SYNOPSYS INC
Form 10-Q
August 24, 2018
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-Q

(MARK ONE)
ý QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
FOR THE QUARTERLY PERIOD ENDED JULY 31, 2018
OR
¨ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
FOR THE TRANSITION PERIOD FROM TO
COMMISSION FILE NUMBER: 000-19807

SYNOPSYS, INC.
(Exact name of registrant as specified in its charter)

DELAWARE	56-1546236
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer 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 ý 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 ý 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	ý	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. ¨

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

As of August 22, 2018, there were 148,588,107 shares of the registrant's common stock outstanding.

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FOR THE FISCAL QUARTER ENDED JULY 31, 2018
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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)

	July 31, 2018	October 31, 2017*
ASSETS		
Current assets:		
Cash and cash equivalents	$741,236	$1,048,356
Accounts receivable, net	501,331	451,144
Income taxes receivable and prepaid taxes	44,378	48,257
Prepaid and other current assets	178,638	134,836
Total current assets	1,465,583	1,682,593
Property and equipment, net	290,446	266,014
Goodwill	3,138,666	2,706,974
Intangible assets, net	394,485	253,843
Long-term prepaid taxes	86,405	20,157
Deferred income taxes	167,427	243,989
Other long-term assets	252,203	222,844
Total assets	$5,795,215	$5,396,414
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable and accrued liabilities	$449,037	$499,846
Accrued income taxes	6,909	39,811
Deferred revenue	1,129,651	1,064,528
Short-term debt	497,808	9,924
Total current liabilities	2,083,405	1,614,109
Long-term accrued income taxes	36,704	33,239
Long-term deferred revenue	113,842	83,252
Long-term debt	123,750	134,063
Other long-term liabilities	273,512	252,027
Total liabilities	2,631,213	2,116,690
Stockholders' equity:		
Preferred stock, $0.01 par value: 2,000 shares authorized; none outstanding	—	—
Common stock, $0.01 par value: 400,000 shares authorized; 148,559 and 150,445 shares outstanding, respectively	1,486	1,505
Capital in excess of par value	1,591,293	1,622,429
Retained earnings	2,296,546	2,143,873
Treasury stock, at cost: 8,701 and 6,817 shares, respectively	(636,533)	(426,208)
Accumulated other comprehensive income (loss)	(94,653)	(65,979)
Total Synopsys stockholders' equity	3,158,139	3,275,620
Non-controlling interest	5,863	4,104
Total stockholders' equity	3,164,002	3,279,724
Total liabilities and stockholders' equity	$5,795,215	$5,396,414

* 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 July 31,		Nine Months Ended July 31,	
	2018	2017	2018	2017
Revenue:				
Time-based products	$570,053	$503,530	$1,697,756	$1,493,991
Upfront products	99,579	100,251	291,143	263,310
Maintenance and service	110,082	91,600	337,077	270,935
Total revenue	779,714	695,381	2,325,976	2,028,236
Cost of revenue:				
Products	115,437	107,104	335,030	304,982
Maintenance and service	49,790	43,828	150,674	122,618
Amortization of intangible assets	20,154	18,614	59,612	59,720
Total cost of revenue	185,381	169,546	545,316	487,320
Gross margin	594,333	525,835	1,780,660	1,540,916
Operating expenses:				
Research and development	277,402	228,663	793,947	664,326
Sales and marketing	157,953	131,520	455,653	395,242
General and administrative	84,336	46,350	199,517	170,654
Amortization of intangible assets	10,651	7,906	30,926	23,806
Restructuring charges	23	6,026	1,917	31,038
Total operating expenses	530,365	420,465	1,481,960	1,285,066
Operating income	63,968	105,370	298,700	255,850
Other income (expense), net	7,925	7,421	12,595	27,322
Income before income taxes	71,893	112,791	311,295	283,172
Provision (benefit) for income taxes	(7,516)	(3,960)	133,105	26,527
Net income	$79,409	$116,751	$178,190	$256,645
Net income per share:				
Basic	$0.53	$0.78	$1.20	$1.71
Diluted	$0.52	$0.75	$1.16	$1.66
Shares used in computing per share amounts:				
Basic	148,490	150,214	148,760	150,460
Diluted	152,614	154,683	153,118	154,787

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 July 31,		Nine Months Ended July 31,	
	2018	2017	2018	2017
	(in thousands)			
Net income	$79,409	$116,751	$178,190	$256,645
Other comprehensive income (loss):				
Change in foreign currency translation adjustment	(18,231)	3,026	(8,273)	12,327
Changes in unrealized gains (losses) on available-for-sale securities, net of tax of $0 for periods presented	—	20	—	(34)
Cash flow hedges:				
Deferred gains (losses), net of tax of $2,518 and $1,363, for the three and nine months ended July 31, 2018, respectively, and of $(1,971) and $(4,917) for each of the same periods in fiscal 2017, respectively	(12,371)	8,517	(7,891)	19,005
Reclassification adjustment on deferred (gains) losses included in net income, net of tax of $247 and $2,767, for the three and nine months ended July 31, 2018, respectively, and of $232 and $(933) for each of the same periods in fiscal 2017, respectively	(1,662)	22	(12,510)	5,615
Other comprehensive income (loss), net of tax effects	(32,264)	11,585	(28,674)	36,913
Comprehensive income	$47,145	$128,336	$149,516	$293,558

See accompanying notes to unaudited condensed consolidated financial statements.

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SYNOPSYS, INC.
UNAUDITED CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	Nine Months Ended July 31,	
	2018	2017
Cash flows from operating activities:		
Net income	$178,190	$256,645
Adjustments to reconcile net income to net cash provided by operating activities:		
Amortization and depreciation	150,245	144,112
Stock compensation	102,540	79,697
Allowance for doubtful accounts	3,368	1,289
(Gain) loss on sale of investments	4	(1)
(Gain) loss on sale of property and equipment	(97)	—
Write-down of long-term investments	—	1,300
Deferred income taxes	5,509	(10,960)
Net changes in operating assets and liabilities, net of acquired assets and liabilities:		
Accounts receivable	(41,695)	42,413
Prepaid and other current assets	(58,409)	(13,636)
Other long-term assets	(31,659)	(33,416)
Accounts payable and accrued liabilities	(56,491)	36,129
Income taxes	(35,014)	(19,169)
Deferred revenue	76,780	(34,692)
Net cash provided by operating activities	293,271	449,711
Cash flows from investing activities:		
Proceeds from sales and maturities of short-term investments	12,449	130,529
Purchases of short-term investments	—	(137,486)
Proceeds from sales of long-term investments	494	839
Purchases of long-term investments	(645)	—
Proceeds from sales of property and equipment	1,662	—
Purchases of property and equipment	(70,469)	(50,227)
Cash paid for acquisitions and intangible assets, net of cash acquired	(646,687)	(187,624)
Capitalization of software development costs	(2,714)	(3,130)
Other	—	2,100
Net cash used in investing activities	(705,910)	(244,999)
Cash flows from financing activities:		
Proceeds from credit facilities and term loan	615,000	270,000
Repayment of debt	(137,500)	(38,750)
Issuances of common stock	72,722	78,718
Payments for taxes related to net share settlement of equity awards	(42,636)	(35,376)
Purchase of equity forward contract	(33,000)	—
Purchases of treasury stock	(367,000)	(300,000)
Other	1,759	(482)
Net cash provided by (used in) financing activities	109,345	(25,890)
Effect of exchange rate changes on cash and cash equivalents	(3,826)	(456)
Net change in cash and cash equivalents	(307,120)	178,366
Cash and cash equivalents, beginning of year	1,048,356	976,620
Cash and cash equivalents, end of period	$741,236	$1,154,986

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 seeking to ensure the security and quality 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 semiconductor 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 security and quality of software code in a wide variety of industries, including electronics, financial services, media, automotive, medicine, energy, and industrials.

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, 2017 as filed with the SEC on December 14, 2017.

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 every five or six years, the Company has a 53-week year. When a 53-week year occurs, the Company includes the additional week in the first quarter to realign fiscal quarters with calendar quarters. Fiscal 2018 will be a 53-week year and will end on November 3, 2018, which will impact our revenue, expenses and operating results. Fiscal 2017 was a 52-week year and ended on October 28, 2017.

The results of operations for the first nine months of fiscal 2018 and 2017 included 40 weeks and 39 weeks, respectively, and ended on August 4, 2018 and July 29, 2017, respectively. 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 nine months ended July 31, 2018, the Company completed several acquisitions with aggregate cash consideration of $631.1 million, net of cash, cash equivalents and short-term investments acquired. The Company does not consider these acquisitions to be material, individually or in the aggregate, to the Company’s unaudited condensed consolidated statements of operations.

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Acquisition of Black Duck Software (Black Duck)

On December 11, 2017, the Company acquired Black Duck, a privately-held leader in automated solutions for securing and managing open source software, for $565.1 million total purchase consideration. With this acquisition, the Company has acquired industry-leading products which automate the process of identifying and inventorying the open source codes, detecting known security vulnerabilities and license compliance issues.

As of July 31, 2018, the total purchase consideration and the preliminary purchase price allocation were as follows:

	(in thousands)
Cash paid	$ 563,500
Fair value of assumed equity awards allocated to purchase consideration	1,588
Total consideration	$ 565,088
Goodwill	$ 396,346
Identifiable intangibles assets acquired	178,000
Cash, cash equivalents and short-term investments	19,491
Other tangible liabilities acquired, net	(13,249)
Deferred revenue	(15,500)
Total purchase allocation	$ 565,088

The preliminary goodwill of $396.3 million is not deductible for tax purposes. The acquired identifiable intangible assets of $178.0 million were valued using the income or cost methods. The intangible assets are being amortized over their respective useful lives ranging from one to ten years. The acquisition-related costs directly attributable to the business combination of $13.9 million, including compensation expenses, professional fees and other direct expenses, were expensed as incurred in the unaudited condensed consolidated statement of operations for the nine months ended July 31, 2018. The Company funded the acquisition with cash. The cash consideration was $544.0 million, net of acquired cash, cash equivalents and short-term investments.

