payments are collected in equal or nearly equal installments, when evaluated over the entire term of the arrangement. If we no longer were to have a history of collecting under the original contract without providing concessions on time-based licenses, revenue from such licenses would be required to be recognized when payments under the contract become due and payable.

Such a change could have a material adverse effect on our results of operations.

We must also make judgments when assessing whether a contract amendment to a time-based arrangement (primarily in the context of a license extension or renewal) constitutes a concession. We have established a history of collecting under contracts for which the fee has been assessed as fixed or determinable, without providing concessions on payments, products or services.

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Generally, we are able to estimate whether collection is probable, but significant judgment is applied as we assess the creditworthiness of our customers to make this determination. Key external and internal factors are considered in developing our creditworthiness assessment, including public information, historical and current financial statements and past collection history. If our experience were to change, it could have a material adverse effect on our results of operations. If, in our judgment, collection of a fee is not probable, we do not record revenue until the uncertainty is removed, which is generally upon receipt of cash payment.

Revenue associated with our time-based licenses is recognized on a recurring basis over the term of the arrangement, commencing upon the later of the effective date of the arrangement or delivery of the first software product. In general, product revenue associated with perpetual licenses where vendor specific objective evidence, or VSOE, exists for the undelivered maintenance, is recognized up front, upon the later of the effective date of the arrangement or delivery of the software product, provided all other conditions for revenue recognition have been met, and maintenance revenue is recognized ratably over the maintenance term. If certain other criteria are met, revenue for design IP is recognized upon delivery and we accrue the expected costs of maintenance. A relatively small percentage of our revenue from software and IP licenses is recognized on an upfront basis.

Our hardware products generally include the hardware product and its related essential software, and maintenance for the hardware and the essential software. Consideration allocated to the hardware product and the essential software is recognized as revenue at the time of delivery, provided all other conditions for revenue recognition have been met. Consideration allocated to the maintenance is recognized ratably over the maintenance term.

Revenue from services and customized IP arrangements is recognized either on the time and materials method, as work is performed, or on the percentage-of-completion method. If a service contract is considered to be part of a multiple element arrangement, or MEA, that includes a software contract, revenue is generally recognized on a recurring basis over the duration of the software contract. For contracts with fixed or not-to-exceed fees, we estimate on a monthly basis the percentage of completion based on the completion of milestones relating to the arrangement. We have a history of accurately estimating project status and the costs necessary to complete projects. A number of internal and external factors can affect our estimates, including labor rates, utilization and efficiency variances, and specification and testing requirement changes. If different conditions were to prevail such that accurate estimates could not be made, then the use of the completed contract method would be required and the recognition of all revenue and costs would be deferred until the project was completed. Such a change could have a material impact on our results of operations.

If a group of contracts is so closely related that they are, in effect, part of a single arrangement, such arrangements are deemed to be an MEA. We exercise significant judgment to evaluate the relevant facts and circumstances in determining whether the separate contracts should be accounted for individually as distinct arrangements or whether the separate contracts are, in substance, an MEA. Our judgments about whether a group of contracts is an MEA can affect the timing of revenue recognition under those contracts, which could have an effect on our results of operations for the periods involved. For example, a perpetual license agreement that would otherwise result in upfront revenue upon delivery may be deemed part of an MEA when it is executed within close proximity, or in contemplation of, other license agreements that require recurring revenue recognition with the same customer, in which event all the revenue is recognized over the longest term of any component of the MEA instead of up front.

For an MEA that includes software and nonsoftware elements, we allocate consideration to all software elements as a group and all nonsoftware elements based on their relative standalone selling prices. Revenue allocated to each deliverable is then recognized when all four criteria are met. In these circumstances, there is a hierarchy to determine the standalone selling price to be used for allocating consideration to the deliverables as follows:

- Vendor-specific objective evidence of fair value, or VSOE;
- Third-party evidence of selling price, or TPE; and
- Best estimate of the selling price, or BSP.

We calculate the BSP of our hardware products based on our pricing practices, including the historical average prices charged for comparable hardware products, because VSOE or TPE cannot be established. Our process for determining BSP for our software deliverables without VSOE or TPE takes into account multiple factors that vary depending upon the unique facts and circumstances related to each deliverable. Key external and internal factors

considered in developing the BESPs include prices charged by us for similar arrangements, historical pricing practices and the nature of the product. In addition, when developing BESPs, we may consider other factors as appropriate, including the pricing of competitive alternatives if they exist, and product-specific business objectives. We exercise significant judgment to evaluate the relevant facts and circumstances in calculating the BESP of the deliverables in our arrangements.

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Business Combinations

When we acquire businesses, we allocate the purchase price to the acquired tangible assets and assumed liabilities, including deferred revenue, liabilities associated with the fair value of contingent consideration and acquired identifiable intangible assets. Any residual purchase price is recorded as goodwill. The allocation of the purchase price requires us to make significant estimates in determining the fair values of these acquired assets and assumed liabilities, especially with respect to intangible assets and goodwill. These estimates are based on information obtained from management of the acquired companies, our assessment of this information, and historical experience. These estimates can include, but are not limited to, the cash flows that an acquired business is expected to generate in the future, the cash flows that specific assets acquired with that business are expected to generate in the future, the appropriate weighted-average cost of capital, and the cost savings expected to be derived from acquiring an asset. These estimates are inherently uncertain and unpredictable, and if different estimates were used, the purchase price for the acquisition could be allocated to the acquired assets and assumed liabilities differently from the allocation that we have made to the acquired assets and assumed liabilities. In addition, unanticipated events and circumstances may occur that may affect the accuracy or validity of such estimates, and if such events occur, we may be required to adjust the value allocated to acquired assets or assumed liabilities.

We also make significant judgments and estimates when we assign useful lives to the definite-lived intangible assets identified as part of our acquisitions. These estimates are inherently uncertain and if we used different estimates, the useful life over which we amortize intangible assets would be different. In addition, unanticipated events and circumstances may occur that may impact the useful life assigned to our intangible assets, which would impact our amortization of intangible assets expense and our results of operations.

Fair Value of Financial Instruments

On a quarterly basis, we measure at fair value certain financial assets and liabilities. Inputs to valuation techniques are observable or unobservable. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect our market assumptions.

While we believe the observable and unobservable inputs we use to measure the fair value are reasonable, different inputs or estimates may materially impact the resulting fair value measurements of these instruments and may also impact our results of operations. For an additional description of our fair value measurements, see Note 16 in the notes to consolidated financial statements.

New Accounting Standards

Revenue Recognition

In May 2014, the FASB issued a new standard related to revenue recognition. Under the new standard, revenue is recognized when a customer obtains control of promised goods or services and is recognized in an amount that reflects the consideration which the entity expects to receive in exchange for those goods or services. In addition, the standard requires disclosure of the nature, amount, timing, and uncertainty of revenue and cash flows arising from contracts with customers. The FASB has recently issued several amendments to the standard, including clarification on accounting for licenses of intellectual property and identifying performance obligations.

The new standard will be effective for us beginning the first quarter of fiscal 2018. The guidance permits two methods of adoption: retrospectively to each prior reporting period presented (full retrospective method), or modified retrospectively with the cumulative effect of initially applying the guidance recognized at the date of initial application (the cumulative catch-up transition method).

While we continue to assess all potential impacts of the standard, our preliminary assessment is that we expect to continue to recognize revenue for our time-based software arrangements over time, which represents a significant percentage of our total revenue. This preliminary assessment is based on the conclusion that the multiple software licenses and related updates in our time-based arrangements constitute a single, combined performance obligation. The timing of revenue recognition for our hardware and professional services is expected to remain substantially unchanged.

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We currently believe the most significant impact of the adoption of this new standard relates to our accounting for multiple element arrangements, or MEAs, that combine many software-related deliverables, which may include multiple software contracts with varying terms, IP licenses, and/or service elements. Using the current accounting guidance that requires vendor-specific objective evidence, or VSOE, to recognize revenue separately for the different software elements, the revenue related to these MEAs is generally recognized over time beginning with the delivery of the last specified deliverable and ending on the latest end date. For example, under the current accounting guidance, an MEA that included a perpetual IP license (delivered at contract execution) with 12 months of maintenance and a 36-month time-based software contract would all be recognized over the 36-month term of the software contract. Under the new standard, amounts will be allocated to each of the performance obligations and the related revenue will be recognized as each performance obligation is fulfilled. In the example above, an amount would be allocated to the IP, the maintenance and the time-based software contract, and those respective revenue amounts would be recognized upon delivery of the IP, over the 12-month maintenance term and over the 36-month time-based software term. The allocation of revenue for each performance obligation noted above is determined based on the standalone selling price, or SSP, of each performance obligation. More judgment and estimates will be required within the revenue recognition process than are required under current GAAP, including estimating the SSP for each performance obligation identified within our contracts. We are currently performing analyses to determine the SSP for each of the performance obligations that have been identified. In addition, we are currently implementing systems and processes to assist in the adoption of this new accounting standard. We currently anticipate adopting the standard using the cumulative catch-up transition method.

Financial Instruments

In January 2016, the FASB issued a new accounting standard that will impact certain aspects of recognition, measurement, presentation and disclosure of financial instruments. The updated standard is effective for us in the first quarter of fiscal 2018, and early adoption is permitted. We are currently evaluating the effect the updated standard will have on our consolidated financial statements and related disclosures.

Leases

In February 2016, the FASB issued a new accounting standard requiring, among other things, the recognition of lease liabilities and corresponding right-of-use assets on the balance sheet by lessees for certain lease arrangements that are classified as operating leases under the previous standard. The updated standard is effective for us in the first quarter of fiscal 2019, with early adoption permitted, and requires the use of a modified retrospective approach for leases that exist or are entered into after the beginning of the earliest comparative period in the financial statements. We anticipate that the adoption of this standard will have a material effect on our consolidated balance sheets and may require changes to our systems and processes. We have not yet made any decision on the timing of adoption.

Income Tax

In October 2016, the FASB issued a new accounting standard that will amend the accounting for income taxes on intra-entity transfers of assets other than inventory. The new guidance requires the recognition of the income tax consequences of an intra-entity asset transfer when the transfer occurs. For intra-entity transfers of inventory, the income tax effects will continue to be deferred until the inventory has been sold to a third party. The new standard is effective for us in the first quarter of fiscal 2018, and early adoption is permitted. The new guidance is required to be applied on a modified retrospective basis through a cumulative-effect adjustment directly to retained earnings as of the beginning of the period of adoption. We are currently evaluating the effects, if any, that the adoption of this guidance will have on our consolidated financial statements.

Business Combinations

In January 2017, the FASB issued a new accounting standard that revises the definition of a business as it relates to acquisitions, disposals, goodwill impairments and consolidations. The updated standard is effective for us in the first quarter of fiscal 2018, and early adoption is permitted. We are currently evaluating the effect of adopting the new standard.

Goodwill Impairment

In January 2017, the FASB issued a new accounting standard that simplifies the required test of goodwill for impairment by eliminating “Step 2” from the goodwill impairment test. The new standard is effective for us in the first

quarter of fiscal 2020, and early adoption is permitted. The new guidance is required to be applied on a prospective basis. We do not anticipate that the adoption of this standard will have have a significant impact on our consolidated financial statements or the related disclosures.

For information regarding new accounting standards adopted during fiscal 2016, see Note 2 in the notes to consolidated financial statements under the heading “Recently Adopted Accounting Standards.”

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Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Foreign Currency Risk

A material portion of our revenue, expenses and business activities are transacted in the U.S. dollar. In certain foreign countries where we price our products and services in U.S. dollars, a decrease in value of the local currency relative to the U.S. dollar results in an increase in the prices for our products and services compared to those products of our competitors that are priced in local currency. This could result in our prices being uncompetitive in certain markets.

In certain countries where we may invoice customers in the local currency our revenues benefit from a weaker dollar and are adversely affected by a stronger dollar. The opposite impact occurs in countries where we record expenses in local currencies. In those cases, our costs and expenses benefit from a stronger dollar and are adversely affected by a weaker dollar. The fluctuations in our operating expenses outside the United States resulting from volatility in foreign exchange rates are not generally moderated by corresponding fluctuations in revenues from existing contracts.

We enter into foreign currency forward exchange contracts to protect against currency exchange risks associated with existing assets and liabilities. A foreign currency forward exchange contract acts as a hedge by increasing in value when underlying assets decrease in value or underlying liabilities increase in value due to changes in foreign exchange rates. Conversely, a foreign currency forward exchange contract decreases in value when underlying assets increase in value or underlying liabilities decrease in value due to changes in foreign exchange rates. These forward contracts are not designated as accounting hedges, so the unrealized gains and losses are recognized in other income, net, in advance of the actual foreign currency cash flows with the fair value of these forward contracts being recorded as accrued liabilities or other current assets.

We do not use forward contracts for trading purposes. Our forward contracts generally have maturities of 90 days or less. We enter into foreign currency forward exchange contracts based on estimated future asset and liability exposures, and the effectiveness of our hedging program depends on our ability to estimate these future asset and liability exposures. Recognized gains and losses with respect to our current hedging activities will ultimately depend on how accurately we are able to match the amount of foreign currency forward exchange contracts with actual underlying asset and liability exposures.

The following table provides information about our foreign currency forward exchange contracts as of December 31, 2016. The information is provided in United States dollar equivalent amounts. The table presents the notional amounts, at contract exchange rates, and the weighted average contractual foreign currency exchange rates expressed as units of the foreign currency per United States dollar, which in some cases may not be the market convention for quoting a particular currency. All of these forward contracts mature before or during February 2017.

	Notional Principal	Weighted Average Contract Rate
	(In millions)	
Forward Contracts:		
European Union euro	\$ 56.9	0.94
Japanese yen	34.5	115.28
Israeli shekel	29.3	3.80
Indian rupee	19.2	67.97
British pound	17.2	0.79
South Korean won	11.6	1,179.14
Chinese renminbi	8.0	6.97
Other	15.4	N/A
Total	\$ 192.1	
Estimated fair value	\$ (2.7)	

We actively monitor our foreign currency risks, but there is no guarantee that our foreign currency hedging activities will substantially offset the impact of fluctuations in currency exchange rates on our results of operations, cash flows and financial position.

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Interest Rate Risk

Our exposure to market risk for changes in interest rates relates primarily to our portfolio of marketable debt securities, our portfolio of cash and cash equivalents and outstanding balances drawn on our revolving credit facility, if any.

We are exposed to interest rate fluctuations in many of the world's leading industrialized countries, but the fair value of our marketable debt securities and our interest income and expense is most sensitive to fluctuations in the general level of United States interest rates. In this regard, changes in United States interest rates affect the interest earned on our marketable debt securities and cash and cash equivalents, any unrealized and realized gains or losses on our marketable debt securities and the costs associated with foreign currency hedges. Pursuant to our investment policy, we limit the amount of our credit exposure to any one issuer, other than in securities issued by the United States Treasury and United States government agencies.

All highly liquid securities with a maturity of three months or less at the date of purchase are considered to be cash equivalents. Securities with maturities greater than three months are classified as available-for-sale and are considered to be short-term investments. The carrying value of our interest-bearing instruments approximated fair value as of December 31, 2016.

Interest rates under our revolving credit facility and 2019 Term Loan are variable, so interest expense could be adversely affected by changes in interest rates, particularly for periods when we maintain an outstanding balance under the revolving credit facility. Interest rates for our revolving credit facility and 2019 Term Loan can fluctuate based on changes in market interest rates and in an interest rate margin that varies based on our consolidated leverage ratio. As of December 31, 2016, we had a \$50.0 million outstanding balance under our revolving credit facility. For additional description of this revolving credit facility see Note 3 in the notes to consolidated financial statements.

Equity Price Risk

Equity Investments

We have a portfolio of equity investments that includes marketable equity securities and non-marketable investments. Our equity investments are made primarily in connection with our strategic investment program. Under our strategic investment program, from time to time, we make cash investments in companies with technologies that are potentially strategically important to us. See Note 4 in the notes to consolidated financial statements for an additional description of these investments. Our non-marketable investments had a carrying value of \$3.2 million as of December 31, 2016, and \$3.9 million as of January 2, 2016.

