UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

(Mark One)

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

For the quarterly period ended October 1, 2022

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 000-15867

CADENCE DESIGN SYSTEMS, INC.
(Exact Name of Registrant as Specified in Its Charter)

Delaware	**00-0000000**
(State or Other Jurisdiction of Incorporation or Organization)	**(I.R.S. Employer Identification No.)**
2655 Seely Avenue, Building 5, San Jose, California	**95134**
(Address of Principal Executive Offices)	**(Zip Code)**

(408) 943-1234
Registrant's Telephone Number, including Area Code

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, $0.01 par value per share	**CDNS**	**Nasdaq Global Select Market**

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

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

Large Accelerated Filer	☒	Accelerated Filer	☐	Smaller Reporting Company	☐
Non-accelerated Filer	☐			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 ☒

On October 1, 2022, approximately 274,316,000 shares of the registrant's common stock, $0.01 par value, were outstanding.

CADENCE DESIGN SYSTEMS, INC.
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PART I. FINANCIAL INFORMATION

Item 1. Financial Statements

CADENCE DESIGN SYSTEMS, INC.
CONDENSED CONSOLIDATED BALANCE SHEETS
(In thousands)
(Unaudited)

	As of	
	October 1, 2022	January 1, 2022
ASSETS		
Current assets:		
Cash and cash equivalents	$ 1,026,051	$ 1,088,940
Receivables, net	391,181	337,596
Inventories	114,283	115,721
Prepaid expenses and other	138,968	173,512
Total current assets	1,670,483	1,715,769
Property, plant and equipment, net	348,238	305,911
Goodwill	1,348,494	928,358
Acquired intangibles, net	353,912	233,265
Deferred taxes	783,315	763,770
Other assets	463,645	439,226
Total assets	$ 4,968,087	$ 4,386,299
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Revolving credit facility	$ 150,000	$ —
Accounts payable and accrued liabilities	454,688	417,283
Current portion of deferred revenue	652,306	553,942
Total current liabilities	1,256,994	971,225
Long-term liabilities:		
Long-term portion of deferred revenue	102,167	101,148
Long-term debt	647,799	347,588
Other long-term liabilities	252,999	225,663
Total long-term liabilities	1,002,965	674,399
Commitments and contingencies (Note 12)		
Stockholders' equity:		
Common stock and capital in excess of par value	2,697,632	2,467,701
Treasury stock, at cost	(3,522,219)	(2,740,003)
Retained earnings	3,654,848	3,046,288
Accumulated other comprehensive loss	(122,133)	(33,311)
Total stockholders' equity	2,708,128	2,740,675
Total liabilities and stockholders' equity	$ 4,968,087	$ 4,386,299

See notes to condensed consolidated financial statements.

CADENCE DESIGN SYSTEMS, INC.
CONDENSED CONSOLIDATED INCOME STATEMENTS
(In thousands, except per share amounts)
(Unaudited)

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
Revenue:				
Product and maintenance	$ 845,788	$ 706,160	$ 2,494,317	$ 2,093,098
Services	56,766	44,735	167,524	122,110
Total revenue	902,554	750,895	2,661,841	2,215,208
Costs and expenses:				
Cost of product and maintenance	62,351	54,185	203,863	174,933
Cost of services	25,249	22,402	74,245	62,380
Marketing and sales	152,925	143,401	432,407	412,194
Research and development	323,629	289,105	901,121	845,324
General and administrative	73,688	42,990	174,051	123,275
Amortization of acquired intangibles	3,946	5,000	13,543	14,661
Restructuring	14	(222)	42	(968)
Total costs and expenses	641,802	556,861	1,799,272	1,631,799
Income from operations	260,752	194,034	862,569	583,409
Interest expense	(5,463)	(4,196)	(13,852)	(12,729)
Other income (expenses), net	(3,017)	(1,143)	(13,879)	3,701
Income before provision for income taxes	252,272	188,695	834,838	574,381
Provision for income taxes	65,967	12,388	226,278	55,005
Net income	$ 186,305	$ 176,307	$ 608,560	$ 519,376
Net income per share – basic	$ 0.69	$ 0.65	$ 2.24	$ 1.90
Net income per share – diluted	$ 0.68	$ 0.63	$ 2.21	$ 1.86
Weighted average common shares outstanding – basic	271,131	273,194	271,694	273,636
Weighted average common shares outstanding – diluted	274,957	278,311	275,683	279,046

See notes to condensed consolidated financial statements.

CADENCE DESIGN SYSTEMS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(In thousands)
(Unaudited)

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
Net income	$ 186,305	$ 176,307	$ 608,560	$ 519,376
Other comprehensive income (loss), net of tax effects:				
Foreign currency translation adjustments	(40,768)	(5,483)	(90,764)	(9,618)
Changes in defined benefit plan liabilities	15	(288)	1,942	(520)
Total other comprehensive loss, net of tax effects	(40,753)	(5,771)	(88,822)	(10,138)
Comprehensive income	$ 145,552	$ 170,536	$ 519,738	$ 509,238

See notes to condensed consolidated financial statements.

CADENCE DESIGN SYSTEMS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(In thousands)
(Unaudited)

	Three Months Ended October 1, 2022					
	Common Stock					
	Shares	Par Value and Capital in Excess of Par	Treasury Stock	Retained Earnings	Accumulated Other Comprehensive Loss	Total
Balance, July 2, 2022	273,870	$ 2,590,893	$ (3,352,827)	$ 3,468,543	$ (81,380)	$ 2,625,229
Net income	—	—	—	186,305	—	$ 186,305
Other comprehensive loss, net of taxes	—	—	—	—	(40,753)	$ (40,753)
Purchase of treasury stock	(959)	—	(150,013)	—	—	$ (150,013)
Equity forward contract	—	17,965	(17,965)			$ —
Issuance of common stock and reissuance of treasury stock under equity incentive plans, net of forfeitures	1,574	23,095	30,363	—	—	$ 53,458
Stock received for payment of employee taxes on vesting of restricted stock	(169)	(7,772)	(31,777)	—	—	$ (39,549)
Stock-based compensation expense	—	73,451	—	—	—	$ 73,451
Balance, October 1, 2022	274,316	$ 2,697,632	$ (3,522,219)	$ 3,654,848	$ (122,133)	$ 2,708,128

	Three Months Ended October 2, 2021					
	Common Stock					
	Shares	Par Value and Capital in Excess of Par	Treasury Stock	Retained Earnings	Accumulated Other Comprehensive Loss	Total
Balance, July 3, 2021	276,780	$ 2,354,801	$ (2,509,668)	$ 2,693,402	$ (21,792)	$ 2,516,743
Net income	—	—	—	176,307	—	$ 176,307
Other comprehensive loss, net of taxes	—	—	—	—	(5,771)	$ (5,771)
Purchase of treasury stock	(723)	—	(110,011)	—	—	$ (110,011)
Issuance of common stock and reissuance of treasury stock under equity incentive plans, net of forfeitures	1,249	9,319	22,061	—	—	$ 31,380
Stock received for payment of employee taxes on vesting of restricted stock	(165)	(5,075)	(25,057)	—	—	$ (30,132)
Stock-based compensation expense	—	52,746	—	—	—	$ 52,746
Balance, October 2, 2021	277,141	$ 2,411,791	$ (2,622,675)	$ 2,869,709	$ (27,563)	$ 2,631,262

	Nine Months Ended October 1, 2022					
	Common Stock					
	Shares	Par Value and Capital in Excess of Par	Treasury Stock	Retained Earnings	Accumulated Other Comprehensive Loss	Total
Balance, January 1, 2022	276,796	$ 2,467,701	$ (2,740,003)	$ 3,046,288	$ (33,311)	$ 2,740,675
Net income	—	—	—	608,560	—	$ 608,560
Other comprehensive loss, net of taxes	—	—	—	—	(88,822)	$ (88,822)
Purchase of treasury stock	(4,664)	—	(720,062)	—	—	$ (720,062)
Equity forward contract	—	(12,035)	(17,965)	—	—	$ (30,000)
Issuance of common stock and reissuance of treasury stock under equity incentive plans, net of forfeitures	2,738	60,327	43,353	—	—	$ 103,680
Stock received for payment of employee taxes on vesting of restricted stock	(554)	(15,551)	(87,542)	—	—	$ (103,093)
Stock-based compensation expense	—	197,190	—	—	—	$ 197,190
Balance, October 1, 2022	274,316	$ 2,697,632	$ (3,522,219)	$ 3,654,848	$ (122,133)	$ 2,708,128

	Nine Months Ended October 2, 2021					
	Common Stock					
	Shares	Par Value and Capital in Excess of Par	Treasury Stock	Retained Earnings	Accumulated Other Comprehensive Loss	Total
Balance, January 2, 2021	278,941	$ 2,217,939	$ (2,057,829)	$ 2,350,333	$ (17,425)	$ 2,493,018
Net income	—	—	—	519,376	—	$ 519,376
Other comprehensive loss, net of taxes	—	—	—	—	(10,138)	$ (10,138)
Purchase of treasury stock	(3,766)	—	(502,301)	—	—	$ (502,301)
Issuance of common stock and reissuance of treasury stock under equity incentive plans, net of forfeitures	2,640	52,236	31,396	—	—	$ 83,632
Stock received for payment of employee taxes on vesting of restricted stock	(674)	(14,244)	(93,941)	—	—	$ (108,185)
Stock-based compensation expense	—	155,860	—	—	—	$ 155,860
Balance, October 2, 2021	277,141	$ 2,411,791	$ (2,622,675)	$ 2,869,709	$ (27,563)	$ 2,631,262

See notes to condensed consolidated financial statements.

CADENCE DESIGN SYSTEMS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)
(Unaudited)

	Nine Months Ended	
	October 1, 2022	October 2, 2021
Cash and cash equivalents at beginning of period	$ 1,088,940	$ 928,432
Cash flows from operating activities:		
Net income	608,560	519,376
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	98,178	106,962
Amortization of debt discount and fees	810	952
Stock-based compensation	197,190	155,860
(Gain) loss on investments, net	4,777	(330)
Deferred income taxes	(49,834)	(34,566)
Provisions for losses on receivables	471	234
ROU asset amortization and change in operating lease liabilities	(883)	(2,917)
Other non-cash items	158	146
Changes in operating assets and liabilities, net of effect of acquired businesses:		
Receivables	(57,309)	15,132
Inventories	(8,020)	(25,608)
Prepaid expenses and other	30,596	36,632
Other assets	17,644	8,127
Accounts payable and accrued liabilities	24,514	10,501
Deferred revenue	113,712	84,183
Other long-term liabilities	(2,305)	10,417
Net cash provided by operating activities	978,259	885,101
Cash flows from investing activities:		
Purchases of non-marketable investments	(1,000)	—
Proceeds from the sale of non-marketable investments	—	128
Purchases of property, plant and equipment	(86,295)	(49,977)
Purchases of intangible assets	(1,000)	—
Cash paid in business combinations, net of cash acquired	(586,163)	(220,026)
Net cash used for investing activities	(674,458)	(269,875)
Cash flows from financing activities:		
Proceeds from term loan	300,000	—
Proceeds from revolving credit facility	450,000	—
Payment on revolving credit facility	(300,000)	—
Payment of debt issuance costs	(425)	(1,285)
Proceeds from issuance of common stock	103,682	83,632
Stock received for payment of employee taxes on vesting of restricted stock	(103,093)	(108,185)
Payments for repurchases of common stock	(750,062)	(502,301)
Net cash used for financing activities	(299,898)	(528,139)
Effect of exchange rate changes on cash and cash equivalents	(66,792)	(1,700)
Increase (decrease) in cash and cash equivalents	(62,889)	85,387
Cash and cash equivalents at end of period	$ 1,026,051	$ 1,013,819
Supplemental cash flow information:		
Cash paid for interest	$ 8,508	$ 8,117
Cash paid for taxes, net	148,151	47,687

See notes to condensed consolidated financial statements.

