

SYNOPSYS INC  
Form 10-Q  
May 19, 2017  
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UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549

FORM 10-Q

(MARK ONE)

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

FOR THE QUARTERLY PERIOD ENDED APRIL 30, 2017

OR

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

FOR THE TRANSITION PERIOD FROM TO  
COMMISSION FILE NUMBER: 000-19807

SYNOPSYS, INC.

(Exact name of registrant as specified in its charter)

DELAWARE 56-1546236  
(State or other jurisdiction of (I.R.S. Employer  
incorporation or organization) Identification Number)  
690 EAST MIDDLEFIELD ROAD  
MOUNTAIN VIEW, CA 94043  
(Address of principal executive offices, including zip code)  
(650) 584-5000  
(Registrant's telephone number, including area code)

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

Large accelerated filer ☒ Accelerated Filer ☐

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

Emerging growth company ☐

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

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

As of May 17, 2017, there were 150,310,618 shares of the registrant's common stock outstanding.

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 FOR THE FISCAL QUARTER ENDED APRIL 30, 2017  
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## PART I. FINANCIAL INFORMATION

## Item 1. Financial Statements

## SYNOPSYS, INC.

## UNAUDITED CONDENSED CONSOLIDATED BALANCE SHEETS

(in thousands, except par value amounts)

	April 30, 2017	October 31, 2016*
<b>ASSETS</b>		
Current assets:		
Cash and cash equivalents	\$991,325	\$976,620
Short-term investments	140,243	140,695
Total cash, cash equivalents and short-term investments	1,131,568	1,117,315
Accounts receivable, net	373,770	438,873
Income taxes receivable and prepaid taxes	55,505	56,091
Prepaid and other current assets	121,169	104,659
Total current assets	1,682,012	1,716,938
Property and equipment, net	259,476	257,035
Goodwill	2,661,538	2,518,245
Intangible assets, net	274,609	266,661
Long-term prepaid taxes	15,068	13,991
Long-term deferred income taxes	367,000	281,926
Other long-term assets	206,855	185,569
Total assets	\$5,466,558	\$5,240,365
<b>LIABILITIES AND STOCKHOLDERS' EQUITY</b>		
Current liabilities:		
Accounts payable and accrued liabilities	\$351,500	\$401,451
Accrued income taxes	11,796	22,693
Deferred revenue	952,050	1,085,802
Short-term debt	278,001	205,000
Total current liabilities	1,593,347	1,714,946
Long-term accrued income taxes	37,714	39,562
Long-term deferred revenue	81,476	79,856
Long-term debt	139,688	—
Other long-term liabilities	236,838	210,855
Total liabilities	2,089,063	2,045,219
Stockholders' equity:		
Preferred stock, \$0.01 par value: 2,000 shares authorized; none outstanding	—	—
Common stock, \$0.01 par value: 400,000 shares authorized; 150,549 and 151,454 shares outstanding, respectively	1,506	1,515
Capital in excess of par value	1,661,205	1,644,675
Retained earnings	2,170,133	1,947,585
Treasury stock, at cost: 6,713 and 5,811 shares, respectively	(376,100 )	(294,052 )
Accumulated other comprehensive income (loss)	(79,249 )	(104,577 )
Total stockholders' equity	3,377,495	3,195,146
Total liabilities and stockholders' equity	\$5,466,558	\$5,240,365

\* Derived from audited financial statements.

See accompanying notes to unaudited condensed consolidated financial statements.



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## SYNOPSYS, INC.

## UNAUDITED CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS

(in thousands, except per share amounts)

	Three Months Ended April 30,		Six Months Ended April 30,	
	2017	2016	2017	2016
Revenue:				
Time-based products	\$501,096	\$484,175	\$990,461	\$948,455
Upfront products	83,450	58,163	163,059	101,600
Maintenance and service	95,523	62,667	179,335	123,554
Total revenue	680,069	605,005	1,332,855	1,173,609
Cost of revenue:				
Products	100,907	85,444	197,878	161,837
Maintenance and service	41,487	21,631	78,790	44,156
Amortization of intangible assets	19,634	24,555	41,106	55,081
Total cost of revenue	162,028	131,630	317,774	261,074
Gross margin	518,041	473,375	1,015,081	912,535
Operating expenses:				
Research and development	223,015	216,172	435,663	412,877
Sales and marketing	137,211	120,926	263,722	243,546
General and administrative	83,438	41,553	124,304	81,250
Amortization of intangible assets	7,864	7,024	15,900	13,959
Restructuring charges	12,907	894	25,012	2,987
Total operating expenses	464,435	386,569	864,601	754,619
Operating income	53,606	86,806	150,480	157,916
Other income (expense), net	8,414	10,417	19,901	3,649
Income before income taxes	62,020	97,223	170,381	161,565
Provision (benefit) for income taxes	8,714	27,847	30,487	32,154
Net income	\$53,306	\$69,376	\$139,894	\$129,411
Net income per share:				
Basic	\$0.35	\$0.46	\$0.93	\$0.85
Diluted	\$0.34	\$0.45	\$0.90	\$0.84
Shares used in computing per share amounts:				
Basic	150,384	152,250	150,583	152,609
Diluted	154,861	154,536	154,754	154,921

See accompanying notes to unaudited condensed consolidated financial statements.

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SYNOPSYS, INC.

## UNAUDITED CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

(in thousands)

	Three Months Ended April 30, 2017		Six Months Ended April 30, 2017		2016	
	(in thousands)					
Net income	\$53,306	\$69,376	\$139,894		\$129,411	
Other comprehensive income (loss):						
Change in foreign currency translation adjustment	13,961	17,388	9,301		2,933	
Changes in unrealized gains (losses) on available-for-sale securities, net of tax of \$0 for periods presented	9	106	(54)		59	
Cash flow hedges:						
Deferred gains (losses), net of tax of \$(2,265) and \$(2,945), for the three and six months ended April 30, 2017, respectively, and of \$(2,367) and \$1,285 for each of the same periods in fiscal 2016, respectively	4,036	3,041	10,488		(9,593)	
Reclassification adjustment on deferred (gains) losses included in net income, net of tax of \$(315) and \$(1,164), for the three and six months ended April 30, 2017, respectively, and of \$(1,790) and \$(3,171), for each of the same periods in fiscal 2016, respectively	1,738	5,197	5,593		8,913	
Other comprehensive income (loss), net of tax effects	19,744	25,732	25,328		2,312	
Comprehensive income	\$73,050	\$95,108	\$165,222		\$131,723	
See accompanying notes to unaudited condensed consolidated financial statements.						

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SYNOPSYS, INC.

## UNAUDITED CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS

(in thousands)

	Six Months Ended April 30, 2017	2016
Cash flows from operating activities:		
Net income	\$ 139,894	\$ 129,411
Adjustments to reconcile net income to net cash provided by operating activities:		
Amortization and depreciation	97,044	107,226
Stock compensation	51,396	46,472
Allowance for doubtful accounts	679	450
(Gain) loss on sale of investments	(1 )	(10 )
Write-down of long-term investments	1,300	—
Deferred income taxes	3,339	(9,984 )
Net changes in operating assets and liabilities, net of acquired assets and liabilities:		
Accounts receivable	81,098	93,619
Prepaid and other current assets	(13,291 )	(23,208 )
Other long-term assets	(24,021 )	656
Accounts payable and accrued liabilities	(23,341 )	(108,005 )
Income taxes	(11,436 )	3,489
Deferred revenue	(132,803 )	(52,852 )
Net cash provided by operating activities	169,857	187,264
Cash flows from investing activities:		
Proceeds from sales and maturities of short-term investments	94,512	75,570
Purchases of short-term investments	(94,182 )	(79,079 )
Proceeds from sales of long-term investments	—	1,785
Purchases of property and equipment	(31,195 )	(28,900 )



Cash paid for acquisitions and intangible assets, net of cash acquired	(187,624)	)	(46,100)	)
Capitalization of software development costs	(2,066)	)	(1,973)	)
Other	2,100		—	
Net cash used in investing activities	(218,455)	)	(78,697)	)
Cash flows from financing activities:				
Proceeds from credit facilities	250,000		60,000	
Repayment of debt	(36,875)	)	(15,000)	)
Issuances of common stock	62,254		42,764	
Payments for taxes related to net share settlement of equity awards	(8,058)	)	(5,981)	)
Purchase of equity forward contract	(20,000)	)	(20,000)	)
Purchases of treasury stock	(180,000)	)	(180,000)	)
Other	(482)	)	(550)	)
Net cash provided by (used in) financing activities	66,839		(118,767)	)
Effect of exchange rate changes on cash and cash equivalents	(3,536)	)	1,958	
Net change in cash and cash equivalents	14,705		(8,242)	)
Cash and cash equivalents, beginning of year	976,620		836,188	
Cash and cash equivalents, end of period	\$ 991,325		\$ 827,946	

See accompanying notes to unaudited condensed consolidated financial statements.

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SYNOPSYS, INC.

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

Note 1. Description of Business

Synopsys, Inc. (Synopsys or the Company) provides software, intellectual property and services used by designers across the entire silicon to software spectrum, from engineers creating advanced semiconductors to software developers ensuring the quality and security of their applications. The Company is a global leader in supplying the electronic design automation (EDA) software that engineers use to design and test integrated circuits (ICs), also known as chips. The Company also offers intellectual property (IP) products, which are pre-designed circuits that engineers use as components of larger chip designs rather than design those circuits themselves. The Company provides software and hardware used to develop the electronic systems that incorporate chips and the software that runs on them. To complement these offerings, the Company provides technical services and support to help its customers develop advanced chips and electronic systems. The Company is also a leading provider of software tools and services that improve the quality and security of software code in a wide variety of industries, including electronics, financial services, energy, industrials, and automotive.

Note 2. Summary of Significant Accounting Policies

The Company has prepared the accompanying unaudited condensed consolidated financial statements pursuant to the rules and regulations of the Securities and Exchange Commission (SEC). Pursuant to these rules and regulations, the Company has condensed or omitted certain information and footnote disclosures it normally includes in its annual consolidated financial statements prepared in accordance with U.S. generally accepted accounting principles (U.S. GAAP). In management's opinion, the Company has made all adjustments (consisting only of normal, recurring adjustments, except as otherwise indicated) necessary to fairly present its unaudited condensed consolidated balance sheets, results of operations, comprehensive income and cash flows. The Company's interim period operating results do not necessarily indicate the results that may be expected for any other interim period or for the full fiscal year. These financial statements and accompanying notes should be read in conjunction with the consolidated financial statements and notes thereto in Synopsys' Annual Report on Form 10-K for the fiscal year ended October 31, 2016 as filed with the SEC on December 12, 2016.

Use of Estimates. To prepare financial statements in conformity with U.S. GAAP, management must make estimates and assumptions that affect the amounts reported in the unaudited condensed consolidated financial statements and accompanying notes. Actual results could differ from these estimates and may result in material effects on the Company's operating results and financial position.

Principles of Consolidation. The unaudited condensed consolidated financial statements include the accounts of the Company and all of its subsidiaries. All significant intercompany accounts and transactions have been eliminated.

Fiscal Year End. The Company's fiscal year ends on the Saturday nearest to October 31 and consists of 52 weeks, with the exception that approximately every five years, the Company has a 53-week year. Fiscal 2017 and 2016 are both 52-week years. The second fiscal quarters of fiscal 2017 and 2016 ended on April 29, 2017 and April 30, 2016, respectively, and the prior fiscal year ended on October 29, 2016. For presentation purposes, the unaudited condensed consolidated financial statements and accompanying notes refer to the closest calendar month end.

Note 3. Business Combinations

During the six months ended April 30, 2017, the Company completed acquisitions with an aggregate total purchase consideration of \$188.1 million, net of cash acquired. The Company assumed unvested stock options with a fair value of \$4.4 million using the Black-Scholes option-pricing model and will expense the options over their remaining service periods on a straight-line basis. The Company does not consider these acquisitions to be material, individually or in the aggregate, to the Company's consolidated financial statements. The preliminary purchase price allocations resulted in \$132.9 million of goodwill, of which \$11.9 million is deductible for tax purposes, and \$64.9 million of acquired identifiable intangible assets valued using the income or cost methods. The intangible assets are being amortized over their respective useful lives ranging from one to seven years. The acquisition-related costs for these acquisitions totaling \$3.9 million were expensed as incurred in the unaudited condensed consolidated statement of operations. The Company funded the acquisitions with existing cash and debt.

The preliminary fair value estimates for the assets acquired and liabilities assumed for all fiscal 2017 acquisitions are not yet finalized and may change as additional information becomes available during the respective measurement periods. The primary areas of those preliminary estimates relate to certain tangible assets and

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liabilities, identifiable intangible assets, and income taxes. Additional information, which existed as of the acquisition date but is yet unknown to the Company, may become known to the Company during the remainder of the measurement period, a period not to exceed 12 months from the acquisition date. Changes to the provisional amounts recorded as assets or liabilities during the measurement period may result in an adjustment to goodwill.

## Note 4. Goodwill and Intangible Assets

Goodwill as of April 30, 2017 and October 31, 2016 consisted of the following:

	(in thousands)
As of October 31, 2016	\$ 2,518,245
Additions	132,908
Effect of foreign currency translation	10,385
As of April 30, 2017	\$ 2,661,538

Intangible assets as of April 30, 2017 consisted of the following:

	Gross Assets	Accumulated Amortization	Net Assets
	(in thousands)		
Core/developed technology	\$622,979	\$ 495,488	\$ 127,491
Customer relationships	276,756	153,598	123,158
Contract rights intangible	173,589	168,332	5,257
Trademarks and trade names	25,129	15,659	9,470
In-process research and development (IPR&D)(1)	4,600	—	4,600
Capitalized software development costs	31,708	27,075	4,633
Total	\$1,134,761	\$ 860,152	\$ 274,609

(1) IPR&D is reclassified to core/developed technology upon completion or is written off upon abandonment.

Intangible assets as of October 31, 2016 consisted of the following:

	Gross Assets	Accumulated Amortization	Net Assets
	(in thousands)		
Core/developed technology	\$610,812	\$ 460,722	\$ 150,090
Customer relationships	235,997	139,932	96,065
Contract rights intangible	171,248	162,183	9,065
Trademarks and trade names	20,729	13,821	6,908
Capitalized software development costs	29,642	25,109	4,533
Total	\$1,068,428	\$ 801,767	\$ 266,661

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Amortization expense related to intangible assets consisted of the following:

	Three Months Ended April 30, 2017 2016		Six Months Ended April 30, 2017 2016	
	(in thousands)			
Core/developed technology	\$16,471	\$21,607	\$34,754	\$43,863
Customer relationships	6,844	6,295	13,736	12,488
Contract rights intangible	3,286	2,885	6,677	11,106
Trademarks and trade names	896	792	1,838	1,583
Capitalized software development costs(2)	989	921	1,966	1,836
Total	\$28,486	\$32,500	\$58,971	\$70,876

(2) Amortization of capitalized software development costs is included in cost of products revenue in the unaudited condensed consolidated statements of operations.

The following table presents the estimated future amortization of the existing intangible assets:

Fiscal Year	(in thousands)
Remainder of fiscal 2017	\$ 51,862
2018	82,127
2019	56,945
2020	39,483
2021	21,343
2022 and thereafter	18,249
IPR&D(3)	4,600
Total	\$ 274,609

(3) IPR&D assets are amortized over their useful lives upon completion or written off upon abandonment.

#### Note 5. Financial Assets and Liabilities

Cash equivalents and short-term investments. The Company classifies time deposits and other investments with maturities less than three months as cash equivalents. Debt securities and other investments with maturities longer than three months are classified as short-term investments. The Company's investments generally have a term of less than three years and are classified as available-for-sale carried at fair value, with unrealized gains and losses included in the unaudited condensed consolidated balance sheets as a component of accumulated other comprehensive income (loss), net of tax. Those unrealized gains or losses deemed other than temporary are reflected in other income (expense), net. The cost of securities sold is based on the specific identification method and realized gains and losses are included in other income (expense), net.

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As of April 30, 2017, the balances of our available-for-sale securities are:

	Cost	Gross Unrealized Gains	Gross Unrealized Losses Less Than 12 Months	Gross Unrealized Losses 12 Months or Longer	Estimated Fair Value(1)
(in thousands)					
Cash equivalents:					
Money market funds	\$392,191	\$ —	\$ —	\$ —	\$ 392,191
Commercial paper	3,448	—	—	—	3,448
Certificates of deposit	1,000	—	—	—	1,000
Corporate debt securities	1,550	—	—	—	1,550
U.S. government agency securities	2,000	—	—	—	2,000
Total:	\$400,189	\$ —	\$ —	\$ —	\$ 400,189
Short-term investments:					
U.S. government agency securities	\$16,494	\$ —	\$ (34 )	\$ —	\$ 16,460
Certificates of deposit	21,214	—	—	—	21,214
Commercial paper	23,472	—	—	—	23,472
Corporate debt securities	57,469	39	(29 )	—	57,479
Asset-backed securities	20,829	5	(15 )	—	20,819
Other	799	—	—	—	799
Total:	\$140,277	\$ 44	\$ (78 )	\$ —	\$ 140,243

(1) See Note 6. Fair Value Measures for further discussion on fair values of cash equivalents and short-term investments.