The Company also assumed unvested restricted stock units (RSUs) and stock options with a fair value of $15.6 million. The Black-Scholes option-pricing model was used to determine the fair value of these stock options, whereas the fair value of the RSUs was based on the market price on the grant date of the instruments. Of the total fair value of the equity awards assumed, $1.6 million was allocated to the purchase consideration and $14.0 million was allocated to future services to be expensed over their remaining service periods on a straight-line basis.

Other Fiscal 2018 Acquisitions

During the nine months ended July 31, 2018, the Company completed other acquisitions for a total purchase consideration of $87.1 million, net of cash acquired. The Company does not consider these acquisitions to be material to the Company’s unaudited condensed consolidated financial statements. The preliminary purchase price allocations resulted in $38.4 million of goodwill, which is not deductible for tax purposes, and $50.2 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 $3.4 million, were expensed as incurred in the unaudited condensed consolidated statement of operations. The Company funded these acquisitions with cash.

The preliminary fair value estimates for the assets acquired and liabilities assumed for all acquisitions completed within 12 months from the applicable acquisition date 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 liabilities, identifiable intangible assets, and income taxes. Additional information, which existed as of the respective acquisition dates but is yet unknown to the Company, may become known to the Company during the remainder of the respective measurement periods, a period not to exceed 12 months from the applicable acquisition date. Changes to the provisional amounts recorded as assets or liabilities during a measurement period may result in an adjustment to goodwill.

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Note 4. Goodwill and Intangible Assets

Goodwill as of July 31, 2018 and October 31, 2017 consisted of the following:

	(in thousands)
As of October 31, 2017	$ 2,706,974
Additions	434,741
Adjustments	(76)
Effect of foreign currency translation	(2,973)
As of July 31, 2018	$ 3,138,666

Intangible assets as of July 31, 2018 consisted of the following:

	Gross Assets	Accumulated Amortization	Net Assets
	(in thousands)		
Core/developed technology	$772,014	$ 581,789	$ 190,225
Customer relationships	358,022	194,758	163,264
Contract rights intangible	184,006	176,045	7,961
Trademarks and trade names	42,929	20,771	22,158
In-process research and development (IPR&D)(1)	7,100	—	7,100
Capitalized software development costs	35,582	31,805	3,777
Total	$1,399,653	$ 1,005,168	$ 394,485

Intangible assets as of October 31, 2017 consisted of the following:

	Gross Assets	Accumulated Amortization	Net Assets
	(in thousands)		
Core/developed technology	$647,975	$ 526,796	$ 121,179
Customer relationships	278,811	166,886	111,925
Contract rights intangible	174,615	172,178	2,437
Trademarks and trade names	25,329	17,401	7,928
In-process research and development (IPR&D)(1)	6,600	—	6,600
Capitalized software development costs	32,868	29,094	3,774
Total	$1,166,198	$ 912,355	$ 253,843

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Amortization expense related to intangible assets consisted of the following:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2018	2017	2018	2017
	(in thousands)			
Core/developed technology	$18,692	$15,575	$55,745	$50,330
Customer relationships	9,584	6,834	27,803	20,569
Contract rights intangible	1,357	3,215	3,619	9,893
Trademarks and trade names	1,172	896	3,371	2,734
Capitalized software development costs	894	1,002	2,710	2,968
Total	$31,699	$27,522	$93,248	$86,494

The following table presents the estimated future amortization of the existing intangible assets as of July 31, 2018:

Fiscal Year	(in thousands)
Remainder of fiscal 2018	$ 29,972
2019	102,027
2020	77,490
2021	55,511
2022	43,938
2023 and thereafter	78,447
IPR&D(1)	7,100
Total	$ 394,485

(1) IPR&D assets are reclassified to core/developed technology and 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.

As of July 31, 2018, the balances of our cash equivalents 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	$70,217	$ —	$ —	$ —	$ 70,217
Total:	$70,217	$ —	$ —	$ —	$ 70,217

(1) See Note 6. Fair Value Measures for further discussion on fair values of cash equivalents.

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As of October 31, 2017, the balances of our cash equivalents 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	$560,594	$ —	$ —	$ —	$ 560,594
Total:	$560,594	$ —	$ —	$ —	$ 560,594

(1) See Note 6. Fair Value Measures for further discussion on fair values of cash equivalents.

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 balance sheets 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 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 a majority 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.

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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 July 31,		Nine Months Ended July 31,	
	2018	2017	2018	2017
	(in thousands)			
Gain (loss) recorded in other income (expense), net	$1,567	$515	$1,244	$1,838

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

	As of July 31, 2018	As of October 31, 2017
	(in thousands)	
Total gross notional amount	$902,267	$955,139
Net fair value	$(9,202)	$14,052

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 July 31, 2018		
Other current assets	$ 3,872	$ 9
Accrued liabilities	$ 12,962	$ 121
As of October 31, 2017		
Other current assets	$ 16,582	$ 15
Accrued liabilities	$ 2,485	$ 59

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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	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)
		(in thousands)		
Three months ended July 31, 2018				
Foreign exchange contracts	Revenue	$ 1,422	Revenue	$ (308)
Foreign exchange contracts	Operating expenses	(13,793)	Operating expenses	1,970
Total		$ (12,371)		$ 1,662
Three months ended July 31, 2017				
Foreign exchange contracts	Revenue	$ (176)	Revenue	$ (198)
Foreign exchange contracts	Operating expenses	8,747	Operating expenses	176
Total		$ 8,571		$ (22)
Nine months ended July 31, 2018				
Foreign exchange contracts	Revenue	$ (542)	Revenue	$ 1,190
Foreign exchange contracts	Operating expenses	(7,349)	Operating expenses	11,320
Total		$ (7,891)		$ 12,510
Nine months ended July 31, 2017				
Foreign exchange contracts	Revenue	$ 6,824	Revenue	$ (2,379)
Foreign exchange contracts	Operating expenses	12,357	Operating expenses	(3,236)
Total		$ 19,181		$ (5,615)

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) recognized in statement of operations on derivatives (ineffective portion)(1)	Amount of gain (loss) recognized in statement of operations on derivatives (excluded from effectiveness testing)(2)
	(in thousands)	
Foreign exchange contracts		
For the three months ended July 31, 2018	$ (132)	$ 782
For the three months ended July 31, 2017	$ 11	$ 776
For the nine months ended July 31, 2018	$ 389	$ 2,488
For the nine months ended July 31, 2017	$ 175	$ 3,393

(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 require an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. Accounting standards also establish a fair value hierarchy based on the 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;

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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.
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 July 31, 2018:

Description	Total	Fair Value Measurement Using Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
	(in thousands)			
Assets				
Cash equivalents:				
Money market funds	$70,217	$ 70,217	$ —	$ —
Prepaid and other current assets:				
Foreign currency derivative contracts	3,882	—	3,882	—
Other long-term assets:				
Deferred compensation plan assets	220,975	220,975	—	—
Total assets	$295,074	$ 291,192	$ 3,882	$ —
Liabilities				
Accounts payable and accrued liabilities:				
Foreign currency derivative contracts	$13,083	$ —	$ 13,083	$ —
Other long-term liabilities:				
Deferred compensation plan liabilities	220,975	220,975	—	—
Total liabilities	$234,058	$ 220,975	$ 13,083	$ —

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Assets and liabilities measured at fair value on a recurring basis are summarized below as of October 31, 2017:

Description	Total	Fair Value Measurement Using Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
	(in thousands)			
Assets				
Cash equivalents:				
Money market funds	$560,594	$ 560,594	$ —	$ —
Prepaid and other current assets:				
Foreign currency derivative contracts	16,596	—	16,596	—
Other long-term assets:				
Deferred compensation plan assets	197,542	197,542	—	—
Total assets	$774,732	$ 758,136	$ 16,596	$ —
Liabilities				
Accounts payable and accrued liabilities:				
Foreign currency derivative contracts	$2,544	$ —	$ 2,544	$ —
Other long-term liabilities:				
Deferred compensation plan liabilities	197,542	197,542	—	—
Total liabilities	$200,086	$ 197,542	$ 2,544	$ —

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 and nine months ended July 31, 2018. The Company did not recognize any impairment during the three months ended July 31, 2017 and recorded $1.3 million of other-than-temporary impairment during the nine months ended July 31, 2017.

Note 7. Liabilities and Restructuring Charges

During the nine months ended July 31, 2018, the Company incurred restructuring charges of approximately $1.9 million as part of a business realignment, and the charges were substantially paid prior to the end of the period. Total charges under this realignment are expected to be $8 million to $10 million consisting of severance and benefits in fiscal 2018.

In fiscal 2017, the Company recorded $36.6 million of restructuring charges for severance and benefits due to involuntary and voluntary employee termination actions. During the nine months ended July 31, 2018, the Company made payments of $17.3 million related to the 2017 actions. There was no outstanding balance as of July 31, 2018. As of October 31, 2017, the outstanding balance was $17.5 million recorded in accounts payable and accrued liabilities as payroll and related benefits in the audited consolidated balance sheets.

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Accounts payable and accrued liabilities consist of:

	July 31, 2018	October 31, 2017
	(in thousands)	
Payroll and related benefits	$338,014	$ 382,773
Other accrued liabilities	61,550	97,119
Accounts payable	49,473	19,954
Total	$449,037	$ 499,846

Other long-term liabilities consist of:

	July 31, 2018	October 31, 2017
	(in thousands)	
Deferred compensation liability	$220,975	$ 197,542
Other long-term liabilities	52,537	54,485
Total	$273,512	$ 252,027

Note 8. Credit Facility

In July 2018, the Company entered into a 220.0 million RMB (approximately $33.0 million) credit agreement with a lender in China. Borrowings bear interest at a floating rate based on the Chinese Central Bank rate plus 10% of such rate. The Company expects to draw on the credit facility from quarter to quarter as needed.