CADENCE DESIGN SYSTEMS, INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Unaudited)

NOTE 1. BASIS OF PRESENTATION AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Presentation

The condensed consolidated financial statements included in this Quarterly Report on Form 10-Q have been prepared by Cadence Design Systems, Inc. ("Cadence") without audit, pursuant to the rules and regulations of the United States Securities and Exchange Commission (the "SEC"). Certain information and footnote disclosures normally included in consolidated financial statements prepared in accordance with United States generally accepted accounting principles ("U.S. GAAP") have been condensed or omitted pursuant to such rules and regulations. However, Cadence believes that the disclosures contained in this Quarterly Report on Form 10-Q comply with the requirements of Section 13(a) of the Securities Exchange Act of 1934, as amended, (the "Exchange Act") for a Quarterly Report on Form 10-Q and are adequate to make the information presented not misleading. These condensed consolidated financial statements are meant to be, and should be, read in conjunction with the consolidated financial statements and the Notes thereto included in Cadence's Annual Report on Form 10-K for the fiscal year ended January 1, 2022.

The unaudited condensed consolidated financial statements included in this Quarterly Report on Form 10-Q reflect all adjustments (which include only normal, recurring adjustments and those items discussed in these Notes) that are, in the opinion of management, necessary to state fairly the results of operations, cash flows and financial position for the periods and dates presented. The results for such periods are not necessarily indicative of the results to be expected for the full fiscal year. Certain prior period balances have been reclassified to conform to the current period presentation. Management has evaluated subsequent events through the issuance date of the unaudited condensed consolidated financial statements.

Fiscal Year End

On September 7, 2022, Cadence's Board of Directors approved a change in its fiscal year end from the Saturday closest to December 31 of each year to December 31 of each year. Cadence's fiscal quarters will end on March 31, June 30, and September 30. The fiscal year change is effective beginning with Cadence's 2023 fiscal year, which will begin on January 1, 2023.

Cadence's fiscal year end date for fiscal 2022 will remain December 31, 2022 as previously disclosed. Consistent with SEC guidance, no transition report is required in connection with the change in Cadence's fiscal year end. Accordingly, Cadence intends to file an Annual Report on Form 10-K for the year ended December 31, 2022, and the new fiscal year will take effect from January 1, 2023 to December 31, 2023.

Use of Estimates

Preparation of the condensed consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the condensed consolidated financial statements and the reported amounts of revenue and expenses during the reporting period.

Despite continued uncertainty and disruption in the global economy and financial markets, Cadence is not aware of any specific event or circumstance that would require an update to its estimates or judgments or a revision of the carrying value of its assets or liabilities as of October 24, 2022, the date of issuance of this Quarterly Report on Form 10-Q. These estimates may change, as new events or developments occur and additional information is obtained. Actual results could differ materially from these estimates under different assumptions or conditions.

Recently Adopted Accounting Standards

Lessors - Certain Leases with Variable Lease Payments

In July 2021, the Financial Accounting Standards Board ("FASB"), issued ASU 2021-05, "Lessors - Certain Leases with Variable Lease Payments," which allows lessors to classify and account for a lease with variable payments that do not depend on a reference index or a rate as an operating lease if both of the following criteria are met: (1) the lease would have been classified as a sales-type lease or a direct financing lease in accordance with the classification criteria as defined in ASC Topic 842 and (2) the lessor would have otherwise recognized a day-one loss on the lease arrangement. This standard better aligns the accounting with the underlying economics of these arrangements as lessors are not permitted to include most variable payments which do not depend on a reference index or a rate in the lease receivable while assets are derecognized at lease commencement. This standard is effective for fiscal years beginning after December 15, 2021, including interim periods within those fiscal years. Cadence adopted this standard on January 2, 2022, the first day of fiscal 2022, on a prospective basis. The adoption of this standard did not have a material impact on Cadence's condensed consolidated financial statements and related disclosures.

Business Combinations

In October 2021, the FASB issued ASU 2021-08, “Accounting for Contract Assets and Contract Liabilities from Contracts with Customers,” which requires contract assets and contract liabilities acquired in a business combination to be recognized and measured by the acquirer on the acquisition date in accordance with “Revenue from Contracts with Customers (Topic 606)” as if the acquiring entity had originated the contracts. This approach differs from the previous requirement to measure contract assets and contract liabilities acquired in a business combination at fair value. Cadence adopted this standard on January 2, 2022, the first day of fiscal 2022. The adoption of this standard did not impact acquired contract assets or liabilities from business combinations that occurred prior to the date of adoption, and the impact in current and future periods will depend on the contract assets and contract liabilities acquired. For business combinations completed during the third quarter of fiscal 2022, Cadence recognized deferred revenue of $11.8 million from the acquired businesses as if Cadence had originated the contracts in accordance with Topic 606 rather than at fair value. For additional information relating to Cadence’s acquisitions, see Note 5 in the notes to condensed consolidated financial statements.

NOTE 2. REVENUE

Cadence groups its products and services into five categories related to major design activities. The following table shows the percentage of revenue contributed by each of Cadence’s five product categories for the three and nine months ended October 1, 2022 and October 2, 2021:

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
Custom Integrated Circuit (“IC”) Design and Simulation	22 %	23 %	22 %	23 %
Digital IC Design and Signoff	29 %	29 %	28 %	28 %
Functional Verification, including Emulation and Prototyping Hardware*	25 %	23 %	26 %	25 %
Intellectual Property (“IP”)	12 %	14 %	13 %	13 %
System Design and Analysis	12 %	11 %	11 %	11 %
Total	100 %	100 %	100 %	100 %

* Includes immaterial amount of revenue accounted for under leasing arrangements.

Cadence generates revenue from contracts with customers and applies judgment in identifying and evaluating any terms and conditions in contracts which may impact revenue recognition. Certain of Cadence’s licensing arrangements allow customers the ability to remix among software products. Cadence also has arrangements with customers that include a combination of products, with the actual product selection and number of licensed users to be determined at a later date. For these arrangements, Cadence estimates the allocation of the revenue to product categories based upon the expected usage of products. Revenue by product category fluctuates from period to period based on demand for products and services, and Cadence’s available resources to deliver them. No single customer accounted for 10% or more of total revenue during the three and nine months ended October 1, 2022 or the three and nine months ended October 2, 2021.

Generally, between 85% and 90% of Cadence’s annual revenue is characterized as recurring revenue. Recurring revenue includes revenue recognized over time from our software arrangements, services, royalties, maintenance on IP licenses and hardware, and operating leases of hardware. Recurring revenue also includes revenue recognized at varying points in time over the term of other arrangements with non-cancelable commitments, whereby the customer commits to a fixed dollar amount over a specified period of time that can be used to purchase from a list of products or services. These arrangements do not meet the definition of a revenue contract until the customer executes a separate selection form to identify the products and services that they are purchasing. Each separate selection form under the arrangement is treated as an individual contract and accounted for based on the respective performance obligations.

The remainder of Cadence’s revenue is recognized at a point in time and is characterized as up-front revenue. Up-front revenue is primarily generated by sales of emulation and prototyping hardware and individual IP licenses. The percentage of Cadence’s recurring and up-front revenue may be impacted by delivery of hardware and IP products to its customers in any single fiscal period.

The following table shows the percentage of Cadence's revenue that is classified as recurring or up-front for the three and nine months ended October 1, 2022 and October 2, 2021:

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
Revenue recognized over time	81 %	86 %	82 %	84 %
Revenue from arrangements with non-cancelable commitments	3 %	3 %	2 %	3 %
Recurring revenue	84 %	89 %	84 %	87 %
Up-front revenue	16 %	11 %	16 %	13 %
Total	100 %	100 %	100 %	100 %

Significant Judgments

Cadence's contracts with customers often include promises to transfer to a customer multiple software and/or IP licenses and services, including professional services, technical support services, and rights to unspecified updates. Determining whether licenses and services are distinct performance obligations that should be accounted for separately, or not distinct and thus accounted for together, requires significant judgment. In some arrangements, such as most of Cadence's IP license arrangements, Cadence has concluded that the licenses and associated services are distinct from each other. In others, like Cadence's time-based software arrangements, the licenses and certain services are not distinct from each other. Cadence's time-based software arrangements include multiple software licenses and updates to the licensed software products, as well as technical support, and Cadence has concluded that these promised goods and services are a single, combined performance obligation.

The accounting for contracts with multiple performance obligations requires the contract's transaction price to be allocated to each distinct performance obligation based on relative standalone selling price ("SSP"). Judgment is required to determine the SSP for each distinct performance obligation because Cadence rarely licenses or sells products on a standalone basis. In instances where the SSP is not directly observable because Cadence does not sell the license, product or service separately, Cadence determines the SSP using information that maximizes the use of observable inputs and may include market conditions. Cadence typically has more than one SSP for individual performance obligations due to the stratification of those items by classes of customers and circumstances. In these instances, Cadence may use information such as the size of the customer and geographic region of the customer in determining the SSP.

Revenue is recognized over time for Cadence's combined performance obligations that include software licenses, updates, technical support and maintenance that are separate performance obligations with the same term. For Cadence's professional services, revenue is recognized over time, generally using costs incurred or hours expended to measure progress. Judgment is required in estimating project status and the costs necessary to complete projects. A number of internal and external factors can affect these estimates, including labor rates, utilization and efficiency variances and specification and testing requirement changes. For Cadence's other performance obligations recognized over time, revenue is generally recognized using a time-based measure of progress reflecting generally consistent efforts to satisfy those performance obligations throughout the arrangement term.

If a group of agreements are so closely related that they are, in effect, part of a single arrangement, such agreements are deemed to be one arrangement for revenue recognition purposes. Cadence exercises significant judgment to evaluate the relevant facts and circumstances in determining whether the separate agreements should be accounted for separately or as, in substance, a single arrangement. Cadence's judgments about whether a group of contracts comprise a single arrangement can affect the allocation of consideration to the distinct performance obligations, which could have an effect on results of operations for the periods involved.

Cadence is required to estimate the total consideration expected to be received from contracts with customers. In limited circumstances, the consideration expected to be received is variable based on the specific terms of the contract or based on Cadence's expectations of the term of the contract. Generally, Cadence has not experienced significant returns or refunds to customers. These estimates require significant judgment and a change in these estimates could have an effect on its results of operations during the periods involved.