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As of October 31, 2016, the balances of our available-for-sale securities are:

	Cost	Gross Unrealized Gains	Gross Unrealized Losses Less Than 12 Continuous Months	Gross Unrealized Losses 12 Continuous Months or Longer	Estimated Fair Value(1)
(in thousands)					
Cash equivalents:					
Money market funds	\$499,274	\$ —	\$ —	\$ —	—\$ 499,274
Commercial paper	1,498	—	—	—	1,498
Certificates of deposit	4,200	—	—	—	4,200
Total:	\$504,972	\$ —	\$ —	\$ —	—\$ 504,972
Short-term investments:					
U.S. government agency securities	\$13,607	\$ 4	\$ (8 )	\$ —	—\$ 13,603
Certificates of deposit	12,849	—	—	—	12,849
Commercial paper	25,430	1	—	—	25,431
Corporate debt securities	58,753	43	(18 )	—	58,778
Asset-backed securities	22,146	12	(12 )	—	22,146
Non-U.S. government agency securities	3,403	—	(3 )	—	3,400
Other	4,488	—	—	—	4,488
Total:	\$140,676	\$ 60	\$ (41 )	\$ —	—\$ 140,695

(1) See Note 6. Fair Value Measures for further discussion on fair values of cash equivalents and short-term investments.

As of April 30, 2017, the stated maturities of the Company's available-for-sale securities are:

	Amortized Cost	Fair Value
(in thousands)		
Due in 1 year or less	\$97,324	\$97,306
Due in 2-5 years	42,779	42,762
Due in 6-10 years	174	175
Total	\$140,277	\$140,243

Non-marketable equity securities. The Company's strategic investment portfolio consists of non-marketable equity securities in privately-held companies. The securities accounted for under cost method investments are reported at cost net of impairment losses. Securities accounted for under equity method investments are recorded at cost plus the proportional share of the issuers' income or loss, which is recorded in the Company's other income (expense), net. The cost basis of securities sold is based on the specific identification method. Refer to Note 6. Fair Value Measures.

Derivatives. The Company recognizes derivative instruments as either assets or liabilities in the unaudited condensed consolidated financial statements at fair value and provides qualitative and quantitative disclosures about such derivatives. The Company operates internationally and is exposed to potentially adverse movements in foreign currency exchange rates. The Company enters into hedges in the form of foreign currency forward contracts to reduce its exposure to foreign currency rate changes on non-functional currency denominated forecasted transactions and balance sheet positions including: (1) certain assets and liabilities, (2) shipments forecasted to

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occur within approximately one month, (3) future billings and revenue on previously shipped orders, and (4) certain future intercompany invoices denominated in foreign currencies.

The duration of forward contracts ranges from approximately one month to 22 months, the majority of which are short-term. The Company does not use foreign currency forward contracts for speculative or trading purposes. The Company enters into foreign exchange forward contracts with high credit quality financial institutions that are rated 'A' or above and to date has not experienced nonperformance by counterparties. Further, the Company anticipates continued performance by all counterparties to such agreements.

The assets or liabilities associated with the forward contracts are recorded at fair value in other current assets or accrued liabilities in the unaudited condensed consolidated balance sheets. The accounting for gains and losses resulting from changes in fair value depends on the use of the foreign currency forward contract and whether it is designated and qualifies for hedge accounting.

**Cash Flow Hedging Activities**

Certain foreign exchange forward contracts are designated and qualify as cash flow hedges. These contracts have durations of approximately 22 months or less. Certain forward contracts are rolled over periodically to capture the full length of exposure to the Company's foreign currency risk, which can be up to three years. To receive hedge accounting treatment, all hedging relationships are formally documented at the inception of the hedge, and the hedges must be highly effective in offsetting changes to future cash flows on the hedged transactions. The effective portion of gains or losses resulting from changes in fair value of these hedges is initially reported, net of tax, as a component of other comprehensive income (OCI) in stockholders' equity and reclassified into revenue or operating expenses, as appropriate, at the time the hedged transactions affect earnings. The Company expects less than half of the hedge balance in OCI to be reclassified to the statements of operations within the next 12 months.

Hedging effectiveness is evaluated monthly using spot rates, with any gain or loss caused by hedging ineffectiveness recorded in other income (expense), net. The premium/discount component of the forward contracts is recorded to other income (expense), net, and is not included in evaluating hedging effectiveness.

**Non-designated Hedging Activities**

The Company's foreign exchange forward contracts that are used to hedge non-functional currency denominated balance sheet assets and liabilities are not designated as hedging instruments. Accordingly, any gains or losses from changes in the fair value of the forward contracts are recorded in other income (expense), net. The gains and losses on these forward contracts generally offset the gains and losses associated with the underlying assets and liabilities, which are also recorded in other income (expense), net. The duration of the forward contracts for hedging the Company's balance sheet exposure is approximately one month.

The Company also has certain foreign exchange forward contracts for hedging certain international revenues and expenses that are not designated as hedging instruments. Accordingly, any gains or losses from changes in the fair value of the forward contracts are recorded in other income (expense), net. The gains and losses on these forward contracts generally offset the gains and losses associated with the foreign currency in operating income. The duration of these forward contracts is usually less than one year. The overall goal of the Company's hedging program is to minimize the impact of currency fluctuations on its net income over its fiscal year.

The effects of the changes in the fair values of non-designated forward contracts are summarized as follows:

	Three Months Ended April 30, 2017		Six Months Ended April 30, 2016	
	2016	2017	2016	2017
	(in thousands)			
Gain (loss) recorded in other income (expense), net	\$1,263	\$1,914	\$1,322	\$(1,849)



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The notional amounts in the table below for derivative instruments provide one measure of the transaction volume outstanding:

	As of April 30, 2017	As of October 31, 2016
	(in thousands)	
Total gross notional amount	\$851,854	\$758,246
Net fair value	\$4,261	\$(15,358 )

The notional amounts for derivative instruments do not represent the amount of the Company's exposure to market gain or loss. The Company's exposure to market gain or loss will vary over time as a function of currency exchange rates. The amounts ultimately realized upon settlement of these financial instruments, together with the gains and losses on the underlying exposures, will depend on actual market conditions during the remaining life of the instruments.

The following represents the unaudited condensed consolidated balance sheet location and amount of derivative instrument fair values segregated between designated and non-designated hedge instruments:

	Fair values of derivative instruments designated as hedging instruments	Fair values of derivative instruments not designated as hedging instruments
	(in thousands)	
As of April 30, 2017		
Other current assets	\$ 11,525	\$ 799
Accrued liabilities	\$ 7,922	\$ 141
As of October 31, 2016		
Other current assets	\$ 4,625	\$ 27
Accrued liabilities	\$ 19,910	\$ 101

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The following table represents the unaudited condensed consolidated statement of operations location and amount of gains and losses on derivative instrument fair values for designated hedge instruments, net of tax:

	Location of gain (loss) recognized in OCI on derivatives  (in thousands)	Amount of gain (loss) recognized in OCI on derivatives (effective portion)	Location of gain (loss) reclassified from OCI	Amount of gain (loss) reclassified from OCI (effective portion)
Three months ended				
April 30, 2017				
Foreign exchange contracts Revenue		\$ (1,604 )	Revenue	\$ (428 )
Foreign exchange contracts Operating expenses		5,669	Operating expenses	(1,310 )
Total		\$ 4,065		\$ (1,738 )
Three months ended				
April 30, 2016				
Foreign exchange contracts Revenue		\$ (6,182 )	Revenue	\$ (1,429 )
Foreign exchange contracts Operating expenses		9,322	Operating expenses	(3,768 )
Total		\$ 3,140		\$ (5,197 )
Six months ended				
April 30, 2017				
Foreign exchange contracts Revenue		\$ 7,000	Revenue	\$ (2,181 )
Foreign exchange contracts Operating expenses		3,610	Operating expenses	(3,412 )
Total		\$ 10,610		\$ (5,593 )
Six months ended				
April 30, 2016				
Foreign exchange contracts Revenue		\$ (7,673 )	Revenue	\$ (1,217 )
Foreign exchange contracts Operating expenses		(1,945 )	Operating expenses	(7,696 )
Total		\$ (9,618 )		\$ (8,913 )

The following table represents the ineffective portions and portions excluded from effectiveness testing of the hedge gains (losses) for derivative instruments designated as hedging instruments, which are recorded in other income (expense), net:

	Amount of gain (loss) <del>recognized</del> in statement of operations on derivatives derivatives (ineffective effectiveness testing) portion)(1) (in thousands)	Amount of gain (loss) <del>recognized</del> in statement of operations on derivatives derivatives (ineffective effectiveness testing) portion)(2) (in thousands)
Foreign exchange contracts		
For the three months ended April 30, 2017	\$ (5 )	\$ 1,499
For the three months ended April 30, 2016	\$ 201	\$ 2,140
For the six months ended April 30, 2017	\$ 164	\$ 2,617
For the six months ended April 30, 2016	\$ 455	\$ 3,541

(1)The ineffective portion includes forecast inaccuracies.

(2)The portion excluded from effectiveness testing includes the discount earned or premium paid for the contracts.

Note 6. Fair Value Measures

Accounting Standards Codification (ASC) 820-10, Fair Value Measurements and Disclosures, defines fair value, establishes guidelines and enhances disclosure requirements for fair value measurements. The accounting guidance requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The accounting guidance also establishes a fair value hierarchy based on the

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independence of the source and objective evidence of the inputs used. There are three fair value hierarchies based upon the level of inputs that are significant to fair value measurement:

Level 1—Observable inputs that reflect quoted prices (unadjusted) for identical instruments in active markets;

Level 2—Observable inputs other than quoted prices included in Level 1 for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, and model-driven valuations in which all significant inputs and significant value drivers are observable in active markets; and

Level 3—Unobservable inputs to the valuation derived from fair valuation techniques in which one or more significant inputs or significant value drivers are unobservable.

On a recurring basis, the Company measures the fair value of certain of its assets and liabilities, which include cash equivalents, short-term investments, non-qualified deferred compensation plan assets, and foreign currency derivative contracts.

The Company's cash equivalents and short-term investments are classified within Level 1 or Level 2 because they are valued using quoted market prices in an active market or alternative independent pricing sources and models utilizing market observable inputs.

The Company's non-qualified deferred compensation plan assets consist of money market and mutual funds invested in domestic and international marketable securities that are directly observable in active markets and are therefore classified within Level 1.

The Company's foreign currency derivative contracts are classified within Level 2 because these contracts are not actively traded and the valuation inputs are based on quoted prices and market observable data of similar instruments.

The Company's borrowings under its credit and term loan facilities are classified within Level 2 because these borrowings are not actively traded and have a variable interest rate structure based upon market rates currently available to the Company for debt with similar terms and maturities. Refer to Note 8. Credit Facility.

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## Assets and Liabilities Measured at Fair Value on a Recurring Basis

Assets and liabilities measured at fair value on a recurring basis are summarized below as of April 30, 2017:

Description	Total	Fair Value Measurement Using			Significant Unobservable Inputs (Level 3)
		Quoted Prices in Active Markets for Identical (Level 1)	Significant Observable (Level 2)	Other Inputs	
		(in thousands)			
Assets					
Cash equivalents:					
Money market funds	\$392,191	\$ 392,191	\$ —	\$ —	—
Commercial paper	3,448	—	3,448	—	—
Certificates of deposit	1,000	—	1,000	—	—
Corporate debt securities	1,550	—	1,550	—	—
U.S. government agency securities	2,000	—	2,000	—	—
Short-term investments:					
U.S. government agency securities	16,460	—	16,460	—	—
Certificates of deposit	21,214	—	21,214	—	—
Commercial paper	23,472	—	23,472	—	—
Corporate debt securities	57,479	—	57,479	—	—
Asset-backed securities	20,819	—	20,819	—	—
Other	799	—	799	—	—
Prepaid and other current assets:					
Foreign currency derivative contracts	12,324	—	12,324	—	—
Other long-term assets:					
Deferred compensation plan assets	184,436	184,436	—	—	—
Total assets	\$737,192	\$ 576,627	\$ 160,565	\$ —	—
Liabilities					
Accounts payable and accrued liabilities:					
Foreign currency derivative contracts	\$8,063	\$ —	\$ 8,063	\$ —	—
Other long-term liabilities:					
Deferred compensation plan liabilities	184,436	184,436	—	—	—
Total liabilities	\$192,499	\$ 184,436	\$ 8,063	\$ —	—

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Assets and liabilities measured at fair value on a recurring basis are summarized below as of October 31, 2016:

Description	Total	Fair Value Measurement Using			Significant Unobservable Inputs (Level 3)
		Quoted Prices in			
		Active Markets for Identical Assets (Level 1)	Significant Observable Inputs (Level 2)	Other	
(in thousands)					
Assets					
Cash equivalents:					
Money market funds	\$499,274	\$ 499,274	\$ —		\$ —
Commercial paper	1,498	—	1,498		—
Certificates of deposit	4,200	—	4,200		—
Short-term investments:					
U.S. government agency securities	13,603	—	13,603		—
Certificates of deposit	12,849	—	12,849		—
Commercial paper	25,431	—	25,431		—
Corporate debt securities	58,778	—	58,778		—
Asset-backed securities	22,146	—	22,146		—
Non-U.S. government agency securities	3,400	—	3,400		—
Other	4,488	4,488	—		—
Prepaid and other current assets:					
Foreign currency derivative contracts	4,652	—	4,652		—
Other long-term assets:					
Deferred compensation plan assets	163,185	163,185	—		—
Total assets	\$813,504	\$ 666,947	\$ 146,557		\$ —
Liabilities					
Accounts payable and accrued liabilities:					
Foreign currency derivative contracts	\$20,010	\$ —	\$ 20,010		\$ —
Other long-term liabilities:					
Deferred compensation plan liabilities	163,185	163,185	—		—
Total liabilities	\$183,195	\$ 163,185	\$ 20,010		\$ —

#### Assets/Liabilities Measured at Fair Value on a Non-Recurring Basis

##### Non-Marketable Equity Securities

Equity investments in privately-held companies, also called non-marketable equity securities, are accounted for using either the cost or equity method of accounting.

The non-marketable equity securities are measured and recorded at fair value when an event or circumstance which impacts the fair value of these securities indicates an other-than-temporary decline in value has occurred. In such events, these equity investments would be classified within Level 3 as they are valued using significant unobservable inputs or data in an inactive market, and the valuation requires management judgment due to the absence of market price and inherent lack of liquidity. The Company monitors these investments and generally uses the income approach to assess impairments based primarily on the financial conditions of these companies.

The Company did not recognize any impairment during the three months ended April 30, 2017 and recorded an \$1.3 million of other-than-temporary impairment during the six months ended April 30, 2017. The Company did not recognize any impairment during the three and six months ended April 30, 2016.

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The following table presents the non-marketable equity securities that were measured and recorded at fair value within other long-term assets on a non-recurring basis and the loss recorded in other income (expense), net.

Balance as Significant of Unobservable April Inputs 30, (Level 3) 2017	Total (losses) during three months ended April 30, 2017	Total (losses) during six months ended April 30, 2017
(in thousands)		
Non-marketable equity securities \$ —	\$ —	—\$(1,300)

## Note 7. Liabilities and Restructuring Charges

During the three and six months ended April 30, 2017, the Company incurred restructuring charges of approximately \$12.9 million and \$25.0 million, respectively, for involuntary and voluntary employee termination actions. The restructuring actions were undertaken to structure the company for future growth, reallocate resources to priority areas, and to a lesser extent, eliminate operational redundancy. The total charges under the 2017 restructuring plans, as of April 30, 2017, are expected to be \$32 million to \$34 million, and will depend in part on the number of eligible employees that accept outstanding offers of our 2017 Voluntary Retirement Program (VRP). These charges consist primarily of severance and retirement benefits. Such payments are expected to be completed by the end of the second quarter of fiscal 2018.

In fiscal 2016, the Company incurred \$9.6 million of restructuring charges for severance and benefits due to involuntary employee termination activities. As of April 30, 2017, the remaining outstanding balance from the 2016 restructuring activities was immaterial.

The following is a summary of restructuring activities during the six months ended April 30, 2017:

	(in thousands)
Liability as of October 31, 2016	\$ 5,679
Restructuring costs incurred	25,012
Cash payments	(18,819 )
As of April 30, 2017(1)	\$ 11,872

(1) Outstanding balance recorded in accounts payable and accrued liabilities as payroll and related benefits.

Accounts payable and accrued liabilities consist of:

	April 30, 2017	October 31, 2016
	(in thousands)	
Payroll and related benefits	\$ 230,480	\$ 321,430
Other accrued liabilities	87,482	66,276
Accounts payable	33,538	13,745
Total	\$ 351,500	\$ 401,451

Other long-term liabilities consist of:

	April 30, 2017	October 31, 2016
	(in thousands)	
Deferred compensation liability	\$ 184,436	\$ 163,185
Other long-term liabilities	52,402	47,670
Total	\$ 236,838	\$ 210,855

Note 8. Credit Facility

On November 28, 2016, the Company entered into an amended and restated credit agreement with several lenders (the Credit Agreement) providing for (i) a \$650.0 million senior unsecured revolving credit facility (the Revolver) and (ii) a \$150.0 million senior unsecured term loan facility (the Term Loan). The Credit Agreement amended and



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restated the Company's previous credit agreement dated May 19, 2015 (the 2015 Agreement), in order to increase the size of the revolving credit facility from \$500.0 million to \$650.0 million, provide a new \$150.0 million senior unsecured term loan facility, and to extend the termination date of the revolving credit facility from May 19, 2020 to November 28, 2021. Subject to obtaining additional commitments from lenders, the principal amount of the loans provided under the Credit Agreement may be increased by the Company by up to an additional \$150.0 million. The Credit Agreement contains financial covenants requiring the Company to operate within a maximum leverage ratio and a minimum interest coverage ratio, as well as other non-financial covenants. As of April 30, 2017, the Company was in compliance with all financial covenants.

During the first quarter of fiscal 2017, the Company received funding of \$150.0 million under the Term Loan.