Item 8. Financial Statements and Supplementary Data

The financial statements required by Item 8 are submitted as a separate section of this Annual Report on Form 10-K. See Part IV, Item 15, "Exhibits and Financial Statement Schedules."

Summary Quarterly Data-Unaudited

	2016				2015			
	4 th	3 rd	2 nd	1 st	4 th	3 rd	2 nd	1 st
	(In thousands, except per share amounts)							
Revenue	\$468,980	\$446,220	\$453,021	\$447,862	\$441,079	\$433,763	\$415,883	\$411,366
Cost of revenue	76,048	56,607	61,783	62,054	60,902	65,211	51,755	60,585
Net income ^{(1) (2)}	38,477	64,712	49,335	50,562	80,374	77,624	58,160	36,259
Net income per share - basic ⁽¹⁾ ⁽²⁾	0.14	0.23	0.17	0.17	0.27	0.27	0.20	0.13
	0.14	0.23	0.17	0.17	0.26	0.25	0.19	0.12

Net income per share - diluted ⁽¹⁾
(2)

-
- (1) During the third quarter of fiscal 2015, we recorded a benefit for income taxes of \$13.8 million resulting from the effective settlement of a tax examination of a foreign subsidiary.
- (2) During the fourth quarter of fiscal 2015, we recorded a benefit for income taxes of \$10.1 million resulting from the enactment of the United States federal research tax credit in December 2015.

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Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure
None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

As required by Rule 13a-15 of the Securities Exchange Act of 1934, as amended, or the Exchange Act, under the supervision and with the participation of our management, including our Chief Executive Officer, or CEO, and our Chief Financial Officer, or CFO, we evaluated the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) as of December 31, 2016. The evaluation of our disclosure controls and procedures included a review of our processes and the effect on the information generated for use in this Annual Report on Form 10-K. In the course of this evaluation, we sought to identify any material weaknesses in our disclosure controls and procedures, to determine whether we had identified any acts of fraud involving personnel who have a significant role in our disclosure controls and procedures, and to confirm that any necessary corrective action, including process improvements, was taken. This type of evaluation is done every fiscal quarter so that our conclusions concerning the effectiveness of these controls can be reported in our periodic reports filed with the SEC. The overall goals of these evaluation activities are to monitor our disclosure controls and procedures and to make modifications as necessary. We intend to maintain these disclosure controls and procedures, modifying them as circumstances warrant.

Based on their evaluation as of December 31, 2016, our CEO and CFO have concluded that our disclosure controls and procedures were effective to provide reasonable assurance that the information required to be disclosed by us in our reports filed or submitted under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and is accumulated and communicated to our management, including the CEO and CFO, as appropriate to allow timely decisions regarding required disclosure.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting during the fiscal quarter ended December 31, 2016 that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Inherent Limitations on Effectiveness of Controls

Our management, including our CEO and CFO, does not expect that our disclosure controls and procedures or our internal control over financial reporting will prevent or detect all errors and all fraud. Internal control over financial reporting, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of internal control are met. Further, the design of internal control must reflect the fact that there are resource constraints, and the benefits of the control must be considered relative to their costs. While our disclosure controls and procedures and internal control over financial reporting are designed to provide reasonable assurance of their effectiveness, because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within Cadence, have been detected.

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act). Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2016. In making this assessment, our management used the criteria established in Internal Control-Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission, or COSO. Our management has concluded that, as of December 31, 2016, our internal control over financial reporting is effective based on these criteria. Our independent registered public accounting firm, KPMG LLP, has issued an attestation report on our internal control over financial reporting, which is included in Part IV, Item 15, "Exhibits and Financial Statement Schedules."

Item 9B. Other Information

None.

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PART III.

Item 10. Directors, Executive Officers and Corporate Governance

The information required by Item 10 as to directors is incorporated herein by reference from the sections entitled “Proposal 1 - Election of Directors” and “Other Matters - Section 16(a) Beneficial Ownership Reporting Compliance” in Cadence’s definitive proxy statement for its 2017 Annual Meeting of Stockholders. The executive officers of Cadence are listed at the end of Item 1 of Part I of this Annual Report on Form 10-K.

The information required by Item 10 as to Cadence’s code of ethics is incorporated herein by reference from the section entitled “Corporate Governance - Code of Business Conduct” in Cadence’s definitive proxy statement for its 2017 Annual Meeting of Stockholders.

The information required by Item 10 as to the director nomination process and Cadence’s Audit Committee is incorporated by reference from the section entitled “Cadence’s Board of Directors - Committees of the Board of Directors” in Cadence’s definitive proxy statement for its 2017 Annual Meeting of Stockholders.

Item 11. Executive Compensation

The information required by Item 11 is incorporated herein by reference from the sections entitled “Cadence’s Board of Directors - Compensation of Directors,” “Compensation Committee Report,” “Compensation Committee Interlocks and Insider Participation,” “Compensation of Executive Officers” and “Potential Payments Upon Termination or Change-in-Control and Employment Contracts” in Cadence’s definitive proxy statement for its 2017 Annual Meeting of Stockholders.

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

The information required by Item 12 is incorporated herein by reference from the sections entitled “Security Ownership of Certain Beneficial Owners and Management” and “Equity Compensation Plan Information” in Cadence’s definitive proxy statement for its 2017 Annual Meeting of Stockholders.

Item 13. Certain Relationships and Related Transactions and Director Independence

The information required by Item 13 is incorporated herein by reference from the sections entitled “Certain Transactions” and “Cadence’s Board of Directors - Director Independence” in Cadence’s definitive proxy statement for its 2017 Annual Meeting of Stockholders.

Item 14. Principal Accountant Fees and Services

The information required by Item 14 is incorporated herein by reference from the section entitled “Fees Billed to Cadence by KPMG LLP During Fiscal 2016 and 2015” in Cadence’s definitive proxy statement for its 2017 Annual Meeting of Stockholders.

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PART IV.

Item 15. Exhibits and Financial Statement Schedules

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(a) 2. Financial Statement Schedules

All financial statement schedules are omitted because they are not applicable, not required or the required information is shown in the consolidated financial statements or notes thereto.

(a) 3. Exhibits 87

The exhibits listed in the accompanying Exhibit Index (following the Signatures section of this Annual Report on Form 10-K) are filed or incorporated by reference as part of this Annual Report on Form 10-K.

The exhibits filed or incorporated by reference as part of this Annual Report on Form 10-K contain agreements to which Cadence is a party. These agreements are included to provide information regarding their terms and are not intended to provide any other factual or disclosure information about Cadence or the other parties to the agreements. Certain of the agreements contain representations and warranties by each of the parties to the applicable agreement, and any such representations and warranties have been made solely for the benefit of the other parties to the applicable agreement as of specified dates, may apply materiality standards that are different than those applied by investors, and may be subject to important qualifications and limitations that are not necessarily reflected in the agreement.

Accordingly, these representations and warranties may not describe the actual state of affairs as of the date they were made or at any other time, and should not be relied upon as statements of factual information.

Cadence, the Cadence logo, Allegro, Connections, Genus, Incisive, Innovus, JasperGold, Joules, Modus, OrCAD, Palladium, Quantus, Sigrity, Spectre, Tempus, Tensilica, Virtuoso and Voltus are trademarks or registered trademarks of Cadence Design Systems, Inc. Other service marks, trademarks and tradenames referred to in this Annual Report on Form 10-K are the property of their respective owners.

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Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders

Cadence Design Systems, Inc.:

We have audited the accompanying consolidated balance sheets of Cadence Design Systems, Inc. and subsidiaries (the Company) as of December 31, 2016 and January 2, 2016, and the related consolidated income statements, statements of comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2016. We also have audited Cadence Design Systems, Inc.'s internal control over financial reporting as of December 31, 2016, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Cadence Design Systems, Inc.'s management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting included in Item 9A. Our responsibility is to express an opinion on these consolidated financial statements and an opinion on the Company's internal control over financial reporting based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement and whether effective internal control over financial reporting was maintained in all material respects. Our audits of the consolidated financial statements included examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

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.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Cadence Design Systems, Inc. and subsidiaries as of December 31, 2016 and January 2, 2016, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2016, in conformity with U.S. generally accepted accounting principles. Also in our opinion, Cadence Design Systems, Inc. maintained, in all material respects, effective internal control over financial reporting as of December 31, 2016, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

/s/ KPMG LLP
Santa Clara, California
February 10, 2017

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CADENCE DESIGN SYSTEMS, INC.
CONSOLIDATED BALANCE SHEETS
December 31, 2016 and January 2, 2016
(In thousands, except par value)

	As of December 31, 2016	January 2, 2016 As Adjusted (Note 2)
ASSETS		
Current assets:		
Cash and cash equivalents	\$465,232	\$616,686
Short-term investments	3,057	94,498
Receivables, net	157,171	164,848
Inventories	39,475	56,762
Prepaid expenses and other	37,099	31,441
Total current assets	702,034	964,235
Property, plant and equipment, net	238,607	228,599
Goodwill	572,764	551,772
Acquired intangibles, net	258,814	296,482
Long-term receivables	12,949	4,498
Other assets	311,740	299,929
Total assets	\$2,096,908	\$2,345,515
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Revolving credit facility	\$50,000	\$—
Accounts payable and accrued liabilities	239,496	238,022
Current portion of deferred revenue	296,066	298,285
Total current liabilities	585,562	536,307
Long-term liabilities:		
Long-term portion of deferred revenue	66,769	30,209
Long-term debt	643,493	343,288
Other long-term liabilities	59,314	59,596
Total long-term liabilities	769,576	433,093
Commitments and contingencies (Notes 10 and 11)		
Stockholders' equity:		
Preferred stock - \$0.01 par value; authorized 400 shares, none issued or outstanding	—	—
Common stock - \$0.01 par value; authorized 600,000 shares; issued and outstanding shares: 278,099 and 309,392, respectively	1,820,081	1,863,086
Treasury stock, at cost; 51,061 shares and 19,768 shares, respectively	(1,190,053)	(400,555)
Retained earnings (accumulated deficit)	136,902	(73,991)
Accumulated other comprehensive loss	(25,160)	(12,425)
Total stockholders' equity	741,770	1,376,115
Total liabilities and stockholders' equity	\$2,096,908	\$2,345,515

See notes to consolidated financial statements.

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CADENCE DESIGN SYSTEMS, INC.
CONSOLIDATED INCOME STATEMENTS
For the three fiscal years ended December 31, 2016
(In thousands, except per share amounts)

	2016	2015	2014
Revenue:			
Product and maintenance	\$1,683,771	\$1,578,944	\$1,479,151
Services	132,312	123,147	101,781
Total revenue	1,816,083	1,702,091	1,580,932
Costs and expenses:			
Cost of product and maintenance	183,291	155,659	156,333
Cost of service	73,201	82,794	67,373
Marketing and sales	395,194	402,432	399,688
Research and development	735,340	637,567	603,006
General and administrative	125,106	109,982	113,619
Amortization of acquired intangibles	18,095	23,716	24,017
Restructuring and other charges	40,955	4,511	10,252
Total costs and expenses	1,571,182	1,416,661	1,374,288
Income from operations	244,901	285,430	206,644
Interest expense	(23,670)	(28,311)	(34,121)
Other income, net	15,922	10,477	8,479
Income before provision for income taxes	237,153	267,596	181,002
Provision for income taxes	34,067	15,179	22,104
Net income	\$203,086	\$252,417	\$158,898
Net income per share – basic	\$0.71	\$0.88	\$0.56
Net income per share – diluted	\$0.70	\$0.81	\$0.52
Weighted average common shares outstanding – basic	284,502	288,018	283,349
Weighted average common shares outstanding – diluted	291,256	312,302	306,775

See notes to consolidated financial statements.

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CADENCE DESIGN SYSTEMS, INC.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

For the three fiscal years ended December 31, 2016

(In thousands)

	2016	2015	2014
Net income	\$203,086	\$252,417	\$158,898
Other comprehensive loss, net of tax effects:			
Foreign currency translation adjustments	(12,801)	(25,276)	(11,476)
Changes in unrealized holding gains or losses on available-for-sale securities, net of reclassification adjustments for realized gains and losses	716	169	(305)
Changes in defined benefit plan liabilities	(650)	335	(183)
Total other comprehensive loss, net of tax effects	(12,735)	(24,772)	(11,964)
Comprehensive income	\$190,351	\$227,645	\$146,934

See notes to consolidated financial statements.

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CADENCE DESIGN SYSTEMS, INC.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

For the three fiscal years ended December 31, 2016

(In thousands)

	Common Stock	Par Value and Capital in Excess of Par	Treasury Stock	Retained Earnings (Accumulated Deficit)	Accumulated Other Comprehensive Income (Loss)	Total
	Shares					
Balance, December 28, 2013	288,133	1,757,242	(140,142)	(485,306)	24,311	\$1,156,105
Net income	—	—	—	158,898	—	\$158,898
Other comprehensive loss, net of taxes	—	—	—	—	(11,964)	\$(11,964)
Purchase of treasury stock	(5,856)	—	(100,117)	—	—	\$(100,117)
Issuance of common stock and reissuance of treasury stock under equity incentive plans, net of forfeitures	10,631	8,630	57,518	—	—	\$66,148
Stock received for payment of employee taxes on vesting of restricted stock	(1,324)	(3,676)	(21,051)	—	—	\$(24,727)
Tax benefit from stock-based compensation	—	5,439	—	—	—	\$5,439
Stock-based compensation expense	—	83,792	—	—	—	\$83,792
Balance, January 3, 2015	291,584	\$1,851,427	\$(203,792)	\$(326,408)	\$12,347	\$1,333,574
Net income	—	—	—	252,417	—	\$252,417
Other comprehensive loss, net of taxes	—	—	—	—	(24,772)	\$(24,772)
Purchase of treasury stock	(16,255)	—	(333,189)	—	—	\$(333,189)
Issuance of common stock and reissuance of treasury stock under equity incentive plans, net of forfeitures	12,399	(90,542)	165,253	—	—	\$74,711
Issuance of common stock for settlement of 2015 Warrants	23,122	—	—	—	—	\$—
Stock received for payment of employee taxes on vesting of restricted stock	(1,458)	(4,824)	(28,827)	—	—	\$(33,651)
Tax benefit from stock-based compensation	—	14,684	—	—	—	\$14,684
Stock-based compensation expense	—	92,341	—	—	—	\$92,341
Balance, January 2, 2016	309,392	\$1,863,086	\$(400,555)	\$(73,991)	\$(12,425)	\$1,376,115
Cumulative effect adjustment (Note 2)	—	364	—	7,807	—	\$8,171
Net income	—	—	—	203,086	—	\$203,086
Other comprehensive loss, net of taxes	—	—	—	—	(12,735)	\$(12,735)
Purchase of treasury stock	(40,493)	—	(960,289)	—	—	\$(960,289)
	10,587	(147,074)	202,506	—	—	\$55,432

Issuance of common stock and
reissuance of treasury stock under
equity incentive plans, net of
forfeitures

Stock received for payment of employee taxes on vesting of restricted stock	(1,387)	(5,512)	(31,715)	—	—	\$(37,227)
Stock-based compensation expense	—	109,217	—	—	—	\$109,217
Balance, December 31, 2016	278,099	\$1,820,081	\$(1,190,053)	\$136,902	\$ (25,160)	\$741,770

See notes to consolidated financial statements.