Contract Balances

The timing of revenue recognition may differ from the timing of invoicing to customers, and these timing differences result in receivables, contract assets, or contract liabilities (deferred revenue) on Cadence's condensed consolidated balance sheets. For certain software, hardware and IP agreements with payment plans, Cadence records an unbilled receivable related to revenue recognized upon transfer of control because it has an unconditional right to invoice and receive payment in the future related to those transferred products or services. Cadence records a contract asset when revenue is recognized prior to invoicing and Cadence does not have the unconditional right to invoice or retains performance risk with respect to that performance obligation. Cadence records deferred revenue when revenue is recognized subsequent to invoicing. For Cadence's time-based software agreements, customers are generally invoiced in equal, quarterly amounts, although some customers prefer to be invoiced in single or annual amounts.

The contract assets indicated below are included in prepaid expenses and other in the condensed consolidated balance sheets and primarily relate to Cadence's rights to consideration for work completed but not billed as of the balance sheet date on services and customized IP contracts. The contract assets are transferred to receivables when the rights become unconditional, usually upon completion of a milestone.

Cadence's contract balances as of October 1, 2022 and January 1, 2022 were as follows:

	As of	
	October 1, 2022	January 1, 2022
	(In thousands)	
Contract assets	$ 38,442	$ 6,811
Deferred revenue	754,473	655,090

Cadence recognized revenue of $63.9 million and $488.9 million during the three and nine months ended October 1, 2022, and $59.8 million and $389.8 million during the three and nine months ended October 2, 2021, that was included in the deferred revenue balance at the beginning of each respective fiscal year. All other activity in deferred revenue, with the exception of deferred revenue assumed from acquisitions, is due to the timing of invoices in relation to the timing of revenue as described above.

Payment terms and conditions vary by contract type, although terms generally include a requirement of payment within 30 to 60 days. In instances where the timing of revenue recognition differs from the timing of invoicing, Cadence has determined that its contracts generally do not include a significant financing component. The primary purpose of invoicing terms is to provide customers with simplified and predictable ways of purchasing Cadence's products and services, and not to facilitate financing arrangements.

Remaining Performance Obligations

Revenue allocated to remaining performance obligations represents the transaction price allocated to the performance obligations that are unsatisfied, or partially unsatisfied, which includes unearned revenue and amounts that will be invoiced and recognized as revenue in future periods. Cadence has elected to exclude the potential future royalty receipts from the remaining performance obligations. Contracted but unsatisfied performance obligations were approximately $5.5 billion as of October 1, 2022, which included $433.5 million of non-cancelable commitments from customers where actual product selection and quantities of specific products or services are to be determined by customers at a later date. As of October 1, 2022, Cadence expected to recognize 54% of the contracted but unsatisfied performance obligations, excluding non-cancelable commitments, as revenue over the next 12 months and the remainder thereafter.

Cadence recognized revenue of $12.1 million and $35.2 million during the three and nine months ended October 1, 2022, and $13.3 million and $35.0 million during the three and nine months ended October 2, 2021, from performance obligations satisfied in previous periods. These amounts represent royalties earned during the period and exclude contracts with nonrefundable prepaid royalties. Nonrefundable prepaid royalties are recognized upon delivery of the IP because Cadence's right to the consideration is not contingent upon customers' future shipments.

NOTE 3. RECEIVABLES, NET

Cadence's current and long-term receivables balances as of October 1, 2022 and January 1, 2022 were as follows:

	As of	
	October 1, 2022	January 1, 2022
	(In thousands)	
Accounts receivable	$ 240,369	$ 185,599
Unbilled accounts receivable	153,376	155,689
Long-term receivables	9,473	5,098
Total receivables	403,218	346,386
Less allowance for doubtful accounts	(2,564)	(3,692)
Total receivables, net	$ 400,654	$ 342,694

Cadence's customers are primarily concentrated within the semiconductor and electronics systems industries. As of October 1, 2022 and January 1, 2022, no single customer accounted for 10% or more of Cadence's total receivables.

NOTE 4. DEBT

Cadence's outstanding debt as of October 1, 2022 and January 1, 2022 was as follows:

	October 1, 2022			January 1, 2022		
	(In thousands)					
	Principal	Unamortized Discount	Carrying Value	Principal	Unamortized Discount	Carrying Value
Revolving Credit Facility	$ 150,000	$ —	$ 150,000	$ —	$ —	$ —
2024 Notes	350,000	(1,794)	348,206	350,000	(2,412)	347,588
2025 Term Loan	300,000	(407)	299,593	—	—	—
Total outstanding debt	$ 800,000	$ (2,201)	$ 797,799	$ 350,000	$ (2,412)	$ 347,588

Revolving Credit Facility

In June 2021, Cadence entered into a five-year senior unsecured revolving credit facility with a group of lenders led by Bank of America, N.A., as administrative agent (the "2021 Credit Facility"). In September 2022, Cadence amended the 2021 Credit Facility to, among other things, allow Cadence to change its fiscal year to match the calendar year commencing in 2023 and change the interest rate benchmark for loans under the 2021 Credit Facility from LIBOR to Term SOFR. The material terms of the 2021 Credit Facility otherwise remain unchanged.

The 2021 Credit Facility provides for borrowings up to $700 million, with the right to request increased capacity up to an additional $350 million upon the receipt of lender commitments, for total maximum borrowings of $1.05 billion. The 2021 Credit Facility expires on June 30, 2026. Any outstanding loans drawn under the 2021 Credit Facility are due at maturity on June 30, 2026, subject to an option to extend the maturity date. Outstanding borrowings may be repaid at any time prior to maturity. Debt issuance costs of $1.3 million were recorded to other assets in Cadence's condensed consolidated balance sheet at the inception of the agreement and are being amortized to interest expense over the term of the 2021 Credit Facility.

Interest accrues on borrowings under the 2021 Credit Facility at a rate equal to, at Cadence's option, either (1) SOFR plus a margin between 0.750% and 1.250% per annum, determined by reference to the credit rating of Cadence's unsecured debt, plus a SOFR adjustment of 0.10% or (2) the base rate plus a margin between 0.000% and 0.250% per annum, determined by reference to the credit rating of Cadence's unsecured debt. As of October 1, 2022, the interest rate on the 2021 Credit Facility was 3.82%. Interest is payable quarterly. A commitment fee ranging from 0.070% to 0.175% is assessed on the daily average undrawn portion of revolving commitments.

The 2021 Credit Facility contains customary negative covenants that, among other things, restrict Cadence's ability to incur additional indebtedness and grant liens. In addition, the 2021 Credit Facility contains financial covenants that require Cadence to maintain a funded debt to EBITDA ratio not greater than 3.25 to 1, with a step up to 3.75 to 1 for one year following an acquisition by Cadence of at least $250.0 million that results in a pro forma leverage ratio between 3.00 to 1 and 3.50 to 1. As of October 1, 2022, Cadence was in compliance with all financial covenants associated with the 2021 Credit Facility.

2024 Notes

In October 2014, Cadence issued $350.0 million aggregate principal amount of 4.375% Senior Notes due October 15, 2024 (the "2024 Notes"). Cadence received net proceeds of $342.4 million from the issuance of the 2024 Notes, net of a discount of $1.4 million and issuance costs of $6.2 million. Both the discount and issuance costs are being amortized to interest expense over the term of the 2024 Notes using the effective interest method. Interest is payable in cash semi-annually in April and October. The 2024 Notes are unsecured and rank equal in right of payment to all of Cadence's existing and future senior indebtedness. The carrying value of the 2024 Notes was $348.2 million and $347.6 million as of October 1, 2022 and January 1, 2022, respectively. The fair value of the 2024 Notes was approximately $345.8 million as of October 1, 2022.

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

The indenture governing the 2024 Notes includes customary representations, warranties and restrictive covenants, including, but not limited to, restrictions on Cadence's ability to grant liens on assets, enter into sale and lease-back transactions, or merge, consolidate or sell assets, and also includes customary events of default.

2025 Term Loan

In September 2022, Cadence entered into a $300.0 million three-year senior non-amortizing term loan facility due on September 7, 2025 with a group of lenders led by Bank of America, N.A., as administrative agent (the "2025 Term Loan"). The 2025 Term Loan is unsecured and ranks equal in right of payment to all of Cadence's unsecured indebtedness. Proceeds from the loan were used to fund Cadence's acquisition of OpenEye Scientific Software, Inc. ("OpenEye").

Amounts outstanding under the 2025 Term Loan accrue interest at a rate equal to, at Cadence's option, either (1) Term SOFR plus a margin between 0.625% per annum and 1.125% per annum, determined by reference to the credit rating of Cadence's unsecured debt, plus a SOFR adjustment of 0.10% or (2) base rate plus a margin between 0.000% per annum and 0.125% per annum, determined by reference to the credit rating of Cadence's unsecured debt. As of October 1, 2022, the interest rate on the 2025 Term Loan was 4.08%. Interest is payable quarterly. Borrowings bear interest at what is estimated to be current market rates of interest. Accordingly, the carrying value of the 2025 Term Loan approximates fair value.

The 2025 Term Loan contains customary negative covenants that, among other things, restrict Cadence's ability to incur additional indebtedness, grant liens and make certain asset dispositions. In addition, the 2025 Term Loan contains a financial covenant that requires Cadence to maintain a funded debt to EBITDA ratio not greater than 3.25 to 1, with a step-up to 3.75 to 1 for one year following an acquisition by Cadence of at least $250.0 million that results in a pro forma leverage ratio between 3.00 to 1 and 3.50 to 1. As of October 1, 2022, Cadence was in compliance with all financial covenants associated with the 2025 Term Loan.

NOTE 5. ACQUISITIONS

Acquisition of OpenEye Scientific Software, Inc.

On August 31, 2022, Cadence acquired all of the outstanding equity of OpenEye, a leading provider of computational molecular modeling and simulation software used by pharmaceutical and biotechnology companies for drug discovery. The addition of OpenEye's technologies and experienced team with its deep scientific expertise is expected to accelerate Cadence's Intelligent System Design™ strategy and broadens Cadence's System Design and Analysis technology portfolio. The acquisition expands Cadence's total addressable market, bringing Cadence's computational software expertise to apply proven algorithmic, simulation and solver advances to life sciences. The aggregate cash consideration for Cadence's acquisition of OpenEye, net of cash acquired of $13.2 million, was $461.1 million. Subject to service and other conditions, Cadence expects to recognize expense for consideration paid to certain former OpenEye shareholders, now employed by Cadence, through the first quarter of fiscal 2026.

The total purchase consideration was allocated to the assets acquired and liabilities assumed based on their respective estimated fair values on the acquisition date as follows:

		Fair Value
		(In thousands)
Current assets	$	24,890
Goodwill		368,148
Acquired intangibles		117,400
Other long-term assets		6,542
Total assets acquired		516,980
Current liabilities		15,489
Long-term liabilities		27,225
Total liabilities assumed		42,714
Total purchase consideration	$	474,266

The allocation of purchase consideration to certain assets and liabilities has not been finalized. Cadence will continue to evaluate certain estimates and assumptions, primarily related to taxes and assumed liabilities, during the measurement period (up to one year from the acquisition date). The recorded goodwill is attributed to intangible assets that do not qualify for separate recognition, including the acquired assembled workforce, and will not be deductible for tax purposes.