Outstanding principal payments under the Term Loan are due as follows:

Fiscal year	(in thousands)
Remainder of fiscal 2017	\$ 3,750
2018	10,313
2019	14,062
2020	17,813
2021	27,187
2022	75,000
Total	\$ 148,125

As of April 30, 2017, the Company had a \$147.7 million outstanding balance, net of an immaterial amount of debt issuance costs, under the Term Loan, of which \$139.7 million is classified as long-term liabilities, and a \$270.0 million outstanding balance under the Revolver, all of which are considered short-term liabilities. As of October 31, 2016, the Company had no outstanding balance under the previous term loan from the 2015 Agreement and a \$205.0 million outstanding balance under the previous revolver from the 2015 Agreement, which are considered short-term liabilities. The Company expects its borrowings under the Revolver will fluctuate from quarter to quarter. Borrowings bear interest at a floating rate based on a margin over the Company's choice of market observable base rates as defined in the Credit Agreement. As of April 30, 2017, borrowings under the Term Loan bore interest at LIBOR +1.125% and the applicable interest rate for the Revolver was LIBOR +1.000%. In addition, commitment fees are payable on the Revolver at rates between 0.125% and 0.200% per year based on the Company's leverage ratio on the daily amount of the revolving commitment.

The carrying amount of the short-term and long-term debt approximates the estimated fair value. These borrowings under the Credit Agreement have a variable interest rate structure and are classified within Level 2 of the fair value hierarchy.

#### Note 9. Accumulated Other Comprehensive Income (Loss)

Components of accumulated other comprehensive income (loss), on an after-tax basis where applicable, were as follows:

	April 30, 2017	October 31, 2016
	(in thousands)	
Cumulative currency translation adjustments	\$(75,399)	\$(84,700)
Unrealized gain (loss) on derivative instruments, net of taxes	(3,815)	(19,896)
Unrealized gain (loss) on available-for-sale securities, net of taxes	(35)	19
Total accumulated other comprehensive income (loss)	\$(79,249)	\$(104,577)

The effect of amounts reclassified out of each component of accumulated other comprehensive income (loss) into net income was as follows:

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	Three Months Ended April 30, 2017      2016		Six Months Ended April 30, 2017      2016	
	(in thousands)			
Reclassifications from accumulated other comprehensive income (loss) into unaudited condensed consolidated statement of operations:				
Gain (loss) on cash flow hedges, net of taxes				
Revenues	\$ (428 )	\$ (1,429 )	\$ (2,181 )	\$ (1,217 )
Operating expenses	(1,310 )	(3,768 )	(3,412 )	(7,696 )
Gain (loss) on available-for-sale securities				
Other income (expense)	\$ —	13	1	\$ 10
Total reclassifications into net income	\$ (1,738 )	\$ (5,184 )	\$ (5,592 )	\$ (8,903 )

## Note 10. Stock Repurchase Program

The Company's Board of Directors (the Board) previously approved a stock repurchase program pursuant to which the Company was authorized to purchase up to \$500.0 million of its common stock, and has periodically replenished the stock repurchase program to such amount. The Board replenished the stock repurchase program up to \$500.0 million on August 31, 2016. The program does not obligate Synopsys to acquire any particular amount of common stock, and the program may be suspended or terminated at any time by Synopsys' Chief Financial Officer or the Board. The Company repurchases shares to offset dilution caused by ongoing stock issuances from existing equity plans for equity compensation awards and issuances related to acquisitions, and when management believes it is a good use of cash. Repurchases are transacted in accordance with Rule 10b-18 of the Securities Exchange Act of 1934, as amended (the Exchange Act), and may be made through any means including, but not limited to, open market purchases, plans executed under Rule 10b5-1(c) of the Exchange Act and structured transactions. As of April 30, 2017, \$235.5 million remained available for further repurchases under the program.

In December 2016, the Company entered into an accelerated share repurchase agreement (the December 2016 ASR) to repurchase an aggregate of \$100.0 million of the Company's common stock. Pursuant to the December 2016 ASR, the Company made a prepayment of \$100.0 million and received initial share deliveries valued at \$80.0 million. The remaining balance of \$20.0 million was settled in February 2017. Total shares purchased under the December 2016 ASR were approximately 1.7 million shares, at an average purchase price of \$60.53 per share.

In February 2017, the Company entered into an accelerated share repurchase agreement (the February 2017 ASR) to repurchase an aggregate of \$100.0 million of the Company's common stock. Pursuant to the February 2017 ASR, the Company made a prepayment of \$100.0 million and received initial share deliveries valued at \$80.0 million. The remaining balance of \$20.0 million was settled in May 2017. Total shares purchased under the February 2017 ASR were approximately 1.4 million shares, at an average purchase price of \$72.02 per share.

Stock repurchase activities are as follow:

	Three Months Ended April 30, 2017      2016		Six Months Ended April 30, 2017      2016	
	(in thousands)			
Total shares repurchased (1)	1,381	515	2,775	4,364
Total cost of the repurchased shares(1)	\$ 100,000	\$ 20,000	\$ 180,000	\$ 200,000
Reissuance of treasury stock	1,502	1,261	1,870	1,462

(1) Does not include the 265,894 shares and \$20.0 million equity forward contract, respectively, from the February 2017 ASR settled in May 2017.



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## Note 11. Stock Compensation

The compensation cost recognized in the unaudited condensed consolidated statements of operations for the Company's stock compensation arrangements was as follows:

	Three Months Ended April 30,		Six Months Ended April 30,	
	2017	2016	2017	2016
	(in thousands)			
Cost of products	\$2,813	\$2,608	\$5,812	\$5,204
Cost of maintenance and service	947	563	1,808	1,142
Research and development expense	12,568	11,838	25,452	23,423
Sales and marketing expense	4,807	4,741	9,936	9,442
General and administrative expense	4,427	3,709	8,388	7,261
Stock compensation expense before taxes	25,562	23,459	51,396	46,472
Income tax benefit	(7,065 )	(6,135 )	(14,206 )	(12,152 )
Stock compensation expense after taxes	\$18,497	\$17,324	\$37,190	\$34,320

In addition to the tax benefit disclosed above, the Company recorded net excess tax benefits from stock-based compensation in the provision for income taxes of \$8.3 million and \$11.3 million, respectively, for the three and six months ended April 30, 2017. As of April 30, 2017, there was \$173.0 million of unamortized share-based compensation expense relating to options and restricted stock units and awards, which is expected to be amortized over a weighted-average period of approximately 2.4 years.

The intrinsic values of equity awards exercised during the periods are as follows:

	Three Months Ended April 30,		Six Months Ended April 30,	
	2017	2016	2017	2016
	(in thousands)			
Intrinsic value of awards exercised	\$22,369	\$7,224	\$28,656	\$8,498

In March 2016, the Financial Accounting Standards Board (FASB) issued ASU 2016-09, "Compensation-Stock Compensation (Topic 718), Improvements to Employee Share-Based Payment Accounting." The Company elected to early adopt ASU 2016-09 in the first quarter of fiscal 2017. As required by ASU 2016-09, excess tax benefits recognized on stock-based compensation expense are classified as an operating activity in the consolidated statements of cash flows and the Company has elected to apply this provision on a prospective basis. The Company also elected to account for forfeitures as they occur and recorded a one-time adoption expense of \$0.4 million to retained earnings. See Note 15. Taxes for additional information on tax impacts.

## Note 12. Net Income per Share

The Company computes basic net income per share by dividing net income available to common stockholders by the weighted-average number of common shares outstanding during the period. Diluted net income per share reflects the dilution from potential common shares outstanding, such as stock options and unvested restricted stock units and awards, during the period using the treasury stock method.

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The table below reconciles the weighted-average common shares used to calculate basic net income per share with the weighted-average common shares used to calculate diluted net income per share:

	Three Months Ended April 30,		Six Months Ended April 30,	
	2017	2016	2017	2016
	(in thousands, except per share amounts)			
Numerator:				
Net income	\$53,306	\$69,376	\$139,894	\$129,411
Denominator:				
Weighted-average common shares for basic net income per share	150,384	152,250	150,583	152,609
Dilutive effect of potential common shares from equity-based compensation	4,477	2,286	4,171	2,312
Weighted-average common shares for diluted net income per share	154,861	154,536	154,754	154,921
Net income per share:				
Basic	\$0.35	\$0.46	\$0.93	\$0.85
Diluted	\$0.34	\$0.45	\$0.90	\$0.84
Anti-dilutive employee stock-based awards excluded(1)	948	2,886	738	2,649

These employee stock-based awards were anti-dilutive for the respective periods and are excluded in calculating (1) diluted net income per share. While such awards were anti-dilutive for the respective periods, they could be dilutive in the future.

## Note 13. Segment Disclosure

Certain disclosures are required for operating segments, products and services, geographic areas of operation and major customers. Segment reporting is based upon the “management approach,” i.e., how management organizes the Company’s operating segments for which separate financial information is (1) available and (2) evaluated regularly by the Chief Operating Decision Makers (CODMs) in deciding how to allocate resources and in assessing performance. Synopsys’ CODMs are the Company’s two Co-Chief Executive Officers.

The Company operates in a single segment to provide software products and consulting services primarily in the EDA software industry. In making operating decisions, the CODMs primarily consider consolidated financial information, accompanied by disaggregated information about revenues by geographic region. Specifically, the CODMs consider where individual “seats” or licenses to the Company’s products are located in allocating revenue to particular geographic areas. Revenue is defined as revenues from external customers. Goodwill is not allocated since the Company operates in one reportable operating segment. Revenues related to operations in the United States and other geographic areas were:

	Three Months Ended April 30,		Six Months Ended April 30,	
	2017	2016	2017	2016
	(in thousands)			
Revenue:				
United States	\$350,489	\$297,388	\$669,908	\$572,318
Europe	78,395	73,112	154,068	145,047
Japan	57,206	58,535	118,904	111,781
Asia-Pacific and Other	193,979	175,970	389,975	344,463
Consolidated	\$680,069	\$605,005	\$1,332,855	\$1,173,609

Geographic revenue data for multi-region, multi-product transactions reflect internal allocations and are therefore subject to certain assumptions and the Company’s methodology.



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For the three and six months ended April 30, 2017 and 2016, one customer, including its subsidiaries, through multiple agreements accounted for greater than 10% of the Company's total revenues.

## Note 14. Other Income (Expense), net

The following table presents the components of other income (expense), net:

	Three Months Ended April 30, 2017		Six Months Ended April 30, 2016	
	2017	2016	2017	2016
	(in thousands)			
Interest income	\$1,499	\$889	\$2,733	\$1,469
Interest expense	(1,860)	(848)	(3,168)	(1,521)
Gain (loss) on assets related to executive deferred compensation plan assets	7,763	8,707	15,543	(687)
Foreign currency exchange gain (loss)	(623)	(783)	2,599	(202)
Other, net	1,635	2,452	2,194	4,590
Total	\$8,414	\$10,417	\$19,901	\$3,649

## Note 15. Taxes

## Effective Tax Rate

The Company estimates its annual effective tax rate at the end of each fiscal quarter. The effective tax rate takes into account the Company's estimations of annual pre-tax income, the geographic mix of pre-tax income and interpretations of tax laws and possible outcomes of audits.

The following table presents the provision (benefit) for income taxes and the effective tax rates:

	Three Months Ended April 30, 2017		Six Months Ended April 30, 2016	
	2017	2016	2017	2016
	(in thousands)			
Income before income taxes	\$62,020	\$97,223	\$170,381	\$161,565
Provision (benefit) for income taxes	\$8,714	\$27,847	\$30,487	\$32,154
Effective tax rate	14.1	% 28.6	% 17.9	% 19.9

The Company's effective tax rate for the three and six months ended April 30, 2017 is lower than the statutory federal income tax rate of 35% primarily due to lower taxes on certain earnings considered as indefinitely reinvested in foreign operations, U.S. federal and California research tax credits and excess tax benefits from stock-based compensation, partially offset by state taxes and the tax effect of non-deductible stock-based compensation and the integration of acquired technologies. The integration of acquired technologies represents the income tax effect resulting from the transfer of certain intangible assets among company-controlled entities.

The Company's effective tax rate decreased in the three and six months ended April 30, 2017, as compared to the same period in fiscal 2016, primarily due to excess tax benefits from stock-based compensation, partially offset by the permanent reinstatement of the U.S. federal research tax credit in the first quarter of fiscal 2016.

On December 18, 2015, the president signed into law the Protecting Americans from Tax Hikes Act of 2015 which permanently reinstated the research tax credit retroactive to January 1, 2015. As a result of the new legislation, the Company recognized a benefit in the first quarter of fiscal 2016 related to ten months of fiscal 2015 and two months of fiscal 2016 as well as a benefit to the annual effective tax rate for ten months of fiscal 2016.

On July 27, 2015, the United States Tax Court (Tax Court) issued an opinion (Altera Corp. et al. v. Commissioner) regarding the treatment of stock-based compensation expense in intercompany cost-sharing arrangements. The U.S. Treasury has not withdrawn the requirement to include stock-based compensation from its regulations and the IRS has initiated an appeal of the Tax Court's opinion. As the final resolution with respect to historical cost-sharing of stock-based compensation, and the potential favorable benefits to the Company, is unclear, the Company is recording no impact at this time and will continue to monitor developments related to this opinion and the potential impact of those developments on the Company's prior fiscal years. Effective February 1, 2016, the Company





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amended its cost-sharing arrangement to exclude stock-based compensation expense on a prospective basis and has reflected the corresponding benefits in its effective annual tax rate.

The timing of the resolution of income tax examinations is highly uncertain as well as the amounts and timing of various tax payments that are part of the settlement process. This could cause large fluctuations in the balance sheet classification of current and non-current assets and liabilities. The Company believes that in the coming 12 months, it is reasonably possible that either certain audits will conclude or the statute of limitations on certain state and foreign income and withholding taxes will expire, or both. Given the uncertainty as to ultimate settlement terms, the timing of payment and the impact of such settlements on other uncertain tax positions, the range of the estimated potential decrease in underlying unrecognized tax benefits is between \$0 and \$31 million.

As discussed in Note 11, the Company adopted ASU 2016-09 in the first quarter of fiscal 2017. The Company recorded all income tax effects of share-based awards in its provision for income taxes in the condensed consolidated statement of operations on a prospective basis. Prior to adoption, the Company did not recognize excess tax benefits from stock-based compensation as a charge to capital in excess of par value to the extent that the related tax deduction did not reduce income taxes payable. Upon adoption of ASU 2016-09, the Company recorded a deferred tax asset of \$106.5 million for the previously unrecognized excess tax benefits with an offsetting adjustment to retained earnings. Adoption of the new standard resulted in net excess tax benefits in the provision for income taxes of \$11.3 million for the six months ended April 30, 2017.

### State Examinations

In the first quarter of fiscal 2016, the Company reached final settlement with the California Franchise Tax Board for fiscal 2011, 2010 and 2009. As a result of the settlement, the Company reduced its deferred tax assets by \$4.9 million, recognized \$10.3 million in unrecognized tax benefits, and increased its valuation allowance by \$5.4 million.

### Non-U.S. Examinations

In October 2016, the Hungarian Tax Authority (HTA) completed an audit of the Company's Hungary subsidiary (Synopsys Hungary) for fiscal years 2011 through 2013. The HTA has challenged certain of Synopsys Hungary's tax positions taken during these years, including the timing of deduction of certain research expenses and for withholding taxes on payments made to affiliates, resulting in a proposed aggregate tax assessment of approximately \$46 million. If the assessment is ultimately upheld, Synopsys Hungary could also be liable for additional interest and penalties of approximately \$19 million. While the ultimate outcome is not certain, the Company believes there is no merit to these assessments and intends to contest them. While the appeal could take several years, the Company believes that it will ultimately prevail against the positions taken by the HTA.

The Company is also under examination by the tax authorities in certain other jurisdictions, including the Republic of Korea. No assessments have been proposed in these examinations.

In the second quarter of fiscal 2016, the Company agreed to settle certain transfer pricing issues with the Indian tax authorities for fiscal years 2010 to 2015. As a result of the settlement, the Company recognized income tax expense, net of foreign tax credits, of \$2.4 million.

### Note 16. Contingencies

#### Legal Proceedings

The Company is subject to routine legal proceedings, as well as demands, claims and threatened litigation that arise in the normal course of its business. The ultimate outcome of any litigation is uncertain and unfavorable outcomes could have a negative impact on the Company's results of operations and financial condition. The Company 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 is estimable, the Company accrues a liability for the estimated loss. The Company has determined that, except as set forth below, no disclosure of estimated loss is required for a claim against the Company because: (1) there is not a reasonable possibility that a loss exceeding amounts already recognized (if any) may be incurred with respect to such claim; (2) a reasonably possible loss or range of loss cannot be estimated; or (3) such estimate is immaterial.

#### Mentor Patent Litigation

The Company is engaged in complex patent litigation with Mentor Graphics Corporation (Mentor) involving several actions in different forums. The Company succeeded to the litigation when it acquired Emulation & Verification Engineering S.A. (EVE) on October 4, 2012. At the time of the acquisition, EVE and EVE-USA, Inc. (collectively, the

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EVE Parties) had been defendants in three patent infringement lawsuits filed by Mentor. Each lawsuit as well as subsequent lawsuits are further described below.

### Background

As mentioned above, at the time of the acquisition, the EVE Parties had been defendants in three patent infringement lawsuits filed by Mentor. Mentor filed suit against the EVE Parties in federal district court in the District of Oregon on August 16, 2010 alleging that EVE's ZeBu products infringed Mentor's United States Patent No. 6,876,962. Mentor filed an additional suit in federal district court in the District of Oregon on August 17, 2012 alleging that EVE's ZeBu products infringed Mentor's United States Patent No. 6,947,882. Both cases sought damages and a permanent injunction.

On September 27, 2012, the Company and the EVE Parties filed an action for declaratory relief against Mentor in federal district court in the Northern District of California, seeking a determination that Mentor's United States Patents Nos. 6,009,531, 5,649,176, and 6,240,376, which were the subject of a patent infringement lawsuit filed by Mentor against EVE in 2006 and settled in the same year, are invalid and not infringed by EVE's products. Mentor asserted patent infringement counterclaims in this action based on the same three patents and sought damages and a permanent injunction. In April 2013, this action was transferred to the federal district court in Oregon and consolidated with the two Mentor lawsuits in that district (the Oregon Action), as further described below.