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CADENCE DESIGN SYSTEMS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
For the three fiscal years ended December 31, 2016
(In thousands)

	2016	2015	2014
Cash and cash equivalents at beginning of year	\$616,686	\$932,161	\$536,260
Cash flows from operating activities:			
Net income	203,086	252,417	158,898
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	119,588	118,165	115,634
Amortization of debt discount and fees	1,069	9,402	20,529
Stock-based compensation	109,217	92,341	83,792
Gain on investments, net	(4,725)	(2,124)	(4,707)
Gain on sale of property, plant and equipment	(923)	—	—
Deferred income taxes	(4,869)	(13,148)	12,478
Other non-cash items	4,027	646	6,854
Changes in operating assets and liabilities, net of effect of acquired businesses:			
Receivables	(3,299)	(44,732)	(17,925)
Inventories	4,934	(1,120)	(11,708)
Prepaid expenses and other	(6,903)	(1,380)	(2,501)
Other assets	(6,566)	(1,558)	(42,181)
Accounts payable and accrued liabilities	2,655	15,321	3,856
Deferred revenue	30,742	(27,019)	(11,860)
Other long-term liabilities	(3,154)	(19,011)	5,563
Net cash provided by operating activities	444,879	378,200	316,722
Cash flows from investing activities:			
Purchases of available-for-sale securities	(20,525)	(96,531)	(124,165)
Proceeds from the sale of available-for-sale securities	55,619	60,949	85,384
Proceeds from the maturity of available-for-sale securities	57,762	31,316	46,612
Proceeds from the sale of long-term investments	2,917	4,570	1,085
Proceeds from the sale of property, plant and equipment	923	—	—
Purchases of property, plant and equipment	(53,712)	(44,808)	(39,810)
Cash paid in business combinations and asset acquisitions, net of cash acquired	(41,627)	—	(167,121)
Net cash provided by (used for) investing activities	1,357	(44,504)	(198,015)
Cash flows from financing activities:			
Proceeds from issuance of debt	300,000	—	348,649
Proceeds from revolving credit facility	115,000	—	100,000
Payment on revolving credit facility	(65,000)	—	(100,000)
Payment of convertible notes	—	(349,999)	(1)
Payment of convertible notes embedded conversion derivative liability	—	(530,643)	(1)
Proceeds from convertible notes hedges	—	530,643	1
Payment of debt issuance costs	(622)	—	(6,500)
Payment of acquisition-related contingent consideration	—	—	(1,835)
Excess tax benefits from stock-based compensation	—	15,591	7,583
Proceeds from issuance of common stock	55,440	74,938	65,913
Stock received for payment of employee taxes on vesting of restricted stock	(37,226)	(33,651)	(24,727)
Payments for repurchases of common stock	(960,289)	(333,189)	(100,117)
Net cash provided by (used for) financing activities	(592,697)	(626,310)	288,965
Effect of exchange rate changes on cash and cash equivalents	(4,993)	(22,861)	(11,771)

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Increase (decrease) in cash and cash equivalents	(151,454)	(315,475)	395,901
Cash and cash equivalents at end of year	\$465,232	\$616,686	\$932,161
Supplemental cash flow information:			
Cash paid for interest	\$21,024	\$19,918	\$9,963
Cash paid for income taxes, net	36,823	29,494	26,453
Non-cash investing and financing activities:			
Available-for-sale securities received from customer	—	—	1,695

See notes to consolidated financial statements.

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CADENCE DESIGN SYSTEMS, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

For the three fiscal years ended December 31, 2016

NOTE 1. BUSINESS OVERVIEW

Cadence Design Systems, Inc., or Cadence, provides solutions that enable its customers to design complex and innovative electronic products. Cadence's solutions are designed to give its customers a competitive edge in their development of electronic systems, integrated circuits, or ICs, and electronic devices and increasingly sophisticated manufactured products, by optimizing performance, minimizing power consumption, shortening the time to bring their products to market and reducing their design, development and manufacturing costs. Cadence's product offerings include electronic design automation software, emulation and prototyping hardware, system interconnect and analysis and two categories of intellectual property, or IP, commonly referred to as verification IP, and design IP. Cadence provides maintenance for its software, emulation and prototyping hardware, and IP product offerings. Cadence also provides engineering services related to methodology, education, hosted design solutions and design services for advanced ICs and development of custom IP.

NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Principles of Consolidation and Basis of Presentation

The consolidated financial statements include the accounts of Cadence and its subsidiaries after elimination of intercompany accounts and transactions. All consolidated subsidiaries are wholly owned by Cadence. Certain prior period balances have been reclassified to conform to the current period presentation.

Cadence's fiscal year-end is the Saturday closest to December 31. Fiscal 2016 and fiscal 2015 were 52-week years. Fiscal 2014 was a 53-week year ending on January 3, 2015.

Use of Estimates

Preparation of the consolidated financial statements in conformity with United States generally accepted accounting principles, or U.S. GAAP, requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenue and expenses during the reporting period. Actual results could differ from those estimates.

Recently Adopted Accounting Standards

Stock-based Compensation

In March 2016, the Financial Accounting Standards Board, or FASB, issued a new accounting standard intended to simplify various aspects related to how stock-based awards are accounted for and presented in the financial statements. The new standard: (a) requires all income tax effects of awards to be recognized in the income statement when the awards vest or are settled, (b) requires classification of excess tax benefits as an operating activity in the statement of cash flows rather than a financing activity, (c) eliminates the requirement to defer recognition of an excess tax benefit until the benefit is realized through a reduction to taxes payable, (d) modifies statutory withholding tax requirements, and (e) provides for a policy election to account for forfeitures as they occur. The guidance is effective in the first quarter of fiscal 2017 and early adoption is permitted if all amendments are adopted in the same period. Cadence elected to early adopt the new standard during the first quarter of fiscal 2016.

As a result of early adoption, Cadence recorded all income tax effects of share-based awards in its provision for income taxes in the consolidated income statements. Cadence also recorded a cumulative effect adjustment of approximately \$7.8 million as a reduction of opening accumulated deficit on Cadence's consolidated balance sheets. The cumulative effect adjustment was comprised of approximately \$8.1 million related to the recognition of excess tax benefits from stock-based compensation, offset by \$0.3 million related to the policy election to recognize the impact of forfeitures on stock-based compensation expense as they occur. Additionally, Cadence adopted the change in presentation in the consolidated statement of cash flows related to excess tax benefits on a prospective basis.

Accordingly, prior periods have not been adjusted. There was no impact for the change in presentation in the statement of cash flows related to statutory tax withholding requirements because Cadence has historically classified the statutory tax withholding as a financing activity in its consolidated statement of cash flows. In the future, the

amount of excess tax benefits or deficiencies realized through the income tax provision may fluctuate depending on the value of the underlying equity instruments at the time of vesting or settlement.

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Debt Issuance Costs

In April 2015, the FASB issued a new accounting standard requiring that debt issuance costs be presented in the balance sheet as a direct deduction from the associated debt liability. The new standard became effective for Cadence in the first quarter of fiscal 2016 and required retrospective application. As a result, prior period balances have been reclassified to conform to the current period presentation. Adoption of this standard did not have a material impact on Cadence's consolidated balance sheets.

Cash, Cash Equivalents and Short-Term Investments

Cadence considers all highly liquid investments with original maturities of three months or less on the date of purchase to be cash equivalents. Cadence's short-term investments include marketable debt securities with original maturities greater than three months on the date of purchase and marketable equity securities. Cadence considers its entire portfolio of marketable debt and equity securities to be available for sale and available to fund current operations. Available-for-sale debt and equity securities are carried at fair value, with the unrealized gains and losses presented net of tax as a separate component of other comprehensive income. Unrealized and realized gains and losses are determined using the specific identification method.

Cadence recognizes gains on its available-for-sale securities when they are realized. Cadence recognizes losses on its available-for-sale securities when they are realized or when Cadence has determined that an other-than-temporary decline in fair value has occurred. For an available-for-sale debt security, an other-than-temporary decline in fair value has occurred when the security's fair value is less than its amortized cost basis and Cadence intends to sell the security, or it is more likely than not that Cadence will be required to sell the security before recovery of its amortized cost basis. Cadence records realized gains, realized losses and other-than-temporary impairments as part of other income, net in the consolidated income statements.

Foreign Operations

Cadence transacts business in various foreign currencies. The United States dollar is the functional currency of Cadence's consolidated entities operating in the United States and certain of its consolidated subsidiaries operating outside the United States. The functional currency for Cadence's other consolidated entities operating outside of the United States is generally the local country's currency.

Cadence translates the financial statements of consolidated entities whose functional currency is not the United States dollar into United States dollars. Cadence translates assets and liabilities at the exchange rate in effect as of the financial statement date and translates income statement accounts using an average exchange rate for the period. Cadence includes adjustments from translating assets and liabilities into United States dollars, and the effect of exchange rate changes on intercompany transactions of a long-term investment nature in stockholders' equity as a component of accumulated other comprehensive income. Cadence reports gains and losses from foreign exchange rate changes related to intercompany receivables and payables that are not of a long-term investment nature, as well as gains and losses from foreign currency transactions of a monetary nature in other income, net, in the consolidated income statements.

Revenue Recognition

Software and IP Revenue Recognition

Cadence primarily uses time-based licenses to license its software. Certain software and IP products are licensed using a perpetual license.

Time-based licenses - Cadence's time-based license arrangements offer customers the right to access and use all of the products delivered at the outset of an arrangement and updates throughout the entire term of the arrangement, which is generally two to three years, with no rights to return. Cadence's updates provide for continued access to evolving technology as customers' designs migrate to more advanced nodes. In addition, certain time-based license arrangements include:

- Remix among the products delivered at the outset of the arrangement, so long as the cumulative contractual value of all products in use does not exceed the total license fee determined at the outset of the arrangement; and
- Use unspecified additional products that become commercially available during the term of the arrangement.

In general, product and maintenance revenue associated with time-based licenses is recognized on a recurring basis over the term of the license, commencing upon the later of the effective date of the arrangement or delivery of the licensed product.

Perpetual licenses - Cadence's perpetual licenses consist of software licensed on a perpetual basis with no right to return or ability to remix the licensed software. Cadence licenses its design IP under a perpetual license on a per-design basis.

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In general, product revenue associated with perpetual licenses where VSOE exists for the undelivered maintenance is recognized upon delivery of the licensed product and maintenance revenue is recognized ratably over the maintenance term. If VSOE does not exist for the undelivered maintenance in a perpetual license, product revenue is recognized on a recurring basis over the maintenance term. If certain other criteria are met, revenue for design IP is recognized upon delivery and we accrue the expected costs of maintenance.

Hardware Revenue Recognition

Cadence generally has a minimum of two deliverables in arrangements involving the sale or lease of its hardware products. The first deliverable is the hardware product and software essential to the functionality of the hardware product, and the second deliverable is the right to receive maintenance on the hardware product and its software. Cadence allocates consideration between these deliverables based on the relative standalone selling price for each deliverable. Consideration allocated to the hardware product and its essential software is recognized as revenue at the time of delivery provided all other conditions for revenue recognition have been met. Consideration allocated to maintenance is recognized as revenue ratably over the maintenance term.

Services Revenue Recognition

Services revenue primarily consists of revenue received for performing engineering services. These services are generally not related to the functionality of the products licensed. In certain instances, Cadence will customize its IP on a fixed fee basis. Revenue from service contracts is recognized either on the time and materials method, as work is performed, or on the percentage-of-completion method. If a service contract is considered to be part of a multiple element arrangement, or MEA, that includes a software contract, revenue is generally recognized on a recurring basis over the duration of the software contract. For contracts with fixed or not-to-exceed fees, Cadence estimates on a monthly basis the percentage-of-completion based on the progress to completion of the services. Cadence has a history of accurately estimating project status and the costs necessary to complete projects. A number of internal and external factors can affect these estimates, including labor rates, utilization and efficiency variances and specification and testing requirement changes. If different conditions were to prevail such that accurate estimates could not be made, then the use of the completed contract method would be required and the recognition of all revenue and costs would be deferred until the project was completed. Such a change could have a material impact on Cadence's results of operations.

Revenue Recognition Criteria

Although the timing and amount of revenue recognition differs based on the deliverables in each arrangement, Cadence begins revenue recognition for an arrangement when persuasive evidence of an arrangement exists, delivery has occurred, the fee is fixed or determinable, and collection of the resulting receivable is probable.

Persuasive evidence of an arrangement - Generally, Cadence uses a contract signed by the customer as evidence of an arrangement for time-based licenses, licenses of its IP products and hardware leases. If a contract signed by the customer does not exist, Cadence has historically used a purchase order as evidence of an arrangement for software perpetual licenses, hardware sales, maintenance renewals and small fixed-price service projects, such as training classes and small methodology service engagements. For all other service engagements, Cadence uses a signed professional services agreement and a statement of work to evidence an arrangement. In cases where both a signed contract and a purchase order exist, Cadence considers the signed contract to be the most persuasive evidence of the arrangement. Sales through Cadence's distributors are evidenced by a master agreement governing the relationship, together with binding purchase orders from the distributor on a transaction-by-transaction basis.

Product delivery - Software and VIP, and the corresponding access keys, are generally delivered to customers electronically. Electronic delivery occurs when Cadence provides the customer access to the software. Occasionally, Cadence will deliver software on a DVD with standard transfer terms of free-on-board, or F.O.B., shipping point. Design IP is also delivered electronically via download from a secure site. Cadence's software and IP license agreements generally do not contain conditions for acceptance. Delivery of an entire hardware system is deemed to occur upon its successful installation. For certain hardware products, installation is the responsibility of the customer, as the system is fully functional at the time of shipment and delivery is deemed to be complete when the products are shipped with freight terms of F.O.B. shipping point.

Fee is fixed or determinable - Cadence assesses whether a fee is fixed or determinable at the outset of the arrangement, primarily based on the payment terms associated with the transaction. Cadence has established a history of collecting under the original contract without providing concessions on payments, products or services. For contracts that do not include a substantial upfront payment, Cadence considers that a fee is fixed or determinable if the arrangement has payment periods that are equal to or less than the term of the licenses and the payments are collected in equal or nearly equal installments, when evaluated over the entire term of the arrangement. Cadence has a history of collecting receivables under software contracts of up to five years for which the fee has been assessed as fixed or determinable.

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Significant judgment is involved in assessing whether a fee is fixed or determinable. Cadence must also make these judgments when assessing whether a contract amendment to a time-based arrangement (primarily in the context of a license extension or renewal) constitutes a concession. Cadence's experience has been that it is able to determine whether a fee is fixed or determinable. While Cadence does not expect that experience to change, if Cadence no longer were to have a history of collecting under the original contract without providing concessions, revenue would be required to be recognized when payments become due and payable. Such a change could have a material impact on Cadence's results of operations.

Collection is probable - Cadence assesses the probability of collecting from each customer at the outset of the arrangement based on a number of factors, including the customer's payment history, its current creditworthiness and geographic location. If in Cadence's judgment collection of a fee is not probable, Cadence does not record revenue until the uncertainty is removed, which is generally upon receipt of cash payment.

Multiple Element Arrangements

An MEA is any arrangement that includes or contemplates rights for a combination of software, IP or hardware products, services, training or maintenance in a single arrangement. From time to time, Cadence may include individual deliverables in separately priced and separately executed contracts with the same customer. Cadence evaluates all relevant facts and circumstances in determining whether the separate contracts should be accounted for individually as distinct arrangements or whether the separate contracts are, in substance, an MEA. Significant judgment is involved in determining whether a group of contracts might be so closely related that they are, in effect, part of a single arrangement. Cadence's judgments about whether several contracts together comprise an MEA can affect the timing of revenue recognition under those contracts, which could have an effect on its results of operations for the periods involved.

For an MEA that includes software and nonsoftware elements, Cadence allocates the total consideration based on the relative standalone selling prices of each element. In these circumstances, Cadence is required to use a hierarchy to determine the standalone selling price to be used for allocating consideration to deliverables as follows:

✓Vendor specific objective evidence of fair value, or VSOE;

✓Third-party evidence of selling price, or TPE; and

✓Best estimate of the selling price, or BESP.

Vendor-specific objective evidence of fair value - Cadence's VSOE for maintenance is based upon the customer's stated annual renewal rates and VSOE for services is based on the price charged when the services are sold separately. Cadence has not established VSOE for certain products, including software and IP licenses and hardware products, or for annual maintenance that is not cancellable by the customer.