Acquired Intangibles

		Fair Value	Weighted-Average Amortization Period
		(In thousands)	(in years)
Existing technology	$	53,900	7.0 years
Agreements and relationships		61,400	12.3 years
Tradenames, trademarks and patents		2,100	7.0 years
Total acquired intangibles with definite lives	$	117,400	9.8 years

Acquisition of FFG Holdings Limited

On July 14, 2022, Cadence acquired all of the outstanding equity of FFG Holdings Limited ("Future Facilities"), a provider of electronics cooling analysis and energy performance optimization solutions for data center design and operations using physics-based 3D digital twins. The addition of Future Facilities' technologies and expertise supports Cadence's Intelligent System Design strategy and broadens its System Design and Analysis technology portfolio with the addition of solutions that enable companies to make informed business decisions about data center design, operations and lifecycle management that reduce their carbon footprint. The aggregate cash consideration for Cadence's acquisition of Future Facilities, net of cash acquired of $2.8 million, was $100.1 million. Subject to service and other conditions, Cadence expects to recognize expense for consideration paid to certain former Future Facilities shareholders, now employed by Cadence, subject to service and other conditions, through the third quarter of fiscal 2025.

The total purchase consideration was allocated to the assets acquired and liabilities assumed based on their respective estimated fair values on the acquisition date as follows:

		Fair Value
		(In thousands)
Current assets	$	7,992
Goodwill		67,868
Acquired intangibles		38,100
Other long-term assets		3,102
Total assets acquired		117,062
Current liabilities		4,952
Long-term liabilities		9,210
Total liabilities assumed		14,162
Total purchase consideration	$	102,900

The allocation of purchase consideration to certain assets and liabilities has not been finalized. Cadence will continue to evaluate certain estimates and assumptions, primarily related to taxes and assumed liabilities, during the measurement period (up to one year from the acquisition date). The recorded goodwill is attributed to intangible assets that do not qualify for separate recognition, including the acquired assembled workforce and expected synergies from combining operations of Future Facilities with Cadence. The goodwill will not be deductible for tax purposes.

Acquired Intangibles

	Fair Value	Weighted-Average Amortization Period
	(In thousands)	(in years)
Existing technology	$ 20,900	6.0 years
Agreements and relationships	15,600	9.0 years
Tradenames, trademarks and patents	1,600	8.0 years
Total acquired intangibles with definite lives	$ 38,100	7.3 years

Other Acquisitions

During the second quarter of fiscal 2022, Cadence completed one business combination for aggregate cash consideration of $25.0 million. The total purchase consideration was allocated to assets acquired based on their respective estimated fair values on the acquisition date. Cadence recorded $15.0 million of acquired intangible assets, which consisted of $8.2 million of existing technology and $6.8 million of in-process technology. Cadence also recognized $10.0 million of goodwill, which is primarily attributed to an assembled workforce. The goodwill recognized is expected to be deductible for tax purposes.

Pro Forma Financial Information

Cadence has not presented pro forma financial information for acquisitions completed during the first three quarters of fiscal 2022 because the results of operations from the acquired businesses are not material to Cadence's condensed consolidated financial statements.

Transaction Costs

Transaction costs associated with acquisitions are included in general and administrative expense in Cadence's condensed consolidated income statement. During the three and nine months ended October 1, 2022, transaction costs associated with acquisitions were $3.6 million and $10.1 million, respectively. During the three and nine months ended October 2, 2021, transaction costs associated with acquisitions were $0.1 million and $2.0 million, respectively.

NOTE 6. GOODWILL AND ACQUIRED INTANGIBLES

Goodwill

The changes in the carrying amount of goodwill during the nine months ended October 1, 2022 were as follows:

	Gross Carrying Amount
	(In thousands)
Balance as of January 1, 2022	$ 928,358
Goodwill resulting from acquisitions	446,000
Effect of foreign currency translation	(25,864)
Balance as of October 1, 2022	$ 1,348,494

Acquired Intangibles, Net

Acquired intangibles as of October 1, 2022 were as follows, excluding intangibles that were fully amortized as of January 1, 2022:

	Gross Carrying Amount	Accumulated Amortization	Acquired Intangibles, Net
		(In thousands)	
Existing technology	$ 468,489	$ (267,918)	$ 200,571
Agreements and relationships	269,597	(133,089)	136,508
Tradenames, trademarks and patents	12,545	(2,512)	10,033
Total acquired intangibles with definite lives	750,631	(403,519)	347,112
In-process technology	6,800	—	6,800
Total acquired intangibles	$ 757,431	$ (403,519)	$ 353,912

In-process technology as of October 1, 2022 consisted of acquired projects that, if completed, will contribute to Cadence's existing product offerings. As of October 1, 2022, these projects were expected to be completed during the fourth quarter of fiscal 2023. During the three and nine months ended October 1, 2022, there were no transfers from in-process technology to existing technology.

Acquired intangibles as of January 1, 2022 were as follows, excluding intangibles that were fully amortized as of January 2, 2021:

	Gross Carrying Amount	Accumulated Amortization	Acquired Intangibles, Net
		(In thousands)	
Existing technology	$ 405,481	$ (254,599)	$ 150,882
Agreements and relationships	205,057	(130,187)	74,870
Tradenames, trademarks and patents	10,666	(3,153)	7,513
Total acquired intangibles	$ 621,204	$ (387,939)	$ 233,265

Amortization expense from existing technology and maintenance agreements is included in cost of product and maintenance. Amortization expense for the three and nine months ended October 1, 2022 and October 2, 2021 by condensed consolidated income statement caption was as follows:

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
		(In thousands)		
Cost of product and maintenance	$ 8,867	$ 11,774	$ 30,906	$ 35,774
Amortization of acquired intangibles	3,946	5,000	13,543	14,661
Total amortization of acquired intangibles	$ 12,813	$ 16,774	$ 44,449	$ 50,435

As of October 1, 2022, the estimated amortization expense for intangible assets with definite lives was as follows for the following five fiscal years and thereafter:

	(In thousands)
2022 - remaining period	$ 14,870
2023	56,040
2024	54,280
2025	42,213
2026	36,298
2027	34,056
Thereafter	109,355
Total estimated amortization expense	$ 347,112

NOTE 7. STOCK-BASED COMPENSATION

Stock-based compensation expense is reflected in Cadence's condensed consolidated income statements for the three and nine months ended October 1, 2022 and October 2, 2021 as follows:

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
	(In thousands)			
Cost of product and maintenance	$ 1,046	$ 885	$ 2,751	$ 2,601
Cost of services	1,331	1,158	3,494	3,177
Marketing and sales	14,991	10,784	39,650	32,284
Research and development	43,327	32,957	115,516	97,101
General and administrative	12,756	6,962	35,779	20,697
Total stock-based compensation expense	$ 73,451	$ 52,746	$ 197,190	$ 155,860

Cadence had total unrecognized compensation expense related to stock option and restricted stock grants of $534.9 million as of October 1, 2022, which will be recognized over the remaining vesting period. The remaining weighted average vesting period of unvested awards is 2.4 years.

NOTE 8. STOCK REPURCHASE PROGRAM

In August 2022, Cadence's Board of Directors increased the prior authorization to repurchase shares of Cadence common stock by authorizing an additional $ 1 billion. The actual timing and amount of repurchases are subject to business and market conditions, corporate and regulatory requirements, stock price, acquisition opportunities and other factors.

During the three and nine months ended October 1, 2022, Cadence repurchased approximately 0.9 million shares and 4.1 million shares, respectively, on the open market, for an aggregate purchase price of $150.0 million and $650.0 million, respectively.

In June 2022, Cadence also entered into an accelerated share repurchase ("ASR") agreement with Royal Bank of Canada to repurchase an aggregate of $100.0 million of Cadence common stock. The ASR agreement was accounted for as two separate transactions (1) a repurchase of common stock and (2) an equity-linked contract on Cadence's own stock. In June 2022, Cadence received an initial share delivery of approximately 0.5 million shares, which represented the number of shares at a market price equal to $70.0 million. An equity-linked contract for $30.0 million, representing the remaining shares to be delivered by Royal Bank of Canada under the ASR agreement, was recorded to stockholders' equity as of July 2, 2022. In September 2022, the ASR agreement settled and resulted in a delivery to Cadence of approximately 0.1 million additional shares. In total, approximately 0.6 million shares were repurchased under the ASR agreement at an average price per share of $167.07. The shares received were treated as a repurchase of common stock for purposes of calculating earnings per share.

As of October 1, 2022, approximately $1.4 billion of Cadence's share repurchase authorizations remained available to repurchase shares of Cadence common stock.

The shares repurchased under Cadence's repurchase authorizations and the total cost of repurchased shares, including commissions, during the three and nine months ended October 1, 2022 and October 2, 2021 were as follows:

	Three Months Ended		Nine Months Ended	
	October 1, 2022*	October 2, 2021	October 1, 2022	October 2, 2021
	(In thousands)			
Shares repurchased	959	723	4,664	3,766
Total cost of repurchased shares	$ 180,013	$ 110,011	$ 750,062	$ 502,301

* Includes 109,365 shares and $30.0 million equity forward contract from the June 2022 ASR settled in September 2022.

NOTE 9. NET INCOME PER SHARE

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

The calculations for basic and diluted net income per share for the three and nine months ended October 1, 2022 and October 2, 2021 are as follows:

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
	(In thousands, except per share amounts)			
Net income	$ 186,305	$ 176,307	$ 608,560	$ 519,376
Weighted average common shares used to calculate basic net income per share	271,131	273,194	271,694	273,636
Stock-based awards	3,826	5,117	3,989	5,410
Weighted average common shares used to calculate diluted net income per share	274,957	278,311	275,683	279,046
Net income per share - basic	$ 0.69	$ 0.65	$ 2.24	$ 1.90
Net income per share - diluted	$ 0.68	$ 0.63	$ 2.21	$ 1.86

The following table presents shares of Cadence's common stock outstanding for the three and nine months ended October 1, 2022 and October 2, 2021 that were excluded from the computation of diluted net income per share because the effect of including these shares in the computation of diluted net income per share would have been anti-dilutive:

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
	(In thousands)			
Long-term market-based awards	1,761	—	1,485	—
Options to purchase shares of common stock	514	331	678	267
Non-vested shares of restricted stock	26	5	63	46
Total potential common shares excluded	2,301	336	2,226	313

NOTE 10. FAIR VALUE

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

- Level 1 – Quoted prices for identical instruments in active markets;
- Level 2 – Quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, and model-derived valuations in which all significant inputs and significant value drivers are observable in active markets; and
- Level 3 – Valuations derived from valuation techniques in which one or more significant inputs or significant value drivers are unobservable.

This hierarchy requires Cadence to minimize the use of unobservable inputs and to use observable market data, if available, when determining fair value. Cadence recognizes transfers between levels of the hierarchy based on the fair values of the respective financial instruments at the end of the reporting period in which the transfer occurred. There were no transfers between levels of the fair value hierarchy during the nine months ended October 1, 2022.