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 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 July 31, 2018, the Company was in compliance with all financial covenants.

As of July 31, 2018, the Company had a $136.6 million outstanding balance, net of debt issuance costs, under the Term Loan, of which $123.8 million is classified as long-term liabilities. Outstanding principal payments under the Term Loan are due as follows:

Fiscal year	(in thousands)
Remainder of fiscal 2018	$ 2,813
2019	14,062
2020	17,813
2021	27,187
2022	75,000
Total	$ 136,875

As of October 31, 2017, the Company had a $144.0 million outstanding balance, net of debt issuance costs, under the Term Loan, of which $134.1 million is classified as long-term liabilities, and no outstanding balance under the Revolver.

In December 2017, the Company drew down $450.0 million under the Revolver and the total outstanding balance of the Revolver as of July 31, 2018 was $485.0 million after partial repayments, which is included in 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 July 31, 2018, 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

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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:

	July 31, 2018	October 31, 2017
	(in thousands)	
Cumulative currency translation adjustments	$(78,680)	$(70,407)
Unrealized gain (loss) on derivative instruments, net of taxes	(15,973)	4,428
Total accumulated other comprehensive income (loss)	$(94,653)	$(65,979)

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

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2018	2017	2018	2017
	(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	$(308)	$(198)	$1,190	$(2,379)
Operating expenses	1,970	176	11,320	(3,236)
Gain (loss) on available-for-sale securities				
Other income (expense)	—	—	—	1
Total reclassifications into net income	$1,662	$(22)	$12,510	$(5,614)

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 April 5, 2018. The program does not obligate the Company to acquire any particular amount of common stock, and the program may be suspended or terminated at any time by the Company's 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 July 31, 2018, $325.0 million remained available for further repurchases under the program.

In September 2017, the Company entered into an accelerated share repurchase agreement (the September 2017 ASR) to repurchase an aggregate of $100.0 million of the Company's common stock. Pursuant to the September 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 November 2017. Total shares repurchased under the September 2017 ASR were approximately 1.2 million shares, at an average purchase price of $83.80 per share.

In December 2017, the Company entered into two simultaneous accelerated share repurchase agreements (the December 2017 ASRs) to repurchase an aggregate of $200.0 million of the Company's common stock. Pursuant to

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the December 2017 ASRs, the Company made a prepayment of $200.0 million to receive initial deliveries of shares valued at $160.0 million. In February 2018, the Company received additional deliveries of shares valued at $20.0 million for one of the two December 2017 ASRs. The remaining balance of $20.0 million was settled in March 2018. Total shares repurchased under the December 2017 ASR were approximately 2.3 million shares, at an average purchase price of $87.08 per share.

In May 2018, the Company entered into an accelerated share repurchase agreement (the May 2018 ASR) to repurchase an aggregate of $165.0 million of the Company's common stock. Pursuant to the May 2018 ASR, the Company made a prepayment of $165.0 million and received initial share deliveries valued at $132.0 million. The remaining balance of $33.0 million is anticipated to be settled on or before November 1, 2018, upon completion of the repurchase. Under the terms of the May 2018 ASR, the specific number of shares that the Company ultimately repurchases will be based on the volume-weighted average share price of the Company's common stock during the repurchase period, less a discount.

Stock repurchase activities are as follows:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2018	2017	2018	2017
	(in thousands)			
Total shares repurchased(1)(2)	1,509	1,627	4,411	4,401
Total cost of the repurchased shares (1)(2)	$132,000	$120,000	$387,000	$300,000
Reissuance of treasury stock	1,107	1,316	2,527	3,188

(1) The first quarter of fiscal 2018 includes the settlement of the $20.0 million equity forward contract related to the September 2017 ASR.

(2) The Company also repurchased 0.4 million shares at an average price of $82.61 per share, for an aggregate purchase price of $35.0 million during the second quarter of fiscal 2018.

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 July 31,		Nine Months Ended July 31,	
	2018	2017	2018	2017
	(in thousands)			
Cost of products	$3,820	$3,358	$10,663	$9,170
Cost of maintenance and service	1,442	1,073	3,979	2,881
Research and development expense	18,412	13,617	48,958	39,069
Sales and marketing expense	7,317	5,494	20,813	15,430
General and administrative expense	6,261	4,759	18,127	13,147
Stock compensation expense before taxes	37,252	28,301	102,540	79,697
Income tax benefit	(7,111)	(8,086)	(19,574)	(22,769)
Stock compensation expense after taxes	$30,141	$20,215	$82,966	$56,928

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 $14.6 million and $25.4 million, respectively, for the three and nine months ended July 31, 2018. The Company recorded net excess tax benefits from stock-based compensation in the provision for income taxes of $18.4 million and $29.7 million, respectively, for the three and nine months ended July 31, 2017. As of July 31, 2018, there was $280.8 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 2.5 years.

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

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2018	2017	2018	2017
	(in thousands)			
Intrinsic value of awards exercised	$19,283	$20,688	$50,075	$49,344

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.

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 July 31,		Nine Months Ended July 31,	
	2018	2017	2018	2017
	(in thousands, except per share amounts)			
Numerator:				
Net income	$79,409	$116,751	$178,190	$256,645
Denominator:				
Weighted-average common shares for basic net income per share	148,490	150,214	148,760	150,460
Dilutive effect of potential common shares from equity-based compensation	4,124	4,469	4,358	4,327
Weighted-average common shares for diluted net income per share	152,614	154,683	153,118	154,787
Net income per share:				
Basic	$0.53	$0.78	$1.20	$1.71
Diluted	$0.52	$0.75	$1.16	$1.66
Anti-dilutive employee stock-based awards excluded(1)	1,063	492	774	1,186

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

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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 July 31,		Nine Months Ended July 31,	
	2018	2017	2018	2017
	(in thousands)			
Revenue:				
United States	$365,414	$358,201	$1,126,624	$1,028,108
Europe	90,657	80,260	273,136	234,259
Japan	71,981	64,119	210,805	183,023
Asia-Pacific and Other	251,662	192,801	715,411	582,846
Consolidated	$779,714	$695,381	$2,325,976	$2,028,236

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

For the three and nine months ended July 31, 2018 and 2017, 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 July 31,		Nine Months Ended July 31,	
	2018	2017	2018	2017
	(in thousands)			
Interest income	$1,096	$2,015	$3,659	$4,747
Interest expense	(4,558)	(2,320)	(11,281)	(5,487)
Gain (loss) on assets related to executive deferred compensation plan assets	8,397	6,791	14,592	22,334
Foreign currency exchange gain (loss)	1,627	278	1,725	2,877
Other, net	1,363	657	3,900	2,851
Total	$7,925	$7,421	$12,595	$27,322

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.

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

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2018	2017	2018	2017
	(in thousands)			
Income before income taxes	$71,893	$112,791	$311,295	$283,172
Provision (benefit) for income taxes	$(7,516)	$(3,960)	$133,105	$26,527
Effective tax rate	(10.5)%	(3.5)%	42.8%	9.4%

Tax Reform

The Tax Cuts and Jobs Act (Tax Act), enacted on December 22, 2017, lowered the statutory federal corporate income tax rate from 35% to 21% effective on January 1, 2018. Because the Company's fiscal 2018 commenced on November 1, 2017, the annual statutory federal corporate tax rate applicable to fiscal 2018 is a blended rate of 23.4%. Beginning in the Company's fiscal 2019, the annual statutory federal corporate tax rate will be 21%.

The Company’s effective tax rate for the nine months ended July 31, 2018 differs from the statutory federal corporate tax rate of 23.4% primarily due to accounting for the effects of the enactment of the Tax Act, which increased income tax expense by $119 million in the first quarter of fiscal 2018. The increased income tax expense was partially offset by the benefits of lower-taxed international earnings, U.S. federal and California research tax credits and excess tax benefits from stock-based compensation, and partially increased by state taxes and the tax effects 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 months ended July 31, 2018 as compared to the same period in fiscal 2017, primarily due to a decrease in the federal tax rate and an increase in research tax credits. The Company's effective tax rate increased in the nine months ended July 31, 2018, as compared to the same period in fiscal 2017, primarily due to the effects of the Tax Act.

The following accounting impacts of the Tax Act are provisional, based on currently available information and technical guidance on the interpretations of the Tax Act. The Company continues to obtain, analyze and interpret additional guidance issued by the U.S. Treasury Department, the Internal Revenue Service (IRS), state taxing jurisdictions, the FASB, and other standard-setting and regulatory bodies, as such guidance becomes available, in order to complete its accounting for the impact of the Tax Act. Additional information that is needed to complete the analysis but is currently unavailable includes, but is not limited to, the amount of earnings of certain subsidiaries as well as the amount of foreign taxes paid on such earnings, the final determination of certain net deferred tax assets subject to remeasurement and when the related temporary differences will be settled or realized, and the tax treatment of such provisions of the Tax Act by various state tax authorities. In addition, the Company does not currently have sufficient information and guidance to determine the impact of certain changes to the taxation of its foreign earnings that will become effective for the Company in its fiscal year 2019. The provisional accounting impacts may change in future reporting periods until the Company's accounting analysis is finalized, which will occur no later than the first quarter of the fiscal year 2019, as permitted by SEC Staff Accounting Bulletin 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act.

As a result of the reduction in the federal corporate tax rate, the Company remeasured its deferred taxes as of the date of enactment of the Tax Act, resulting in a first quarter provisional tax charge of $46 million based on the tax rate that is expected to apply when such deferred taxes are settled or realized in future periods.