### The Oregon Action

After transfer of the Company's declaratory relief action to Oregon and consolidation of that action with Mentor's 2010 and 2012 lawsuits, the Company asserted patent infringement counterclaims against Mentor based on the Company's United States Patents Nos. 6,132,109 and 7,069,526, seeking damages and a permanent injunction. After pre-trial summary judgment rulings in favor of both sides, the only patent remaining at issue in the Oregon Action was Mentor's '376 patent.

The Oregon Action went to trial on the remaining Mentor patent, and a jury reached a verdict on October 10, 2014 finding that certain features of the ZeBu products infringed the '376 patent and assessing damages of approximately \$36 million. On March 12, 2015, the court entered an injunction prohibiting certain sales activities relating to the features found by the jury to infringe. The Company released a new version of ZeBu software that does not include such features. The Company accrued an immaterial amount as a loss contingency in the quarter ended October 31, 2015. Both parties appealed from the court's judgment following the jury verdict.

The Federal Circuit heard the parties' respective appeals and issued a decision on March 16, 2017. The panel affirmed the jury verdict and damages award on Mentor's '376 patent and reversed the district court's dismissal of Mentor's '176, '531 and '882 patents and the Company's '109 patent. Proceedings on these patents will resume in the federal district court in Oregon, including trial of alleged supplemental damages on and willful infringement of the '376 patent. On May 1, 2017, the Company petitioned for rehearing by all judges currently sitting on the Federal Circuit. On May 9, 2017, the Federal Circuit invited Mentor to respond to the petition on or before May 23, 2017.

Due to the affirmation of the verdict by the Federal Circuit, the Company has accrued an aggregate amount of \$39.0 million as a loss contingency, which is the amount estimated to be the probable loss. The associated charge has been recorded in general and administrative expenses in the income statements for the three and six months ended April 30, 2017.

### The California Action

On December 21, 2012, the Company filed an action for patent infringement against Mentor in federal district court in the Northern District of California, alleging that Mentor's Veloce products infringe the Company's United States Patents Nos. 5,748,488, 5,530,841, 5,680,318 and 6,836,420 (the California Action). This case sought damages and a permanent injunction. The court stayed the action as to the '420 patent pending the U.S. Patent and Trademark Office's inter partes review of that patent and appeals from that proceeding. On January 20, 2015, the court granted Mentor's motion for summary judgment on the '488, '841, and '318 patents, finding that such patents were invalid. The Company appealed the court's ruling and on October 17, 2016, the Federal Circuit affirmed the district court's decision. The Company is currently seeking review of the Federal Circuit's ruling in the U.S. Supreme Court.

### PTO Proceedings

On September 26, 2012, the Company filed two inter partes review requests with the U.S. Patent and Trademark Office (the PTO) challenging the validity of Mentor's '376 and '882 patents. The PTO granted review of the '376 patent and

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denied review of the '882 patent. On February 19, 2014, the PTO issued its final decision in the review of the '376 patent, finding some of the challenged claims invalid and some of the challenged claims valid. On April 22, 2014, the Company appealed to the Federal Circuit from the PTO's decision finding certain claims valid. Mentor filed a cross-appeal on May 2, 2014 from the PTO's decision finding certain claims invalid. On February 10, 2016, the Federal Circuit affirmed the PTO's decision in all respects.

On December 21, 2013, Mentor filed an inter partes review request with the PTO challenging the validity of the Company's '420 patent. On June 11, 2015, the PTO issued its final decision in the review, finding all of the challenged claims invalid. On August 12, 2015, the Company appealed to the Federal Circuit from the PTO's decision. On October 11, 2016, the Federal Circuit affirmed the PTO's decision.

On September 30, 2016, the Company filed a petition requesting ex parte reexamination of all of the claims of the '376 patent asserted in the Oregon Action. Mentor objected on procedural grounds. On November 8, 2016, the PTO instituted reexamination of the '376 patent. On December 15, 2016, the PTO vacated its decision to institute reexamination based upon Mentor's procedural objection. The Company thereafter filed a renewed request for ex parte reexamination of only Claims 24, 26 and 27 of the patent, which was granted by the PTO in February 2017. On May 2, 2017, the Company also sued the PTO in federal district court in the Eastern District of Virginia, challenging the PTO's decision not to institute reexamination of Claims 1 and 28. The ex parte reexamination and the lawsuit are ongoing.

While the Company intends to defend all of the above matters vigorously, the ultimate outcome of any litigation, including the litigation with Mentor, is uncertain and may have an adverse outcome resulting in losses beyond recorded amounts. In the event of an unfavorable final outcome, there exists the possibility of a material adverse impact on the Company's consolidated financial statements for the period in which the effects become reasonably estimable.

### Non-Income Based Taxes

The Company undergoes examination from time to time by U.S. and foreign authorities for non-income based taxes, such as sales, use and value-added taxes. The Company is currently under examination by tax authorities in certain jurisdictions. If the potential loss from such examinations is considered probable and the amount or the range of loss could be estimated, the Company would accrue a liability for the estimated expense.

### Note 17. Effect of New Accounting Pronouncements

In May 2014, the FASB issued Accounting Standards Update (ASU) 2014-09, "Revenue from Contracts with Customers (Topic 606)," which supersedes the revenue recognition requirements in "Revenue Recognition (Topic 605)." This ASU requires an entity to recognize revenue when goods are transferred or services are provided to customers in an amount that reflects the consideration to which the entity expects to be entitled to in exchange for those goods or services. This ASU also requires disclosures enabling users of financial statements to understand the nature, amount, timing, and uncertainty of revenue and cash flows arising from contracts with customers.

Since the issuance of Topic 606, the FASB has issued several amendments to the ASU, including deferral of the adoption date initially proposed, clarification on accounting for licenses of intellectual property, and identifying performance obligations.

Topic 606 will be effective for the Company beginning in fiscal 2019, including interim periods within that reporting period. The ASU permits two retrospective methods for adoption. The Company currently anticipates adopting Topic 606 using the modified retrospective method under which the cumulative effect of initially applying the guidance is recognized at the date of initial application.

The Company derives the majority of its total revenue from Technology Subscription License (TSL) contracts. The Company believes that the promised licenses of software (i.e., functional intellectual property) and the promise to provide substantive, timely, and technologically relevant updates in its TSL contracts reflect inputs to a combined item that represents a single overall promise to provide customer access to a suite of EDA software in an integrated solution that will evolve as our customers' industries evolve through rapid technology changes. Accordingly, the Company has concluded that this single overall promise will be recognized as revenue over the term of the contract period. Accordingly, the Company expects that there will be no significant change in the nature and timing of revenue

recognition for our TSL contracts under Topic 606.

The timing of revenue recognition for the Company's upfront products, maintenance and professional services is expected to remain substantially unchanged.

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The Company continues to assess all potential impacts of Topic 606 on other multiple element software arrangements that combine many software-related deliverables. As the requirement to have Vendor-Specific Objective Evidence (VSOE) for undelivered elements is not necessary to separate revenue from delivered software licenses, which is an essential criterion for separation under current standard, revenue would no longer be recognized over the arrangement period for certain of the Company's term licenses and IP licenses. The Company is currently in the process of evaluating the impact of these changes on the remainder of its arrangements.

Topic 606 also requires the deferral of incremental costs of obtaining a contract with a customer. This will require the Company to capitalize incremental costs such as commissions and other costs directly related to obtaining customer contracts and amortize those costs over the period the assets are expected to contribute future cash flows, which will be over the life of the contract. Under the existing rules, the Company expenses commissions based on shipments.

In February 2016, the FASB issued ASU 2016-2, "Leases (Topic 842)," which supersedes the lease requirements in "Leases (Topic 840)." This ASU requires a lessee to recognize a right-of-use asset and a lease payment liability for most leases in the Consolidated Statement of Financial Position. This ASU also makes some changes to lessor accounting and aligns with the new revenue recognition guidance. This ASU will be effective for fiscal 2020, including interim periods within that reporting period, and earlier adoption is permitted. The Company is currently in the process of evaluating the impact of adoption on its consolidated financial statements and related disclosures.

In October 2016, the FASB issued ASU 2016-16, "Income Taxes (Topic 740), Intra-Entity Transfers of Assets Other Than Inventory." This ASU requires the immediate recognition of current and deferred income tax effects of intra-entity transfers of assets other than inventory. This ASU will be effective for fiscal 2019, including interim periods within that reporting period, and earlier adoption is permitted. The Company is currently in the process of evaluating the impact of adoption on its consolidated financial statements.

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### Item 2. Management’s Discussion and Analysis of Financial Condition and Results of Operations

This Quarterly Report on Form 10-Q, includes forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the Securities Act) and Section 21E of the Securities Exchange Act of 1934, as amended (the Exchange Act), which are subject to the “safe harbor” created by those sections. Any statements herein that are not statements of historical fact may be deemed to be forward-looking statements. For example, words such as “may,” “will,” “could,” “would,” “can,” “should,” “anticipate,” “expect,” “intend,” “believe,” “estimate,” “project,” “continue,” negatives of such terms, and similar expressions intended to identify forward-looking statements. Without limiting the foregoing, forward-looking statements contained in this Quarterly Report on Form 10-Q include, but are not limited to, statements concerning expected growth in the semiconductor industry and the effects of industry and customer consolidation, our business outlook, our business model, our growth strategy, the ability of our prior acquisitions to drive revenue growth, the sufficiency of our cash, cash equivalents and short-term investments and cash generated from operations, our future liquidity requirements, and other statements that involve certain known and unknown risks, uncertainties and other factors that could cause our actual results, time frames or achievements to differ materially from those expressed or implied in our forward-looking statements. Such risks and uncertainties include, among others, those identified below in Part II, Item 1A. Risk Factors of this Quarterly Report on Form 10-Q. The information included herein represents our estimates and assumptions as of the date of this filing. Unless required by law, we undertake no obligation to update publicly any forward-looking statements, or to update the reasons actual results could differ materially from those anticipated in these forward-looking statements, even if new information becomes available in the future. All subsequent written or oral forward-looking statements attributable to Synopsys or persons acting on our behalf are expressly qualified in their entirety by these cautionary statements. Readers are urged to carefully review and consider the various disclosures made in this report and in other documents we file from time to time with the Securities and Exchange Commission (SEC) that attempt to advise interested parties of the risks and factors that may affect our business.

The following summary of our financial condition and results of operations should be read together with our unaudited condensed consolidated financial statements and the related notes thereto contained in Part I, Item 1 of this report and with our audited consolidated financial statements and the related notes thereto contained in our Annual Report on Form 10-K for the fiscal year ended October 31, 2016, as filed with the SEC on December 12, 2016.

#### Overview

#### Business Summary

Synopsys, Inc. provides software, intellectual property, and services used by designers across the entire silicon to software spectrum, from engineers creating advanced semiconductors to software developers seeking to ensure the quality and security of their applications. We are a global leader in supplying the electronic design automation (EDA) software that engineers use to design and test ICs, also known as chips. We also offer intellectual property (IP) products, which are pre-designed circuits that engineers use as components of larger chip designs rather than design those circuits themselves. We provide software and hardware used to develop the electronic systems that incorporate chips and the software that runs on them. To complement these offerings, we provide technical services and support to help our customers develop advanced chips and electronic systems. We are also a leading provider of software tools and services that improve the quality and security of software code in a wide variety of industries, including electronics, financial services, energy, industrials, and automotive.

Our EDA and IP customers are generally semiconductor and electronics systems companies. Our solutions help these companies overcome the challenges of developing increasingly advanced electronics products while also helping them reduce their design and manufacturing costs. While our products are an important part of our customers’ development process, their research and development budget and spending decisions may be affected by their business outlook and willingness to invest in new and increasingly complex chip designs. In addition, several consolidations have taken place in the semiconductor industry recently. While we do not believe customer consolidations have had a material impact on our results, the future impact is uncertain. For a discussion of potential risks, please see the risk factor titled “Consolidation among our customers and within the industries in which we operate, as well as our dependence on a relatively small number of large customers, may negatively impact our operating results.” in Part II, Item 1A, Risk Factors.





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Despite global economic uncertainty, we have maintained profitability and positive cash flow on an annual basis in recent years. We achieved these results not only because of our solid execution, leading technologies and strong customer relationships, but also because of our time-based revenue business model. Under this model, a substantial majority of our customers pay over time and we typically recognize this revenue over the life of the contract, which averages approximately three years. Time-based revenue, which consists of time-based products, maintenance and service revenue, represents approximately 90% of our total revenue. The revenue we recognize in a particular period generally results from selling efforts in prior periods rather than the current period. Due to our business model, decreases as well as increases in customer spending do not immediately affect our revenues in a significant way. Our growth strategy is based on building on our leadership in our EDA products, expanding and proliferating our IP offerings, and driving growth in the software quality and security market. As we continue to expand our product portfolio and our total addressable market, for instance in the software quality and security space, and as hardware product sales grow, we may experience increased variability in our total revenue, though we expect time-based revenue to continue to represent at least 90% of all revenue other than hardware revenue. Overall, our business outlook remains solid based on our leading technologies, customer relationships, business model, diligent expense management, and acquisition strategy. We believe that these factors will help us continue to execute our strategies successfully.

### Financial Performance Summary

In the second quarter of fiscal 2017, compared to the same period of fiscal 2016:

Revenues were \$680.1 million, an increase of \$75.1 million, or 12%, primarily driven by the overall growth in our business due to increases of hardware sales, IP consulting projects and TSL license revenues, and to a lesser extent from acquisitions.

Total cost of revenue and operating expenses were \$626.5 million, an increase of \$108.3 million, or 21%, primarily due to an increase in accrued loss contingencies as a result of litigation, increases in headcount, including those from acquisitions, higher product and consulting costs due to higher sales, and an increase in variable compensation due to the timing of shipments.

Operating income of \$53.6 million, a decrease of \$33.2 million or 38%.

During the three-month period ended April 30, 2017, 88% of our revenue was time-based.

### New Accounting Pronouncements

See Note 17 of the Notes to Unaudited Condensed Consolidated Financial Statements.

### Critical Accounting Policies and Estimates

Our discussion and analysis of our financial results under the heading “Results of Operations” below are based on our unaudited condensed consolidated financial statements, which we have prepared in accordance with U.S. GAAP. In preparing these financial statements, we make assumptions, judgments and estimates that can affect the reported amounts of assets, liabilities, revenues and expenses and net income. On an ongoing basis, we evaluate our estimates based on historical experience and various other assumptions we believe are reasonable under the circumstances. Our actual results may differ from these estimates.

The accounting policies that most frequently require us to make assumptions, judgments and estimates, and therefore are critical to understanding our results of operations, are:

- Revenue recognition;
- Valuation of business combinations;
- Valuation of intangible assets; and
- Income taxes.

Our critical accounting policies and estimates are discussed in Part II, Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations of our Annual Report on Form 10-K for the fiscal year ended October 31, 2016, filed with the SEC on December 12, 2016.

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### Results of Operations

#### Revenue Background

We generate our revenue from the sale of products that include software licenses, maintenance and services, and to a lesser extent, hardware products. Software license revenue consists of fees associated with the licensing of our software. Maintenance and service revenue consists of maintenance fees associated with perpetual licenses and professional services fees. Hardware revenue consists of sales of Field Programmable Gate Array (FPGA)-based emulation and prototyping products.

Most of our customer arrangements are complex, involving hundreds of products and various license rights, bundled with post-contract customer support and additional meaningful rights that provide a complete end-to-end solution to the customer. Throughout the contract, our customers are typically using a myriad of products to complete each phase of a chip design and are concurrently working on multiple chip designs, or projects, in different phases of the design. During this time, the customer looks to us to release state-of-the-art technology as we keep up with the pace of change, to address requested enhancements to our tools to meet customer specifications, to provide support at each stage of the customer's design, including the final manufacturing of the chip (the tape-out stage), and other important services.

With respect to software licenses, we utilize primarily two license types:

Technology Subscription Licenses (TSLs). TSLs are time-based licenses for a finite term, and generally provide the customer limited rights to receive, or to exchange certain quantities of licensed software for, unspecified future technology. The majority of our arrangements are TSLs due to the nature of the business and customer requirements.

In addition to the licenses, the arrangements also include: post-contract customer support, which includes providing frequent updates and upgrades to maintain the utility of the software due to rapid changes in technology; other intertwined services such as multiple copies of the tools; assisting our customers in applying our technology in their development environment; and rights to remix licenses for other licenses.

Perpetual licenses. Perpetual licenses continue as long as the customer renews maintenance plus an additional 20 years. Perpetual licenses do not provide the customer any rights to receive, or to exchange licensed software for, unspecified future technology. Customers purchase maintenance separately for the first year and may renew annually.

For the two software license types, we recognize revenue as follows:

TSLs. We typically recognize revenue from TSL fees ratably over the term of the license period, or as customer installments become due and payable, whichever is later. Revenue attributable to TSLs is reported as "time-based products revenue" in the unaudited condensed consolidated statements of operations.

Perpetual licenses. We recognize revenue from perpetual licenses in full upon shipment of the software if payment terms require the customer to pay at least 75% of the license fee and 100% of the maintenance fee within one year from shipment and all other revenue recognition criteria are met. Revenue attributable to these perpetual licenses is reported as "upfront products revenue" in the unaudited condensed consolidated statements of operations. For perpetual licenses in which less than 75% of the license fee and 100% of the maintenance fee is payable within one year from shipment, we recognize revenue as customer installments become due and payable. Such revenue is reported as "time-based products revenue" in the unaudited condensed consolidated statements of operations.

Under current accounting rules and policies, we recognize revenue from orders we receive for software licenses, services and hardware products at varying times.