On a quarterly basis, Cadence measures at fair value certain financial assets and liabilities. The fair value of financial assets and liabilities was determined using the following levels of inputs as of October 1, 2022 and January 1, 2022:

	Fair Value Measurements as of October 1, 2022			
	Total	Level 1	Level 2	Level 3
	(In thousands)			
Assets				
Cash equivalents:				
Money market funds	$ 587,205	$ 587,205	$ —	$ —
Marketable equity securities	3,963	3,963	—	—
Securities held in Non-Qualified Deferred Compensation (“NQDC”) trust	50,509	50,509	—	—
Total Assets	$ 641,677	$ 641,677	$ —	$ —

	Total	Level 1	Level 2	Level 3
	(In thousands)			
Liabilities				
Foreign currency exchange contracts	$ 16,748	$ —	$ 16,748	$ —
Total Liabilities	$ 16,748	$ —	$ 16,748	$ —

	Fair Value Measurements as of January 1, 2022			
	Total	Level 1	Level 2	Level 3
	(In thousands)			
Assets				
Cash equivalents:				
Money market funds	$ 658,474	$ 658,474	$ —	$ —
Marketable equity securities	5,956	5,956	—	—
Securities held in NQDC trust	56,165	56,165	—	—
Total Assets	$ 720,595	$ 720,595	$ —	$ —

	Total	Level 1	Level 2	Level 3
	(In thousands)			
Liabilities				
Foreign currency exchange contracts	$ 306	$ —	$ 306	$ —
Total Liabilities	$ 306	$ —	$ 306	$ —

Level 1 Measurements

Cadence’s cash equivalents held in money market funds, marketable equity securities and the trading securities held in Cadence’s NQDC trust are measured at fair value using Level 1 inputs.

Level 2 Measurements

The valuation techniques used to determine the fair value of Cadence’s foreign currency forward exchange contracts, the 2024 Notes and the 2025 Term Loan are classified within Level 2 of the fair value hierarchy. For additional information relating to Cadence’s debt arrangements, see Note 4 in the notes to condensed consolidated financial statements.

Level 3 Measurements

During the second quarter of fiscal 2022, Cadence acquired intangible assets of $15.0 million. The fair value of the intangible assets acquired was determined using the multi-period excess earnings method, a variation of the income approach that utilizes unobservable inputs classified as Level 3 measurements. This method estimates the revenues and cash flows derived from the acquired assets, net of investment in supporting assets. The resulting cash flow, which is attributable solely to the assets acquired, is then discounted at a rate of return commensurate with the associated risk of the asset to calculate the present value. Cadence assumed discount rates between 23% and 25%.

During the third quarter of fiscal 2022, Cadence acquired combined intangible assets of $155.5 million through its acquisitions of OpenEye and Future Facilities. For existing technology acquired during the third quarter of fiscal 2022, the fair value was determined by applying the relief-from-royalty method. This method is based on the application of a royalty rate to forecasted revenue to quantify the benefit of owning the intangible asset rather than paying a royalty for use of the asset. To estimate royalty savings over time, Cadence projected revenue from the acquired existing technology over the estimated remaining life of the technology, including the effect of assumed technological obsolescence, before applying an assumed royalty rate. For both OpenEye and Future Facilities, Cadence assumed technological obsolescence at a rate of 10% annually, before applying an assumed royalty rate of 25%.

The fair value for agreements and relationships acquired during the third quarter of fiscal 2022 was determined by using the multi-period excess earnings method. This method reflects the present value of the projected cash flows that are expected to be generated from existing customers, less charges representing the contribution of other assets to those cash flows. Projected income from existing customer relationships was determined using customer retention rates between 95% and 100% for OpenEye and 95% for Future Facilities. The present value of operating cash flows from existing customers was determined using discount rates ranging from 10% to 11%.

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

NOTE 11. INVENTORY

Cadence's inventory balances as of October 1, 2022 and January 1, 2022 were as follows:

	As of	
	October 1, 2022	January 1, 2022
	(In thousands)	
Inventories:		
Raw materials	$ 106,299	$ 88,629
Finished goods	7,984	27,092
Total inventories	$ 114,283	$ 115,721

NOTE 12. COMMITMENTS AND CONTINGENCIES

Legal Proceedings

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

Other Contingencies

Cadence provides its customers with a warranty on sales of hardware products, generally for a 90-day period. Cadence did not incur any significant costs related to warranty obligations during the three and nine months ended October 1, 2022 and October 2, 2021.

Cadence's product license and services agreements typically include a limited indemnification provision for claims from third parties relating to Cadence's intellectual property. If the potential loss from any indemnification claim is considered probable and the amount or the range of loss can be estimated, Cadence accrues a liability for the estimated loss. The indemnification is generally limited to the amount paid by the customer. Cadence did not incur any significant losses from indemnification claims during the three and nine months ended October 1, 2022 and October 2, 2021.

NOTE 13. ACCUMULATED OTHER COMPREHENSIVE LOSS

Cadence's accumulated other comprehensive loss is comprised of the aggregate impact of foreign currency translation gains and losses and changes in defined benefit plan liabilities and is presented in Cadence's condensed consolidated statements of comprehensive income.

Accumulated other comprehensive loss was comprised of the following as of October 1, 2022 and January 1, 2022:

	As of	
	October 1, 2022	January 1, 2022
	(In thousands)	
Foreign currency translation loss	$ (117,317)	$ (26,553)
Changes in defined benefit plan liabilities	(4,816)	(6,758)
Total accumulated other comprehensive loss	$ (122,133)	$ (33,311)

For the three and nine months ended October 1, 2022 and October 2, 2021 there were no significant amounts related to foreign currency translation loss or changes in defined benefit plan liabilities reclassified from accumulated other comprehensive loss to net income.

NOTE 14. SEGMENT REPORTING

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

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

The following table presents a summary of revenue by geography for the three and nine months ended October 1, 2022 and October 2, 2021:

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
	(In thousands)			
Americas:				
United States	$ 392,222	$ 331,463	$ 1,174,734	$ 970,925
Other Americas	15,165	11,487	39,010	31,353
Total Americas	407,387	342,950	1,213,744	1,002,278
Asia:				
China	148,325	98,325	401,460	287,357
Other Asia	156,250	136,272	466,891	404,509
Total Asia	304,575	234,597	868,351	691,866
Europe, Middle East and Africa	142,983	129,606	431,660	384,341
Japan	47,609	43,742	148,086	136,723
Total	$ 902,554	$ 750,895	$ 2,661,841	$ 2,215,208

The following table presents a summary of long-lived assets by geography as of October 1, 2022 and January 1, 2022:

	As of	
	October 1, 2022	January 1, 2022
	(In thousands)	
Americas:		
United States	$ 328,455	$ 267,202
Other Americas	7,376	975
Total Americas	335,831	268,177
Asia:		
China	52,158	56,403
Other Asia	69,859	54,677
Total Asia	122,017	111,080
Europe, Middle East and Africa	55,560	53,748
Japan	4,504	3,030
Total	$ 517,912	$ 436,035

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

The following discussion should be read in conjunction with the condensed consolidated financial statements and notes thereto included in this Quarterly Report on Form 10-Q (this "Quarterly Report") and in conjunction with our Annual Report on Form 10-K for the fiscal year ended January 1, 2022 (our "Annual Report"). This Quarterly Report contains statements that are not historical in nature, are predictive, or that depend upon or refer to future events or conditions or contain other forward-looking statements. Statements including, but not limited to, statements regarding the extent and timing of future revenues and expenses and customer demand, statements regarding the deployment of our products and services, statements regarding our reliance on third parties, statements regarding the impact on our business of the COVID-19 pandemic and related public health measures or mandates, statements regarding the impact of government actions and other statements using words such as "anticipates," "believes," "could," "estimates," "expects," "forecasts," "intends," "may," "plans," "projects," "should," "targets," "will" and "would," and words of similar import and the negatives thereof, constitute forward-looking statements. These statements are predictions based upon our current expectations about future events. Actual results could vary materially as a result of certain factors, including, but not limited to, those expressed in these statements. We refer you to the "Results of Operations," "Quantitative and Qualitative Disclosures About Market Risk," and "Liquidity and Capital Resources" sections contained in this Quarterly Report, the "Risk Factors" section contained in our Annual Report for the fiscal year ended January 1, 2022, and the risks discussed in our other Securities and Exchange Commission ("SEC") filings, which identify important risks and uncertainties that could cause actual results to differ materially from those contained in the forward-looking statements.

We urge you to consider these factors carefully in evaluating the forward-looking statements contained in this Quarterly Report. All subsequent written or oral forward-looking statements attributable to our company or persons acting on our behalf are expressly qualified in their entirety by these cautionary statements. The forward-looking statements included in this Quarterly Report are made only as of the date of this Quarterly Report. We do not intend, and disclaim any obligation, to update these forward-looking statements.

Business Overview

Cadence is a leader in electronic system design, building upon more than 30 years of computational software expertise. We enable our customers to develop electronic products. Our products and services are designed to give our customers a competitive edge in their development of integrated circuits ("ICs"), systems-on-chip ("SoCs"), and increasingly sophisticated electronic devices and systems. Our products and services do this by optimizing performance, minimizing power consumption, shortening the time to bring our customers' products to market, improving engineering productivity and reducing their design, development and manufacturing costs. We offer software, hardware, services and reusable IC design blocks, which are commonly referred to as intellectual property ("IP").

Our strategy, which we call Intelligent System Design™, is to provide the technology necessary for our customers to develop electronic products across a variety of vertical markets including consumer, hyperscale computing, mobile, 5G communications, automotive, aerospace and defense, industrial and healthcare. Our products and services enable our customers to develop complex and innovative electronic products, so demand for our technology is driven by our customers' investment in new designs and products. Historically, the industry that provided the tools used by IC engineers was referred to as Electronic Design Automation ("EDA"). Today, our offerings include and extend beyond EDA.

We group our products into categories related to major design activities:

- Custom IC Design and Simulation;
- Digital IC Design and Signoff;
- Functional Verification;
- IP; and
- System Design and Analysis.

Consistent with our Intelligent System Design strategy, in the third quarter of fiscal 2022, we completed our acquisitions of OpenEye Scientific Software, Inc. ("OpenEye") and FFG Holdings Limited ("Future Facilities"). Both of these acquisitions are expected to add important new technologies and capabilities to our System Design and Analysis technology portfolio that we believe will enhance our ability to pursue attractive opportunities in the markets we serve. These acquisitions are expected to increase expenses, including amortization of acquired intangible assets, more than revenue for at least the remainder of fiscal 2022.

For additional information about our products, see the discussion in Item 1, "Business," under the heading "Products and Product Strategy," in our Annual Report for the fiscal year ended January 1, 2022.

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

Fiscal Year End

On September 7, 2022, our Board of Directors approved a change in our fiscal year end from the Saturday closest to December 31 of each year to December 31 of each year. Our fiscal quarters will end on March 31, June 30, and September 30. The fiscal year change is effective beginning with our 2023 fiscal year, which will begin on January 1, 2023.