Third-party evidence of selling price - TPE is determined based on competitor prices for similar deliverables when sold separately. Generally, Cadence's offerings contain significant differentiation such that comparable pricing of products with similar functionality cannot be obtained. Furthermore, Cadence is unable to reliably determine what similar competitor products' selling prices are when those products are sold on a standalone basis. Therefore, Cadence typically is not able to obtain TPE and TPE is not used to determine any standalone selling prices.

Best estimate of the selling price - Cadence calculates the BESP of its hardware products based on its pricing practices, including the historical average prices charged for comparable hardware products. Cadence's process for determining BESP for its software deliverables takes into account multiple factors that vary depending upon the unique facts and circumstances related to each deliverable. Key external and internal factors considered in developing the BESPs include prices charged by Cadence for similar arrangements, historical pricing practices and the nature of the product. In addition, when developing BESPs, Cadence may consider other factors as appropriate, including the pricing of competitive alternatives if they exist, and product-specific business objectives.

For MEAs that contain software and nonsoftware elements, Cadence allocates the consideration to software or software-related elements as a group, and to any nonsoftware element separately based on the standalone selling price hierarchy. The consideration allocated to each element is then recognized as revenue when the basic revenue recognition criteria are met for each element. Once the consideration is allocated to the group of software and software-related elements, it then follows the recognition principles of software revenue recognition accounting standards.

For MEAs involving only software and software-related deliverables, VSOE must exist to allocate the total fee among all delivered and undelivered elements, or if VSOE of all undelivered elements exists, revenue is recognized using the residual method. Under the residual method, the VSOE of the undelivered elements is deferred and the remaining portion of the arrangement fee is recognized up front as the elements are delivered. If VSOE does not exist for all elements to support the allocation of the total fee among all elements of the arrangement, or if VSOE does not exist for all undelivered elements to apply the residual method, revenue is recognized on a recurring basis over the term of the undelivered elements.

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Other Factors Regarding Revenue Recognition

Taxes collected from customers and remitted to governmental authorities - Cadence applies the net basis presentation for taxes collected from customers and remitted to governmental authorities.

Derivative Financial Instruments

Cadence enters into foreign currency forward exchange contracts with financial institutions to protect against currency exchange risks associated with existing assets and liabilities. A foreign currency forward exchange contract acts as a hedge by increasing in value when underlying assets decrease in value or underlying liabilities increase in value due to changes in foreign exchange rates. Conversely, a foreign currency forward exchange contract decreases in value when underlying assets increase in value or underlying liabilities decrease in value due to changes in foreign exchange rates. The forward contracts are not designated as accounting hedges and, therefore, the unrealized gains and losses are recognized in other income, net, in advance of the actual foreign currency cash flows. The fair value of these forward contracts is recorded in accrued liabilities or in other current assets. These forward contracts generally have maturities of 90 days or less.

Receivables

Cadence's receivables, net includes invoiced accounts receivable and the current portion of unbilled receivables. Unbilled receivables represent amounts Cadence has recorded as revenue for which payments from a customer are due over time. Cadence's accounts receivable and unbilled receivables were initially recorded at the transaction value. Cadence's long-term receivables balance includes receivable balances to be invoiced more than one year after each balance sheet date.

Allowances for Doubtful Accounts

Each fiscal quarter, Cadence assesses its ability to collect outstanding receivables, and provides allowances for a portion of its receivables when collection is not probable. Cadence analyzes the creditworthiness of its customers, historical experience, changes in customer demand and the overall economic climate in the industries that Cadence serves. Provisions are made based upon a specific review of customer receivables and are recorded in operating expenses.

Inventories

Inventories are stated at the lower of cost or market value. Cadence's inventories include high technology parts and components for complex emulation and prototyping hardware systems. These parts and components are specialized in nature and may be subject to rapid technological obsolescence. While Cadence has programs to minimize the required inventories on hand and considers technological obsolescence when estimating required reserves to reduce recorded amounts to market values, it is reasonably possible that such estimates could change in the near term. Cadence's policy is to reserve for inventory in excess of 12-month demand or for other known obsolescence or realization issues.

Property, Plant and Equipment

Property, plant and equipment is stated at historical cost. Depreciation and amortization are generally provided over the estimated useful lives, using the straight-line method, as follows:

Computer equipment and related software	2-7 years
Buildings	25-32 years
Leasehold improvements	Shorter of the lease term or the estimated useful life
Building improvements and land improvements	Estimated useful life up to 32 years
Furniture and fixtures	3-5 years
Equipment	3-5 years

Cadence capitalizes certain costs of software developed for internal use. Capitalization of software developed for internal use begins at the application development phase of the project. Amortization begins when the computer software is substantially complete and ready for its intended use. Amortization is recorded on a straight-line basis over the estimated useful life. Cadence capitalized costs of software developed for internal use of \$3.5 million, \$2.0 million, and \$2.1 million during fiscal 2016, 2015 and 2014, respectively.

Cadence recorded depreciation and amortization expense of \$52.7 million, \$48.7 million and \$49.2 million during fiscal 2016, 2015 and 2014, respectively, for property, plant and equipment.

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Software Development Costs

Software development costs are capitalized beginning when a product's technological feasibility has been established by completion of a working model of the product and amortization begins when a product is available for general release to customers. The period between the achievement of technological feasibility and the general release of Cadence's products has typically been of short duration. Costs incurred during fiscal 2016, 2015 and 2014 were not material.

Goodwill

Cadence conducts a goodwill impairment analysis annually and as necessary if changes in facts and circumstances indicate that the fair value of Cadence's single reporting unit may be less than its carrying amount. Cadence's goodwill impairment test consists of two steps. The first step requires that Cadence compare the estimated fair value of its single reporting unit to the carrying value of the reporting unit's net assets, including goodwill. If the fair value of the reporting unit is greater than the carrying value of its net assets, goodwill is not considered to be impaired and no further testing is required. If the fair value of the reporting unit is less than the carrying value of its net assets, Cadence would be required to complete the second step of the test by analyzing the fair value of its goodwill. If the carrying value of the goodwill exceeds its fair value, an impairment charge is recorded.

Long-Lived Assets, Including Acquired Intangibles

Cadence's definite-lived, long-lived assets consist of property, plant and equipment and other acquired intangibles. Acquired intangibles with definite lives are amortized on a straight-line basis over the remaining estimated economic life of the underlying products and technologies, which range from one to fourteen years. Cadence reviews its definite-lived, long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount of a long-lived asset or asset group may not be recoverable. Recoverability of an asset or asset group is measured by comparison of its carrying amount to the expected future undiscounted cash flows that the asset or asset group is expected to generate. If it is determined that the carrying amount of an asset group is not recoverable, an impairment loss is recorded in the amount by which the carrying amount of the asset or asset group exceeds its fair value.

Non-Marketable Investments

Cadence's non-marketable investments include its investments in privately-held companies. These investments are initially recorded at cost and are included in other assets in the consolidated balance sheets. Cadence accounts for these investments using either the cost method or the equity method of accounting. Cadence reviews the fair value of its non-marketable investments on a regular basis to determine whether the investments in these companies are other-than-temporarily impaired. Cadence considers investee financial performance and other information received from the investee companies, as well as any other available estimates of the fair value of the investee companies in its review. If Cadence determines the carrying value of an investment exceeds its fair value, and that difference is other than temporary, Cadence writes down the value of the investment to its fair value. Cadence records investment write-downs in other income, net, in the consolidated income statements.

Nonqualified Deferred Compensation Trust

Executive officers, senior management and members of Cadence's Board of Directors may elect to defer compensation payable to them under Cadence's Nonqualified Deferred Compensation Plan, or the NQDC. Deferred compensation payments are held in investment accounts and the values of the accounts are adjusted each quarter based on the fair value of the investments held in the NQDC.

The selected investments held in the NQDC accounts are classified as trading securities. Trading securities are carried at fair value, with the unrealized gains and losses recognized in the consolidated income statements as other income, net. These trading securities are classified in other assets in the consolidated balance sheets because the securities are not available for Cadence's use in its operations.

Cadence's obligation with respect to the NQDC trust is recorded in other long-term liabilities on the consolidated balance sheets. Increases and decreases in the NQDC trust liability are recorded as compensation expense in the consolidated income statements.

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Deferred Revenue

Deferred revenue arises when customers are billed for products or services in advance of revenue recognition. Cadence's deferred revenue consists primarily of unearned revenue on product licenses and the related maintenance for which revenue is recognized over the duration of the license. The fees for time-based licenses are generally billed quarterly in advance and the related revenue is recognized over multiple periods over the ensuing license period. Maintenance on perpetual licenses is generally renewed annually, billed in full in advance, and the corresponding revenue is recognized over the 12-month maintenance term.

Comprehensive Income

Cadence reports comprehensive income in the consolidated statements of comprehensive income. Accumulated other comprehensive loss is reported as a component of stockholders' equity and includes foreign currency translation gains and losses, changes in defined benefit plan liabilities, and unrealized gains and losses on marketable securities that are available for sale.

Accounting for Income Taxes

Cadence accounts for the effect of income taxes in its consolidated financial statements using the asset and liability method. This process involves estimating actual current tax liabilities together with assessing carryforwards and temporary differences resulting from differing treatment of items, such as depreciation, for tax and accounting purposes. These differences result in deferred tax assets and liabilities, measured using enacted tax rates expected to apply to taxable income in the years when those temporary differences are expected to be recovered or settled. Cadence then records a valuation allowance to reduce the deferred tax assets to the amount that Cadence believes is more likely than not to be realized based on its judgment of all available positive and negative evidence. The weight given to the potential effect of negative and positive evidence is commensurate with the extent to which the strength of the evidence can be objectively verified. This assessment, which is completed on a taxing jurisdiction basis, takes into account a number of types of evidence, including the following:

- The nature and history of current or cumulative financial reporting income or losses;
- Sources of future taxable income;
- The anticipated reversal or expiration dates of the deferred tax assets; and
- Tax planning strategies.

Cadence takes a two-step approach to recognizing and measuring the financial statement benefit of uncertain tax positions. The first step is to evaluate the tax position for recognition by determining whether the weight of available evidence indicates that it is more likely than not that the tax position will be sustained on audit, including resolution of any related appeals or litigation processes. The second step is to measure the tax benefit as the largest amount that is more than 50% likely of being realized upon settlement of the audit. Cadence classifies interest and penalties on unrecognized tax benefits as income tax expense or benefit.

Restructuring Charges

Cadence records personnel-related restructuring charges with customary termination benefits when the costs are both probable and estimable. Cadence records personnel-related restructuring charges with non-customary termination benefits when the plan has been communicated to the affected employees. Cadence records facilities-related restructuring charges in the period in which the affected facilities are vacated. In connection with facilities-related restructuring plans, Cadence has made a number of estimates and assumptions related to losses on excess facilities that have been vacated or consolidated, particularly the timing of subleases and sublease terms. Closure and space reduction costs included in the restructuring charges include payments required under leases less any applicable estimated sublease income after the facilities are abandoned, lease buyout costs and certain contractual costs to maintain facilities during the period after abandonment.

Cadence records estimated provisions for termination benefits and outplacement costs along with other personnel-related restructuring costs, long-term asset impairments related to abandoned assets and other costs associated with the restructuring plan. Cadence regularly evaluates the adequacy of its lease loss accruals and severance and related benefits accruals, and adjusts the balances based on actual costs incurred or changes in estimates and assumptions. Subsequent adjustments to restructuring accruals are classified in restructuring and other charges in the consolidated income statements.

Table of Contents**Stock-Based Compensation**

Cadence recognizes the cost of employee services received in exchange for awards of equity instruments as stock-based compensation expense. Stock-based compensation expense is measured at the grant date based on the value of the award and is recognized as expense over the requisite service period, which is typically the vesting period. Cadence recognizes stock-based compensation expense on the straight-line method for awards that only contain a service condition and on the graded-vesting method for awards that contain both a service and performance condition. Cadence recognizes the impact of forfeitures on stock-based compensation expense as they occur. The fair value of stock options and purchase rights issued under Cadence's ESPP are calculated using the Black-Scholes option pricing model. The computation of the expected volatility assumption used for new awards is based on implied volatility when the remaining maturities of the underlying traded options are at least one year. When the remaining maturities of the underlying traded options are less than one year, expected volatility is based on a weighting of historical and implied volatilities. When determining the expected term, Cadence reviews historical employee exercise behavior from options having similar vesting periods. The risk-free interest rate for the period within the expected term of the option is based on the yield of United States Treasury notes for the comparable term in effect at the time of grant. The expected dividend yield used in the calculation is zero because Cadence has not historically paid and does not expect to pay dividends in the foreseeable future.

Treasury Stock

Cadence generally issues shares related to its stock-based compensation plans from shares held in treasury. When treasury stock is reissued at an amount higher than its cost, the difference is recorded as a component of capital in excess of par in the consolidated statements of stockholders' equity. When treasury stock is reissued at an amount lower than its cost, the difference is recorded as a component of capital in excess of par to the extent that gains exist to offset the losses. If there are no accumulated treasury stock gains in capital in excess of par, the losses upon reissuance of treasury stock are recorded as a component of retained earnings (accumulated deficit) in the consolidated statements of stockholders' equity. There were no losses recorded by Cadence on the reissuance of treasury stock during fiscal 2016, 2015 or 2014.

Concentrations of Credit Risk

Financial instruments, including derivative financial instruments, that may potentially subject Cadence to concentrations of credit risk, consist principally of cash and cash equivalents, short-term investments, long-term investments, accounts receivable and forward contracts. Cadence's short-term investments include debt securities issued by financial institutions, corporations, the United States Treasury and other United States government agencies. Credit exposure related to Cadence's foreign currency forward contracts is limited to the realized and unrealized gains on these contracts.

Advertising

Cadence expenses the costs of advertising as incurred. Total advertising expense, including marketing programs and events, was \$8.4 million, \$7.9 million and \$6.6 million during fiscal 2016, 2015 and 2014, respectively, and is included in marketing and sales in the consolidated income statements.

NOTE 3. DEBT

Cadence's outstanding debt as of December 31, 2016 and January 2, 2016 was as follows:

	December 31, 2016			January 2, 2016		
	(In thousands)					
	Principal	Unamortized Discount	Carrying Value	Principal	Unamortized Discount	Carrying Value
Revolving Credit Facility	\$50,000	\$ —	\$50,000	\$—	\$ —	\$—
2019 Term Loan	300,000	(434)	299,566	—	—	—
2024 Notes	350,000	(6,073)	343,927	350,000	(6,712)	343,288
Total outstanding debt	\$700,000	\$ (6,507)	\$693,493	\$350,000	\$ (6,712)	\$343,288

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Revolving Credit Facility

Cadence maintains a senior unsecured revolving credit facility with a group of lenders led by Bank of America, N.A., as administrative agent. The credit facility provides for borrowings up to \$250.0 million, with the right to request increased capacity up to an additional \$150.0 million upon the receipt of lender commitments, for total maximum borrowings of \$400.0 million. The credit facility, as amended, expires on September 19, 2019 and has no subsidiary guarantors. Any outstanding loans drawn under the credit facility are due at maturity on September 19, 2019.

Outstanding borrowings may be paid at any time prior to maturity.

Interest accrues on borrowings under the credit facility at either LIBOR plus a margin between 1.25% and 2.0% per annum or at the base rate plus a margin between 0.25% and 1.0% per annum. The interest rate applied to borrowings is determined by Cadence's consolidated leverage ratio as specified by the credit facility agreement. As of December 31, 2016, the interest rate on Cadence's revolving credit facility was 2.51%. Interest is payable quarterly. A commitment fee ranging from 0.20% to 0.35% is assessed on the daily average undrawn portion of revolving commitments.

The credit facility contains customary negative covenants that, among other things, restrict Cadence's ability to incur additional indebtedness, grant liens, make certain investments (including acquisitions), dispose of certain assets and make certain payments, including share repurchases and dividends. In addition, the credit facility contains financial covenants that require Cadence to maintain a leverage ratio not to exceed 2.75 to 1, and a minimum interest coverage ratio of 3 to 1.