As part of the adoption of a new territorial tax system applicable to foreign earnings, the Tax Act requires the Company to pay a one-time tax (transition tax) on previously untaxed earnings and profits of certain of the Company’s foreign subsidiaries at a rate of 15.5% on such earnings represented by foreign cash and certain other net current

assets, and 8% on the remaining earnings, in each case reduced by certain foreign tax credits. In the first quarter of fiscal 2018, the Company recorded a provisional transition tax expense of $71 million, as well as $2 million of provisional state taxes on these earnings, and income taxes payable of $78 million. The calculation of the transition tax is dependent in part on the actual amount of foreign earnings and foreign taxes for fiscal 2018, as well as potential changes to the Company's tax structure that could occur in response to the Tax Act.

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Upon further analyses of certain aspects of the Tax Act and refinement of the Company's calculations during the second quarter of fiscal 2018, the Company adjusted the provisional income taxes payable from $78 million to $18 million primarily to reflect utilization of research credits and net operating loss carryforwards that the Company believes should be available to reduce the transition tax. This adjustment resulted in a reduction of previously recognized deferred tax assets and a decrease in income tax liability, but did not change the provisional transition tax expense recorded in the first quarter of fiscal 2018. During the third quarter of fiscal 2018, proposed guidance on the transition tax was released by the IRS, which the Company is evaluating. The Company currently intends to elect to pay the transition tax over a period of eight years as permitted by the Tax Act. Refinements to the calculation of the provisional transition tax expense and potential changes to the Company's tax structure could further affect the amount of transition tax expense and transition tax payable.

The Tax Act also provides an exemption from federal income taxes for distributions by foreign subsidiaries made after December 31, 2017 that were not subject to the transition tax. The Company has provided for U.S. state income taxes and foreign withholding taxes on undistributed earnings of certain of its foreign subsidiaries to the extent such earnings are no longer considered to be indefinitely reinvested in the operations of those subsidiaries.

The Company has recorded provisional amounts for the tax effects of certain other new provisions of the Tax Act related to compensation and employee benefits in the three and nine months ended July 31, 2018, based on information currently available.

The Tax Act also introduced several new tax provisions related to the taxation of foreign earnings, discussed below:

- A tax on global intangible low-tax income (GILTI), which is determined annually based on the Company’s aggregate foreign subsidiaries’ income in excess of certain qualified business asset investment return, will be effective for the Company in its fiscal year 2019. The Company needs additional information to complete its analysis on whether to adopt an accounting policy to account for the tax effects of GILTI in the period that it is subject to such tax, or to provide deferred taxes for book and tax basis differences that upon reversal, may be subject to such tax. Accordingly, the Company has not recorded any tax with respect to GILTI in the three and nine months ended July 31, 2018. The Company will make an accounting policy election and complete the required accounting no later than the first quarter of fiscal 2019.

- A base erosion and anti-abuse tax (BEAT), which functions as a minimum tax that partially disallows deductions for certain related party transactions, that is not effective for the Company until its fiscal year 2019.

- A special tax deduction for foreign-derived intangible income (FDII), which, in general, allows a deduction of certain intangible income earned in the U.S. and derived from foreign sources, that is not effective for the Company until its fiscal year 2019.

The applicability and impact of these new tax provisions is dependent in part on potential changes to the Company's tax structure that could occur in response to the Tax Act, and on forthcoming IRS guidance.

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. In view of the Tax Court opinion, the Company amended its cost-sharing arrangement effective February 1, 2016 to exclude stock-based compensation expense on a prospective basis and has reflected the corresponding benefits in its income tax expense for fiscal year 2016 and 2017 and in its effective annual tax rate for fiscal year 2018. On July 24, 2018, the United States Court of Appeals for the Ninth Circuit reversed the decision of the Tax Court, however, subsequently withdrew the decision on August 7, 2018. A rehearing of the case has been scheduled for October 16, 2018. As the final resolution with respect to cost-sharing of stock-based compensation remains unclear, the Company is currently not planning to revise its cost-sharing arrangement and will continue to monitor developments in the Altera case.

The timing of the resolution of income tax examinations is highly uncertain, as are 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,

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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 $13 million.

As discussed in Note 11. Stock Compensation, 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. Net excess tax benefits reduced the provision for income taxes by $14.6 million and $25.4 million, respectively, for the three and nine months ended July 31, 2018 and by $18.4 million and $29.7 million, respectively, for the three and nine months ended July 31, 2017.

Non-U.S. Examinations

In July 2017, the Hungarian Tax Authority (HTA) issued a final assessment against the Company’s Hungarian subsidiary (Synopsys Hungary) for fiscal years 2011 through 2013. The HTA has disallowed Synopsys Hungary's tax positions taken during these years regarding the timing of the deduction of research expenses and applied withholding taxes on certain payments made to affiliates, resulting in an aggregate tax assessment of approximately $47 million and interest and penalties of $18 million. In addition, if the treatment of research expenses were applied to fiscal years after 2014, Synopsys Hungary could lose approximately $18 million in tax benefit in tax periods subsequent to fiscal 2017 due to the enacted reduction of Hungary’s corporate income tax rate. While the ultimate outcome is not certain, the Company believes there is no merit to the assessment and that it will ultimately prevail against the positions taken by the HTA. To that end, on August 2, 2017, Synopsys Hungary filed a claim contesting the final assessment with the Hungarian Administrative Court. On November 16, 2017, Synopsys Hungary paid the assessment as required by law, while continuing its challenge to the assessment in court. The amount paid is included in long-term prepaid taxes on the balance sheet. A court hearing was held in July 2018, and further hearings are pending. If the Company prevails, the assessment of $47 million and associated interest and penalties would be canceled, but the Hungarian statutory accounting treatment could have an indirect adverse impact on certain tax benefits in the year of the cancellation.

In the third quarter of fiscal 2017, the Company settled certain transfer pricing issues with the Korean National Tax Service for fiscal years 2012 to 2016. As a result of the settlement, the Company recognized income tax expense of $7.9 million. The Company also reached agreement with the Taiwanese tax authorities on certain tax positions for fiscal year 2014, resulting in an income tax benefit of $10.9 million.

The Company is also under examination by the tax authorities in certain other jurisdictions. No material assessments have been proposed in these examinations.

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 often uncertain and unfavorable outcomes could have a negative impact on the Company’s results of operations and financial condition. The Company regularly 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. Legal proceedings are inherently uncertain and as circumstances change, it is possible that the amount of any accrued liability may increase, decrease, or be eliminated.

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

Prior to the legal settlement on June 29, 2018 as further described below, the Company was engaged in complex patent litigation with Mentor Graphics Corporation (Mentor) involving several actions in different forums. The

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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. Mentor also filed a patent infringement lawsuit against Nihon EVE K.K. in Tokyo District Court in 2010 alleging that certain ZeBu products infringe Mentor's Japanese Patent No. P3,588,324. The litigation matter in Japan no longer exists, as the Japan IP High Court affirmed the Tokyo District Court ruling that such products did not infringe Mentor's patent.

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. Due to the affirmation of the verdict by the Federal Circuit, the Company had accrued an aggregate amount of $39.0 million as a loss contingency, which was the amount estimated to be the probable loss. The associated charge was recorded in general and administrative expenses in the income statements for the year ended October 31, 2017.

Proceedings on these patents resumed 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 September 1, 2017, the Federal Circuit denied the Company's petition for rehearing. On November 30, 2017, the Company filed a petition for certiorari with the U.S. Supreme Court seeking review of the Federal Circuit's ruling. The parties completed briefing on March 27, 2018. On April 4, 2018, the Company's petition was distributed for conference by the Supreme Court. On April 23, 2018, the Solicitor General was invited to file a brief on behalf of the United States.

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

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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 sought review of the Federal Circuit’s ruling in the U.S. Supreme Court, and on October 2, 2017, the U.S. Supreme Court denied the Company's petition.

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. On July 28, 2017, cross-motions for summary judgment were argued, and the Company’s suit challenging the PTO’s decision not to reexamine claims 1 and 28 was dismissed on November 15, 2017. On March 26, 2018, the Company appealed the dismissal to the Federal Circuit. The PTO’s response was due on June 6, 2018.

On May 22, 2017, the Company petitioned for ex parte reexamination of certain claims of the ‘882 patent. On June 20, 2017, the PTO instituted reexamination on all of the challenged claims and on October 23, 2017 rejected the challenged claims of the ‘882 patent. On March 9, 2018, the PTO withdrew its rejection of the challenged claims.

Legal Settlement

In March 2017, Siemens PLM Software (Siemens) acquired Mentor. On June 29, 2018, the Company and Siemens settled all outstanding patent litigation between the Company and Mentor for a $65.0 million payment made in the current quarter from the Company to Siemens. As noted above, the Company had previously accrued $39.0 million and recorded the remaining $26.0 million as an expense in the current quarter. As a result of the settlement, the litigation with Mentor was dismissed and the injunction entered in connection with that litigation was vacated.

The settlement included mutual seven-year patent cross-licenses between the Company and Siemens, and between the Company and Mentor. The Company and Mentor also amended an existing interoperability agreement to collaborate on a wide range of EDA products for the benefit of their mutual customers. The amendment includes a one-time termination charge between $0 and $25.0 million, payable to Mentor under certain conditions.

Tax Matters

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, and 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.

In addition to the foregoing, the Company is, from time to time, party to various other claims and legal proceedings in the ordinary course of our business, including with tax and other governmental authorities. For a description of certain

of these other matters, refer to Note 15. Taxes.

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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 and electronics industries, and the effects of consolidation among our customers and within the industries in which we operate, 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, 2017, as filed with the SEC on December 14, 2017.

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 security and quality of their applications. We are 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. 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 are used to improve the security and quality of software code in a wide variety of industries, including electronics, financial services, media, automotive, medicine, energy and industrials.

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, a number of consolidations have taken place in the semiconductor industry over the past several years. While we do not believe customer consolidations have had a material impact on our results, the future impact of ongoing consolidation 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 consistently grown our revenue since 2005. 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 consists of time-based products, maintenance and service 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 security and quality market. As we continue to expand our product portfolio and our total addressable market, for instance in the software security and quality space, and as hardware product sales grow, we expect to 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.