COVID-19 Pandemic

Since its inception, the COVID-19 pandemic has posed a variety of challenges to our day-to-day operations. Despite these challenges, the pandemic has not had a material, adverse impact on our results of operations, financial condition, liquidity or cash flows. Going forward, and as the COVID-19 pandemic reaches endemic stages, the degree of impact on our business will depend on factors such as the duration and severity of the pandemic, the spread of new variants, actions taken by government authorities, and measures taken by our customers and suppliers.

While we are unable to accurately predict the full impact that COVID-19 and its continuing repercussions will have on our results of operations, financial condition, liquidity and cash flows, we have implemented policies and practices that have enabled us to support critical operations and execute our strategy. For example, to support the health and well-being of our employees, we currently have a large number of employees who operate in a hybrid work environment, choosing to alternate between working from home and working from our facilities. Because these and similar measures may not fully mitigate the direct and indirect impacts of the COVID-19 pandemic on our business, our management continues to actively monitor and respond to ongoing developments of the COVID-19 pandemic.

Russia-Ukraine Conflict

During the first half of fiscal 2022, due to the ongoing conflict between Russia and Ukraine and the corresponding sanctions imposed by the United States and other countries, we terminated our operations in Russia. The termination of our operations in Russia has not limited our ability to develop or support our products and has not had a material impact on our results of operations, financial condition, liquidity or cash flows. We do not have operations or employees in Ukraine. We will continue to monitor the future developments relative to this conflict and the potential impacts it could have on our employees and our ability to provide products and services to our global customer base.

Expansion of Trade Restrictions

On October 7, 2022, the Bureau of Industry and Security ("BIS") of the U.S. Department of Commerce released broad changes in export control regulations, including new restrictions concerning advanced node IC production in China and the inclusion of additional Chinese technology companies on the BIS's "Unverified List." In addition, on October 14, 2022, a new rule went into effect imposing U.S. export controls on additional technologies, including electronic computer-aided design software specially designed for the development of ICs with Gate-All-Around Field-Effect Transistor (GAAFET) structure. Based on our current assessments, we expect the impact of these expanded trade restrictions on our business to be limited. We will continue to monitor for any further trade restrictions, other regulatory or policy changes by the U.S. or foreign governments and any actions in response. For additional information regarding risks related to international relations and changes in governmental regulations and policies, including existing restrictions imposed by the BIS, see Part I, Item 1A, "Risk Factors," in our Annual Report.

Critical Accounting Estimates

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

For further information about our critical accounting estimates, see the discussion in Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations," under the heading "Critical Accounting Estimates" in our Annual Report.

New Accounting Standards

For additional information about the adoption of new accounting standards, see Note 1 in the notes to condensed consolidated financial statements.

Results of Operations

Financial results for the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, reflect the following:

- revenue growth that exceeded the growth of our costs and expenses;
- increased revenue from software, IP and other arrangements where revenue is recognized over time;
- growth in revenue from emulation and prototyping hardware and IP where revenue is recognized up-front;
- continued investment in research and development activities and technical sales support; and
- increased provision for income taxes primarily due to changes to tax laws in the United States.

Revenue

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

Generally, between 85% and 90% of our annual revenue is characterized as recurring revenue. Recurring revenue includes revenue recognized over time from our software arrangements, services, royalties, maintenance on IP licenses and hardware, and operating leases of hardware. Recurring revenue also includes revenue recognized at varying points in time over the term of other arrangements with non-cancelable commitments, whereby the customer commits to a fixed dollar amount over a specified period of time that can be used to purchase from a list of products or services.

The remainder of our revenue is recognized at a point in time and is characterized as up-front revenue. Up-front revenue is primarily generated by our sales of emulation and prototyping hardware and individual IP licenses. The percentage of our recurring and up-front revenue and fluctuations in revenue within our geographies are impacted by delivery of hardware and IP products to our customers in any single fiscal period.

The following table shows the percentage of our revenue that is classified as recurring or up-front for the three months ended October 1, 2022 and October 2, 2021:

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
Revenue recognized over time	81 %	86 %	82 %	84 %
Revenue from arrangements with non-cancelable commitments	3 %	3 %	2 %	3 %
Recurring revenue	84 %	89 %	84 %	87 %
Up-front revenue	16 %	11 %	16 %	13 %
Total	100 %	100 %	100 %	100 %

While the percentage of revenue characterized as recurring compared to revenue characterized as up-front may vary between fiscal quarters, the overall mix of revenue is relatively consistent on an annual basis or over the course of twelve consecutive months. The following table shows the percentage of recurring revenue for the twelve-month periods ending concurrently with our five most recent fiscal quarters:

	Trailing Twelve Months Ended				
	October 1, 2022	July 2, 2022	April 2, 2022	January 1, 2022	October 2, 2021
Recurring revenue	86 %	87 %	87 %	88 %	87 %
Up-front revenue	14 %	13 %	13 %	12 %	13 %
Total	100 %	100 %	100 %	100 %	100 %

Revenue by Period

The following table shows our revenue for the three months ended October 1, 2022 and October 2, 2021 and the change in revenue between periods:

	Three Months Ended		Change	
	October 1, 2022	October 2, 2021	Amount	Percentage
	(In millions, except percentages)			
Product and maintenance	$ 845.8	$ 706.2	$ 139.6	20 %
Services	56.8	44.7	12.1	27 %
Total revenue	$ 902.6	$ 750.9	$ 151.7	20 %

The following table shows our revenue for the nine months ended October 1, 2022 and October 2, 2021 and the change in revenue between periods:

	Nine Months Ended		Change	
	October 1, 2022	October 2, 2021	Amount	Percentage
	(In millions, except percentages)			
Product and maintenance	$ 2,494.3	$ 2,093.1	$ 401.2	19 %
Services	167.5	122.1	45.4	37 %
Total revenue	$ 2,661.8	$ 2,215.2	$ 446.6	20 %

Product and maintenance revenue increased during the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, due to increased revenue in each of our five product categories. This growth was driven by our customers investing in new, complex designs for their products that include the design of electronic systems for consumer, hyperscale computing, mobile, 5G communications, automotive, aerospace and defense, industrial and healthcare.

Services revenue increased during the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, primarily due to increased revenue from our custom IP offerings. Services revenue may fluctuate from period to period based on the timing of fulfillment of our services and IP performance obligations.

No single customer accounted for 10% or more of total revenue during the three and nine months ended October 1, 2022 or October 2, 2021.

Revenue by Product Category

The following table shows the percentage of revenue contributed by each of our five product categories and services for the past five consecutive quarters:

	Three Months Ended				
	October 1, 2022	July 2, 2022	April 2, 2022	January 1, 2022	October 2, 2021
Custom IC Design and Simulation	22 %	23 %	22 %	24 %	23 %
Digital IC Design and Signoff	29 %	27 %	27 %	29 %	29 %
Functional Verification, including Emulation and Prototyping Hardware	25 %	24 %	28 %	21 %	23 %
IP	12 %	14 %	13 %	14 %	14 %
System Design and Analysis	12 %	12 %	10 %	12 %	11 %
Total	100 %	100 %	100 %	100 %	100 %

Revenue by product category fluctuates from period to period based on demand for our products and services, our available resources and our ability to deliver and support them. Certain of our licensing arrangements allow customers the ability to remix among software products. Additionally, we have arrangements with customers that include a combination of our products, with the actual product selection and number of licensed users to be determined at a later date. For these arrangements, we estimate the allocation of the revenue to product categories based upon the expected usage of our products. The actual usage of our products by these customers may differ and, if that proves to be the case, the revenue allocation in the table above would differ.

Revenue by Geography

	Three Months Ended		Change	
	October 1, 2022	October 2, 2021	Amount	Percentage
	(In millions, except percentages)			
United States	$ 392.2	$ 331.5	$ 60.7	18 %
Other Americas	15.2	11.5	3.7	32 %
China	148.3	98.3	50.0	51 %
Other Asia	156.3	136.3	20.0	15 %
Europe, Middle East and Africa	143.0	129.6	13.4	10 %
Japan	47.6	43.7	3.9	9 %
Total revenue	$ 902.6	$ 750.9	$ 151.7	20 %

The increase in revenue in the United States, China, Other Asia, and Europe, Middle East and Africa during the three months ended October 1, 2022, as compared to the three months ended October 2, 2021, was primarily due to increased revenue from our software and hardware offerings.

	Nine Months Ended		Change	
	October 1, 2022	October 2, 2021	Amount	Percentage
	(In millions, except percentages)			
United States	$ 1,174.7	$ 970.9	$ 203.8	21 %
Other Americas	39.0	31.4	7.6	24 %
China	401.5	287.4	114.1	40 %
Other Asia	466.9	404.5	62.4	15 %
Europe, Middle East and Africa	431.6	384.3	47.3	12 %
Japan	148.1	136.7	11.4	8 %
Total revenue	$ 2,661.8	$ 2,215.2	$ 446.6	20 %

The increase in revenue in the United States and China during the nine months ended October 1, 2022, as compared to the nine months ended October 2, 2021, was primarily due to increased revenue from our software, hardware and IP offerings. The increase in revenue in Other Asia and Europe, Middle East and Africa during the nine months ended October 1, 2022, as compared to the nine months ended October 2, 2021, was primarily due to increased revenue from our software and hardware offerings.

Revenue by Geography as a Percent of Total Revenue

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
United States	43 %	44 %	44 %	44 %
Other Americas	2 %	2 %	1 %	2 %
China	17 %	13 %	15 %	13 %
Other Asia	17 %	18 %	18 %	18 %
Europe, Middle East and Africa	16 %	17 %	16 %	17 %
Japan	5 %	6 %	6 %	6 %
Total	100 %	100 %	100 %	100 %

The substantial majority of our revenue is transacted in the United States dollar. However, certain revenue transactions are denominated in foreign currencies. For an additional description of how changes in foreign exchange rates affect our condensed consolidated financial statements, see the discussion under Item 3, “Quantitative and Qualitative Disclosures About Market Risk – Foreign Currency Risk.”

Cost of Revenue

The following tables show our cost of revenue for the three and nine months ended October 1, 2022 and October 2, 2021 and the change in cost of revenue between periods:

	Three Months Ended		Change	
	October 1, 2022	October 2, 2021	Amount	Percentage
	(In millions, except percentages)			
Cost of product and maintenance	$ 62.4	$ 54.2	$ 8.2	15 %
Cost of services	25.2	22.4	2.8	13 %

	Nine Months Ended		Change	
	October 1, 2022	October 2, 2021	Amount	Percentage
	(In millions, except percentages)			
Cost of product and maintenance	$ 203.9	$ 174.9	$ 29.0	17 %
Cost of services	74.2	62.4	11.8	19 %

Cost of Product and Maintenance

Cost of product and maintenance includes costs associated with the sale and lease of our emulation and prototyping hardware and licensing of our software and IP products, certain employee salary and benefits and other employee-related costs, cost of our customer support services, amortization of technology-related and maintenance-related acquired intangibles, costs of technical documentation and royalties payable to third-party vendors. Cost of product and maintenance depends primarily on our hardware product sales in any given period, but is also affected by employee salary and benefits and other employee-related costs, reserves for inventory, and the timing and extent to which we acquire intangible assets, license third-party technology or IP, and sell our products that include such acquired or licensed technology or IP.