In most instances, we recognize revenue on a TSL software license order over the license term and on a term or perpetual software license order in the quarter in which the license is delivered. The weighted-average term of the TSLs and term licenses is typically three years, but varies from quarter to quarter due to the nature and timing of the arrangements entered into during the quarter. For the three months ended April 30, 2017 and 2016, the weighted-average license term was 2.7 and 2.3 years, respectively.

- Revenue on contracts requiring significant modification or development is accounted for using the percentage of completion method over the period of the development.

• Revenue on hardware product orders is generally recognized in full at the time the product is shipped and when title is transferred.



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Contingent revenue is recognized if and when the event that removes the contingency occurs.

Revenue on maintenance orders is recognized ratably over the maintenance period (normally one year).

Revenue on professional services orders is generally recognized as the services are performed.

Infrequently, we enter into certain license arrangements wherein licenses are provided for a finite term without any other services or rights, including rights to receive, or to exchange licensed software for, unspecified future technology. We recognize revenue from term licenses in full upon shipment of the software and when all other revenue recognition criteria are met.

Our revenue in any period is equal to the sum of our time-based products, upfront products, and maintenance and services for the period. We derive time-based products revenue largely from TSL orders received and delivered in prior quarters and to a smaller extent from contracts in which revenue is recognized as customer installments become due and payable and from contingent revenue arrangements. We derive upfront products revenue directly from term and perpetual license and hardware product orders mostly booked and shipped during the period. We derive maintenance revenue largely from maintenance orders received in prior periods since our maintenance orders generally yield revenue ratably over a term of one year. We also derive professional services revenue primarily from orders received in prior quarters, since we recognize revenue from professional services as those services are delivered and accepted or on percentage of completion for arrangements requiring significant modification of our software, and not when they are booked.

Our revenue is sensitive to the mix of TSLs and perpetual licenses delivered during a reporting period. A TSL order typically yields lower current quarter revenue but contributes to revenue in future periods. For example, a \$120,000 order for a three-year TSL delivered on the last day of a quarter typically generates no revenue in that quarter, but \$10,000 in each of the 12 succeeding quarters. Conversely, a \$120,000 order for perpetual licenses with greater than 75% of the license fee due within one year from shipment typically generates \$120,000 in revenue in the quarter the product is delivered, but no future revenue. Additionally, revenue in a particular quarter may also be impacted by perpetual licenses in which less than 75% of the license fees and 100% of the maintenance fees are payable within one year from shipment as the related revenue will be recognized as revenue in the period when customer payments become due and payable.

Most of our customer arrangements are complex, involving hundreds of products and various license rights, and our customers bargain with us over many aspects of these arrangements. For example, they often demand a broader portfolio of solutions, support and services and seek more favorable terms such as expanded license usage, future purchase rights and other unique rights at an overall lower total cost. No single factor typically drives our customers' buying decisions, and we compete on all fronts to serve customers in a highly competitive EDA market. Customers generally negotiate the total value of the arrangement rather than just unit pricing or volumes.

#### Total Revenue

	April 30,			
	2017	2016	\$ Change	% Change
	(dollars in millions)			
Three months ended	\$680.1	\$605.0	\$ 75.1	12 %
Six months ended	\$1,332.9	\$1,173.6	\$ 159.3	14 %

Our revenue is subject to fluctuations, primarily due to customer requirements, including payment terms and the timing and value of contract renewals. For example, we experience variability in our revenue due to factors such as the timing of IP consulting projects, royalties, variability in hardware sales and certain contracts where revenue is recognized when customer installment payments are due. As revenue from hardware sales are recognized upfront, customer demand and timing requirements for such hardware may result in increased variability of our total revenue. The increase in total revenue for the three and six months ended April 30, 2017 compared to the same period in fiscal 2016 was primarily attributable to the overall growth in our business mainly due to higher hardware sales, IP consulting projects, TSL license revenue from arrangements booked in prior periods, and to a lesser extent due to revenue from acquired companies.



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## Time-Based Products Revenue

	April 30,		\$ Change	% Change	
	2017	2016			
	(dollars in millions)				
Three months ended	\$501.1	\$484.2	\$ 16.9	3	%
Percentage of total revenue	74	% 80	%		
Six months ended	\$990.5	\$948.5	\$ 42.0	4	%
Percentage of total revenue	74	% 81	%		

The increase in time-based products revenue for the three and six months ended April 30, 2017 compared to the same periods in fiscal 2016 was primarily attributable to an increase in TSL license revenue due to arrangements booked in prior periods.

## Upfront Products Revenue

	April 30,		\$ Change	% Change	
	2017	2016			
	(dollars in millions)				
Three months ended	\$83.5	\$58.2	\$ 25.3	43	%
Percentage of total revenue	12	% 10	%		
Six months ended	\$163.1	\$101.6	\$ 61.5	61	%
Percentage of total revenue	12	% 9	%		

Changes in upfront products revenue are generally attributable to normal fluctuations in customer requirements, which can drive the amount of upfront orders and revenue in any particular period.

The increase in upfront products revenue for the three and six months ended April 30, 2017 compared to the same periods in fiscal 2016 was primarily attributable to an increase in the sale of hardware products.

As our sales of hardware products grow, upfront products revenue as a percentage of total revenue will likely increase modestly.

## Maintenance and Service Revenue

	April 30,		\$ Change	% Change	
	2017	2016			
	(dollars in millions)				
Three months ended					
Maintenance revenue	\$ 19.7	\$ 18.3	\$ 1.4	8	%
Professional services and other revenue	75.8	44.3	31.5	71	%
Total maintenance and service revenue	\$ 95.5	\$ 62.6	\$ 32.9	53	%
Percentage of total revenue	14	% 10	%		
Six months ended					
Maintenance revenue	\$ 39.1	\$ 36.3	\$ 2.8	8	%
Professional services and other revenue	140.2	87.2	53.0	61	%
Total maintenance and service revenue	\$ 179.3	\$ 123.5	\$ 55.8	45	%
Percentage of total revenue	14	% 10	%		

Changes in maintenance revenue are generally attributable to timing of perpetual contracts and maintenance renewals. The increase in maintenance revenue for the three and six months ended April 30, 2017 compared to the same periods in fiscal 2016 was primarily due to an increase in the volume of arrangements that include maintenance.

The increase in professional services and other revenue for the three and six months ended April 30, 2017 compared to the same periods in fiscal 2016 was primarily due to the increase in, and timing of, IP consulting projects that are accounted for using the percentage of completion method and contributions from acquisitions.

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We expect our professional services revenues to increase in future periods as a result of recent acquisitions, but we do not expect the impact to be material to our total revenue.

## Cost of Revenue

	April 30,				
	2017	2016	\$ Change	% Change	
	(dollars in millions)				
Three months ended					
Cost of products revenue	\$100.9	\$85.4	\$ 15.5	18	%
Cost of maintenance and service revenue	41.5	21.6	19.9	92	%
Amortization of intangible assets	19.6	24.6	(5.0 )	(20 )	)%
Total	\$162.0	\$131.6	\$ 30.4	23	%
Percentage of total revenue	24	% 22	%		
Six months ended					
Cost of license revenue	\$197.9	\$161.8	\$ 36.1	22	%
Cost of maintenance and service revenue	78.8	44.2	34.6	78	%
Amortization of intangible assets	41.1	55.1	(14.0 )	(25 )	)%
Total	\$317.8	\$261.1	\$ 56.7	22	%
Percentage of total revenue	24	% 22	%		

We divide cost of revenue into three categories: cost of products revenue, cost of maintenance and service revenue, and amortization of intangible assets. We segregate expenses directly associated with consulting and training services from cost of products revenue associated with internal functions providing license delivery and post-customer contract support services. We then allocate these group costs between cost of products revenue and cost of maintenance and service revenue based on products and maintenance and service revenue reported.

**Cost of products revenue.** Cost of products revenue includes costs related to products sold and software licensed, allocated operating costs related to product support and distribution costs, royalties paid to third-party vendors, and the amortization of capitalized research and development costs associated with software products that had reached technological feasibility.

**Cost of maintenance and service revenue.** Cost of maintenance and service revenue includes operating costs related to maintaining the infrastructure necessary to operate our services and costs to deliver our consulting services, such as hotline and on-site support, production services and documentation of maintenance updates. We expect our cost of maintenance and service revenue to increase in future periods because of recent acquisitions, but we do not expect the impact to be material to our total cost of revenue.

**Amortization of intangible assets.** Amortization of intangible assets, which is recorded to cost of revenue and operating expenses, includes the amortization of core/developed technology, trademarks, trade names, customer relationships, covenants not to compete related to acquisitions and certain contract rights related to acquisitions. The increase in cost of revenue for the three months ended April 30, 2017 compared to the same period in fiscal 2016 was primarily due to increases of \$13.5 million in personnel-related costs as a result of headcount increases, including those from acquisitions, \$11.2 million in hardware product costs due to timing of shipments, and \$6.5 million in costs related to servicing IP consulting arrangements, which were partially offset by a decrease of \$5.0 million in amortization of intangible assets.

The increase in cost of revenue for the six months ended April 30, 2017 compared to the same period in fiscal 2016 was primarily due to increases of \$28.2 million in personnel-related costs as a result of headcount increases, including those from acquisitions, \$23.9 million in hardware product costs due to timing of shipments, and \$12.7 million in costs related to servicing IP consulting arrangements, which were partially offset by a decrease of \$14.0 million in amortization of intangible assets.

Changes in other cost of revenue categories for the above-mentioned periods were not individually material.



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## Operating Expenses

## Research and Development

	April 30,				
	2017	2016	\$ Change	% Change	
	(dollars in millions)				
Three months ended	\$223.0	\$216.2	\$ 6.8	3	%
Percentage of total revenue	33	% 36			%
Six months ended	\$435.7	\$412.9	\$ 22.8	6	%
Percentage of total revenue	33	% 35			%

The increase in research and development expenses for the three and six months ended April 30, 2017 compared to the same period in fiscal 2016 was primarily due to increases in personnel-related costs as a result of headcount increases, including those from acquisitions.

Changes in other research and development expense categories for the above-mentioned periods were not individually material.

## Sales and Marketing

	April 30,				
	2017	2016	\$ Change	% Change	
	(dollars in millions)				
Three months ended	\$137.2	\$120.9	\$ 16.3	13	%
Percentage of total revenue	20	% 20			%
Six months ended	\$263.7	\$243.5	\$ 20.2	8	%
Percentage of total revenue	20	% 21			%

The increase in sales and marketing expenses for the three months ended April 30, 2017 compared to the same period in fiscal 2016 was primarily due to increases of \$10.9 million variable compensation primarily based on timing of shipments and \$3.5 million in personnel-related costs as a result of headcount increases.

The increase in sales and marketing expenses for the six months ended April 30, 2017 compared to the same period in fiscal 2016 was primarily due to increases of \$11.3 million in personnel-related costs as a result of headcount increases and \$5.6 million variable compensation primarily based on timing of shipments.

Changes in other sales and marketing expense categories for the above-mentioned periods were not individually material.

## General and Administrative

	April 30,				
	2017	2016	\$ Change	% Change	
	(dollars in millions)				
Three months ended	\$83.4	\$41.6	\$ 41.8	100	%
Percentage of total revenue	12	% 7			%
Six months ended	\$124.3	\$81.3	\$ 43.0	53	%
Percentage of total revenue	9	% 7			%

The increase in general and administrative expenses for the three months ended April 30, 2017 compared to the same period in fiscal 2016 was primarily due to increases of \$38.0 million for accrued loss contingencies as a result of litigation, \$2.3 million in facilities expenses and \$2.6 million in personnel-related costs as a result of headcount increases.

The increase in general and administrative expenses for the six months ended April 30, 2017 compared to the same period in fiscal 2016 was primarily due to increases of \$38.0 million for accrued loss contingencies as a result of litigation, \$7.7 million in personnel-related costs as a result of headcount increases and \$4.5 million in facilities expenses, partially offset by \$7.2 million of lower professional service costs.

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Changes in other general and administrative expense categories for the above-mentioned periods were not individually material.

## Amortization of Intangible Assets

	April 30,		\$ Change		% Change
	2017	2016			
	(dollars in millions)				
Three months ended					
Included in cost of revenue	\$ 19.6	\$ 24.6	\$ (5.0 )	(20 )	%
Included in operating expenses	7.9	7.0	0.9	13	%
Total	\$ 27.5	\$ 31.6	\$ (4.1 )	(13 )	%
Percentage of total revenue	4	% 5			%
Six months ended					
Included in cost of revenue	\$ 41.1	\$ 55.1	\$ (14.0 )	(25 )	%
Included in operating expenses	15.9	14.0	1.9	14	%
Total	\$ 57.0	\$ 69.1	\$ (12.1 )	(18 )	%
Percentage of total revenue	4	% 6			%

The decrease in amortization of intangible assets for the three and six months ended April 30, 2017 compared to the same periods in fiscal 2016 was primarily due to intangible assets that were fully amortized, partially offset by additions of acquired intangible assets. See Note 4 of the Notes to Unaudited Condensed Consolidated Financial Statements for a schedule of future amortization amounts.

## Restructuring Charges

During the three and six months ended April 30, 2017, we incurred restructuring charges of approximately \$12.9 million and \$25.0 million, respectively, for involuntary and voluntary employee termination actions. The restructuring actions were undertaken to structure the company for future growth, reallocate resources to priority areas, and to a lesser extent, eliminate operational redundancy. The total charges under the 2017 restructuring plans, as of April 30, 2017, are expected to be \$32 million to \$34 million, and will depend in part on the number of eligible employees that accept outstanding offers of our 2017 Voluntary Retirement Program (VRP). These charges consist primarily of severance and retirement benefits. Such payments are expected to be completed by the end of the second quarter of fiscal 2018.

During the three and six months ended April 30, 2016, we recorded \$0.9 million and \$3.0 million of restructuring charges, respectively. See Note 7 of the Notes to Unaudited Condensed Consolidated Financial Statements for additional information related to our restructuring charges.

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## Other Income (Expense), net

	April 30, 2017    2016    \$ Change    % Change (dollars in millions)				
Three months ended					
Interest income	\$ 1.5	\$ 0.9	\$ 0.6	67	%
Interest (expense)	(1.9 )	(0.9 )	(1.0 )	111	%
Gain (loss) on assets related to executive deferred compensation plan	7.8	8.7	(0.9 )	(10 )	%
Foreign currency exchange gain (loss)	(0.6 )	(0.8 )	0.2	(25 )	%
Other, net	1.6	2.5	(0.9 )	(36 )	%
Total	\$ 8.4	\$ 10.4	\$ (2.0 )	(19 )	%
Six months ended					
Interest income	\$ 2.7	\$ 1.4	\$ 1.3	93	%
Interest (expense)	(3.1 )	(1.5 )	(1.6 )	107	%
Gain (loss) on assets related to executive deferred compensation plan	15.5	(0.7 )	16.2	(2,314 )	%
Foreign currency exchange gain (loss)	2.6	(0.2 )	2.8	(1,400 )	%
Other, net	2.2	4.6	(2.4 )	(52 )	%
Total	\$ 19.9	\$ 3.6	\$ 16.3	453	%

Other income (expense), net, for the three months ended April 30, 2017 was lower compared to the same period in fiscal 2016, primarily due to an increase in interest expense due to higher debt and lower gains in the market value of our executive deferred compensation plan.

Other income (expense), net, for the six months ended April 30, 2017 was higher compared to the same period in fiscal 2016, primarily due to gains in the market value of our executive deferred compensation plan assets compared to a loss in the corresponding period.

## Taxes

Our effective tax rate decreased in the three and six months ended April 30, 2017, as compared to the same period in fiscal 2016, primarily due to excess tax benefits from stock-based compensation, partially offset by the permanent reinstatement of the U.S. federal research tax credit in the first quarter of fiscal 2016. For further discussion of the provision for income taxes, see Note 15 of the Notes to Unaudited Condensed Consolidated Financial Statements.

## Liquidity and Capital Resources

Our sources of cash, cash equivalents and short-term investments are funds generated from our business operations and funds that may be drawn down under our revolving credit and term loan facilities.

As of April 30, 2017, we held an aggregate of \$119.1 million in cash, cash equivalents and short-term investments in the United States and an aggregate of \$1,012.5 million in our foreign subsidiaries. Certain amounts held outside the U.S. could be repatriated to the U.S. (subject to local law restrictions), but under current U.S. tax law, could be subject to U.S. income taxes less applicable foreign tax credits. We have provided for the U.S. income tax liability on foreign earnings, except for foreign earnings that are considered indefinitely reinvested outside the U.S. However, in the event funds from foreign subsidiaries were needed to fund cash needs in the U.S. and if U.S. taxes have not already been previously accrued, we would be required to accrue and pay additional U.S. taxes in order to repatriate these funds. The following sections discuss changes in our unaudited condensed consolidated balance sheets and statements of cash flows, and other commitments of our liquidity and capital resources during the six months ended April 30, 2017.

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## Cash, Cash Equivalents and Short-Term Investments

	April 30, 2017	October 31, 2016	\$ Change	% Change
	(dollars in millions)			
Cash and cash equivalents	\$991.3	\$ 976.6	\$ 14.7	2 %
Short-term investments	\$ 140.3	\$ 140.7	\$ (0.4 )	0 %
Total	\$1,131.6	\$ 1,117.3	\$ 14.3	1 %

Cash, cash equivalents and short-term investments increased primarily due to proceeds from our credit facilities, cash generated from our operations and cash received from employee stock purchases and option exercises. Cash generated was partially offset by cash used for acquisitions and intangible assets, stock repurchases under our accelerated stock repurchase agreements (the December 2016 ASR and the February 2017 ASR), purchases of property and equipment, and repayment of debt.