Fiscal Year End

Our fiscal year ends on the Saturday nearest to October 31 and consists of 52 weeks, with the exception that every five or six years, we have a 53-week year. When a 53-week year occurs, we include the additional week in the first quarter to realign fiscal quarters with calendar quarters. Fiscal 2018 will be a 53-week year and will end on November 3, 2018, which will impact our revenue, expenses and operating results. Fiscal 2017 was a 52-week year and ended on October 28, 2017.

Our results of operations for the first nine months of fiscal 2018 and 2017 included 40 weeks and 39 weeks, respectively, and ended on August 4, 2018 and July 29, 2017, respectively. The extra week in the first quarter of fiscal 2018 resulted in approximately $46 million of additional revenue, and approximately $34 million of additional expenses. For presentation purposes, the unaudited condensed consolidated financial statements and accompanying notes refer to the closest calendar month end.

Financial Performance Summary

In the third quarter of fiscal 2018, compared to the same period of fiscal 2017:

- Revenues were $779.7 million, an increase of $84.3 million, or 12%, primarily driven by the overall growth in our business mainly due to higher TSL license revenue.
- Total cost of revenue and operating expenses were $715.7 million, an increase of $125.7 million, or 21%, primarily due to increases in headcount, including those from acquisitions, and due to the Mentor Graphics Corporation (Mentor) litigation settlement in the third quarter of fiscal 2018.
- Operating income of $64.0 million, a decrease of $41.4 million or 39%.

Effect of New Accounting Pronouncements Not Yet Adopted

In May 2014, the Financial Accounting Standards Board (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 amendments that defer the initially proposed adoption date, clarify accounting for licenses of intellectual property, and identify performance obligations.

Topic 606 will be effective for us beginning in fiscal 2019, including interim periods within that reporting period. The ASU permits two retrospective methods for adoption. We will adopt 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.

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Under the modified retrospective transition method, we will evaluate each contract that is effective on the adoption date as if that contract had been accounted for under Topic 606 from contract inception. Some revenue that would have been recognized in future periods under Topic 605 will be recast under Topic 606 as if the revenue had been recognized in prior periods. As this transition method requires that we do not adjust historical reported revenue amounts, the revenue that would have been recognized under this method prior to the adoption date will be a cumulative catch-up adjustment to retained earnings and will not be recognized as revenue in future periods as previously planned. Because we expect that a slightly lower percentage of our revenue will be recognized over time under Topic 606, we expect to have a small percentage of our year-end backlog to be adjusted to retained earnings upon adoption.

We derive the majority of our total revenue from Technology Subscription License (TSL) contracts. We believe that the promised licenses of software (i.e., functional intellectual property) and the promise to provide substantive, timely, and technologically relevant updates and services in our 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, we have concluded that this single overall promise will be recognized as revenue over the term of the contract period. Accordingly, we expect that there will be not be a material change in the nature and timing of revenue recognition for our TSL contracts under Topic 606.

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

We continue 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 VSOE for undelivered elements is not necessary to separate revenue from delivered software licenses, which is an essential criterion for separation under the current revenue standard, revenue would no longer be recognized over the arrangement period for certain of our term licenses and IP licenses.

Topic 606 also requires the deferral of incremental costs of obtaining a contract with a customer. This will require us 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. As commissions paid for renewals are commensurate with the amounts paid for initial contracts, the deferred incremental costs will be recognized over the contract term. Under the existing rules, we expense commissions based on shipments. We do not expect this change to have a material impact to our commission expenses.

We are currently implementing processes and controls to assist in the adoption of Topic 606.

In February 2016, the FASB issued ASU 2016-02, "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 us in fiscal 2020, including interim periods within that reporting period, and earlier adoption is permitted. We are currently in the process of evaluating the impact of adoption on our 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 us in fiscal 2019, including interim periods within that reporting period, and earlier adoption is permitted. We are currently in the process of evaluating the impact of adoption on our consolidated financial statements.

In August 2017, the FASB issued ASU 2017-12, "Derivatives and Hedging (Topic 815), Targeted Improvements to Accounting for Hedging Activities." This ASU requires expanded hedge accounting for risk components and refining the measurement of hedge results to better reflect an entity's hedging strategies. This ASU also amends the presentation and disclosure requirements and changes how entities assess hedge effectiveness. This ASU will be effective for fiscal 2020, including interim periods within that reporting period, and earlier adoption is permitted. We are currently in the process of evaluating the impact of adoption on our 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

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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, 2017, filed with the SEC on December 14, 2017.

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 hardware products, 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 primarily utilize 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.

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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 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 July 31, 2018 and 2017, the weighted-average license term was 2.5 years.
- 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.
- 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 these arrangements 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 revenue 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 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.

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.

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Total Revenue

	July 31, 2018	2017	$ Change	% Change
	(dollars in millions)			
Three months ended	$779.7	$695.4	$ 84.3	12 %
Nine months ended	$2,326.0	$2,028.2	$ 297.8	15 %

Our revenues are 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 due to certain contracts where revenue is recognized when customer installment payments are due. As revenue from hardware sales is 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 nine months ended July 31, 2018 compared to the same periods in fiscal 2017 was primarily attributable to the overall growth in our business mainly due to higher TSL license revenue from arrangements booked in prior periods. Higher sales of hardware products also contributed to the increase for the nine months ended July 31, 2018. The increase for the nine-month period also included revenues of approximately $46 million due to an extra week in the first quarter of fiscal 2018 compared to fiscal 2017.

Time-Based Products Revenue

	July 31, 2018	2017	$ Change	% Change
	(dollars in millions)			
Three months ended	$570.1	$503.5	$ 66.6	13 %
Percentage of total revenue	73 %	73 %		
Nine months ended	$1,697.8	$1,494.0	$ 203.8	14 %
Percentage of total revenue	73 %	74 %		

The increase in time-based products revenue for the three and nine months ended July 31, 2018 compared to the same periods in fiscal 2017 was primarily attributable to an increase in TSL license revenue due to arrangements booked in prior periods. The increase for the nine-month period also included additional revenue due to an extra week in the first quarter of fiscal 2018 compared to fiscal 2017.

Upfront Products Revenue

	July 31, 2018	2017	$ Change	% Change
	(dollars in millions)			
Three months ended	$99.6	$100.3	$ (0.7)	(1)%
Percentage of total revenue	13 %	14 %		
Nine months ended	$291.1	$263.3	$ 27.8	11 %
Percentage of total revenue	13 %	13 %		

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.

Upfront products revenue for the three months ended July 31, 2018 compared to the same period in fiscal 2017 was flat due to a slight increase in the sale of perpetual licenses mainly for IP products offset by a slight decrease in the sale of hardware products.

The increase in upfront products revenue for the nine months ended July 31, 2018 compared to the same period in fiscal 2017 was primarily attributable to an increase in the sale of hardware products and IP products driven by higher demand from customers and timing of shipments based on customer requirements.

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As our sales of hardware products fluctuate, upfront products revenue as a percentage of total revenue will likely fluctuate. Such fluctuations will continue to be impacted by the timing of shipments based on customer requirements.

Maintenance and Service Revenue

	July 31, 2018	2017	$ Change	% Change
	(dollars in millions)			
Three months ended				
Maintenance revenue	$25.0	$22.4	$ 2.6	12 %
Professional services and other revenue	85.1	69.2	15.9	23 %
Total maintenance and service revenue	$110.1	$91.6	$ 18.5	20 %
Percentage of total revenue	14 %	13 %		
Nine months ended				
Maintenance revenue	$74.6	$61.5	$ 13.1	21 %
Professional services and other revenue	262.5	209.4	53.1	25 %
Total maintenance and service revenue	$337.1	$270.9	$ 66.2	24 %
Percentage of total revenue	14 %	13 %		

The increase in maintenance revenue for the three and nine months ended July 31, 2018 compared to the same periods in fiscal 2017 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 nine months ended July 31, 2018 compared to the same period in fiscal 2017 was primarily due to the increase in consulting projects, including contributions from acquisitions. The increase for the nine-month period also included additional revenue due to an extra week in the first quarter of fiscal 2018 compared to fiscal 2017.

We expect our professional services revenue to continue 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

	July 31, 2018	2017	$ Change	% Change
	(dollars in millions)			
Three months ended				
Cost of products revenue	$115.4	$107.1	$ 8.3	8 %
Cost of maintenance and service revenue	49.8	43.8	6.0	14 %
Amortization of intangible assets	20.2	18.6	1.6	9 %
Total	$185.4	$169.5	$ 15.9	9 %
Percentage of total revenue	24 %	24 %		
Nine months ended				
Cost of products revenue	$335.0	$305.0	$ 30.0	10 %
Cost of maintenance and service revenue	150.7	122.6	28.1	23 %
Amortization of intangible assets	59.6	59.7	(0.1)	— %
Total	$545.3	$487.3	$ 58.0	12 %
Percentage of total revenue	23 %	24 %		

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.

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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 July 31, 2018 compared to the same period in fiscal 2017 was primarily due to an increase of $10.4 million in personnel-related costs as a result of headcount increases including those from acquisitions.

The increase in cost of revenue for the nine months ended July 31, 2018 compared to the same period in fiscal 2017 was primarily due to an increase of $41.6 million in personnel-related costs as a result of headcount increases including those from acquisitions as well as one additional week of expenses of approximately $4.5 million.

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

Operating Expenses

Research and Development

	July 31, 2018	2017	$ Change	% Change
	(dollars in millions)			
Three months ended	$277.4	$228.7	$ 48.7	21 %
Percentage of total revenue	36 %	33 %		
Nine months ended	$793.9	$664.3	$ 129.6	20 %
Percentage of total revenue	34 %	33 %		

The increase in research and development expenses for the three months ended July 31, 2018 compared to the same period in fiscal 2017 was primarily due to an increase of $38.6 million in personnel-related costs as a result of headcount increases, including those from acquisitions.