A summary of cost of product and maintenance is as follows:

	Three Months Ended		Change	
	October 1, 2022	October 2, 2021	Amount	Percentage
	(In millions, except percentages)			
Product and maintenance-related costs	$ 53.5	$ 42.4	$ 11.1	26 %
Amortization of acquired intangibles	8.9	11.8	(2.9)	(25) %
Total cost of product and maintenance	$ 62.4	$ 54.2	$ 8.2	15 %

	Nine Months Ended		Change	
	October 1, 2022	October 2, 2021	Amount	Percentage
	(In millions, except percentages)			
Product and maintenance-related costs	$ 173.0	$ 139.1	$ 33.9	24 %
Amortization of acquired intangibles	30.9	35.8	(4.9)	(14) %
Total cost of product and maintenance	$ 203.9	$ 174.9	$ 29.0	17 %

The changes in product and maintenance-related costs for the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, were due to the following:

	Change	
	Three Months Ended	Nine Months Ended
	(In millions)	
Emulation and prototyping hardware costs	$ 10.3	$ 32.3
Other items	0.8	1.6
Total change in product and maintenance-related costs	$ 11.1	$ 33.9

Costs associated with our emulation and prototyping hardware products include components, assembly, testing, applicable reserves and overhead. These costs make our cost of emulation and prototyping hardware products higher, as a percentage of revenue, than our cost of software and IP products. Emulation and prototyping hardware costs increased during the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, primarily due to increased revenue from emulation and prototyping hardware products.

Cost of Services

Cost of services primarily includes employee salary, benefits and other employee-related costs to perform work on revenue-generating projects and costs to maintain the infrastructure necessary to manage a services organization. Cost of services may fluctuate from period to period based on our utilization of design services engineers on revenue-generating projects rather than internal development projects.

Operating Expenses

Our operating expenses include marketing and sales, research and development, and general and administrative expenses. Factors that tend to cause our operating expenses to fluctuate include changes in the number of employees due to hiring and acquisitions, our annual, mid-year promotion and pay raise cycle, stock-based compensation, restructuring and other employment separation activities (such as the voluntary retirement program we offered to certain employees during the second quarter of fiscal 2021), foreign exchange rate movements, acquisition-related costs, volatility in variable compensation programs that are driven by operating results, and charitable donations.

Stock-based compensation for the three and nine months ended October 1, 2022 increased, as compared to the three and nine months ended October 2, 2021, due to an increased number of grants under our equity incentive plans, including long-term market-based awards, to attract and retain talent.

Many of our operating expenses are transacted in various foreign currencies. We recognize lower expenses in periods when the United States dollar strengthens in value against other currencies and we recognize higher expenses when the United States dollar weakens against other currencies. For an additional description of how changes in foreign exchange rates affect our condensed consolidated financial statements, see the discussion in Item 3, "Quantitative and Qualitative Disclosures About Market Risk – Foreign Currency Risk."

Our operating expenses for the three and nine months ended October 1, 2022 and October 2, 2021 were as follows:

	Three Months Ended		Change	
	October 1, 2022	October 2, 2021	Amount	Percentage
	(In millions, except percentages)			
Marketing and sales	$ 152.9	$ 143.4	$ 9.5	7 %
Research and development	323.6	289.1	34.5	12 %
General and administrative	73.7	43.0	30.7	71 %
Total operating expenses	$ 550.2	$ 475.5	$ 74.7	16 %

	Nine Months Ended		Change	
	October 1, 2022	October 2, 2021	Amount	Percentage
	(In millions, except percentages)			
Marketing and sales	$ 432.4	$ 412.2	$ 20.2	5 %
Research and development	901.1	845.3	55.8	7 %
General and administrative	174.1	123.3	50.8	41 %
Total operating expenses	$ 1,507.6	$ 1,380.8	$ 126.8	9 %

Our operating expenses, as a percentage of total revenue, for the three and nine months ended October 1, 2022 and October 2, 2021 were as follows:

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
Marketing and sales	17 %	19 %	16 %	19 %
Research and development	36 %	40 %	34 %	39 %
General and administrative	8 %	6 %	7 %	6 %
Total operating expenses	61 %	65 %	57 %	64 %

Marketing and Sales

The increase in marketing and sales expense for the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, was due to the following:

	Change	
	Three Months Ended	Nine Months Ended
	(In millions)	
Salary, benefits and other employee-related costs	$ 0.3	$ 9.7
Stock-based compensation	4.2	7.4
Marketing programs and events	3.6	6.9
Travel and sales meetings	1.3	1.9
Voluntary retirement program	—	(6.7)
Other items	0.1	1.0
Total change in marketing and sales expense	$ 9.5	$ 20.2

Salary, benefits and other employee-related costs included in marketing and sales expense increased during the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, primarily due to increased compensation costs related to additional headcount. Costs related to marketing programs and events increased during the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, primarily due to an increased number of in-person meetings and events.

Research and Development

The increase in research and development expense for the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, was due to the following:

	Change	
	Three Months Ended	Nine Months Ended
	(In millions)	
Salary, benefits and other employee-related costs	$ 16.6	$ 34.5
Stock-based compensation	10.4	18.4
Facilities and other infrastructure costs	3.4	7.7
Professional services	2.6	7.0
Travel	1.8	2.7
Voluntary retirement program	—	(14.7)
Other items	(0.3)	0.2
Total change in research and development expense	$ 34.5	$ 55.8

Salary, benefits and other employee-related costs included in research and development expense increased during the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, primarily due to increased compensation costs related to additional headcount from hiring.

General and Administrative

The increase in general and administrative expense for the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, was due to the following:

	Change	
	Three Months Ended	Nine Months Ended
	(In millions)	
Contributions to non-profit organizations	$ 22.0	$ 25.3
Professional services	4.9	16.0
Stock-based compensation	5.8	15.1
Salary, benefits and other employee-related costs	1.8	4.4
Voluntary retirement program	—	(2.6)
Foreign service tax refund	(4.0)	(9.0)
Other items	0.2	1.6
Total change in general and administrative expense	$ 30.7	$ 50.8

The increase in contributions to non-profit organizations during the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, is the result of our continued commitment to support charitable initiatives, including the Cadence Giving Foundation. Professional services included in general and administrative expense increased during the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, primarily due to an increase in acquisition-related professional services and legal fees and costs for other matters. Stock-based compensation included in general and administrative expense increased during the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, primarily due to equity awards granted to executives.

Operating Margin

Operating margin represents income from operations as a percentage of total revenue. Our operating margin for the three and nine months ended October 1, 2022, and the three and nine months ended October 2, 2021 was as follows:

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
Operating margin	29 %	26 %	32 %	26 %

Generally, our operating margin during the second half of the fiscal year is impacted by incremental costs associated with our annual, mid-year promotion and pay raise cycle. Operating margin increased during the three and nine months ended October 1, 2022, as compared to the three and nine months ended October 2, 2021, primarily because revenue growth in each of our five product categories exceeded growth in cost of revenue and operating expense. For the remainder of fiscal 2022, we expect our operating margin to be impacted by the operating expenses from our acquisitions, including amortization of acquired intangibles, exceeding the revenue contributed from our acquisitions.

Interest Expense

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
	(In millions)			
Contractual interest expense:				
2024 Notes	3.8	3.8	$ 11.4	$ 11.4
2025 Term Loan	0.9	—	0.9	—
Revolving credit facility	0.7	0.2	1.1	0.5
Amortization of debt discount:				
2024 Notes	0.2	0.2	0.6	0.6
Other	(0.1)	—	(0.1)	0.2
Total interest expense	$ 5.5	$ 4.2	$ 13.9	$ 12.7

Income Taxes

The following table presents the provision for income taxes and the effective tax rate for the three and nine months ended October 1, 2022 and October 2, 2021:

	Three Months Ended		Nine Months Ended	
	October 1, 2022	October 2, 2021	October 1, 2022	October 2, 2021
	(In millions, except percentages)			
Provision for income taxes	$ 66.0	$ 12.4	$ 226.3	$ 55.0
Effective tax rate	26.1 %	6.6 %	27.1 %	9.6 %

The United States enacted the Tax Cuts and Jobs Act in December 2017, which requires companies to capitalize all of their R&D costs, including software development costs, incurred in tax years beginning after December 31, 2021. Beginning in fiscal 2022, we began capitalizing and amortizing R&D costs over five years for domestic research and 15 years for international research rather than expensing these costs as incurred. As a result, we expect our fiscal 2022 effective tax rate and our cash tax payments to increase significantly as compared to fiscal 2021. We also expect to recognize increases to our deferred tax assets as we begin to capitalize domestic research costs.

Our provision for income taxes for the three and nine months ended October 1, 2022 was primarily attributable to federal, state and foreign income taxes on our anticipated fiscal 2022 income. We also recognized tax benefits of $18.0 million and $36.9 million related to stock-based compensation that vested or was exercised during each period. Our provision for income taxes for the three and nine months ended October 1, 2022, reflected the impact of the Tax Cuts and Jobs Act, which requires the capitalization and amortization of R&D costs incurred after December 31, 2021.

Our provision for income taxes for the three and nine months ended October 2, 2021 was primarily attributable to federal, state and foreign income taxes on our then anticipated fiscal 2021 income, partially offset by the tax benefit of $13.7 million for the three and nine months ended October 2, 2021 related to an increase in our foreign-derived intangible income, and tax benefits of $14.3 million and $59.1 million for the three and nine months ended October 2, 2021, respectively, related to stock-based compensation that vested or was exercised during the period.

We maintain valuation allowances on certain federal, state, and foreign deferred tax assets. While we believe our current valuation allowance is sufficient, we assess the need for an adjustment to the valuation allowance on a quarterly basis. The assessment is based on our estimates of future sources of taxable income in the jurisdictions in which we operate and the periods over which our deferred tax assets will be realizable. In the event we determine that we will be able to realize all or part of our net deferred tax assets in the future, the valuation allowance will be reversed in the period in which we make such determination. The release of a valuation allowance would result in an increase to our net deferred tax assets and a decrease to income tax expense in the period in which the release is recorded.

Our future effective tax rates may also be materially impacted by tax amounts associated with our foreign earnings at rates different from the United States federal statutory rate, research credits, the tax impact of stock-based compensation, accounting for uncertain tax positions, business combinations, closure of statutes of limitations or settlement of tax audits and changes in tax law. A significant amount of our foreign earnings is generated by our subsidiaries organized in Ireland and Hungary. Our future effective tax rates may be adversely affected if our earnings were to be lower in countries where we have lower statutory tax rates. We currently expect that our fiscal 2022 effective tax rate will be approximately 28%. We expect that our quarterly effective tax rates will vary from our fiscal 2022 effective tax rate as a result of recognizing the income tax effects of stock-based awards in the quarterly periods that the awards vest or are settled and other items that we cannot anticipate. For additional discussion about how our effective tax rate could be affected by various risks, see Part I, Item 1A, “Risk Factors,” in our Annual Report.