As of December 31, 2016 and January 2, 2016, Cadence was in compliance with all financial covenants associated with the revolving credit facility.

2019 Term Loan

On January 28, 2016, Cadence entered into a \$300.0 million three-year senior unsecured non-amortizing term loan facility due on January 28, 2019, or the 2019 Term Loan, with a group of lenders led by JPMorgan Chase Bank, N.A., as administrative agent. The 2019 Term Loan is unsecured.

Amounts outstanding under the 2019 Term Loan initially accrue interest at a rate equal to LIBOR plus a margin of 1.125% per annum, which may increase to a rate equal to LIBOR plus a margin of up to 1.875% per annum, depending on Cadence's leverage ratio. As of December 31, 2016, the interest rate on Cadence's 2019 Term Loan was 2.29%.

The covenants of the 2019 Term Loan are generally consistent with Cadence's existing five-year senior unsecured revolving credit facility. In addition, the term loan agreement contains certain financial covenants that require Cadence to maintain a funded debt-to-EBITDA ratio not greater than 2.75 to 1, with a step-up to 3.25 to 1 for one year following an acquisition by Cadence of at least \$250.0 million that results in a pro forma leverage ratio between 2.50 to 1 and 3.00 to 1. As of December 31, 2016, Cadence was in compliance with all financial covenants associated with the 2019 Term Loan.

2024 Notes

In October 2014, Cadence issued \$350.0 million aggregate principal amount of 4.375% Senior Notes due October 15, 2024, or the 2024 Notes. Cadence received net proceeds of \$342.4 million from the issuance of the 2024 Notes, net of a discount of \$1.4 million and issuance costs of \$6.2 million. Both the discount and issuance costs are being amortized to interest expense over the term of the 2024 Notes using the effective interest method. Interest is payable in cash semi-annually in April and October. The 2024 Notes are unsecured and rank equal in right of payment to all of Cadence's existing and future senior indebtedness.

Cadence may redeem the 2024 Notes, in whole or in part, at a redemption price equal to the greater of (a) 100% of the principal amount of the notes to be redeemed and (b) the sum of the present values of the remaining scheduled payments of principal and interest, plus any accrued and unpaid interest, as more particularly described in the indenture governing the 2024 Notes.

The indenture governing the 2024 Notes includes customary representations, warranties and restrictive covenants, including, but not limited to, restrictions on Cadence's ability to grant liens on assets, enter into sale and lease-back transactions, or merge, consolidate or sell assets, and also includes customary events of default. As of December 31, 2016 and January 2, 2016, Cadence was in compliance with all financial covenants associated with the 2024 Notes.

For information regarding the impact of new accounting standards on the presentation of debt issuance costs, see Note 2 under the heading “Recently Adopted Accounting Standards.”

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NOTE 4. CASH, CASH EQUIVALENTS AND INVESTMENTS

Cadence's cash, cash equivalents and short-term investments at fair value as of December 31, 2016 and January 2, 2016 were as follows:

	As of	
	December 31, 2016	January 2, 2016
	(In thousands)	
Cash and cash equivalents	\$465,232	\$616,686
Short-term investments	3,057	94,498
Cash, cash equivalents and short-term investments	\$468,289	\$711,184

Cash and Cash Equivalents

The following table summarizes Cadence's cash and cash equivalents at fair value as of December 31, 2016 and January 2, 2016:

	As of	
	December 31, 2016	January 2, 2016
	(In thousands)	
Cash and interest bearing deposits	\$227,508	\$255,995
Money market funds	237,724	360,691
Total cash and cash equivalents	\$465,232	\$616,686

Short-Term Investments

The following tables summarize Cadence's short-term investments as of December 31, 2016 and January 2, 2016:

As of December 31, 2016				
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
	(In thousands)			
Marketable equity securities	\$2,131	\$ 926	\$ —	\$3,057

As of January 2, 2016				
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
	(In thousands)			
Corporate debt securities	\$34,905	\$ 1	\$ (77)	\$34,829
Bank certificates of deposit	15,049	1	(4)	15,046
United States Treasury securities	36,372	2	(88)	36,286
United States government agency securities	4,151	1	—	4,152
Commercial paper	1,993	—	—	1,993
Marketable debt securities	92,470	5	(169)	92,306
Marketable equity securities	1,817	375	—	2,192
Total short-term investments	\$94,287	\$ 380	\$ (169)	\$94,498

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Realized gains and losses from the sale of marketable debt and equity securities are recorded in other income, net in the consolidated income statements.

Non-Marketable Investments

Cadence's non-marketable investments generally consist of voting preferred stock, convertible debt or other instruments of privately-held entities and are included in other assets on Cadence's consolidated balance sheets. If Cadence determines that it has the ability to exercise significant influence over the issuer, which may include considering whether the investments are in-substance common stock, the investment is accounted for using the equity method.

Cadence records in the consolidated income statements as other income, net, realized gains and losses from the sale of non-marketable investments, write downs related to cost method investments due to other-than-temporary declines in value and its proportional share of issuers' gains or losses related to equity method investments.

The equity method income or loss recorded by Cadence is based on its percentage ownership in the issuer.

Cadence's non-marketable investments as of December 31, 2016 and January 2, 2016 were as follows:

	As of	
	December 31, 2016	January 2, 2016
	(In thousands)	
Cost method	\$532	\$ 1,081
Equity method	2,634	2,836
Total non-marketable investments	\$3,166	\$ 3,917

NOTE 5. RECEIVABLES, NET

Cadence's current and long-term receivables balances as of December 31, 2016 and January 2, 2016 were as follows:

	As of	
	December 31, 2016	January 2, 2016
	(In thousands)	
Accounts receivable	\$85,554	\$ 107,041
Unbilled accounts receivable	71,617	57,807
Long-term receivables	12,949	4,498
Total receivables	170,120	169,346
Less allowance for doubtful accounts	—	—
Total receivables, net	\$170,120	\$ 169,346

Cadence's customers are primarily concentrated within the semiconductor and electronics systems industries. As of December 31, 2016, no one customer accounted for 10% or more of Cadence's total receivables. As of January 2, 2016, one customer accounted for 12% of Cadence's total receivables, and no other customer accounted for 10% or more of Cadence's total receivables. As of December 31, 2016, approximately 47% of Cadence's total receivables were attributable to the ten customers with the largest balances of total receivables. As of January 2, 2016, approximately 45% of Cadence's total receivables were attributable to the ten customers with the largest balances of total receivables.

Table of Contents**NOTE 6. STOCK REPURCHASE PROGRAMS**

In July 2015, Cadence's Board of Directors approved an 18-month plan to repurchase shares of Cadence common stock of up to an aggregate of \$1.2 billion, beginning in the third quarter of fiscal 2015. This plan concluded in the fourth quarter of fiscal 2016. As of December 31, 2016, there were no remaining authorizations to repurchase shares of our common stock.

The shares repurchased under Cadence's repurchase authorizations and the total cost of repurchased shares, including commissions, during fiscal 2016, 2015 and 2014 were as follows:

	2016	2015	2014
	(In thousands)		
Shares repurchased	40,493	16,255	5,856
Total cost of repurchased shares	\$960,289	\$333,189	\$100,117

NOTE 7. ACQUISITIONS**2016 Acquisitions**

During fiscal 2016, Cadence completed two business combinations for total cash consideration of \$42.4 million, after taking into account cash acquired of \$1.8 million. The total purchase consideration was allocated to the assets acquired and liabilities assumed based on their respective estimated fair values on the acquisition dates. Cadence will also make payments to certain employees over a period of up to four years subject to continued employment and other conditions. Cadence recorded a total of \$23.6 million of goodwill, \$23.2 million of acquired intangible assets and \$2.6 million of net liabilities consisting primarily of deferred revenue.

The recorded goodwill is primarily related to expected synergies from combining operations of the acquired companies. The weighted-average amortization period for definite-lived intangible assets acquired is approximately 8.0 years.

Results of operations and the estimated fair value of acquired assets and assumed liabilities are recorded in the consolidated financial statements from the date of acquisition. Pro forma results of operations for the business combinations completed during fiscal 2016 have not been presented because the effects of these acquisitions, individually and in the aggregate, would not have been material to Cadence's financial results. The fair values of acquired intangible assets and assumed liabilities were determined using significant inputs that are not observable in the market. For an additional description of these fair value calculations, see Note 16 in the notes to the consolidated financial statements.

A trust for the benefit of the children of Lip-Bu Tan, Cadence's President, Chief Executive Officer, or CEO, and director, owned less than 2% of Rocketick Technologies Ltd., one of the acquired companies, and Mr. Tan and his wife serve as co-trustees of the trust and disclaim pecuniary and economic interest in the trust. The Board of Directors of Cadence reviewed the transaction and concluded that it was in the best interests of Cadence to proceed with the transaction. Mr. Tan recused himself from the Board of Directors' discussion of the valuation of Rocketick Technologies Ltd. and on whether to proceed with the transaction. A financial advisor provided a fairness opinion to Cadence in connection with the transaction.

2014 Acquisitions

During fiscal 2014, Cadence acquired Jasper Design Automation, Inc., or Jasper, a privately held provider of formal analysis solutions based in Mountain View, California. The acquired technology complements Cadence's existing system design and verification platforms. Total cash consideration for Jasper, after taking into account adjustments for certain costs, and cash held by Jasper at closing of \$28.7 million, was \$139.4 million. Cadence will also make payments to certain employees through the third quarter of fiscal 2017 subject to continued employment and other conditions.

Cadence also completed two other business combinations during fiscal 2014 for total cash consideration of \$27.5 million, after taking into account cash acquired of \$2.1 million.

Acquisition-related Transaction Costs

Transaction costs associated with acquisitions were \$1.1 million, \$0.7 million and \$3.7 million during fiscal 2016, 2015 and 2014, respectively. These costs consist of professional fees and administrative costs and were expensed as

incurred in Cadence's consolidated income statements.

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NOTE 8. GOODWILL AND ACQUIRED INTANGIBLES

Goodwill

The changes in the carrying amount of goodwill during fiscal 2016 and 2015 were as follows:

	Gross Carrying Amount (In thousands)
Balance as of January 3, 2015	\$ 553,767
Effect of foreign currency translation	(1,995)
Balance as of January 2, 2016	551,772
Goodwill resulting from acquisitions	23,579
Effect of foreign currency translation	(2,587)
Balance as of December 31, 2016	\$ 572,764

Cadence completed its annual goodwill impairment test during the third quarter of fiscal 2016 and determined that the fair value of Cadence's single reporting unit substantially exceeded the carrying amount of its net assets and that no impairment existed.

Acquired Intangibles, Net

Acquired intangibles as of December 31, 2016 were as follows, excluding intangibles that were fully amortized as of January 2, 2016:

	Gross Carrying Amount (In thousands)	Accumulated Amortization (In thousands)	Acquired Intangibles, Net (In thousands)
Existing technology	\$342,108	\$ (160,178)	\$ 181,930
Agreements and relationships	174,623	(100,778)	73,845
Tradenames, trademarks and patents	9,806	(6,767)	3,039
Total acquired intangibles	\$526,537	\$ (267,723)	\$ 258,814

Acquired intangibles as of January 2, 2016 were as follows, excluding intangibles that were fully amortized as of January 3, 2015:

	Gross Carrying Amount (In thousands)	Accumulated Amortization (In thousands)	Acquired Intangibles, Net (In thousands)
Existing technology	\$329,627	\$ (124,097)	\$ 205,530
Agreements and relationships	173,325	(86,808)	86,517
Tradenames, trademarks and patents	10,119	(5,684)	4,435
Total acquired intangibles	\$513,071	\$ (216,589)	\$ 296,482

Amortization expense from existing technology and maintenance agreements is included in cost of product and maintenance. Amortization expense for fiscal 2016, 2015 and 2014, by consolidated income statement caption, was as follows:

	2016	2015	2014
	(In thousands)		
Cost of product and maintenance	\$42,387	\$40,532	\$36,907
Amortization of acquired intangibles	18,095	23,716	24,017
Total amortization of acquired intangibles	\$60,482	\$64,248	\$60,924

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Estimated amortization expense for intangible assets with definite lives for the following five fiscal years and thereafter is as follows:

	(In thousands)
2017	\$ 56,024
2018	52,244
2019	45,238
2020	40,034
2021	35,546
Thereafter	29,728

Total estimated amortization expense \$ 258,814

NOTE 9. STOCK COMPENSATION PLANS AND STOCK-BASED COMPENSATION**Equity Incentive Plans**

Cadence's Omnibus Plan provides for the issuance of both incentive and non-qualified options, restricted stock awards, restricted stock units, stock bonuses and the rights to acquire restricted stock to both executive and non-executive employees. During fiscal 2016, Cadence's shareholders approved an amendment to the Omnibus Plan to increase the number of shares of common stock authorized for issuance by 6.0 million. As of December 31, 2016, the total number of shares available for issuance under the Omnibus Plan is approximately 29.0 million plus any shares that are forfeited under prior plans. Options granted under the Omnibus Plan have an exercise price not less than the fair market value of the stock on the date of grant. Options and restricted stock generally vest over a three- to four-year period. Options granted under the Omnibus Plan expire seven years from the date of grant. Vesting of restricted stock awards granted under the Omnibus Plan may require the attainment of specified performance criteria.

Cadence's 1995 Directors Stock Incentive Plan, or the Directors Plan, provides for the issuance of non-qualified options, restricted stock awards and restricted stock units to its non-employee directors. Options granted under the Directors Plan have an exercise price not less than the fair market value of the stock on the date of grant. The maximum number of shares available for issuance under the Directors Plan is approximately 3.6 million. Options granted under the Directors Plan expire after ten years, and options, restricted stock awards and restricted stock units vest one year from the date of grant.

Cadence has assumed certain options granted to employees of acquired companies, or Acquired Options. The Acquired Options were assumed by Cadence outside of its stock option plans, and each option is administered under the terms of the respective original plans of the acquired companies. All of the Acquired Options have been adjusted for the price conversion under the terms of the acquisition agreement between Cadence and the relevant acquired company. If the Acquired Options are canceled, forfeited or expire, they do not become available for future grant. No additional options will be granted under any of the acquired companies' plans.

Stock-based Compensation

Stock-based compensation expense and the related income tax benefit recognized in connection with stock options, restricted stock and the Employee Stock Purchase Plan, or ESPP, during fiscal 2016, 2015 and 2014 were as follows:

	2016	2015	2014
	(In thousands)		
Stock options	\$5,649	\$7,903	\$11,870
Restricted stock	96,989	78,615	65,894
ESPP	6,579	5,823	6,028
Total stock-based compensation expense	\$109,217	\$92,341	\$83,792
Income tax benefit	\$30,980	\$24,294	\$20,544

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Stock-based compensation expense is reflected in Cadence's consolidated income statements during fiscal 2016, 2015 and 2014 as follows:

	2016	2015	2014
	(In thousands)		
Cost of product and maintenance	\$1,995	\$2,436	\$2,244
Cost of services	2,911	3,561	3,280
Marketing and sales	22,700	21,654	20,580
Research and development	64,061	49,755	43,173
General and administrative	17,550	14,935	14,515
Total stock-based compensation expense	\$109,217	\$92,341	\$83,792

Stock Options

The exercise price of each stock option granted under Cadence's employee equity incentive plans is equal to or greater than the closing price of Cadence's common stock on the date of grant. The fair value of each option grant is estimated on the date of grant using the Black-Scholes option pricing model. The weighted-average grant date fair value of options granted and the weighted-average assumptions used in the model for fiscal 2016, 2015 and 2014 were as follows:

	2016	2015	2014
Dividend yield	None	None	None
Expected volatility	31.5 %	26.8 %	29.2 %
Risk-free interest rate	1.21 %	1.61 %	1.59 %
Expected term (in years)	4.8	5.0	4.8
Weighted-average fair value of options granted	\$5.84	\$4.60	\$3.89

A summary of the changes in stock options outstanding under Cadence's equity incentive plans during fiscal 2016 is presented below:

	Shares	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Terms (Years)	Aggregate Intrinsic Value
	(In thousands)			(In thousands)
Options outstanding as of January 2, 2016	8,977	\$ 11.35		
Granted	1,325	20.05		
Exercised	(3,148)	9.84		
Canceled and forfeited	(37)	15.80		
Options outstanding as of December 31, 2016	7,117	\$ 13.61	3.9	\$ 82,618
Options vested as of December 31, 2016	5,036	\$ 11.73	3.3	\$ 67,954

Cadence had total unrecognized compensation expense related to stock option grants of \$10.3 million as of December 31, 2016, which will be recognized over the remaining vesting period. The remaining weighted-average vesting period of unvested awards is 2.4 years.