## Cash Flows

	April 30, 2017	2016	\$ Change
	(dollars in millions)		
Six months ended			
Cash provided by operating activities	\$169.9	\$187.3	\$ (17.4 )
Cash (used in) investing activities	(218.5 )	(78.7 )	(139.8 )
Cash provided by (used in) by financing activities	66.8	(118.8 )	185.6

We expect cash from our operating activities to fluctuate as a result of a number of factors, including the timing of our billings and collections, our operating results, and the timing and amount of tax and other liability payments. Cash provided by or used in our operations is dependent primarily upon the payment terms of our license agreements. We generally receive cash from upfront arrangements much sooner than from time-based products revenue, in which the license fee is typically paid either quarterly or annually over the term of the license.

Cash provided by operating activities. Cash provided by operating activities for the six months ended April 30, 2017 was lower compared to the same period in fiscal 2016, primarily due to higher disbursements for operations, including vendors, partially offset by an increase in cash collections.

Cash (used in) investing activities. Cash used in investing activities for the six months ended April 30, 2017 was higher compared to the same period in fiscal 2016, primarily due to higher cash paid for acquisitions and intangible assets of \$141.5 million.

Cash provided by (used in) financing activities. Cash provided by financing activities for the six months ended April 30, 2017 was higher compared to the same period in fiscal 2016, primarily due to higher proceeds from our credit facilities, net of repayments, of \$168.1 million, and an increase of cash received from employee stock purchases and option exercises of \$19.5 million.

## Accounts Receivable, net

	April 30, 2017	October 31, 2016	\$ Change	% Change
	(dollars in millions)			
Accounts Receivable, net	\$373.8	\$ 438.9	\$ (65.1 )	(15 )%

Our accounts receivable and days sales outstanding (DSO) are primarily driven by our billing and collections activities. Our DSO was 50 days at April 30, 2017 and 63 days at October 31, 2016. Accounts receivable and DSO decreased primarily due to the timing of billings to customers and an increase in collections.

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## Working Capital

Working capital is comprised of current assets less current liabilities, as shown on our unaudited condensed consolidated balance sheets:

	April 30, 2017	October 31, 2016	\$ Change	% Change
	(dollars in millions)			
Current assets	\$ 1,682.0	\$ 1,716.9	\$ (34.9 )	(2 )%
Current liabilities	1,593.3	1,714.9	(121.6 )	(7 )%
Working capital	\$ 88.7	\$ 2.0	\$ 86.7	4,335 %

Increases in our working capital were primarily due to (1) a decrease of \$133.8 million in deferred revenue, (2) a decrease of \$50.0 million in accounts payable and accrued liabilities due to timing of disbursements, (3) an increase of \$16.5 million in prepaid and other current assets primarily due to timing of service contract renewals, (4) an increase of \$14.3 million in cash, cash equivalents and short-term investments, and (5) a decrease of \$10.9 million in accrued income taxes. These changes in working capital were partially offset by an increase of \$73.0 million in short-term debt and a decrease of \$65.1 million in accounts receivable, net, due to the timing of billings to customers and collections.

## Other Commitments—Credit Facility

On November 28, 2016, we entered into an amended and restated credit agreement with several lenders (the Credit Agreement) providing for (i) a \$650.0 million senior unsecured revolving credit facility (the Revolver) and (ii) a \$150.0 million senior unsecured term loan facility (the Term Loan). The Credit Agreement amended and restated our previous credit agreement dated May 19, 2015 (the 2015 Agreement), in order to increase the size of the revolving credit facility from \$500.0 million to \$650.0 million, provide a new \$150.0 million senior unsecured term loan facility, and to extend the termination date of the revolving credit facility from May 19, 2020 to November 28, 2021. Subject to obtaining additional commitments from lenders, the principal amount of the loans provided under the Credit Agreement may be increased by us by up to an additional \$150.0 million. The Credit Agreement contains financial covenants requiring the Company to operate within a maximum leverage ratio and a minimum interest coverage ratio, as well as other non-financial covenants. As of April 30, 2017, we were in compliance with all financial covenants.

During the first quarter of fiscal 2017, we received funding of \$150.0 million under the Term Loan. Outstanding principal payments under the Term Loan are due as follows:

Fiscal year	(in thousands)
Remainder of fiscal 2017	\$ 3,750
2018	10,313
2019	14,062
2020	17,813
2021	27,187
2022	75,000
Total	\$ 148,125

As of April 30, 2017, we had a \$147.7 million outstanding balance, net of an immaterial amount of debt issuance costs, under the Term Loan, of which \$139.7 million is classified as long-term liabilities, and a \$270.0 million outstanding balance under the Revolver, all of which are considered short-term liabilities. As of October 31, 2016, we had no outstanding balance under the previous term loan from the 2015 Agreement and a \$205.0 million outstanding balance under the previous revolver from the 2015 Agreement, which are considered short-term liabilities. We expect borrowings under the Revolver will fluctuate from quarter to quarter. Borrowings bear interest at a floating rate based on a margin over our choice of market observable base rates as defined in the Credit Agreement. As of April 30, 2017, borrowings under the Term Loan bore interest at LIBOR +1.125% and the applicable interest rate for the Revolver was LIBOR +1.000%. In addition, commitment fees are payable on the Revolver at rates between 0.125% and 0.200% per year based on our leverage ratio on the daily amount of the revolving commitment.



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Other

Our available-for-sale securities as of April 30, 2017 consisted of investment-grade U.S. government agency securities, asset-backed securities, corporate debt securities, commercial paper, certificates of deposit, money market funds, and others. We follow an established investment policy and set of guidelines to monitor, manage and limit our exposure to interest rate and credit risk. The policy sets forth credit quality standards and limits our exposure to any one issuer. As of April 30, 2017, we had no direct holdings in structured investment vehicles, sub-prime mortgage-backed securities or collateralized debt obligations and no exposure to these financial instruments through our indirect holdings in money market mutual funds. During the six months ended April 30, 2017, we had no impairment charge associated with our available-for-sale securities portfolio. While we cannot predict future market conditions or market liquidity, we regularly review our investments and associated risk profiles, which we believe will allow us to effectively manage the risks of our investment portfolio.

We proactively manage our cash equivalents and short-term investments balances and closely monitor our capital and stock repurchase expenditures to ensure ample liquidity. Additionally, we believe the overall credit quality of our portfolio is strong, with our global excess cash, and our cash equivalents and fixed income portfolio invested in banks and securities with a weighted-average credit rating exceeding AA. The majority of our investments are classified as Level 1 or Level 2 investments, as measured under fair value guidance. See Notes 5 and 6 of the Notes to Unaudited Condensed Consolidated Financial Statements.

We believe that our current cash and cash equivalents, short-term investments, cash generated from operations, and available credit under our Revolver will satisfy our routine business requirements for at least the next 12 months and the foreseeable future.

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Item 3. Quantitative and Qualitative Disclosures about Market Risk

See Other Commitments—Credit Facility, Item 2. Management’s Discussion and Analysis of Financial Condition and Results of Operations, regarding borrowings under our senior unsecured revolving credit facility.

As of April 30, 2017, our exposure to market risk has not changed materially since October 31, 2016. For more information on financial market risks related to changes in interest rates, reference is made to Item 7A. Quantitative and Qualitative Disclosure about Market Risk contained in Part II of our Annual Report on Form 10-K for the fiscal year ended October 31, 2016, filed with the SEC on December 12, 2016.



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Item 4. Controls and Procedures

- Evaluation of Disclosure Controls and Procedures. As of April 30, 2017, Synopsys carried out an evaluation under the supervision and with the participation of Synopsys' management, including the Co-Chief Executive Officers and Chief Financial Officer, of the effectiveness of the design and operation of Synopsys' disclosure controls and procedures (as such term is defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act). There are inherent limitations to the effectiveness of any system of disclosure controls and procedures. Accordingly, even effective disclosure controls and procedures can only provide reasonable, not absolute, assurance of achieving their control objectives. Our Co-Chief Executive Officers and Chief Financial Officer have concluded that, as of April 30, 2017, Synopsys' disclosure controls and procedures were effective to provide reasonable assurance that information required to be disclosed in the reports Synopsys files and submits under the Exchange Act is recorded, processed, summarized and reported as and when required, and that such information is accumulated and communicated to Synopsys' management, including the Co-Chief Executive Officers and Chief Financial Officer, to allow timely decisions regarding its required disclosure.
- (a) Changes in Internal Control over Financial Reporting. There were no changes in Synopsys' internal control over financial reporting during the three months ended April 30, 2017 that have materially affected, or are reasonably likely to materially affect, Synopsys' internal control over financial reporting.
- (b)

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PART II. OTHER INFORMATION

Item 1. Legal Proceedings

We are subject to routine legal proceedings, as well as demands, claims and threatened litigation that arise in the normal course of our business. The ultimate outcome of any litigation is uncertain and unfavorable outcomes could have a negative impact on our results of operations and financial condition. Regardless of outcome, litigation can have an adverse impact on Synopsys because of the defense costs, diversion of management resources and other factors.

**Mentor Patent Litigation**

The Company is engaged in complex patent litigation with Mentor Graphics Corporation (Mentor) involving several actions in different forums. The Company succeeded to the litigation when it acquired Emulation & Verification Engineering S.A. (EVE) on October 4, 2012. At the time of the acquisition, EVE and EVE-USA, Inc. (collectively, the EVE Parties) had been defendants in three patent infringement lawsuits filed by Mentor. Each lawsuit as well as subsequent lawsuits are further described below.

**Background**

As mentioned above, at the time of the acquisition, the EVE Parties had been defendants in three patent infringement lawsuits filed by Mentor. Mentor filed suit against the EVE Parties in federal district court in the District of Oregon on August 16, 2010 alleging that EVE's ZeBu products infringed Mentor's United States Patent No. 6,876,962. Mentor filed an additional suit in federal district court in the District of Oregon on August 17, 2012 alleging that EVE's ZeBu products infringed Mentor's United States Patent No. 6,947,882. Both cases sought damages and a permanent injunction.

On September 27, 2012, the Company and the EVE Parties filed an action for declaratory relief against Mentor in federal district court in the Northern District of California, seeking a determination that Mentor's United States Patents Nos. 6,009,531, 5,649,176, and 6,240,376, which were the subject of a patent infringement lawsuit filed by Mentor against EVE in 2006 and settled in the same year, are invalid and not infringed by EVE's products. Mentor asserted patent infringement counterclaims in this action based on the same three patents and sought damages and a permanent injunction. In April 2013, this action was transferred to the federal district court in Oregon and consolidated with the two Mentor lawsuits in that district (the Oregon Action), as further described below.

**The Oregon Action**

After transfer of the Company's declaratory relief action to Oregon and consolidation of that action with Mentor's 2010 and 2012 lawsuits, the Company asserted patent infringement counterclaims against Mentor based on the Company's United States Patents Nos. 6,132,109 and 7,069,526, seeking damages and a permanent injunction. After pre-trial summary judgment rulings in favor of both sides, the only patent remaining at issue in the Oregon Action was Mentor's '376 patent.

The Oregon Action went to trial on the remaining Mentor patent, and a jury reached a verdict on October 10, 2014 finding that certain features of the ZeBu products infringed the '376 patent and assessing damages of approximately \$36 million. On March 12, 2015, the court entered an injunction prohibiting certain sales activities relating to the features found by the jury to infringe. The Company released a new version of ZeBu software that does not include such features. The Company accrued an immaterial amount as a loss contingency in the quarter ended October 31, 2015. Both parties appealed from the court's judgment following the jury verdict.

The Federal Circuit heard the parties' respective appeals and issued a decision on March 16, 2017. The panel affirmed the jury verdict and damages award on Mentor's '376 patent and reversed the district court's dismissal of Mentor's '176, '531 and '882 patents and the Company's '109 patent. Proceedings on these patents will resume in the federal district court in Oregon, including trial of alleged supplemental damages on and willful infringement of the '376 patent. On May 1, 2017, the Company petitioned for rehearing by all judges currently sitting on the Federal Circuit. On May 9, 2017, the Federal Circuit invited Mentor to respond to the petition on or before May 23, 2017.

**The California Action**

On December 21, 2012, the Company filed an action for patent infringement against Mentor in federal district court in the Northern District of California, alleging that Mentor's Veloce products infringe the Company's United States



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Patents Nos. 5,748,488, 5,530,841, 5,680,318 and 6,836,420 (the California Action). This case sought damages and a permanent injunction. The court stayed the action as to the '420 patent pending the U.S. Patent and Trademark Office's inter partes review of that patent and appeals from that proceeding. On January 20, 2015, the court granted Mentor's motion for summary judgment on the '488, '841, and '318 patents, finding that such patents were invalid. The Company appealed the court's ruling and on October 17, 2016, the Federal Circuit affirmed the district court's decision. The Company is currently seeking review of the Federal Circuit's ruling in the U.S. Supreme Court.

**PTO Proceedings**

On September 26, 2012, the Company filed two inter partes review requests with the U.S. Patent and Trademark Office (the PTO) challenging the validity of Mentor's '376 and '882 patents. The PTO granted review of the '376 patent and denied review of the '882 patent. On February 19, 2014, the PTO issued its final decision in the review of the '376 patent, finding some of the challenged claims invalid and some of the challenged claims valid. On April 22, 2014, the Company appealed to the Federal Circuit from the PTO's decision finding certain claims valid. Mentor filed a cross-appeal on May 2, 2014 from the PTO's decision finding certain claims invalid. On February 10, 2016, the Federal Circuit affirmed the PTO's decision in all respects.

On December 21, 2013, Mentor filed an inter partes review request with the PTO challenging the validity of the Company's '420 patent. On June 11, 2015, the PTO issued its final decision in the review, finding all of the challenged claims invalid. On August 12, 2015, the Company appealed to the Federal Circuit from the PTO's decision. On October 11, 2016, the Federal Circuit affirmed the PTO's decision.

On September 30, 2016, the Company filed a petition requesting ex parte reexamination of all of the claims of the '376 patent asserted in the Oregon Action. Mentor objected on procedural grounds. On November 8, 2016, the PTO instituted reexamination of the '376 patent. On December 15, 2016, the PTO vacated its decision to institute reexamination based upon Mentor's procedural objection. The Company thereafter filed a renewed request for ex parte reexamination of only Claims 24, 26 and 27 of the patent, which was granted by the PTO in February 2017. On May 2, 2017, the Company also sued the PTO in federal district court in the Eastern District of Virginia, challenging the PTO's decision not to institute reexamination of Claims 1 and 28. The ex parte reexamination and the lawsuit are ongoing.

Further information regarding the accounting impact on the Company with respect to the patent litigation with Mentor is contained in Note 16 in the Notes to Unaudited Condensed Consolidated Financial Statements under the heading "Legal Proceedings."

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Item 1A. Risk Factors

We describe our risk factors below.

The growth of our business depends on the semiconductor and electronics industries.

The growth of the electronic design automation (EDA) industry as a whole, and our EDA and intellectual property (IP) product sales in particular, is dependent on the semiconductor and electronics industries. A substantial portion of our business and revenue depends upon the commencement of new design projects by semiconductor manufacturers and their customers. The increasing complexity of designs of systems-on-chips and integrated circuits, and customers' concerns about managing costs, have previously led and in the future could lead to a decrease in design starts and design activity in general, with some customers focusing more on one discrete phase of the design process or opting for less advanced, but less risky, manufacturing processes that may not require the most advanced EDA products. Demand for our products and services could decrease and our financial condition and results of operations could be adversely affected if growth in the semiconductor and electronics industries slows or stalls. Additionally, as the EDA industry matures, consolidation may result in stronger competition from companies better able to compete as sole source vendors. This increased competition may cause our revenue growth rate to decline and exert downward pressure on our operating margins, which may have an adverse effect on our business and financial condition. Furthermore, the semiconductor and electronics industries have become increasingly complex ecosystems. Many of our customers outsource the manufacture of their semiconductor designs to foundries. Our customers also frequently incorporate third-party IP, whether provided by us or other vendors, into their designs to improve the efficiency of their design process. We work closely with major foundries to ensure that our EDA, IP, and manufacturing solutions are compatible with their manufacturing processes. Similarly, we work closely with other major providers of semiconductor IP, particularly microprocessor IP, to optimize our EDA tools for use with their IP designs and to assure that their IP and our own IP products, which may each provide for the design of separate components on the same chip, work effectively together. If we fail to optimize our EDA and IP solutions for use with major foundries' manufacturing processes or major IP providers' products, or if our access to such foundry processes or third-party IP products is hampered, then our solutions may become less desirable to our customers, resulting in an adverse effect on our business and financial condition.

Consolidation among our customers and within the industries in which we operate, as well as our dependence on a relatively small number of large customers, may negatively impact our operating results.

A number of business combinations, including mergers, asset acquisitions and strategic partnerships, among our customers in the semiconductor and electronics industries have occurred over the last several years, and more could occur in the future. Consolidation among our customers could lead to fewer customers or the loss of customers, increased customer bargaining power, or reduced customer spending on software and services. Furthermore, we depend on a relatively small number of large customers, and on such customers continuing to renew licenses and purchase additional products from us, for a large portion of our revenue. Reduced customer spending or the loss of a small number of customers, particularly our large customers, could adversely affect our business and financial condition. In addition, we and our competitors from time to time acquire businesses and technologies to complement and expand our respective product offerings. If any of our competitors consolidate or acquire businesses and technologies which we do not offer, they may be able to offer a larger technology portfolio, additional support and service capability, or lower prices, which could negatively impact our business and operating results.

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The continued uncertainty in the global economy, and its potential impact on the semiconductor and electronics industries in particular, may negatively affect our business, operating results and financial condition.