The increase in research and development expenses for the nine months ended July 31, 2018 compared to the same period in fiscal 2017 was primarily due to an increase of $85.4 million in personnel-related costs as a result of headcount increases, including those from acquisitions, one additional week of expenses of approximately $19.3 million.

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

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Sales and Marketing

	July 31, 2018	2017	$ Change	% Change
	(dollars in millions)			
Three months ended	$158.0	$131.5	$ 26.5	20 %
Percentage of total revenue	20 %	19 %		
Nine months ended	$455.7	$395.2	$ 60.5	15 %
Percentage of total revenue	20 %	19 %		

The increase in sales and marketing expenses for the three months ended July 31, 2018 compared to the same period in fiscal 2017 was primarily due to an increase of $15.4 million in personnel-related costs as a result of headcount increases, an increase of $4.1 million in variable compensation primarily due to timing of shipments, as well as an increase of $3.9 million due to timing of marketing events.

The increase in sales and marketing expenses for the nine months ended July 31, 2018 compared to the same period in fiscal 2017 was primarily due to an increase of $39.5 million in personnel-related costs as a result of headcount increases, an increase of $5.1 million due to timing of marketing events, and one additional week of expenses of approximately $5.8 million.

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

General and Administrative

	July 31, 2018	2017	$ Change	% Change
	(dollars in millions)			
Three months ended	$84.3	$46.4	$ 37.9	82 %
Percentage of total revenue	11 %	7 %		
Nine months ended	$199.5	$170.7	$ 28.8	17 %
Percentage of total revenue	9 %	8 %		

The increase in general and administrative expenses for the three months ended July 31, 2018 compared to the same period in fiscal 2017 was primarily due to an increase of $26.0 million in legal expenses from a litigation settlement, an increase of $5.7 million in personnel-related costs as a result of headcount increases, as well as an increase of $5.5 million in professional service costs.

The increase in general and administrative expenses for the nine months ended July 31, 2018 compared to the same period in fiscal 2017 was primarily due to an increase of $15.8 million in personnel-related costs as a result of headcount increases, an increase of $17.3 million in professional service costs, and one additional week of expenses of approximately $4.1 million. The increase was partially offset by a decrease of $12.0 million in litigation accrual due to a $38.0 million loss contingency that was recorded for a litigation in the second quarter of fiscal 2017, compared to $26.0 million in fiscal 2018.

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

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Amortization of Intangible Assets

	July 31, 2018	2017	$ Change	% Change
	(dollars in millions)			
Three months ended				
Included in cost of revenue	$20.2	$18.6	$ 1.6	9 %
Included in operating expenses	10.7	7.9	2.8	35 %
Total	$30.9	$26.5	$ 4.4	17 %
Percentage of total revenue	4 %	4 %		
Nine months ended				
Included in cost of revenue	$59.6	$59.7	$ (0.1)	— %
Included in operating expenses	30.9	23.8	7.1	30 %
Total	$90.5	$83.5	$ 7.0	8 %
Percentage of total revenue	4 %	4 %		

Amortization of intangible assets for the three and nine months ended July 31, 2018 compared to the same periods in fiscal 2017 increased primarily due to additions of acquired intangible assets, partially offset by intangible assets that were fully amortized. See Note 4 of the Notes to Unaudited Condensed Consolidated Financial Statements for a schedule of future amortization amounts.

Restructuring Charges

During the nine months ended July 31, 2018, we incurred restructuring charges of approximately $1.9 million as part of a business realignment. Total charges under this realignment are expected to be $8.0 million to $10.0 million consisting of severance and benefits in fiscal 2018.

During the three and nine months ended July 31, 2017, we incurred restructuring charges of $6.0 million and $31.0 million, respectively, for involuntary and voluntary employee termination actions. See Note 7 of the Notes to Unaudited Condensed Consolidated Financial Statements for additional information related to our restructuring charges.

Other Income (Expense), net

	July 31, 2018	2017	$ Change	% Change
	(dollars in millions)			
Three months ended				
Interest income	$1.1	$2.0	$ (0.9)	(45)%
Interest (expense)	(4.6)	(2.3)	(2.3)	100 %
Gain (loss) on assets related to executive deferred compensation plan	8.4	6.8	1.6	24 %
Foreign currency exchange gain (loss)	1.6	0.3	1.3	433 %
Other, net	1.4	0.6	0.8	133 %
Total	$7.9	$7.4	$ 0.5	7 %
Nine months ended				
Interest income	$3.7	$4.7	$ (1.0)	(21)%
Interest (expense)	(11.3)	(5.5)	(5.8)	105 %
Gain (loss) on assets related to executive deferred compensation plan	14.6	22.3	(7.7)	(35)%
Foreign currency exchange gain (loss)	1.7	2.9	(1.2)	(41)%
Other, net	3.9	2.9	1.0	34 %
Total	$12.6	$27.3	$ (14.7)	(54)%

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Other income (expense), net, for the three months ended July 31, 2018 compared to the same period in fiscal 2017 remained relatively flat.

Other income (expense), net, for the nine months ended July 31, 2018 was lower compared to the same period in fiscal 2017, primarily due to lower gains in the market value of our executive deferred compensation plan assets and higher interest expense due to a higher debt balance.

Taxes

Our effective tax rate decreased in the three months ended July 31, 2018 as compared to the same period in fiscal 2017, primarily due to a decrease in the federal corporate tax rate and an increase in research tax credits. Our effective tax rate increased in the nine months ended July 31, 2018, as compared to the same period in fiscal 2017, primarily due to the effects of the Tax Cuts and Jobs Act (Tax Act), enacted on December 22, 2017. The Tax Act transitions the U.S. tax system to a new territorial system and lowers the statutory federal corporate income tax rate from 35% to 21%.

The reduction of the statutory federal corporate tax rate to 21% became effective on January 1, 2018. In fiscal 2018, our statutory federal corporate tax rate is a blended rate of 23.4%, which will be reduced to 21% in fiscal 2019 and thereafter.

We have made provisional estimates of the accounting impacts of certain provisions of the Tax Act. We continue to obtain, analyze and interpret additional guidance issued and will revise our estimates as additional information becomes available. The provisional accounting impacts may change in future reporting periods until the accounting is finalized, which will occur no later than the first quarter of fiscal 2019. The applicability and impact of these new tax provisions is dependent in part on potential changes to our tax structure that could occur in response to the Tax Act, and on forthcoming Internal Revenue Service guidance.

As a result of the reduction in the federal corporate tax rate, we remeasured our deferred taxes, resulting in a first quarter provisional tax charge of $46 million based on the tax rate that will apply when these deferred taxes are settled or realized in future periods.

As part of the adoption of new territorial tax system, the Tax Act requires us to pay a one-time transition tax on previously untaxed earnings and profits of certain of our foreign subsidiaries at a rate of 15.5% on such earnings represented by foreign cash and certain other net current assets, and 8% on the remaining earnings, in each case reduced by certain foreign tax credits. In the first quarter of fiscal 2018, we recorded a provisional transition tax expense of $71 million, as well as $2 million of provisional state taxes on these earnings, and income taxes payable of $78 million. The calculation of the transition tax is dependent in part on the actual amount of foreign earnings and foreign taxes for fiscal 2018, as well as potential changes to our tax structure that could occur in response to the Tax Act.

Upon further analyses of certain aspects of the Tax Act and refinement of our calculations during the second quarter of fiscal 2018, we adjusted the provisional income taxes payable from $78 million to $18 million primarily to reflect utilization of research credits and net operating loss carryforwards that we believe should be available to reduce the transition tax. This adjustment resulted in a reduction of previously recognized deferred tax assets and a decrease in income tax liability, but did not change the provisional transition tax expense recorded in first quarter of fiscal 2018.

During the third quarter of fiscal 2018, proposed guidance on the transition tax was released by the IRS, which we are evaluating. We currently intend to elect to pay the transition tax over a period of eight years as permitted by the Tax Act. Refinements to the calculation of the provisional transition tax expense and potential changes to our tax structure could further affect the amount of transition tax expense and transition tax payable.

As part of the adoption of a territorial tax system, the Tax Act also provides an exemption from federal income taxes for distributions from foreign subsidiaries made after December 31, 2017 that were not subject to the one-time transition tax. We have provided for U.S. state income and foreign withholding taxes on undistributed earnings of certain of our foreign subsidiaries to the extent such earnings are no longer considered to be indefinitely reinvested in the operations of those subsidiaries.

For further discussion of the provision for income taxes and impacts related to the Tax Act, see Note 15 of the Notes to Unaudited Condensed Consolidated Financial Statements.

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Liquidity and Capital Resources

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

As of July 31, 2018, we held an aggregate of $134.8 million in cash and cash equivalents in the United States and an aggregate of $606.4 million in our foreign subsidiaries. As a result of the Tax Act enacted on December 22, 2017, we have recorded a provisional tax liability for the transition tax on foreign earnings, payable over eight years, of $15 million reflected as a long-term liability, as well as state taxes of $3 million. If we decide to repatriate the undistributed earnings of our foreign subsidiaries for use in the U.S. in the future, the earnings that were subject to the transition tax would not be subject to further U.S. tax. In addition, we have provided state and foreign deferred taxes on our undistributed earnings sufficient to address the incremental tax that would be due on future foreign earnings. We expect to incur certain nonrecurring tax liabilities in the near future as a result of changes to our tax structure in connection with the Tax Act and other international tax changes.

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 nine months ended July 31, 2018.

Cash and Cash Equivalents

	July 31, 2018	October 31, 2017	$ Change	% Change
	(dollars in millions)			
Cash and cash equivalents	$741.2	$ 1,048.4	$(307.2)	(29)%

Cash and cash equivalents decreased primarily due to cash used for acquisitions, stock repurchases under our accelerated stock repurchase agreements (the December 2017 ASRs), repayment of debt, and purchases of property and equipment. Cash used was partially offset by net proceeds from our credit facilities and term loan.