The total intrinsic value of and cash received from options exercised during fiscal 2016, 2015 and 2014 was:

	2016	2015	2014
	(In thousands)		
Intrinsic value of options exercised	\$44,835	\$67,363	\$24,032
Cash received from options exercised	30,984	52,261	46,123

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Restricted Stock

Generally, restricted stock, which includes restricted stock awards and restricted stock units, vests over three to four years and is subject to the employee's continuing service to Cadence. Stock-based compensation expense is recognized ratably over the vesting term. The vesting of certain restricted stock grants is subject to attainment of specified performance criteria. Each fiscal quarter, Cadence estimates the probability of the achievement of these performance goals and recognizes any related stock-based compensation expense using the graded-vesting method. The amount of stock-based compensation expense recognized in any one period can vary based on the attainment or expected attainment of the various performance goals. If such performance goals are not ultimately met, no compensation expense is recognized and any previously recognized compensation expense is reversed.

During fiscal 2016, Cadence granted 1.25 million shares of long-term, performance-based stock awards to executives that vest over three to five years and are subject to certain market conditions and the executive's continuing service to Cadence. If the market conditions are not ultimately met, compensation expense previously recognized is not reversed.

Stock-based compensation expense related to performance-based restricted stock grants for fiscal 2016, 2015 and 2014 was as follows:

	2016	2015	2014
	(In thousands)		
Stock-based compensation expense related to performance-based grants	\$9,195	\$5,544	\$5,227

A summary of the changes in restricted stock outstanding under Cadence's equity incentive plans during fiscal 2016, is presented below:

	Shares (In thousands)	Weighted- Average Grant Date Fair Value	Weighted- Average Remaining Vesting Terms (Years)	Aggregate Intrinsic Value (In thousands)
Unvested shares as of January 2, 2016	10,577	\$ 18.13		
Granted	7,145	21.60		
Vested	(4,939)	17.45		
Forfeited	(701)	19.18		
Unvested shares as of December 31, 2016	12,082	\$ 20.40	1.1	\$ 304,698

Cadence had total unrecognized compensation expense related to restricted stock grants of \$198.0 million as of December 31, 2016, which will be recognized over the remaining vesting period. The remaining weighted-average vesting period of unvested awards is 2.3 years.

The total fair value realized by employees upon vesting of restricted stock during fiscal 2016, 2015 and 2014 was:

	2016	2015	2014
	(In thousands)		
Fair value of restricted stock realized upon vesting	\$113,114	\$99,564	\$75,283

Employee Stock Purchase Plan

Cadence provides an ESPP, as amended from time to time. Under the terms of the ESPP, Cadence is authorized to issue up to 74.0 million shares of common stock. A majority of Cadence employees are eligible to participate in the ESPP.

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Under the terms of the ESPP, from and after the offering period that commenced February 1, 2014, eligible employees may purchase Cadence's common stock at a price equal to 85% of the lower of the fair market value at the beginning or the end of the applicable offering period, in an amount not to exceed 7% of their annual base earnings plus bonuses and commissions, and subject to a limit in any calendar year of \$9,411.76 worth of common stock. Under the terms of the ESPP that were in effect through the January 31, 2014 purchase date, eligible employees were subject to a limit of 5% of their annual base earnings plus bonuses and commissions, and subject to a limit in any calendar year of \$7,058.82 worth of common stock. Each offering period has a six-month duration beginning on either February 1 or August 1. The purchase dates fall on the last days of the six-month offering periods.

Compensation expense is calculated using the fair value of the employees' purchase rights under the Black-Scholes option pricing model. The weighted-average grant date fair value of purchase rights granted under the ESPP and the weighted-average assumptions used in the model for fiscal 2016, 2015 and 2014 were as follows:

	2016	2015	2014
Dividend yield	None	None	None
Expected volatility	24.4 %	22.9 %	24.2 %
Risk-free interest rate	0.43 %	0.13 %	0.06 %
Expected term (in years)	0.5	0.5	0.5
Weighted-average fair value of options granted	\$4.85	\$4.23	\$3.39

Shares of common stock issued under the ESPP for fiscal 2016, 2015 and 2014 were as follows:

	2016	2015	2014
	(In thousands, except per share amounts)		
Cadence shares purchased under the ESPP	1,471	1,519	1,689
Cash received for the purchase of shares under the ESPP	\$24,450	\$22,449	\$20,017
Weighted-average purchase price per share	\$16.62	\$14.78	\$11.85

Reserved for Future Issuance

As of December 31, 2016, Cadence had reserved the following shares of authorized but unissued common stock for future issuance:

	Shares (In thousands)
Employee equity incentive plans*	18,709
Employee stock purchase plans	5,189
Directors stock option plans*	1,484
Total	25,382

* Includes shares reserved for: (i) issuance upon exercise of future option grants, (ii) issuance upon vesting of future restricted stock grants, (iii) outstanding but unexercised options to purchase common stock, or (iv) unvested restricted stock units.

NOTE 10. INCOME TAXES

Cadence's income before provision for income taxes included income from the United States and from foreign subsidiaries for fiscal 2016, 2015 and 2014, is as follows:

	2016	2015	2014
	(In thousands)		
United States	\$84,694	\$47,867	\$12,680
Foreign subsidiaries	152,459	219,729	168,322
Total income before provision for income taxes	\$237,153	\$267,596	\$181,002

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Cadence's foreign subsidiaries are generally subject to lower statutory tax rates than the United States statutory federal income tax rate of 35%.

Cadence's provision for income taxes was comprised of the following items for fiscal 2016, 2015 and 2014:

	2016	2015	2014
	(In thousands)		
Current:			
Federal	\$4,839	\$(10,265)	\$(13,754)
State and local	50	(713)	(1,159)
Foreign	34,047	24,622	19,100
Total current	38,936	13,644	4,187

Deferred:			
Federal	(5,291)	(13,165)	2,075
State and local	6,006	1,751	1,633
Foreign	(5,584)	(1,734)	8,770
Total deferred	(4,869)	(13,148)	12,478

Tax expense allocated to shareholders' equity —	14,683	5,439
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Total provision for income taxes	\$34,067	\$15,179	\$22,104
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The provision for income taxes differs from the amount estimated by applying the United States statutory federal income tax rate of 35% to income before provision for income taxes for fiscal 2016, 2015 and 2014 as follows:

	2016	2015	2014
	(In thousands)		
Provision computed at federal statutory income tax rate	\$83,003	\$93,659	\$63,350
State and local income tax, net of federal tax effect	5,534	3,621	1,168
Foreign income tax rate differential	(36,098)	(56,873)	(39,012)
Stock-based compensation	(13,132)	2,687	5,726
Change in deferred tax asset valuation allowance	1,243	(11,066)	10,065
Tax credits	(39,765)	(19,243)	(17,331)
Repatriation of foreign earnings	25,145	50	(2,910)
Non-deductible research and development expense	—	336	2,195
Tax effects of intra-entity transfer of assets	(7,661)	(7,928)	(5,397)
Domestic production activity deduction	(2,826)	—	(1,281)
Withholding taxes	9,870	5,119	4,064
Tax settlements, foreign	5,620	—	—
Interest and penalties not included in tax settlements	451	331	(382)
Increase in unrecognized tax benefits not included in tax settlements	614	3,530	157
Other	2,069	956	1,692
Provision for income taxes	\$34,067	\$15,179	\$22,104
Effective tax rate	14	% 6	% 12

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Cadence adopted the new accounting standard related to stock-based compensation in fiscal 2016, which requires the excess tax benefits or deficiencies to be reflected in the consolidated income statements as a component of the provision for income taxes, whereas these income tax effects were previously recognized in stockholders' equity in the consolidated balance sheets. Total excess tax benefits recognized in the provision for income taxes in fiscal 2016 were \$17.2 million. Cadence adopted the accounting standard on a prospective basis and prior fiscal periods were not restated. For further discussion regarding accounting standards adopted during fiscal 2016, see Note 2 in the notes to consolidated financial statements under the heading "Recently Adopted Accounting Standards."

The components of deferred tax assets and liabilities consisted of the following as of December 31, 2016 and January 2, 2016:

	As of December 31, 2016	January 2, 2016
	(In thousands)	
Deferred tax assets:		
Tax credit carryforwards	\$180,999	\$189,672
Reserves and accruals	62,438	54,774
Intangible assets	23,335	29,256
Capitalized research and development expense for income tax purposes	19,093	26,332
Operating loss carryforwards	23,175	25,208
Deferred income	14,842	16,407
Capital loss carryforwards	20,580	20,552
Stock-based compensation costs	20,087	17,612
Depreciation and amortization	12,202	22,442
Investments	6,442	7,113
Prepaid expenses	26,526	—
Total deferred tax assets	409,719	409,368
Valuation allowance	(92,920)	(91,677)
Net deferred tax assets	316,799	317,691
Deferred tax liabilities:		
Intangible assets	(35,651)	(45,697)
Undistributed foreign earnings	(24,529)	(25,156)
Other	(119)	(1,390)
Total deferred tax liabilities	(60,299)	(72,243)
Total net deferred tax assets	\$256,500	\$245,448

Cadence regularly reviews its deferred tax assets for recoverability and establishes a valuation allowance if it is more likely than not that some portion of the deferred tax assets will not be realized. During fiscal 2016, Cadence determined that there was sufficient positive evidence to conclude that \$316.8 million of deferred tax assets were more likely than not to be realized. The evidence that the Company relied on to make this determination included the following:

- The magnitude and duration of Cadence's historical profitability in the United States;
- Cadence's multi-year history of approximately 90% of the aggregate value of its bookings being of a type that revenue is recurring in nature;
- Cadence's existing revenue backlog as of December 31, 2016 that provides Cadence with an objective source of future revenues to be recognized in fiscal 2017 and subsequent periods; and
- Cadence's expectation of having sufficient sources of income in the future to prevent the expiration of deferred tax assets.

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During fiscal 2016 and 2015, Cadence maintained valuation allowances of \$92.9 million and \$91.7 million, respectively, on certain federal, state and foreign deferred tax assets because the realization of these deferred tax assets require future income of a specific character or amount that Cadence considered uncertain. The valuation allowance primarily relates to the following:

- Tax credits in certain states that are accumulating at a rate greater than Cadence's capacity to utilize the credits and tax credits in certain states where it is likely the credits will expire unused;

- Federal, state and foreign deferred tax assets related to investments and capital losses that can only be utilized against gains that are capital in nature; and

- Foreign tax credits that can only be fully utilized if Cadence has sufficient income of a specific character in the future. Cadence provides for United States income taxes on the earnings of foreign subsidiaries unless the earnings are considered indefinitely reinvested outside of the United States. Cadence intends to indefinitely reinvest \$503.8 million of undistributed earnings of certain foreign subsidiaries as of December 31, 2016, to meet the working capital and long-term capital needs of its foreign subsidiaries.

Cadence has not calculated the unrecognized deferred tax liability for these indefinitely reinvested foreign earnings because it was impracticable due to the complexities and uncertainties of the hypothetical calculation.

As of December 31, 2016, Cadence's operating loss carryforwards were as follows:

	Amount (In thousands)	Expiration Periods
Federal	\$ 2,045	from 2021 through 2029
California	172,903	from 2019 through 2035
Other states (tax effected, net of federal benefit)	2,009	from 2019 through 2035
Foreign (tax effected)	10,515	from 2025 through indefinite

As of December 31, 2016, Cadence had tax credit carryforwards of:

	Amount (In thousands)	Expiration Periods
Federal*	\$ 123,672	from 2019 through 2036
California	36,348	indefinite
Other states	6,738	from 2017 through 2035
Foreign	14,241	from 2017 through 2036

*Certain of Cadence's foreign tax credits have yet to be realized and as a result do not yet have an expiration period.

Examinations by Tax Authorities

Taxing authorities regularly examine Cadence's income tax returns.

In September 2015, a Cadence foreign subsidiary entered into a settlement agreement with a foreign tax authority with respect to its tax returns from 2010 through 2012. As a result of the settlement, Cadence recognized a tax benefit of \$1.2 million from the recognition of previously unrecognized tax benefits. The settlement also provided Cadence with additional visibility into when it could expect to utilize certain tax credits, which in turn allowed Cadence to release \$12.6 million of valuation allowance on anticipated credits.

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As of December 31, 2016 Cadence's earliest tax years that remain open to examination and the assessment of additional tax include:

Jurisdiction	Earliest Tax Year Open to Examination
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United States - Federal	2013
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United States - California	2012
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Hungary	2011
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South Korea	2011
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Unrecognized Tax Benefits

The changes in Cadence's gross amount of unrecognized tax benefits during fiscal 2016, 2015 and 2014 are as follows:

	2016	2015	2014
	(In thousands)		
Unrecognized tax benefits at the beginning of the fiscal year	\$87,820	\$97,224	\$78,279
Gross amount of the increases (decreases) in unrecognized tax benefits of tax positions taken during a prior year*	(155)	(7,331)	8,301
Gross amount of the increases in unrecognized tax benefits as a result of tax positions taken during the current year	11,342	7,513	12,381
Amount of decreases in unrecognized tax benefits relating to settlements with taxing authorities, including the utilization of tax attributes	—	(9,571)	—
Reductions to unrecognized tax benefits resulting from the lapse of the applicable statute of limitations	(149)	(119)	(86)
Effect of foreign currency translation	(318)	104	(1,651)
Unrecognized tax benefits at the end of the fiscal year	\$98,540	\$87,820	\$97,224

Total amounts of unrecognized tax benefits that, if upon resolution of the uncertain tax positions would reduce Cadence's effective tax rate	\$56,248	\$48,335	\$57,127
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* Includes unrecognized tax benefits of tax positions recorded in connection with acquisitions

The total amounts of interest, net of tax, and penalties recognized in the consolidated income statements as provision (benefit) for income taxes for fiscal 2016, 2015 and 2014 were as follows:

	2016	2015	2014
	(In thousands)		
Interest	\$1,166	\$110	\$255
Penalties ³	(127)	(748)	

The total amounts of gross accrued interest and penalties recognized in the consolidated balance sheets as of December 31, 2016 and January 2, 2016 were as follows:

	As of December 31, 2016	As of January 2, 2016
	(In thousands)	
Interest	\$1,332	\$1,128
Penalties ²	265	270

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NOTE 11. COMMITMENTS AND CONTINGENCIES

Lease Commitments

Facilities, equipment and vehicles are leased under various operating leases expiring at various dates through 2031. Certain of these leases contain renewal options and escalating rent payments. Rental expense is recognized on a straight-line basis and was as follows during fiscal 2016, 2015 and 2014:

2016	2015	2014
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(In thousands)

Rent expense	\$28,216	\$27,406	\$26,666
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As of December 31, 2016, future minimum lease payments under non-cancelable operating leases were as follows:

Committed

	Operating Leases	Sub-lease Income	Net Operating Leases
For the fiscal years:	(In thousands)		
2017	\$20,735	\$ (67)	\$ 20,668
2018	17,647	—	17,647
2019	13,918	—	13,918
2020	9,040	—	9,040
2021	7,436	—	7,436
Thereafter	22,195	—	22,195
Total lease payments	\$90,971	\$ (67)	\$ 90,904

Of the operating lease payments noted above, \$0.1 million was accrued as part of Cadence's restructuring plans as of December 31, 2016 and will be charged against the restructuring accrual as paid.