While the global economy has shown improvement, there are still uncertainties surrounding the strength of the recovery in many regions. Weakness in the global economy has adversely affected consumer confidence and the growth of the semiconductor industry in recent years, causing semiconductor companies to behave cautiously and focus on their costs, including their research and development budgets, which capture spending on EDA products and services. Further uncertainty caused by challenging global economic conditions could lead some of our customers to postpone their decision-making, decrease their spending and/or delay their payments to us. Continuing caution by semiconductor companies could, among other things, limit our ability to maintain or increase our sales or recognize revenue from committed contracts and in turn could adversely affect our business, operating results and financial condition.

We cannot predict when widespread global economic confidence will be restored. In addition, should further economic instability affect the banking and financial services industry and result in credit downgrades of the banks we rely on for foreign currency forward contracts, credit and banking transactions, and deposit services, or cause them to default on their obligations, it could adversely affect our financial results and our business. Accordingly, our future business and financial results are subject to uncertainty, and our stock price is at risk of volatile change. If economic conditions deteriorate in the future, or, in particular, if the semiconductor industry does not grow, our future revenues and financial results could be adversely affected. Conversely, in the event of future improvements in economic conditions for our customers, the positive impact on our revenues and financial results may be deferred due to our business model.

We may not be able to realize the potential financial or strategic benefits of the acquisitions we complete, or find suitable target businesses and technology to acquire, which could hurt our ability to grow our business, develop new products or sell our products.

Acquisitions are an important part of our growth strategy. We have completed a significant number of acquisitions in recent years. We expect to make additional acquisitions in the future, but we may not find suitable acquisition targets or we may not be able to consummate desired acquisitions due to unfavorable credit markets, commercially unacceptable terms, or other risks, which could harm our operating results. Acquisitions are difficult, time-consuming, and pose a number of risks, including:

- Potential negative impact on our earnings per share;
- Failure of acquired products to achieve projected sales;
- Problems in integrating the acquired products with our products;
- Difficulties entering into new markets in which we are not experienced or where competitors may have stronger positions;
- Potential downward pressure on operating margins due to lower operating margins of acquired businesses, increased headcount costs and other expenses associated with adding and supporting new products;
- Difficulties in retaining and integrating key employees;
- Substantial reductions of our cash resources and/or the incurrence of debt;
- Failure to realize expected synergies or cost savings;
- Difficulties in integrating or expanding sales, marketing and distribution functions and administrative systems, including information technology and human resources systems;
- Dilution of our current stockholders through the issuance of common stock as part of the merger consideration;
- Assumption of unknown liabilities, including tax and litigation, and the related expenses and diversion of resources;
- Disruption of ongoing business operations, including diversion of management's attention and uncertainty for employees and customers, particularly during the post-acquisition integration process;
- Potential negative impact on our relationships with customers, distributors and business partners;

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• Exposure to new operational risks, regulations, and business customs to the extent acquired businesses are located in regions where we are not currently conducting business;

• The need to implement controls, processes and policies appropriate for a public company at acquired companies that may have lacked such controls, processes and policies;

• Negative impact on our net income resulting from acquisition-related costs; and

• Requirements imposed by government regulators in connection with their review of an acquisition, including required divestitures or restrictions on the conduct of our business or the acquired business.

If we do not manage the foregoing risks, the acquisitions that we complete may have an adverse effect on our business and financial condition.

Our operating results may fluctuate in the future, which may adversely affect our stock price.

Our operating results are subject to quarterly and annual fluctuations, which may adversely affect our stock price. Our historical results should not be viewed as indicative of our future performance due to these periodic fluctuations.

Many factors may cause our revenue or earnings to fluctuate, including:

- Changes in demand for our products due to fluctuations in demand for our customers' products and due to constraints in our customers' budgets for research and development and EDA products and services;

• Product competition in the EDA industry, which can change rapidly due to industry or customer consolidation and technological innovation;

• Our ability to innovate and introduce new products and services or effectively integrate products and technologies that we acquire;

• Failures or delays in completing sales due to our lengthy sales cycle, which often includes a substantial customer evaluation and approval process because of the complexity of our products and services;

• Our ability to implement effective cost control measures;

• Our dependence on a relatively small number of large customers, and on such customers continuing to renew licenses and purchase additional products from us, for a large portion of our revenue;

• Changes in the mix of our products sold, as increased sales of our products with lower gross margins, such as our hardware products, may reduce our overall margins;

• Expenses related to our acquisition and integration of businesses and technology;

• Changes to our effective tax rate;

• Delays, increased costs or quality issues resulting from our reliance on third parties to manufacture our hardware products, which include a sole supplier for certain hardware components; and

• General economic and political conditions that affect the semiconductor and electronics industries.

The timing of revenue recognition may also cause our revenue and earnings to fluctuate, due to factors that include:

• Cancellations or changes in levels of orders or the mix between upfront products revenue and time-based products revenue;

• Delay of one or more orders for a particular period, particularly orders generating upfront products revenue;

• Delay in the completion of professional services projects that require significant modification or customization and are accounted for using the percentage of completion method;

• Delay in the completion and delivery of IP products in development that customers have paid for early access to;

• Customer contract amendments or renewals that provide discounts or defer revenue to later periods;

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The levels of our hardware revenues, which are recognized upfront and are primarily dependent upon our ability to provide the latest technology and meet customer requirements, and which may also impact our levels of excess and obsolete inventory expenses; and

- Changes in our revenue recognition model.

These factors, or any other factors or risks discussed herein, could negatively impact our revenue or earnings and cause our stock price to decline. Additionally, our results may fail to meet or exceed the expectations of securities analysts and investors, or such analysts may change their recommendation regarding our stock, which could cause our stock price to decline. Our stock price has been, and may continue to be, volatile, which may make it harder for our stockholders to sell their shares at a time or a price that is favorable to them.

We operate in highly competitive industries, and if we do not continue to meet our customers' demand for innovative technology at lower costs, our business and financial condition will be harmed.

We compete against EDA vendors that offer a variety of products and services, such as Cadence Design Systems, Inc. and Mentor Graphics Corporation. We also compete with other EDA vendors, including new entrants to the marketplace, that offer products focused on one or more discrete phases of the IC design process, as well as vendors of IP products and system-level solutions. Moreover, our customers internally develop design tools and capabilities that compete with our products, including internal designs that compete with our IP products.

The industries in which we operate are highly competitive and the demand for our products and services is dynamic and depends on a number of factors, including demand for our customers' products, design starts and our customers' budgetary constraints. Technology in these industries evolves rapidly and is characterized by frequent product introductions and improvements as well as changes in industry standards and customer requirements. Semiconductor device functionality requirements continually increase while feature widths decrease, substantially increasing the complexity, cost and risk of chip design and manufacturing. At the same time, our customers and potential customers continue to demand an overall lower total cost of design, which can lead to the consolidation of their purchases with one vendor. In order to succeed in this environment, we must successfully meet our customers' technology requirements and increase the value of our products, while also striving to reduce their overall costs and our own operating costs.

We compete principally on the basis of technology, product quality and features (including ease-of-use), license or usage terms, post-contract customer support, interoperability among products, and price and payment terms.

Specifically, we believe the following competitive factors affect our success:

- Our ability to anticipate and lead critical development cycles and technological shifts, innovate rapidly and efficiently, improve our existing products, and successfully develop or acquire new products;

- Our ability to offer products that provide both a high level of integration into a comprehensive platform and a high level of individual product performance;

- Our ability to enhance the value of our offerings through more favorable terms such as expanded license usage, future purchase rights, price discounts and other unique rights, such as multiple tool copies, post-contract customer support, "re-mix" rights that allow customers to exchange the software they initially licensed for other Synopsys products, and the ability to purchase pools of technology;

- Our ability to compete on the basis of payment terms; and

- Our ability to provide engineering and design consulting for our products.

If we fail to successfully manage these competitive factors, fail to successfully balance the conflicting demands for innovative technology and lower overall costs, or fail to address new competitive forces, our business and financial condition will be adversely affected.

We pursue new product and technology initiatives from time to time, and if we fail to successfully carry out these initiatives, our results of operations could be adversely impacted.

As part of the evolution of our business, we have made substantial investments to develop new products and enhancements to existing products through our acquisitions and research and development efforts. If we are unable to anticipate technological changes in our industry by introducing new or enhanced products in a timely and cost-effective manner, or if we fail to introduce products that meet market demand, we may lose our competitive



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our products may become obsolete, and our business, financial condition or results of operations could be adversely affected.

Additionally, from time to time, we invest in expansion into adjacent markets, including software quality, testing, and security solutions. Although we believe these solutions are complementary to our EDA tools, we have less experience and a more limited operating history in offering software quality, testing, and security products and services, and our efforts in this area may not be successful. Our success in these new markets depends on a variety of factors, including the following:

- Our ability to attract a new customer base, including in industries in which we have less experience;
- Our successful development of new sales and marketing strategies to meet customer requirements;
- Our ability to accurately predict, prepare for, and promptly respond to technological developments in new fields, including, in the case of our software quality, testing, and security tools and services, identifying new security vulnerabilities in software code and ensuring support for a growing number of programming languages;
- Our ability to compete with new and existing competitors in these new industries, many of which may have more financial resources, industry experience, brand recognition, or established customer relationships than we currently do;
- Our ability to skillfully balance our investment in adjacencies with investment in our existing products;
- Our ability to attract and retain employees with expertise in new fields;
- Our ability to sell and support consulting services at profitable margins; and
- Our ability to manage our revenue model in connection with hybrid sales of licensed products and consulting services.

Difficulties in any of our new product development efforts or our efforts to enter adjacent markets could adversely affect our operating results and financial condition.

If we fail to protect our proprietary technology, our business will be harmed.

Our success depends in part upon protecting our proprietary technology. Our efforts to protect our technology may be costly and unsuccessful. We rely on agreements with customers, employees and other third-parties as well as intellectual property laws worldwide to protect our proprietary technology. These agreements may be breached, and we may not have adequate remedies for any breach. Additionally, despite our measures to prevent piracy, other parties may attempt to illegally copy or use our products, which could result in lost revenue. Some foreign countries do not currently provide effective legal protection for intellectual property and our ability to prevent the unauthorized use of our products in those countries is therefore limited. Our trade secrets may also be stolen, otherwise become known, or be independently developed by competitors.

We may need to commence litigation or other legal proceedings in order to:

- Assert claims of infringement of our intellectual property;
- Defend our products from piracy;
- Protect our trade secrets or know-how; or
- Determine the enforceability, scope and validity of the propriety rights of others.

If we do not obtain or maintain appropriate patent, copyright or trade secret protection, for any reason, or cannot fully defend our intellectual property rights in certain jurisdictions, our business and operating results would be harmed. In addition, intellectual property litigation is lengthy, expensive and uncertain. Legal fees related to such litigation will increase our operating expenses and may reduce our net income.

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Changes in United States Generally Accepted Accounting Principles (U.S. GAAP) could adversely affect our reported financial results and may require significant changes to our internal accounting systems and processes.

We prepare our consolidated financial statements in conformity with U.S. GAAP. These principles are subject to interpretation by the Financial Accounting Standards Board (FASB), the Securities and Exchange Commission (SEC) and various bodies formed to interpret and create appropriate accounting principles and guidance.

The FASB is currently working together with the International Accounting Standards Board (IASB) to converge certain accounting principles and facilitate more comparable financial reporting between companies that are required to follow U.S. GAAP and those that are required to follow International Financial Reporting Standards (IFRS). In connection with this initiative, the FASB issued new accounting standards for revenue recognition and accounting for leases. For information regarding new accounting standards, please refer to Note 16 in the Notes to Unaudited Condensed Consolidated Financial Statements under the heading "Effect of New Accounting Pronouncements." These and other such standards may result in different accounting principles, which may significantly impact our reported results or could result in volatility of our financial results. In addition, we may need to significantly change our customer and vendor contracts, accounting systems and processes. The cost and effect of these changes may adversely impact our results of operations.

We may have to invest more resources in research and development than anticipated, which could increase our operating expenses and negatively affect our operating results.

We devote substantial resources to research and development. New competitors, technological advances in the semiconductor industry or by competitors, our acquisitions, our entry into new markets, or other competitive factors may require us to invest significantly greater resources than we anticipate. If we are required to invest significantly greater resources than anticipated without a corresponding increase in revenue, our operating results could decline. Additionally, our periodic research and development expenses may be independent of our level of revenue, which could negatively impact our financial results. Finally, there can be no guarantee that our research and development investments will result in products that create additional revenue.

The global nature of our operations exposes us to increased risks and compliance obligations that may adversely affect our business.

We derive roughly half of our revenue from sales outside the United States, and we expect our orders and revenue to continue to depend on sales to customers outside the U.S. In addition, we have continually expanded our non-U.S. operations in the past several years. This strategy requires us to recruit and retain qualified technical and managerial employees, manage multiple remote locations performing complex software development projects and ensure intellectual property protection outside of the U.S. Our international operations and sales subject us to a number of increased risks, including:

- Ineffective legal protection of intellectual property rights;
    - International economic and political conditions in countries where we do business, such as uncertainty caused by the United Kingdom's initiation of formal procedures to exit the European Union;
  - Difficulties in adapting to cultural differences in the conduct of business, which may include business practices that we are prohibited from engaging in by the Foreign Corrupt Practices Act or other anti-corruption laws;
  - Financial risks such as longer payment cycles and difficulty in collecting accounts receivable;
    - Inadequate local infrastructure that could result in business disruptions;
  - Government trade restrictions, including tariffs, export licenses, or other trade barriers, and changes to existing trade arrangements between various countries;
  - Additional taxes, interest, and potential penalties; and
  - Other factors beyond our control such as natural disasters, terrorism, civil unrest, war and infectious diseases.
- If any of the foreign economies in which we do business deteriorate or if we fail to effectively manage our global operations, our business and results of operations will be harmed.

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In addition, our global operations are subject to numerous U.S. and foreign laws and regulations, including those related to anti-corruption, tax, corporate governance, imports and exports, financial and other disclosures, privacy and labor relations. These laws and regulations are complex and may have differing or conflicting legal standards, making compliance difficult and costly. If we violate these laws and regulations we could be subject to fines, penalties or criminal sanctions, and may be prohibited from conducting business in one or more countries. Although we have implemented policies and procedures to help ensure compliance with these laws and regulations, there can be no assurance that our employees, contractors or agents will not violate such laws and regulations. Any violation individually or in the aggregate could have a material adverse effect on our operations and financial condition. Our financial statements are also affected by fluctuations in foreign currency exchange rates. A weakening U.S. dollar relative to other currencies increases expenses of our foreign subsidiaries when they are translated into U.S. dollars in our consolidated statement of operations. Likewise, a strengthening U.S. dollar relative to other currencies, especially the Japanese Yen, reduces revenue of our foreign subsidiaries upon translation and consolidation. Exchange rates are subject to significant and rapid fluctuations, and therefore we cannot predict the prospective impact of exchange rate fluctuations. Although we engage in foreign currency hedging activity, we may be unable to hedge all of our foreign currency risk, which could have a negative impact on our results of operations.

Cybersecurity threats or other security breaches could compromise sensitive information belonging to us or our customers and could harm our business and our reputation, particularly that of our security testing solutions. We store sensitive data, including intellectual property, our proprietary business information and that of our customers, and confidential employee information, in our data centers and on our networks. Despite our security measures, our information technology and infrastructure may be vulnerable to attacks by hackers or breached due to employee error, malfeasance or other disruptions that could result in unauthorized disclosure or loss of sensitive information.

For example, in October 2015, we discovered unauthorized third-party access, which had begun in July 2015, to our products and product license files hosted on our SolvNet customer license and product delivery system. We determined that no customer project or design data had been accessed. No personally identifiable information or payment card information is stored on the system. While we identified and closed the method used to gain access, it is possible our security measures may be circumvented again in the future, and such a breach could harm our business and reputation. The techniques used to obtain unauthorized access to networks, or to sabotage 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 preventative measures. Furthermore, in the operation of our business we also use third-party vendors that store certain sensitive data, including confidential information about our employees, and these third parties are subject to their own cybersecurity threats. While our standard vendor terms and conditions include provisions requiring the use of appropriate security measures to prevent unauthorized use or disclosure of our data, as well as other safeguards, a breach may still occur. Any security breach of our own or a third-party vendor's systems could cause us to be non-compliant with applicable laws or regulations, subject us to legal claims or proceedings, disrupt our operations, damage our reputation, and cause a loss of confidence in our products and services, any of which could adversely affect our business.

Our software products may also be vulnerable to cyberattacks. An attack could disrupt the proper functioning of our software, cause errors in the output of our customers' work, allow unauthorized access to our or our customers' proprietary information, and other destructive outcomes. As a result, our reputation could suffer, customers could stop buying our products, we could face lawsuits and potential liability, and our financial performance could be negatively impacted.

We are offering software quality and security testing solutions through our acquisition of companies such as Coverity, Codenomicon, Cigital and Codiscope. If we fail to identify new and increasingly sophisticated methods of cyberattack, or fail to invest sufficient resources in research and development regarding new threat vectors, our security testing products and services may fail to detect vulnerabilities in our customers' software code. An actual or perceived failure to identify security flaws may harm the perceived reliability of our security testing products and services, and could result in a loss of customers, sales, or an increased cost to remedy a problem. Furthermore, our acquisitions in the software quality and security testing space may increase our visibility as a security-focused

company and may make us a more attractive target for attacks on our own information technology infrastructure. Successful attacks could damage our reputation as a security-focused company.

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Our results could be adversely affected by a change in our effective tax rate as a result of tax law changes, changes in our geographical earnings mix, an unfavorable government review of our tax returns, or by material differences between our forecasted and actual annual 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. Because we have a wide range of statutory tax rates in the multiple jurisdictions in which we operate, any changes in our geographical earnings mix, including those resulting from our intercompany transfer pricing or from changes in the rules governing transfer pricing, could materially impact our effective tax rate. Furthermore, a change in the tax law of the jurisdictions where we do business, including an increase in tax rates or an adverse change in the treatment of an item of income or expense, could result in a material increase in our tax expense. In addition, U.S. income taxes and foreign withholding taxes have not been provided for on undistributed earnings of certain of our non-U.S. subsidiaries to the extent such earnings are considered to be indefinitely reinvested in the operations of those subsidiaries. If our expectations regarding reinvestment of such earnings change, then our income tax expense could increase.