Cash Flows

	July 31, 2018	2017	$ Change
	(dollars in millions)		
Nine months ended			
Cash provided by operating activities	$293.3	$449.7	$(156.4)
Cash used in investing activities	(705.9)	(245.0)	(460.9)
Cash provided by (used in) financing activities	109.3	(25.9)	135.2

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 nine months ended July 31, 2018 was lower compared to the same period in fiscal 2017, primarily due to higher vendor disbursements and tax payments, partially offset by stronger collections from customers.

Cash used in investing activities. Cash used in investing activities for the nine months ended July 31, 2018 was higher compared to the same period in fiscal 2017, primarily due to cash paid for acquisitions of $646.7 million.

Cash provided by (used in) financing activities. Cash provided by financing activities for the nine months ended July 31, 2018 was higher compared to the same period in fiscal 2017, primarily due to higher proceeds from our credit facilities and term loan, net of repayments, of $246.3 million, partially offset by higher stock repurchase activities of $100.0 million.

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Accounts Receivable, net

	July 31, 2018	October 31, 2017	$ Change	% Change
	(dollars in millions)			
Accounts Receivable, net	$501.3	$ 451.1	$ 50.2	11 %

Changes in our accounts receivable balance are primarily driven by timing of customer billing, collection activities and to a lesser extent, customer receivables acquired through our acquisitions.

Working Capital

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

	July 31, 2018	October 31, 2017	$ Change	% Change
	(dollars in millions)			
Current assets	$1,465.6	$ 1,682.6	$(217.0)	(13)%
Current liabilities	2,083.4	1,614.1	469.3	29 %
Working capital	$(617.8)	$ 68.5	$(686.3)	(1,002)%

Decreases in our working capital were primarily due to a decrease in cash and cash equivalents of $307.2 million, and an increase in short term debt of $487.9 million, which were partially offset by a decrease in accounts payable and accrued liabilities of $50.8 million, and an increase in accounts receivable of $50.2 million.

Other Commitments—Credit Facility

In July 2018, we entered into a 220.0 million RMB (approximately $33.0 million) credit agreement with a lender in China. Borrowings bear interest at a floating rate based on the Chinese Central Bank rate plus 10% of such rate. We expect to draw on the credit facility from quarter to quarter as needed.

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 us to operate within a maximum leverage ratio and a minimum interest coverage ratio, as well as other non-financial covenants. As of July 31, 2018, we were in compliance with all financial covenants.

As of July 31, 2018, we had a $136.6 million outstanding balance, net of debt issuance costs, under the Term Loan, of which $123.8 million is classified as long-term liabilities. Outstanding principal payments under the Term Loan are due as follows:

Fiscal year	(in thousands)
Remainder of fiscal 2018	$ 2,813
2019	14,062
2020	17,813
2021	27,187
2022	75,000
Total	$ 136,875

As of October 31, 2017, we had a $144.0 million outstanding balance, net of debt issuance costs, under the Term Loan, of which $134.1 million is classified as long-term liabilities, and no outstanding balance under the Revolver.

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In December 2017, we drew down $450.0 million under the Revolver and the total outstanding balance of the Revolver as of July 31, 2018 was $485.0 million after partial repayments, which is included in short-term liabilities. We expect the 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 July 31, 2018, 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.

Other

As of July 31, 2018, our cash equivalents consisted of taxable money market mutual funds. We follow an established investment policy and set of guidelines to monitor, manage and limit our exposure to interest rate and credit risk. We proactively manage our cash equivalents 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 equivalents 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, 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.

Contractual Obligations

The following table summarizes our contractual obligations as of July 31, 2018:

	Total	Remainder of Fiscal 2018	Fiscal 2019/ Fiscal 2020	Fiscal 2021/ Fiscal 2022	Thereafter	Other
	(in thousands)					
Operating Leases	$587,986	$ 47,428	$ 89,430	$ 98,915	$ 352,213	$—
Purchase Obligations(1)	404,376	79,953	324,336	87	—	—
Other Long-Term Obligations(2)	624,348	487,698	33,600	103,050	—	—
Long term accrued income taxes(3)	23,229	—	—	—	—	23,229
Total	$1,639,939	$ 615,079	$ 447,366	$ 202,052	$ 352,213	$23,229

(1) Purchase obligations represent an estimate of all open purchase orders and contractual obligations in the ordinary course of business as of July 31, 2018. Although open purchase orders are considered enforceable and legally binding, the terms generally allow us the option to cancel, reschedule or adjust our requirements based on our business needs prior to the delivery of goods or performance of services.

(2) These other obligations include our Term Loan, Revolver, and associated fees.

(3) Long-term accrued income taxes represent uncertain tax benefits as of July 31, 2018. Currently, a reasonably reliable estimate of timing of payments in individual years beyond fiscal 2018 cannot be made due to uncertainties in timing of the commencement and settlement of potential tax audits.

The expected timing of payments of the obligations discussed above is estimated based on current information. Timing of payment and actual amounts paid may be different depending on the time of receipt of goods or services or changes to agreed-upon amounts for certain obligations.

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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 July 31, 2018, our exposure to market risk has not changed materially since October 31, 2017. 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, 2017, filed with the SEC on December 14, 2017.

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Item 4. Controls and Procedures

(a) Evaluation of Disclosure Controls and Procedures. As of July 31, 2018, 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 July 31, 2018, 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.

(b) Changes in Internal Control over Financial Reporting. There were no changes in Synopsys' internal control over financial reporting during the three months ended July 31, 2018 that have materially affected, or are reasonably likely to materially affect, Synopsys' internal control over financial reporting.

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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 often 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.

We regularly review the status of each significant matter and assess its potential financial exposure. If the potential loss from any claim or legal proceeding is considered probable and the amount is estimable, we accrue a liability for the estimated loss. Legal proceedings are inherently uncertain and as circumstances change, it is possible that the amount of any accrued liability may increase, decrease, or be eliminated.

Mentor Patent Litigation

Prior to the legal settlement on June 29, 2018 as further described below, we were 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. Mentor also filed a patent infringement lawsuit against Nihon EVE K.K. in Tokyo District Court in 2010 alleging that certain ZeBu products infringe Mentor’s Japanese Patent No. P3,588,324. The litigation matter in Japan no longer exists, as the Japan IP High Court affirmed the Tokyo District Court ruling that such products did not infringe Mentor's patent.

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

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Mentor's '176, '531 and '882 patents and the Company's '109 patent. Due to the affirmation of the verdict by the Federal Circuit, the Company had accrued an aggregate amount of $39.0 million as a loss contingency, which was the amount estimated to be the probable loss. The associated charge was in general and administrative expenses in the income statements for the year ended October 31, 2017.

Proceedings on these patents resumed 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 September 1, 2017, the Federal Circuit denied the Company's petition for rehearing. On November 30, 2017, the Company filed a petition for certiorari with the U.S. Supreme Court seeking review of the Federal Circuit's ruling. The parties completed briefing on March 27, 2018. On April 4, 2018, the Company's petition was distributed for conference by the Supreme Court. On April 23, 2018, the Solicitor General was invited to file a brief on behalf of the United States.

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 sought review of the Federal Circuit's ruling in the U.S. Supreme Court, and on October 2, 2017, the U.S. Supreme Court denied the Company's petition.

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. On July 28, 2017, cross-motions for summary judgment were argued, and the Company's suit challenging the PTO's decision not to reexamine claims 1 and 28 was dismissed on November 15, 2017. On March 26, 2018, the Company appealed the dismissal to the Federal Circuit. The PTO's response was due on June 6, 2018.

On May 22, 2017, the Company petitioned for ex parte reexamination of certain claims of the ‘882 patent. On June 20, 2017, the PTO instituted reexamination on all of the challenged claims and on October 23, 2017 rejected the challenged claims of the ‘882 patent. On March 9, 2018, the PTO withdrew its rejection of the challenged claims.

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Legal Settlement

In March 2017, Siemens PLM Software (Siemens) acquired Mentor. On June 29, 2018, the Company and Siemens settled all outstanding patent litigation between the Company and Mentor for a $65.0 million payment made in the current quarter from the Company to Siemens. As noted above, the Company had previously accrued $39.0 million and recorded the remaining $26.0 million as an expense in the current quarter. As a result of the settlement, the litigation with Mentor was dismissed and the injunction entered in connection with that litigation was vacated.

The settlement included mutual seven-year patent cross-licenses between the Company and Siemens, and between the Company and Mentor. The Company and Mentor also amended an existing interoperability agreement to collaborate on a wide range of EDA products for the benefit of their mutual customers. The amendment includes a one-time termination charge between $0 and $25.0 million, payable to Mentor under certain conditions.

Other Proceedings

In July 2017, the Hungarian Tax Authority (HTA) issued a final assessment against the Company's Hungarian subsidiary (Synopsys Hungary) for fiscal years 2011 through 2013. The HTA has disallowed Synopsys Hungary's tax positions taken during these years regarding the timing of the deduction of research expenses and applied withholding taxes on certain payments made to affiliates, resulting in an aggregate tax assessment of approximately $47 million and interest and penalties of $18 million. On August 2, 2017, Synopsys Hungary filed a claim contesting the final assessment with the Hungarian Administrative Court. On November 16, 2017, Synopsys Hungary paid the assessment, while continuing its challenge to the assessment in court. The amount paid is included in long-term prepaid taxes on the balance sheet. Hearings were held in February and July 2018, and further hearings are pending.

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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.

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 in recent years, there are still uncertainties surrounding the strength of the recovery in many regions. 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. Such caution by semiconductor companies could, among other things, limit our ability to maintain or increase our sales or recognize revenue from committed contracts.