Purchase Obligations

Cadence had purchase obligations of \$30.4 million as of December 31, 2016 that were associated with agreements or commitments for purchases of goods or services.

Legal Proceedings

From time to time, Cadence is involved in various disputes and litigation that arise in the ordinary course of business. These include disputes and lawsuits related to intellectual property, indemnification obligations, mergers and acquisitions, licensing, contracts, distribution arrangements and employee relations matters. At least quarterly, Cadence reviews the status of each significant matter and assesses its potential financial exposure. If the potential loss from any claim or legal proceeding is considered probable and the amount or the range of loss can be estimated, Cadence accrues a liability for the estimated loss. Legal proceedings are subject to uncertainties, and the outcomes are difficult to predict. Because of such uncertainties, accruals are based on Cadence's judgments using the best information available at the time. As additional information becomes available, Cadence reassesses the potential liability related to pending claims and litigation matters and may revise estimates.

Other Contingencies

Cadence provides its customers with a warranty on sales of hardware products, generally for a 90-day period. Cadence did not incur any significant costs related to warranty obligations during fiscal 2016, 2015 or 2014.

Cadence's product license and services agreements typically include a limited indemnification provision for claims from third parties relating to Cadence's intellectual property. If the potential loss from any indemnification claim is considered probable and the amount or the range of loss can be estimated, Cadence accrues a liability for the estimated loss. The indemnification is generally limited to the amount paid by the customer. Cadence did not incur any significant losses from indemnification claims during fiscal 2016, 2015 or 2014.

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Cadence has initiated various restructuring plans in an effort to better align its resources with its business strategy. These restructuring plans have primarily been comprised of severance payments and termination benefits related to headcount reductions, estimated lease losses related to facilities vacated under the restructuring plans and charges related to assets abandoned as part of the restructuring plans. Cadence initiated two restructuring plans during fiscal 2016, or the 2016 Restructuring Plans. For the plan initiated during the first quarter of fiscal 2016, Cadence recorded restructuring and other charges of approximately \$14.1 million related to severance payments and termination benefits. For the plan initiated during the fourth quarter of fiscal 2016, Cadence recorded an additional \$26.3 million related to severance payments and termination benefits, including costs associated with a voluntary early retirement program offered to certain employees. As of December 31, 2016, total liabilities related to the 2016 Restructuring Plans were \$24.4 million. Cadence expects to make cash payments for severance and related benefits for the 2016 Restructuring Plans through the first quarter of fiscal 2019.

Cadence also initiated restructuring plans during both fiscal 2015 and fiscal 2014 and recorded combined restructuring and other charges under both plans of approximately \$11.5 million related to severance payments and termination benefits and impairments of certain long-lived assets. As of December 31, 2016, total liabilities related to various restructuring plans initiated prior to fiscal 2016 were \$0.1 million. Cash payments for restructuring plans initiated prior to fiscal 2016 will be made through fiscal 2017.

The following table presents activity for Cadence's restructuring plans during fiscal 2016, 2015 and 2014:

	Severance and Benefits	Excess Facilities	Other	Total
(In thousands)				
Balance, December 28, 2013	\$10,672	\$3,552	\$—	\$14,224
Restructuring and other charges (credits), net	8,004	(945)	3,193	10,252
Non-cash charges	—	—	(2,450)	(2,450)
Cash payments	(13,967)	(1,056)	(262)	(15,285)
Effect of foreign currency translation	(247)	(284)	—	(531)
Balance, January 3, 2015	\$4,462	\$1,267	\$481	\$6,210
Restructuring and other charges (credits), net	3,636	1,095	(220)	4,511
Non-cash charges	—	(116)	—	(116)
Cash payments	(7,322)	(1,798)	(261)	(9,381)
Effect of foreign currency translation	(25)	(62)	—	(87)
Balance, January 2, 2016	\$751	\$386	\$—	\$1,137
Restructuring and other charges, net	40,411	544	—	40,955
Non-cash charges	—	(159)	—	(159)
Cash payments	(16,890)	(679)	—	(17,569)
Effect of foreign currency translation	130	(34)	—	96
Balance, December 31, 2016	\$24,402	\$58	\$—	\$24,460

The remaining liability for Cadence's restructuring plans is recorded in the consolidated balance sheet as follows:

	As of December 31, 2016 (In thousands)
Accounts payable and accrued liabilities	\$ 23,239
Other long-term liabilities	1,221
Total liabilities	\$ 24,460

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NOTE 13. OTHER INCOME, NET

Cadence's other income, net, for fiscal 2016, 2015 and 2014 was as follows:

	2016	2015	2014
	(In thousands)		
Interest income	\$2,917	\$2,667	\$1,827
Gains on sale of marketable debt and equity securities, net	317	21	722
Gains on non-marketable investments	2,668	2,348	2,524
Gains (losses) on securities in NQDC trust	1,741	(369)	3,415
Gains on foreign exchange	6,879	5,606	1,742
Gain on sale of property, plant and equipment	923	—	—
Write-down of non-marketable investments	—	—	(1,956)
Other income, net	477	204	205
Total other income, net	\$15,922	\$10,477	\$8,479

NOTE 14. NET INCOME PER SHARE

Basic net income per share is computed by dividing net income during the period by the weighted-average number of shares of common stock outstanding during that period, less unvested restricted stock awards. Diluted net income per share is impacted by equity instruments considered to be potential common shares, if dilutive, computed using the treasury stock method of accounting.

The calculations for basic and diluted net income per share for fiscal 2016, 2015 and 2014 are as follows:

	2016	2015	2014
	(In thousands, except per share amounts)		
Net income	\$203,086	\$252,417	\$158,898
Weighted-average common shares used to calculate basic net income per share	284,502	288,018	283,349
2015 Warrants	—	16,434	15,930
Stock-based awards	6,754	7,850	7,496
Weighted-average common shares used to calculate diluted net income per share	291,256	312,302	306,775
Net income per share - basic	\$0.71	\$0.88	\$0.56
Net income per share - diluted	\$0.70	\$0.81	\$0.52

The following table presents shares of Cadence's common stock outstanding for fiscal 2016, 2015 and 2014 that were excluded from the computation of diluted net income per share because the effect of including these shares in the computation of diluted net income per share would have been anti-dilutive:

	2016	2015	2014
	(In thousands)		
Long-term performance-based awards	1,069	—	—
Options to purchase shares of common stock	581	1,029	2,773
Non-vested shares of restricted stock	27	60	18
Total potential common shares excluded	1,677	1,089	2,791

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NOTE 15. BALANCE SHEET COMPONENTS

A summary of certain balance sheet components as of December 31, 2016 and January 2, 2016 is as follows:

	As of	
	December 31,	January 2,
	2016	2016
	(In thousands)	
Inventories:		
Raw materials	\$26,589	\$40,499
Finished goods	12,886	16,263
Inventories	\$39,475	\$56,762
Property, plant and equipment:		
Computer equipment and related software	\$503,543	\$471,842
Buildings	126,023	126,156
Land	55,785	55,898
Leasehold, building and land improvements	95,040	90,400
Furniture and fixtures	23,580	21,847
Equipment	44,119	42,274
In-process capital assets	3,478	1,527
Total cost	851,568	809,944
Less: Accumulated depreciation and amortization	(612,961)	(581,345)
Property, plant and equipment, net	\$238,607	\$228,599
Other assets:		
Deferred income taxes	\$256,547	\$245,651
Other long-term assets	55,193	54,278
Other assets	\$311,740	\$299,929
Accounts payable and accrued liabilities:		
Payroll and payroll-related accruals	\$174,936	\$155,592
Accounts payable	4,367	25,152
Income taxes payable - current	18,382	11,024
Accrued operating liabilities	41,811	46,254
Accounts payable and accrued liabilities	\$239,496	\$238,022

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NOTE 16. FAIR VALUE

Inputs to valuation techniques are observable or unobservable. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect Cadence's market assumptions. These two types of inputs have created the following fair value hierarchy:

Level 1 – Quoted prices for identical instruments in active markets;

Level 2 – Quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, and model-derived valuations in which all significant inputs and significant value drivers are observable in active markets; and

Level 3 – Valuations derived from valuation techniques in which one or more significant inputs or significant value drivers are unobservable.

This hierarchy requires Cadence to minimize the use of unobservable inputs and to use observable market data, if available, when determining fair value. Cadence recognizes transfers between levels of the hierarchy based on the fair values of the respective financial instruments at the end of the reporting period in which the transfer occurred. There were no transfers between levels of the fair value hierarchy during fiscal 2016.

On a quarterly basis, Cadence measures at fair value certain financial assets and liabilities. The fair value of financial assets and liabilities was determined using the following levels of inputs as of December 31, 2016 and January 2, 2016:

Fair Value Measurements as of
December 31, 2016:

Total	Level 1	Level 2	Level 3
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(In thousands)

Assets

Cash equivalents:

Money market funds	\$237,724	\$237,724	\$ —	\$ —
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Short-term investments:

Marketable equity securities	3,057	3,057	—	—
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Trading securities held in NQDC trust	26,622	26,622	—	—
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Total Assets	\$267,403	\$267,403	\$ —	\$ —
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Total	Level 1	Level 2	Level 3
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(In thousands)

Liabilities

Foreign currency exchange contracts	2,653	—	2,653	—
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Table of ContentsFair Value Measurements as of
January 2, 2016:

Total	Level 1	Level 2	Level 3
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(In thousands)

Assets

Cash equivalents:

Money market funds	\$360,691	\$360,691	\$—	\$—
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Short-term investments:

Corporate debt securities	34,829	—	34,829	—
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Bank certificates of deposit	15,046	—	15,046	—
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United States Treasury securities	36,286	36,286	—	—
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United States government agency securities	4,152	4,152	—	—
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Commercial paper	1,993	—	1,993	—
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Marketable equity securities	2,192	2,192	—	—
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Trading securities held in NQDC trust	24,905	24,905	—	—
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Total Assets	\$480,094	\$428,226	\$51,868	\$—
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Total	Level 1	Level 2	Level 3
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(In thousands)

Liabilities

Foreign currency exchange contracts	\$362	\$—	\$362	\$—
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Level 1 Measurements

Cadence's cash equivalents held in money market funds, available-for-sale United States Treasury securities, United States government agency securities, marketable equity securities and the trading securities held in Cadence's NQDC trust are measured at fair value using level 1 inputs.

Level 2 Measurements

Cadence's available-for-sale corporate debt securities, bank certificates of deposit and commercial paper are measured at fair value using level 2 inputs. Cadence obtains the fair values of its level 2 available-for-sale securities from a professional pricing service and validates the fair values by assessing the pricing methods and inputs and by comparing the fair values to another independent source.

Cadence's foreign currency exchange contracts are measured at fair value using observable foreign currency exchange rates.

Level 3 Measurements

During fiscal 2016, Cadence acquired intangible assets of \$23.2 million. The fair value of the intangible assets acquired was determined using the income and cost approaches and level 3 inputs. Key assumptions include the amount and timing of expected future cash flows, market conditions, projected costs, assumed profit margins, discount rates and the economy in general. The fair value of these intangible assets was affected most significantly by the projected income associated with the intangible assets and the anticipated timing of the projected income, but was also impacted by the discount rate used to adjust the outcomes to their present values. Cadence used discount rates ranging from 14.0% to 17.5% to value the intangible assets acquired.

As part of its acquisitions during fiscal 2016, Cadence also assumed obligations related to deferred revenue, which were estimated using the cost build-up approach. The cost build-up approach determines fair value using estimates of the costs required to fulfill the contracted obligations plus an assumed profit. Cadence assumed a profit margin of 14.5% when valuing these liabilities, which were then adjusted to present value using a discount rate of 3.5%. The resulting fair value using this approach approximates the amount that Cadence would be required to pay a third party to assume the obligation. The fair value of the deferred revenue obligations assumed was affected most significantly by the estimated costs required to fulfill the obligation, but was also affected by the assumed profit margin and the

discount rate.

Cadence believes that its estimates and assumptions related to the fair value of its acquired intangible assets and deferred revenue obligations are reasonable, but significant judgment is involved.

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NOTE 17. EMPLOYEE AND DIRECTOR BENEFIT PLANS

Cadence maintains various defined contribution plans for its eligible U.S. and non-U.S. employees. For employees in the United States, Cadence maintains a 401(k) savings plan to provide retirement benefits through tax-deferred salary deductions and may make discretionary contributions, as determined by the Board of Directors, which cannot exceed a specified percentage of the annual aggregate salaries of those employees eligible to participate. Cadence's total contributions made to these plans during fiscal 2016, 2015 and 2014 were as follows:

	2016	2015	2014
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	(In thousands)
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Contributions to defined contribution plans	\$24,185	\$22,337	\$21,121
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Executive Officers and Directors may also elect to defer compensation payable to them under Cadence's NQDC. Deferred compensation payments are held in investment accounts and the values of the accounts are adjusted each quarter based on the fair value of the investments held in the NQDC. These investments are classified as trading securities in the consolidated balance sheets and gains and losses are recognized as other income, net in the consolidated income statements. Net recognized gains (loss) of trading securities during fiscal 2016, 2015 and 2014 were as follows:

	2016	2015	2014
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	(In thousands)
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Trading securities	\$1,741	\$(369)	\$3,415
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Certain of Cadence's international subsidiaries sponsor defined benefit retirement plans. The unfunded projected benefit obligation for Cadence's defined benefit retirement plans is recorded in other long-term liabilities in the consolidated balance sheets. The unfunded projected benefit obligation for these retirement plans as of December 31, 2016, January 2, 2016 and January 3, 2015 was as follows:

	December 31, 2016	January 2, 2016	January 3, 2015
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	2016	2016	2015
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	(In thousands)
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Unfunded projected benefit obligation - defined benefit retirement plans	\$6,164	\$6,131	\$6,794
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Cadence recorded total expense related to these defined benefit retirement plans during fiscal 2016, 2015 and 2014 as follows:

	2016	2015	2014
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	(In thousands)
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Expense related to defined benefit retirement plans	\$670	\$1,359	\$1,799
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NOTE 18. ACCUMULATED OTHER COMPREHENSIVE LOSS

Cadence's accumulated other comprehensive loss is comprised of the aggregate impact of foreign currency translation gains and losses, changes in defined benefit plan liabilities, and changes in unrealized holding gains and losses on available-for-sale securities net of reclassifications for realized gains and losses, as presented in Cadence's consolidated statements of comprehensive income.

Accumulated other comprehensive loss was comprised of the following as of December 31, 2016, and January 2, 2016:

	As of	
	December 31,	January 2,
	2016	2016
	(In thousands)	
Foreign currency translation loss	\$(22,370)	\$(9,569)
Changes in defined benefit plan liabilities	(3,716)	(3,066)
Unrealized holding gains on available-for-sale securities	926	210
Total accumulated other comprehensive loss	\$(25,160)	\$(12,425)

For fiscal 2016, 2015 and 2014, there were no significant amounts reclassified to net income from foreign currency translation loss or changes in defined benefit plan liabilities components of accumulated other comprehensive loss. Changes in unrealized holding gains or losses on available-for-sale securities includes the following for fiscal 2016, 2015 and 2014:

	2016	2015	2014
	(In thousands)		
Unrealized holding gains or losses	\$770	\$202	\$(156)
Reclassification of unrealized holding gains or losses to other income, net	(54)	(33)	(149)
Changes in unrealized holding gains or losses	\$716	\$169	\$(305)

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NOTE 19. SEGMENT REPORTING

Segment reporting is based on the “management approach,” following the method that management organizes the company’s reportable segments for which separate financial information is made available to, and evaluated regularly by, the chief operating decision maker in allocating resources and in assessing performance. Cadence’s chief operating decision maker is its President and CEO, who reviews Cadence’s consolidated results as one operating segment. In making operating decisions, the CEO primarily considers consolidated financial information, accompanied by disaggregated information about revenues by geographic region.