Further changes in the tax laws of foreign jurisdictions could arise as a result of the base erosion and profit shifting (BEPS) project undertaken by the Organisation for Economic Co-operation and Development (OECD), which represents a coalition of member countries. On October 5, 2015, the OECD issued a series of reports recommending changes to numerous long-standing tax principles. Many of these recommendations are being adopted by various countries in which we do business and may increase our taxes in these countries. In addition, the Republic of Ireland has changed its corporate residence rules and will require changes to our tax position by January 1, 2021. On July 26, 2016, Hungary amended its IP regime to bring it in line with the OECD BEPS Project and will be effective in fiscal 2017. Changes to these and other areas in relation to international tax reform could increase uncertainty in the corporate tax area and may adversely affect our provision for income taxes.

In the U.S., a number of proposals for broad reform of the corporate tax system are under evaluation by various legislative and administrative bodies. It is not possible to accurately determine the overall impact of such proposals on our effective tax rate or balance sheet at this time. Changes in corporate tax rates, the taxation of foreign earnings and the deductibility of expenses could have a material impact on the recoverability of our deferred tax assets, could result in significant one-time charges in the period in which tax reform is enacted, or could result in increases to future U.S. tax expense.

Our income and non-income tax filings are subject to review or audit by the Internal Revenue Service and state, local and foreign taxing authorities. We exercise significant judgment in determining our worldwide provision for income taxes and, in the ordinary course of our business, there may be transactions and calculations where the ultimate tax determination is uncertain. We are also liable for potential tax liabilities of businesses we acquire. Although we believe our tax estimates are reasonable, the final determination in an audit may be materially different than the treatment reflected in our historical income tax provisions and accruals. An assessment of additional taxes because of an audit could adversely affect our income tax provision and net income in the periods for which that determination is made. In October 2016, the Hungarian Tax Authority (HTA) completed an audit of our Hungary subsidiary (Synopsis Hungary) for fiscal years 2011 through 2013. The HTA has challenged certain of Synopsis Hungary's tax positions taken during these years, including the timing of deduction of certain research expenses and for withholding taxes on payments made to affiliates, resulting in a proposed aggregate tax assessment of approximately \$46 million. If the assessment is ultimately upheld, Synopsis Hungary could also be liable for additional interest and penalties of approximately \$19 million. We are also under examination by the tax authorities in certain other jurisdictions, including the Republic of Korea. No assessments have been proposed in these examinations.

We maintain significant deferred tax assets related to federal research credits and certain state tax credits. Our ability to use these credits is dependent upon having sufficient future taxable income in the relevant jurisdiction. Changes in our forecasts of future income could result in an adjustment to the deferred tax asset and a related charge to earnings that could materially affect our financial results.

Liquidity requirements in our U.S. operations may require us to raise cash in uncertain capital markets, which could negatively affect our financial condition.

As of April 30, 2017, approximately 89% of our worldwide cash, cash equivalents and short-term investments balance is held by our international subsidiaries. At present, such foreign funds are considered to be indefinitely reinvested abroad, and to the extent they derive from foreign earnings we have indefinitely reinvested in our foreign operations. We intend to meet our U.S. cash spending needs primarily through our existing U.S. cash balances,

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ongoing U.S. cash flows, and available credit under our term loan and revolving credit facilities. As of April 30, 2017, we had outstanding debt of \$147.7 million, net of an immaterial amount of debt issuance costs, under our \$150.0 million term loan facility, and \$270.0 million of outstanding debt under our \$650.0 million revolving credit facility. Should our cash spending needs in the U.S. rise and exceed these liquidity sources, we may be required to incur additional debt at higher than anticipated interest rates or access other funding sources, which could negatively affect our results of operations, capital structure or the market price of our common stock.

From time to time we are subject to claims that our products infringe on third-party intellectual property rights. We are from time to time subject to claims alleging our infringement of third-party intellectual property rights, including patent rights. For example, we and Emulation & Verification Engineering S.A. (EVE), a company we acquired in October 2012, are party to ongoing patent infringement lawsuits involving Mentor Graphics Corporation. The jury in one of the lawsuits returned a verdict of approximately \$36 million in assessed damages against us for patent infringement, and the court in the lawsuit has entered an injunction prohibiting certain sales activities relating to the features found by the jury to infringe. We have appealed from the injunction and the final judgment in the case. Further information regarding the EVE lawsuits is contained in Part II, Item 1, Legal Proceedings and Note 16 in the Notes to Unaudited Condensed Consolidated Financial Statements under the heading "Legal Proceedings" in our Annual Report on Form 10-K for the fiscal year ended October 31, 2016 as filed with the SEC on December 12, 2016. In addition, under our customer agreements and other license agreements, we agree in many cases to indemnify our customers if our products infringe a third party's intellectual property rights. Infringement claims can result in costly and time-consuming litigation, require us to enter into royalty arrangements, subject us to damages or injunctions restricting our sale of products, invalidate a patent or family of patents, require us to refund license fees to our customers or to forgo future payments or require us to redesign certain of our products, any one of which could harm our business and operating results.

We may be subject to litigation proceedings that could harm our business.

We may be subject to legal claims or regulatory matters involving stockholder, consumer, employment, competition, and other issues on a global basis. Litigation is subject to inherent uncertainties, and unfavorable rulings could occur. An unfavorable ruling could include monetary damages or, in cases for which injunctive relief is sought, an injunction prohibiting us from manufacturing or selling one or more products. If we were to receive an unfavorable ruling on a matter, our business and results of operations could be materially harmed. Further information regarding material pending lawsuits, other than ordinary routine litigation incidental to our business, is contained in Part II, Item 1, Legal Proceedings.

Product errors or defects could expose us to liability and harm our reputation and we could lose market share. Software products frequently contain errors or defects, especially when first introduced, when new versions are released, or when integrated with technologies developed by acquired companies. Product errors could affect the performance or interoperability of our products, could delay the development or release of new products or new versions of products and could adversely affect market acceptance or perception of our products. In addition, allegations of manufacturability issues resulting from use of our IP products could, even if untrue, adversely affect our reputation and our customers' willingness to license IP products from us. Any such errors or delays in releasing new products or new versions of products or allegations of unsatisfactory performance could cause us to lose customers, increase our service costs, subject us to liability for damages and divert our resources from other tasks, any one of which could materially and adversely affect our business and operating results.

Our hardware products, which primarily consist of prototyping and emulation systems, subject us to distinct risks. While sales of our hardware products have historically been immaterial to our total revenue, increased sales of our hardware products subject us to several increased risks, including:

Increased dependence on a sole supplier for certain hardware components, which may reduce our control over product quality and pricing and may lead to delays in production and delivery of our hardware products, should our supplier fail to deliver sufficient quantities of acceptable components in a timely fashion;



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Increasingly variable revenue and decreasingly accurate revenue forecasts, due to fluctuations in hardware revenue, which is recognized upfront upon shipment, as opposed to sales of most software products for which revenue is recognized over time;

Overall reductions in margins, as the gross margin for our hardware products is typically lower than those of our software products;

Longer sales cycles, which create risks of insufficient, excess or obsolete inventory and variations in inventory valuation, which can adversely affect our operating results;

Decreases or delays in customer purchases in favor of next-generation releases, which may lead to excess or obsolete inventory or require us to discount our older hardware products; and

Longer warranty periods than those of our software products, which may require us to replace hardware components under warranty, thus increasing our costs.

We may not be able to continue to obtain licenses to third-party software and intellectual property on reasonable terms or at all, which may disrupt our business and harm our financial results.

We license third-party software and other intellectual property for use in product research and development and, in several instances, for inclusion in our products. We also license third-party software, including the software of our competitors, to test the interoperability of our products with other industry products and in connection with our professional services. These licenses may need to be renegotiated or renewed from time to time, or we may need to obtain new licenses in the future. Third parties may stop adequately supporting or maintaining their technology, or they or their technology may be acquired by our competitors. If we are unable to obtain licenses to these third-party software and intellectual property on reasonable terms or at all, we may not be able to sell the affected products, our customers' use of the products may be interrupted, or our product development processes and professional services offerings may be disrupted, which could in turn harm our financial results, our customers, and our reputation.

The inclusion of third-party intellectual property in our products can also subject us and our customers to infringement claims. Although we seek to mitigate this risk contractually, we may not be able to sufficiently limit our potential liability. Regardless of outcome, infringement claims may require us to use significant resources and may divert management's attention.

Some of our products and technology, including those we acquire, may include software licensed under open source licenses. Some open source licenses could require us, under certain circumstances, to make available or grant licenses to any modifications or derivative works we create based on the open source software. Although we have tools and processes to monitor and restrict our use of open source software, the risks associated with open source usage may not be eliminated and may, if not properly addressed, result in unanticipated obligations that harm our business.

If we fail to timely recruit and retain senior management and key employees, our business may be harmed.

We depend in large part upon the services of key members of our senior management team to drive our future success. If we were to lose the services of any member of our senior management team, our business could be adversely affected. To be successful, we must also attract and retain key technical, sales and managerial employees, including those who join us in connection with acquisitions. There are a limited number of qualified EDA and IC design engineers, and competition for these individuals is intense and has increased. Our employees are often recruited aggressively by our competitors and our customers. Any failure to recruit and retain key technical, sales and managerial employees could harm our business, results of operations and financial condition. Additionally, efforts to recruit and retain qualified employees could be costly and negatively impact our operating expenses.

We issue stock options and restricted stock units and maintain employee stock purchase plans as a key component of our overall compensation. We face pressure to limit the use of such equity-based compensation due to its dilutive effect on stockholders. If we are unable to grant attractive equity-based packages in the future, it could limit our ability to attract and retain key employees.

Our business is subject to evolving corporate governance and public disclosure regulations that have increased both our compliance costs and the risk of noncompliance, which could have an adverse effect on our stock price.

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We are subject to changing rules and regulations promulgated by a number of governmental and self-regulatory organizations, including the SEC, the NASDAQ Stock Market, 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. For example, our efforts to comply with the Dodd-Frank Wall Street Reform and Consumer Protection Act and other regulations, including "conflict minerals" regulations affecting our hardware products, have resulted in, and are likely to continue to result in, increased general and administrative expenses and a diversion of management time and attention from revenue-generating activities to compliance activities.

There are inherent limitations on the effectiveness of our controls and compliance programs.

Regardless of how well designed and operated it is, a control system can provide only reasonable assurance that its objectives will be met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. 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, have been detected. Moreover, although we have implemented compliance programs and compliance training for employees, such measures may not prevent our employees, contractors or agents from breaching or circumventing our policies or violating applicable laws and regulations. Failure of our control systems and compliance programs to prevent error, fraud or violations of law could have a material adverse impact on our business.

Our investment portfolio may be impaired by the deterioration of capital markets.

Our cash equivalent and short-term investment portfolio currently consists of investment-grade U.S. government agency securities, asset-backed securities, corporate debt securities, commercial paper, certificates of deposit, money market funds, municipal securities and other securities, and bank deposits. Our investment portfolio carries both interest rate risk and credit risk. Fixed rate debt securities may have their market value adversely impacted due to a credit downgrade or a rise in interest rates, while floating rate securities may produce less income than expected if interest rates fall or a credit downgrade occurs. As a result of capital pressures on certain banks, especially in Europe, and the continuing low interest rate environment, some of our financial instruments may become impaired.

Our future investment income may fall short of expectations due to changes in interest rates or if the decline in fair value of investments held by us is judged to be other-than-temporary. In addition, we may suffer losses in principal if we are forced to sell securities that decline in market value due to changes in the issuer's credit quality or changes in interest rates.

In preparing our financial statements we make certain assumptions, judgments and estimates that affect amounts reported in our consolidated financial statements, which, if not accurate, may significantly impact our financial results.

We make assumptions, judgments and estimates for a number of items, including the fair value of financial instruments, goodwill, long-lived assets and other intangible assets, the realizability of deferred tax assets, the recognition of revenue and the fair value of stock awards. We also make assumptions, judgments and estimates in determining the accruals for employee-related liabilities, including commissions and variable compensation, and in determining the accruals for uncertain tax positions, valuation allowances on deferred tax assets, allowances for doubtful accounts, and legal contingencies. These assumptions, judgments and estimates are drawn from historical experience and various other factors that we believe are reasonable under the circumstances as of the date of the consolidated financial statements. Actual results could differ materially from our estimates, and such differences could significantly impact our financial results.

Catastrophic events may disrupt our business and harm our operating results.

Due to the global nature of our business, our operating results may be negatively impacted by catastrophic events throughout the world. We rely on a global network of infrastructure applications, enterprise applications and technology systems for our development, marketing, operational, support and sales activities. A disruption or failure of these systems in the event of a major earthquake, fire, telecommunications failure, cybersecurity attack, terrorist attack, epidemic, or other catastrophic event could cause system interruptions, delays in our product development and loss of critical data and could prevent us from fulfilling our customers' orders. Moreover, our corporate headquarters, a significant portion of our research and development activities, our data centers, and certain other critical business operations are located in California, near major earthquake faults. A catastrophic event that results in the destruction

or disruption of our data centers or our critical business or information technology systems would

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severely affect our ability to conduct normal business operations and, as a result, our operating results would be adversely affected.

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## Item 2. Unregistered Sales of Equity Securities and Use of Proceeds

In December 2016, we entered into an accelerated share repurchase agreement (the December 2016 ASR) to repurchase an aggregate of \$100.0 million of our common stock. Pursuant to the December 2016 ASR, we made a prepayment of \$100.0 million and received initial share deliveries of shares valued at \$80.0 million. The remaining balance of \$20.0 million was settled in February 2017. Total shares purchased under the December 2016 ASR were approximately 1.7 million shares, at an average purchase price of \$60.53 per share.

In February 2017, we entered into an accelerated share repurchase agreement (the February 2017 ASR) to repurchase an aggregate of \$100.0 million of our common stock. Pursuant to the February 2017 ASR, the Company made a prepayment of \$100.0 million and received initial share deliveries of shares valued at \$80.0 million. The remaining balance of \$20.0 million was settled in May 2017. Total shares purchased under the February 2017 ASR were approximately 1.4 million shares, at an average purchase price of \$72.02 per share.

The table below sets forth information regarding our repurchases of our common stock during the three months ended April 30, 2017:

Period (1)	Total number of shares purchased	Average price paid per share	Total number of shares purchased as part of publicly announced programs	Maximum dollar value of shares that may yet be purchased under the programs (1)
Month #1				
January 29, 2017 through March 4, 2017(2)	1,381,359	\$72.3925	1,381,359	\$235,479,280
Month #2				
March 5, 2017 through April 1, 2017	—	\$—	—	\$235,479,280
Month #3				
April 2, 2017 through April 29, 2017	—	\$—	—	\$235,479,280
Total	1,381,359		1,381,359	\$235,479,280

(1) As of April 30, 2017, \$235.5 million remained available for future repurchases under the program.

(2) The number of shares purchased and average purchase price paid per share does not include the 265,894 shares and \$20.0 million equity forward contract, respectively, from the February 2017 ASR settled in May 2017.

See Note 10 of the Notes to Unaudited Condensed Consolidated Financial Statements for further information regarding our stock repurchase program.

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## Item 6. Exhibits

Exhibit Number	Exhibit Description	Incorporated By Reference				Filed Herewith
		Form	File No.	Exhibit	Filing Date	
3.1	Amended and Restated Certificate of Incorporation	10-Q	000-19807	3.1	9/15/2003	
3.2	Amended and Restated Bylaws	8-K	000-19807	3.2	5/23/2012	
4.1	Specimen Common Stock Certificate	S-1	33-45138	4.3	2/24/92 (effective date)	
10.4*	2006 Employee Equity Incentive Plan, as amended	8-K	000-19807	10.4	4/10/2017	
10.8*	2017 Non-Employee Directors Equity Incentive Plan	8-K	000-19807	10.8	4/10/2017	
31.1	Certification of Co-Principal Executive Officer furnished pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Exchange Act					X
31.2	Certification of Co-Principal Executive Officer furnished pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Exchange Act					X
31.3	Certification of Principal Financial Officer furnished pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Exchange Act					X
32.1	Certification of Co-Principal Executive Officers and Principal Financial Officer furnished pursuant to Rule 13a-14(b) or Rule 15d-14(b) of the Exchange Act and Section 1350 of Chapter 63 of Title 18 of the United States Code					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 a management contract, compensatory plan or arrangement.

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SIGNATURES

Pursuant to the requirements 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.

SYNOPSYS, INC.

Date: May 19, 2017 By: /s/ TRAC PHAM  
Trac Pham  
Chief Financial Officer  
(Principal Financial Officer)

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## EXHIBIT INDEX

Exhibit Number	Exhibit Description	Incorporated By Reference				Filed Herewith
		Form	File No.	Exhibit	Filing Date	
3.1	Amended and Restated Certificate of Incorporation	10-Q	000-19807	3.1	9/15/2003	
3.2	Amended and Restated Bylaws	8-K	000-19807	3.2	5/23/2012	
4.1	Specimen Common Stock Certificate	S-1	33-45138	4.3	2/24/92 (effective date)	
10.4*	2006 Employee Equity Incentive Plan, as amended	8-K	000-19807	10.4	4/10/2017	
10.8*	2017 Non-Employee Directors Equity Incentive Plan	8-K	000-19807	10.8	4/10/2017	
31.1	Certification of Co-Principal Executive Officer furnished pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Exchange Act					X
31.2	Certification of Co-Principal Executive Officer furnished pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Exchange Act					X
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101.INS	XBRL Instance Document					X
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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

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