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We cannot predict the stability of the economy as a whole or the industries in which we operate. Further economic instability could adversely 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. There is uncertainty regarding how proposed, contemplated or future changes to the complex law, and regulations governing our industry, the banking and financial services industry, and the economy could affect our business. In addition, economic conditions could deteriorate in the future, and, in particular, the semiconductor and electronics industries could fail to grow, including as the result of any disruption of international trade relationships. 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. Any of the foregoing could cause adverse effects on our business, operating results and financial condition, and could cause our stock price to decline.

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 impacts on our relationships with customers, distributors and business partners;
- 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.

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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-especially products, such as hardware, generating upfront revenue-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 in tax rules, as well as changes to our effective tax rate, including the tax effects of infrequent or unusual transactions and tax audit settlements;
- 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, such as disruptions to international trade relationships, including tariffs, export licenses, or other trade barriers affecting our or our suppliers' products.

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, such as hardware;
- 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 as to which customers have paid for early access;
- Customer contract amendments or renewals that provide discounts or defer revenue to later periods;
- 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.

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We compete against EDA vendors that offer a variety of products and services, such as Cadence Design Systems, Inc. and Mentor Graphics Corporation (which was recently acquired by Siemens AG). 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. Moreover, our customers internally develop design tools and capabilities that compete with our products, including internal designs that compete with our IP products.

In the area of IP products, we compete against numerous other IP providers as well as our customers' internally developed IP. In the area of Software Integrity solutions, we compete with numerous other solution providers, many of which focus on specific aspects of software security or quality analysis. We also compete with frequent new entrants, which include start-up companies and more established software companies.

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 business, financial condition, or 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 position, 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:

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- 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, relevant intellectual property rights, or established customer relationships than we currently do;
- Our ability to skillfully balance our investment in adjacent markets with investment in our existing products and services;
- 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.

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 cyber attacks. 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 offer software security and quality testing solutions. If we fail to identify new and increasingly sophisticated methods of cyber attack, 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 growth and recent acquisitions in the software security and quality testing space may increase our visibility as a security-focused company and may make us a more attractive target for attacks on our own

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information technology infrastructure. Successful attacks could damage our reputation as a security-focused company.

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 or weaker legal protection of intellectual property rights;
- Uncertain economic and political conditions in countries where we do business;
- Difficulties in adapting to cultural differences in the conduct of business, which may include business practices in which we are prohibited from engaging 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 uncertainty around changes in tax laws of various countries; and
- Other factors beyond our control such as natural disasters, terrorism, civil unrest, war and infectious diseases.

As our business volume increases in the Asia Pacific region, there is inherent risk, based on the complex relationships between certain Asian countries and the United States, that governmental influences could result in trade disruptions. For example, the U.S. and Chinese governments proposed new or increased tariffs on certain products imported from the other country. If put into effect, these or similar actions could impact our and our customers' and suppliers' businesses and our results of operations. Furthermore, 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.

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. In addition, there is uncertainty regarding how proposed, contemplated or future changes to these complex laws and regulations could affect our business. We may incur substantial expense in complying with the new obligations to be imposed by these laws and regulations, and we may be required to make significant changes in our business operations, all of which may adversely affect our revenues and our business overall. 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, agents or partners 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.

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

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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.

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.

Our hardware products, which primarily consist of prototyping and emulation systems, subject us to distinct risks.

The growth of our hardware products subject us to several 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;
- Increasingly variable revenue and decreasingly accurate revenue forecasts, due to fluctuations in hardware revenue, which is recognized upfront upon shipment, as opposed to most sales of 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.

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.

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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 Part II, Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations-Overview-Effect of New Accounting Pronouncements Not Yet Adopted. 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.

Our results could be adversely affected by a change in our effective tax rate as a result of tax law changes and related new or revised guidance and regulations, changes in our geographical earnings mix, unfavorable government reviews of our tax returns, material differences between our forecasted and actual annual effective tax rates, future changes to our tax structure or by evolving enforcement practices.

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 and impact our financial position and cash flows.

On December 22, 2017, the President of the United States signed into law the Tax Cuts and Jobs Act (Tax Act), which significantly changed prior U.S. tax law and includes numerous provisions that affect our business in the current year and future years. Accounting for these provisions in fiscal 2018 requires the use of provisional estimates in our financial statements, and the exercise of significant judgment in accounting for the Tax Act's provisions. As regulations and guidance evolve with respect to the Tax Act, and as we gather more information and perform more analysis, our results may materially differ from previous estimates, and those differences may materially affect our financial position. In addition, the Tax Act includes certain new provisions that will affect our income from foreign operations beginning in our fiscal 2019, as well as a lower corporate tax rate on income from domestic operations. The applicability and impact of these new tax provisions is dependent in part on potential changes to our tax structure that could occur in response to the Tax Act. The net impact of such changes is uncertain, and could adversely affect our tax rate and cash flow in future years.

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 the changes were effective in fiscal 2017. Changes to these and other areas in relation to international tax reform, including future actions taken by foreign governments in response to the Tax Act, could increase uncertainty and may adversely affect our tax rate and cash flow in future years.

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, including future taxes payable related to the transition tax on earnings from their foreign operations, if any, under the Tax Act. 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.

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In July 2017, the Hungarian Tax Authority (HTA) issued a final assessment against our Hungarian subsidiary (Synopsys Hungary) for fiscal years 2011 through 2013. The HTA has disallowed Synopsys Hungary's tax positions taken during those years regarding the timing of the deduction of research expenses and applied withholding taxes on certain payments made to affiliates, resulting in an aggregate tax assessment of approximately $47 million and interest and penalties of $18 million. We paid the tax assessments, penalties and interest in the first quarter of fiscal 2018 as required by law, and we continue to appeal the assessment through the Hungarian Administrative Court. The amount paid is included in long-term prepaid taxes on the balance sheet. In addition, if the HTA's treatment of research expenses were applied to fiscal years after 2014, Synopsys Hungary could lose approximately $18 million in tax benefits in tax periods subsequent to fiscal 2017 due to the enacted reduction of Hungary's corporate income tax rate. If the assessment is ultimately canceled, the Hungarian statutory accounting treatment could have an indirect adverse impact on certain tax benefits in the year of the cancellation.

We are also under examination by the tax authorities in certain other jurisdictions. No material assessments have been proposed in these examinations.

We maintain significant deferred tax assets related to federal research 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 July 31, 2018, approximately 82% of our worldwide cash, cash equivalents and short-term investments balance is held by our international subsidiaries. We intend to meet our U.S. cash spending needs, including the Tax Act provisional transition tax, primarily through our existing U.S. cash balances, ongoing U.S. cash flows, and available credit under our term loan and revolving credit facilities. As of July 31, 2018, we had outstanding debt of $136.6 million, net of an immaterial amount of debt issuance costs, under our $150.0 million term loan facility, and $485.0 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. 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.

For example, we were engaged in complex patent litigation with Mentor Graphics Corporation (Mentor) involving several actions in different forums. In June 2018, we settled all outstanding patent litigation with Mentor for a $65.0 million payment made in the third quarter of fiscal 2018 to Siemens, who previously acquired Mentor in March 2017. Further information regarding the lawsuits and settlement are 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 conjunction with the settlement, we also amended an existing interoperability agreement with Mentor to collaborate on a wide range of EDA products. The amendment includes a one-time termination charge between $0 and $25 million, payable to Mentor under certain conditions. In the event such conditions are met, the termination charge

could have an adverse effect on our operating results.

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

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We may be subject to legal claims or regulatory matters involving stockholder, consumer, employment, customer, supplier, 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 certain of these matters is contained in Part I, Item 3, 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.

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.

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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.

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 any deterioration of capital markets.

From time to time, our cash equivalent and short-term investment portfolio 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.

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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 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 September 2017, we entered into an accelerated share repurchase agreement (the September 2017 ASR) to repurchase an aggregate of $100.0 million of our common stock. Pursuant to the September 2017 ASR, we 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 November 2017. Total shares repurchased under the September 2017 ASR were approximately 1.2 million shares, at an average purchase price of $83.80 per share.

In December 2017, we entered into two simultaneous accelerated share repurchase agreements (the December 2017 ASRs) to repurchase an aggregate of $200.0 million of our common stock. Pursuant to the December 2017 ASRs, we made a prepayment of $200.0 million to receive initial deliveries of shares valued at $160.0 million. In February 2018, we received additional deliveries of shares valued at $20.0 million for one of the two December 2017 ASRs. The remaining balance of $20.0 million was settled in March 2018. Total shares repurchased under the December 2017 ASR were approximately 2.3 million shares, at an average purchase price of $87.08 per share.

In May 2018, we entered into an accelerated share repurchase agreement (the May 2018 ASR) to repurchase an aggregate of $165.0 million of our common stock. Pursuant to the May 2018 ASR, we made a prepayment of $165.0 million and received initial share deliveries valued at $132.0 million. The remaining balance of $33.0 million is anticipated to be settled on or before November 1, 2018, upon completion of the repurchase. Under the terms of the May 2018 ASR, the specific number of shares that we ultimately repurchase will be based on the volume-weighted average share price of our common stock during the repurchase period, less a discount.

The table below sets forth information regarding our repurchases of our common stock during the three months ended July 31, 2018:

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				
May 6, 2018 through June 9, 2018	1,508,571	$ 87.50	1,508,571	$ 325,000,050
Month #2				
June 10, 2018 through July 7, 2018	—	$ —	—	$ 325,000,050
Month #3				
July 8, 2018 through August 4, 2018	—	$ —	—	$ 325,000,050
Total	1,508,571	$ 87.50	1,508,571	$ 325,000,050

(1) As of July 31, 2018, $325.0 million remained available for future repurchases under the program. 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(P)	S-1	33-45138	4.3	2/24/92 (effective date)	
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

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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: August 24, 2018 By: /s/ TRAC PHAM
Trac Pham
Chief Financial Officer
(Principal Financial Officer)