Outside the United States, Cadence markets and supports its products and services primarily through its subsidiaries. Revenue is attributed to geography based upon the country in which the product is used or services are delivered.

Long-lived assets are attributed to geography based on the country where the assets are located.

The following table presents a summary of revenue by geography for fiscal 2016, 2015 and 2014:

	2016	2015	2014
	(In thousands)		
Americas:			
United States	\$832,583	\$782,419	\$696,608
Other Americas	31,296	25,960	23,357
Total Americas	863,879	808,379	719,965
Asia	445,500	413,588	360,280
Europe, Middle East and Africa	346,701	316,684	328,724
Japan	160,003	163,440	171,963
Total	\$1,816,083	\$1,702,091	\$1,580,932

The following table presents a summary of long-lived assets by geography as of December 31, 2016, January 2, 2016 and January 3, 2015:

	As of		
	December 31, 2016	January 2, 2016	January 3, 2015
	(In thousands)		
Americas:			
United States	\$193,750	\$189,665	\$200,760
Other Americas	757	387	578
Total Americas	194,507	190,052	201,338
Asia	30,564	24,767	22,145
Europe, Middle East and Africa	12,692	12,832	5,951
Japan	844	948	678
Total	\$238,607	\$228,599	\$230,112

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NOTE 20. SUBSEQUENT EVENTS

Revolving Credit Facility and amended 2019 Term Loan

On January 30, 2017, Cadence entered into a five-year senior unsecured revolving credit facility with a group of lenders led by JPMorgan Chase Bank, N.A., as administrative agent, which replaces the senior credit facility originally entered into on December 12, 2012 and as amended on September 19, 2014. The credit facility provides for borrowings up to \$350.0 million, with the right to request increased capacity up to an additional \$250.0 million upon the receipt of lender commitments, for total maximum borrowings of \$600.0 million. The credit facility expires on January 28, 2022 and has no subsidiary guarantors. Any outstanding loans drawn under the credit facility are due at maturity on January 28, 2022. Outstanding borrowings may be paid at any time prior to maturity.

Interest accrues on borrowings under the credit facility at either LIBOR plus a margin between 1.25% and 1.875% per annum or at the base rate plus a margin between 0.25% and 0.875% per annum. Interest is payable quarterly. A commitment fee ranging from 0.15% to 0.30% is assessed on the daily average undrawn portion of revolving commitments.

The credit facility contains customary negative covenants that, among other things, restrict Cadence's ability to incur additional indebtedness, grant liens and make certain investments, make acquisitions, dispose of certain assets and make certain restricted payments, including share repurchases and dividends. In addition, the credit facility contains financial covenants that require Cadence to maintain a leverage ratio not to exceed 3 to 1, and a minimum interest coverage ratio of 3 to 1.

On January 30, 2017, Cadence also amended the agreement for its 2019 Term Loan. The amendment provides Cadence with additional flexibility under the covenants, consistent with the covenants in the credit agreement for its revolving credit facility. The other material terms of the 2019 Term Loan remain unchanged.

Stock Repurchase Authorization

In January 2017, Cadence's Board of Directors authorized the repurchase of shares of Cadence's common stock with a value of up to \$525.0 million in the aggregate. The actual timing and amount of repurchases will be subject to business and market conditions, corporate and regulatory requirements, acquisition opportunities and other factors.

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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.

CADENCE DESIGN
SYSTEMS, INC.

/s/ Lip-Bu Tan
Lip-Bu Tan
President, Chief
Executive Officer and
Director
Dated: February 10, 2017

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.

/s/ Lip-Bu Tan	DATE: February 10, 2017
Lip-Bu Tan	
President, Chief Executive Officer and Director	

/s/ Geoffrey G. Ribar	DATE: February 10, 2017
Geoffrey G. Ribar	
Senior Vice President and Chief Financial Officer	

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POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Lip-Bu Tan, Geoffrey G. Ribar and James J. Cowie, and each of them, as his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments) to this Report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any of them, or their, his or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

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

/s/Dr. John B. Shoven	February 10, 2017
Dr. John B. Shoven, Chairman of the Board of Directors	

/s/Mark W. Adams	February 10, 2017
Mark W. Adams, Director	

/s/Susan L. Bostrom	February 10, 2017
Susan L. Bostrom, Director	

/s/Dr. James D. Plummer	February 10, 2017
Dr. James D. Plummer, Director	

/s/Dr. Alberto Sangiovanni-Vincentelli	February 10, 2017
Dr. Alberto Sangiovanni-Vincentelli, Director	

/s/George M. Scalise	February 10, 2017
George M. Scalise, Director	

/s/Roger S. Siboni	February 10, 2017
Roger S. Siboni, Director	

/s/Young K. Sohn	February 10, 2017
Young K. Sohn, Director	

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EXHIBIT INDEX

Exhibit Number	Exhibit Title	Incorporated by Reference		Exhibit No.	Filing Date	Provided Herewith
		Form	File No.			
3.01	Restated Certificate of Incorporation, as filed with the Secretary of State of the State of Delaware on May 13, 1998.	10-Q	001-10606	3.01(j)	8/18/1998	
3.02	Certificate of Designation for the Series A Junior Participating Preferred Stock, as amended on February 1, 2000.	10-K	001-10606	4.02	3/27/2000	
3.03	The Registrant's Amended and Restated Bylaws, effective as of May 5, 2014.	8-K	000-15867	3.01	5/7/2014	
4.01	Specimen Certificate of the Registrant's Common Stock.	S-4	033-43400	4.01	10/17/1991	
4.02	Base Indenture, dated October 9, 2014, between the Registrant and Wells Fargo Bank, N.A., as trustee.	8-K	000-15867	4.01	10/9/2014	
4.03	First Supplemental Indenture, dated October 9, 2014, between the Registrant and Wells Fargo Bank, N.A., as trustee (including the Form of 4.375% Senior Notes due 2024).	8-K	000-15867	4.02	10/9/2014	
10.01*	The Registrant's Amended and Restated 1987 Stock Incentive Plan.	S-8	333-174201	99.1	5/13/2011	
10.02*	Form of Stock Option Agreement and Form of Stock Option Exercise Request under the Registrant's 1987 Stock Incentive Plan, as amended and restated.	10-Q	001-10606	10.02	8/10/2004	
10.03*	Form of Nonstatutory Incentive Stock Award Agreement under the Registrant's 1987 Stock Incentive Plan, as amended and restated.	10-K	001-10606	10.03	3/16/2005	
10.04*	Form of Incentive Stock Award Agreement for performance-based Incentive Stock Awards granted prior to July 29, 2008, as amended and restated, under the Registrant's 1987 Stock Incentive Plan, as amended and restated.	10-Q	001-10606	10.02	12/11/2008	
10.05*	Form of Incentive Stock Award Agreement for performance-based Incentive Stock Awards to be granted subsequent to July 29, 2008 under the Registrant's 1987 Stock Incentive Plan, as amended and restated.	10-Q	001-10606	10.03	12/11/2008	
10.06*	Form of Stock Option Agreement under the Registrant's 1987 Stock Incentive Plan, as amended and restated.	10-Q	001-10606	10.01	5/1/2009	
10.07*	Form of Incentive Stock Award Agreement for performance-based Incentive Stock Awards under the Registrant's 1987 Stock Incentive Plan, as amended and restated.	10-Q	001-10606	10.02	5/1/2009	
10.08*	The Registrant's 1995 Directors Stock Incentive Plan.	10-Q	001-15867	10.01	7/26/2012	
10.09*	Form of Stock Option Agreement, as currently in effect under the Registrant's 1995 Directors Stock Incentive Plan.	10-K	000-15867	10.76	2/21/2013	
10.10*	Form of Incentive Stock Award Agreement, as currently in effect under the Registrant's 1995 Directors Stock	10-K	000-15867	10.77	2/21/2013	

Incentive Plan.

10.11* The Registrant's Amended and Restated 2000 Equity S-8 333-174200 99.1 5/13/2011
Incentive Plan.

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10.12*	Form of Incentive Stock Award Agreement under the Registrant's Amended and Restated 2000 Equity Incentive Plan.	10-Q	001-10606	10.02	10/28/2011
10.13*	Form of Restricted Stock Unit Award Agreement under the Registrant's Amended and Restated 2000 Equity Incentive Plan.	10-Q	001-10606	10.03	10/28/2011
10.14*	Form of Stock Option Agreement under the Registrant's Amended and Restated 2000 Equity Incentive Plan.	10-Q	001-10606	10.04	10/28/2011
10.15*	The Registrant's Omnibus Equity Incentive Plan, as amended and restated.	S-8	333-212669	99.01	7/25/2016
10.16*	Form of Incentive Stock Award Agreement for Non-Executive Employees and Consultants, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.	S-8	333-195771	99.02	5/7/2014
10.17*	Form of Restricted Stock Unit Agreement for Non-Executive Employees and Consultants, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.	S-8	333-195771	99.03	5/7/2014
10.18*	Form of Stock Option Agreement for Non-Executive Employees and Consultants, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.	S-8	333-195771	99.04	5/7/2014
10.19*	Form of Incentive Stock Award Agreement for Executives, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.	S-8	333-195771	99.05	5/7/2014
10.20*	Form of Restricted Stock Unit Agreement for Executives, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.	S-8	333-195771	99.06	5/7/2014
10.21*	Form of Stock Option Agreement for Executives, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.	S-8	333-195771	99.07	5/7/2014
10.22*	The Registrant's Amended and Restated Employee Stock Purchase Plan.	S-8	333-188449	99.01	5/8/2013
10.23*	The Registrant's 1996 Deferred Compensation Venture Investment Plan, as amended and restated effective January 1, 2001.	10-K	001-10606	10.09	3/12/2002
10.24*	The Registrant's 2002 Deferred Compensation Venture Investment Plan, as amended.	10-Q	001-10606	10.32	8/10/2004
10.25*	The Registrant's 1994 Deferred Compensation Plan, as amended and restated effective November 20, 2003 (409A Grandfathered Plan).	10-K	001-10606	10.1	2/26/2008
10.26*	The Registrant's 2009 Deferred Compensation Plan.	10-K	001-10606	10.13	2/26/2008
10.27*	Amendments Number One, Two and Three of the Registrant's 2009 Deferred Compensation Plan.	10-K	000-15867	10.27	2/18/2016
10.28*	The Senior Executive Bonus Plan.	10-Q	000-15867	10.04	7/25/2016
10.29*	The Registrant's Executive Severance Plan	8-K	001-15867	10.01	5/11/2016
10.30*	Director Medical and Prescription Benefits Coverage Reimbursement Plan.	10-Q	001-10606	10.02	4/29/2011
10.31	Altos Design Automation, Inc. 2006 Stock Plan, as amended December 23, 2009.	S-8	333-174202	99.1	5/13/2011
10.32	Tensilica, Inc. 2007 Stock Incentive Plan.	S-8	333-188452	99.01	5/8/2013

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10.33	C2 Design Automation (d/b/a/ Forte Design Systems) 2010 Stock Option Plan.	S-8	333-194102	99.01	2/24/2014	
10.34	Jasper Design Automation, Inc. 2011 Stock Incentive Plan.	S-8	333-197579	99.01	7/23/2014	
10.35	Form of Incentive Stock Award Agreement under the Jasper Design Automation, Inc. 2011 Stock Incentive Plan.	S-8	333-197579	99.02	7/23/2014	
10.36	Form of Stock Option Agreement under the Jasper Design Automation, Inc. 2011 Stock Incentive Plan.	S-8	333-197579	99.03	7/23/2014	
10.37*	Form of Indemnity Agreement between the Registrant and its directors and executive officers, as amended and restated.	10-Q	000-15867	10.01	7/25/2016	
10.38*	Employment Agreement, effective as of July 29, 2008, between the Registrant and James J. Cowie.	10-K	001-10606	10.92	3/2/2009	
10.39*	Employment Agreement, effective as of January 8, 2009, between the Registrant and Lip-Bu Tan.	10-K	001-10606	10.93	3/2/2009	
10.40*	Employment Agreement, effective as of February 23, 2009, between the Registrant and Chi-Ping Hsu.	10-K	001-10606	10.95	3/2/2009	
10.41*	Employment Agreement, effective as of February 23, 2009, between the Registrant and Nimish H. Modi.	10-K	001-10606	10.96	3/2/2009	
10.42*	Form of First Amendment to Employment Agreement between the Registrant and the Registrant's named executive officers.	10-Q	001-10606	10.02	7/31/2009	
10.43*	Form of Second Amendment to Employment Agreement between the Registrant and the Registrant's named executive officers.	10-K	001-10606	10.94	2/26/2010	
10.44*	Second Amendment to Employment Agreement, effective as of March 1, 2010, between the Registrant and Lip-Bu Tan.	10-K	001-10606	10.95	2/26/2010	
10.45*	Employment Agreement, effective as of October 21, 2011, between the Registrant and Geoffrey G. Ribar.	10-K	001-10606	10.77	2/24/2012	
10.46*	Employment Agreement, effective as of September 20, 2012, between the Registrant and Thomas P. Beckley.	10-K	000-15867	10.44	2/20/2014	
10.47*	Employment Agreement, effective as of March 16, 2015, between the Registrant and Anirudh Devgan.	10-Q	000-15867	10.01	4/27/2015	
10.48*	Executive Transition and Release Agreement, dated October 28, 2015, between the Registrant and Charlie Huang.	8-K	000-15867	10.01	10/29/2015	
10.49*	Letter, dated September 1, 2015, between the Registrant and Neil Zaman.	10-K	000-15867	10.49	2/18/2016	
10.50*	Offer Letter, dated December 15, 2015, between the Registrant and Pieter Vorenkamp.	10-Q	000-15867	10.02	4/25/2016	
10.51*	Offer Letter, dated January 12, 2017, between the Registrant and Surendra Babu Mandava.					X
10.52	Credit Agreement, dated as of December 12, 2012, by and among the Registrant, certain subsidiaries of the Registrant, Bank of America, N.A. and other lenders party thereto.	8-K	000-15867	10.01	12/13/2012	

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10.53	First Amendment to Credit Agreement, dated as of September 19, 2014, by and among the Registrant, certain subsidiaries of the Registrant, Bank of America, N.A. and other lenders party thereto.	8-K 000-15867 10.01 9/22/2014
10.54	Credit Agreement, dated as of January 30, 2017, by and among the Registrant, JPMorgan Chase Bank, N.A. and other lenders party thereto.	8-K 000-15867 10.01 2/1/2017
10.55	Term Loan Agreement, dated as of January 28, 2016, by and among the Registrant, J.P. Morgan Securities LLC, Merrill Lynch, Pierce, Fenner & Smith Incorporated, JPMorgan Chase Bank, N.A., and other lenders party thereto.	8-K 000-15867 10.01 2/3/2016
10.56	Amendment No. 1 to Loan Agreement, dated as of January 30, 2017, by and among the Registrant, JPMorgan Chase Bank, N.A. and other lenders party thereto.	8-K 000-15867 10.02 2/1/2017
21.01	Subsidiaries of the Registrant.	X
23.01	Independent Registered Public Accounting Firm's Consent.	X
31.01	Certification of the Registrant's Chief Executive Officer, Lip-Bu Tan, pursuant to Rule 13a-14 of the Securities Exchange Act of 1934.	X
31.02	Certification of the Registrant's Chief Financial Officer, Geoffrey G. Ribar, pursuant to Rule 13a-14 of the Securities Exchange Act of 1934.	X
32.01	Certification of the Registrant's Chief Executive Officer, Lip-Bu Tan, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.	X
32.02	Certification of the Registrant's Chief Financial Officer, Geoffrey G. Ribar, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.	X
101.INS	XBRL Instance Document.	X
101.SCH	XBRL Taxonomy Extension Schema Document.	X
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document.	X
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document.	X
101.LAB	XBRL Taxonomy Extension Label Linkbase Document.	X
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document.	X

* Indicates management contract or compensatory plan or arrangement covering executive officers or directors of the Registrant.