Liquidity and Capital Resources

	As of		
	October 1, 2022	January 1, 2022	Change
	(In millions)		
Cash and cash equivalents	$ 1,026.1	$ 1,088.9	$ (62.8)
Net working capital	413.5	744.5	(331.0)

Cash and Cash Equivalents

As of October 1, 2022, our principal sources of liquidity consisted of approximately $1.0 billion of cash and cash equivalents as compared to $1.1 billion as of January 1, 2022.

Our primary sources of cash and cash equivalents during the nine months ended October 1, 2022 were cash generated from operations, proceeds from our revolving credit facility, proceeds from our term loan and proceeds from the issuance of common stock resulting from stock purchases under our employee stock purchase plan and stock options exercised during the period.

Our primary uses of cash and cash equivalents during the nine months ended October 1, 2022 were payments related to employee salaries and benefits, operating expenses, repurchases of our common stock, cash paid for business combinations, payments on our revolving credit facility, payment of employee taxes on vesting of restricted stock, and purchases of property, plant and equipment.

Approximately 72% of our cash and cash equivalents were held by our foreign subsidiaries as of October 1, 2022. Our cash and cash equivalents held by our foreign subsidiaries may vary from period to period due to the timing of collections and repatriation of foreign earnings. We expect that current cash and cash equivalent balances and cash flows that are generated from operations and financing activities will be sufficient to meet the needs of our domestic and international operating activities and other capital and liquidity requirements, including acquisitions and share repurchases, for at least the next 12 months and thereafter for the foreseeable future.

Net Working Capital

Net working capital is comprised of current assets less current liabilities, as shown on our condensed consolidated balance sheets. The decrease in our net working capital as of October 1, 2022, as compared to January 1, 2022, is primarily due to our use of cash for investing and financing activities and the timing of cash receipts from customers and disbursements made to vendors.

Cash Flows from Operating Activities

	Nine Months Ended		
	October 1, 2022	October 2, 2021	Change
	(In millions)		
Cash provided by operating activities	$ 978.3	$ 885.1	$ 93.2

Cash flows from operating activities include net income, adjusted for certain non-cash items, as well as changes in the balances of certain assets and liabilities. Our cash flows provided by operating activities are significantly influenced by business levels and the payment terms set forth in our customer agreements. The increase in cash flows from operating activities for the nine months ended October 1, 2022, as compared to the nine months ended October 2, 2021, was primarily due to improved results from operations and timing of cash receipts from customers and disbursements made to vendors.

Cash Flows from Investing Activities

	Nine Months Ended		
	October 1, 2022	October 2, 2021	Change
	(In millions)		
Cash used for investing activities	$ (674.5)	$ (269.9)	$ (404.6)

Cash used for investing activities increased during the nine months ended October 1, 2022, as compared to the nine months ended October 2, 2021, primarily due to increases in payments for business combinations and purchases of property, plant and equipment. We expect to continue our investing activities, including purchasing property, plant and equipment, purchasing intangible assets, acquiring other companies and businesses, purchasing software licenses, and making strategic investments.

Cash Flows from Financing Activities

	Nine Months Ended		
	October 1, 2022	October 2, 2021	Change
	(In millions)		
Cash used for financing activities	$ (299.9)	$ (528.1)	$ 228.2

Cash used for financing activities decreased during the nine months ended October 1, 2022, as compared to the nine months ended October 2, 2021, primarily due to an increase in proceeds from borrowings, partially offset by an increase in payments for repurchases of our common stock.

Other Factors Affecting Liquidity and Capital Resources

Stock Repurchase Program

In August 2022, our Board of Directors increased the prior authorization to repurchase shares of our common stock by authorizing an additional $1 billion. The actual timing and amount of repurchases are subject to business and market conditions, corporate and regulatory requirements, stock price, acquisition opportunities and other factors. As of October 1, 2022, approximately $1.4 billion of the share repurchase authorizations remained available to repurchase shares of our common stock. See Part II, Item 2, "Unregistered Sales of Equity Securities and Use of Proceeds" for additional information on share repurchases.

Revolving Credit Facility

In June 2021, we entered into a five-year senior unsecured revolving credit facility with a group of lenders led by Bank of America, N.A., as administrative agent, as amended in September 2022 (the "2021 Credit Facility"). The 2021 Credit Facility provides for borrowings up to $700.0 million, with the right to request increased capacity up to an additional $350.0 million upon receipt of lender commitments, for total maximum borrowings of $1.05 billion. The 2021 Credit Facility expires on June 30, 2026. Any outstanding loans drawn under the 2021 Credit Facility are due at maturity on June 30, 2026, subject to an option to extend the maturity date. Outstanding borrowings may be repaid at any time prior to maturity. As of October 1, 2022, there were $150.0 million of borrowings outstanding under the 2021 Credit Facility, and we were in compliance with all financial covenants associated with such credit facility.

2024 Notes

In October 2014, we issued $350.0 million aggregate principal amount of 4.375% Senior Notes due October 15, 2024 (the "2024 Notes"). We received net proceeds of $342.4 million from the issuance of the 2024 Notes, net of a discount of $1.4 million and issuance costs of $6.2 million. Interest is payable in cash semi-annually. The 2024 Notes are unsecured and rank equal in right of payment to all of our existing and future senior indebtedness. As of October 1, 2022, we were in compliance with all covenants associated with the 2024 Notes.

2025 Term Loan

In September 2022, we entered into a $300 million three-year senior non-amortizing term loan facility due on September 7, 2025 with a group of lenders led by Bank of America, N.A., as administrative agent (the "2025 Term Loan"). The 2025 Term Loan is unsecured and ranks equal in right of payment to all of our unsecured indebtedness. Proceeds from the 2025 Term Loan were used to fund our acquisition of OpenEye. As of October 1, 2022, we were in compliance with all financial covenants associated with the 2025 Term Loan.

For additional information relating to our debt arrangements, see Note 4 in the notes to condensed consolidated financial statements. For additional information relating to OpenEye and other acquisitions, see Note 5 in the notes to condensed consolidated financial statements.

Other Liquidity Requirements

During the nine months ended October 1, 2022, there were no material changes to our other liquidity requirements as reported in Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations," in our Annual Report for the fiscal year ended January 1, 2022.

Item 3. Quantitative and Qualitative Disclosures About Market Risk

Foreign Currency Risk

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

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

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

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

The following table provides information about our foreign currency forward exchange contracts as of October 1, 2022. The information is provided in U.S. dollar equivalent amounts. The table presents the notional amounts, at contract exchange rates, and the weighted average contractual foreign currency exchange rates expressed as units of the foreign currency per U.S. dollar, which in some cases may not be the market convention for quoting a particular currency. All of these forward contracts mature before or during November, 2022.

	Notional Principal	Weighted Average Contract Rate
	(In millions)	
Forward Contracts:		
European Union euro	$ 135.4	0.98
British pound	102.7	0.84
Israeli shekel	63.5	3.32
Japanese yen	61.6	138.28
Swedish krona	36.7	10.83
Indian rupee	24.4	80.16
Canadian dollar	16.9	1.29
Chinese renminbi	14.0	6.85
Taiwan dollar	12.5	31.3
South Korean won	12.3	1328.46
Singapore dollar	3.6	1.39
Total	$ 483.6	
Estimated fair value	$ (16.7)	

We actively monitor our foreign currency risks, but our foreign currency hedging activities may not substantially offset the impact of fluctuations in currency exchange rates on our results of operations, cash flows and financial position.

Interest Rate Risk

Our exposure to market risk for changes in interest rates relates primarily to our portfolio of cash and cash equivalents and any balances outstanding on our 2021 Credit Facility and 2025 Term Loan. We are exposed to interest rate fluctuations in many of the world's leading industrialized countries, but our interest income and expense is most sensitive to fluctuations in the general level of United States interest rates. In this regard, changes in United States interest rates affect the interest earned on our cash and cash equivalents and the costs associated with foreign currency hedges.

All highly liquid securities with a maturity of three months or less at the date of purchase are considered to be cash equivalents. The carrying value of our interest-bearing instruments approximated fair value as of October 1, 2022.

Interest rates under our 2021 Credit Facility and 2025 Term Loan are variable, so interest expense could be adversely affected by changes in interest rates, particularly for periods when we maintain a balance outstanding under the revolving credit facility. As of October 1, 2022, there were $150.0 million of borrowings outstanding under our 2021 Credit Facility and $300.0 million of borrowings outstanding under our 2025 Term Loan.

Interest rates for our 2021 Credit Facility and 2025 Term Loan can fluctuate based on changes in market interest rates and in interest rate margins that vary based on the credit ratings of our unsecured debt. Assuming all loans were fully drawn and we were to fully exercise our right to increase borrowing capacity under our 2021 Credit Facility and made no prepayments on our 2025 Term Loan, each quarter point change in interest rates would result in a $3.4 million change in annual interest expense on our indebtedness under our 2021 Credit Facility and 2025 Term Loan. For an additional description of the 2021 Credit Facility and 2025 Term Loan, see Note 4 in the notes to condensed consolidated financial statements.

Equity Price Risk

Equity Investments

We have a portfolio of equity investments that includes marketable equity securities and non-marketable investments. Our equity investments are made primarily in connection with our strategic investment program. Under our strategic investment program, from time to time, we make cash investments in companies with technologies that are potentially of strategic importance to us.

Item 4. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

As required by Rule 13a-15 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), under the supervision and with the participation of our management, including our Chief Executive Officer ("CEO") and our Chief Financial Officer ("CFO"), we evaluated the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) as of October 1, 2022.

The evaluation of our disclosure controls and procedures included a review of our processes and the effect on the information generated for use in this Quarterly Report on Form 10-Q. In the course of this evaluation, we sought to identify any material weaknesses in our disclosure controls and procedures, to determine whether we had identified any acts of fraud involving personnel who have a significant role in our disclosure controls and procedures, and to confirm that any necessary corrective action, including process improvements, was taken. This type of evaluation is done every fiscal quarter so that our conclusions concerning the effectiveness of these controls can be reported in our periodic reports filed with the SEC. The overall goals of these evaluation activities are to monitor our disclosure controls and procedures and to make modifications as necessary. We intend to maintain these disclosure controls and procedures, modifying them as circumstances warrant.

Based on their evaluation as of October 1, 2022, our CEO and CFO have concluded that our disclosure controls and procedures were effective as of the end of the period covered by this report to provide reasonable assurance that the information required to be disclosed by us in our reports filed or submitted under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and is accumulated and communicated to our management, including the CEO and CFO, as appropriate to allow timely decisions regarding required disclosure.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting during the fiscal quarter ended October 1, 2022 that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Inherent Limitations on Effectiveness of Controls

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

PART II. OTHER INFORMATION

Item 1. Legal Proceedings

For information about disputes and legal proceedings in which we are involved from time to time, see Note 12 in the notes to condensed consolidated financial statements.

Item 1A. Risk Factors

Our operations and financial results are subject to various risks and uncertainties, including those described in the "Risk Factors" section in our Annual Report for the fiscal year ended January 1, 2022, that could adversely affect our business, financial condition, results of operations, cash flows, liquidity, revenue, growth, prospects, demand, reputation, and the trading price of our common stock, and make an investment in us speculative or risky. There have been no material changes to our risk factors since our Annual Report for the fiscal year ended January 1, 2022. The risk factors summarized in our Annual Report do not include all of the risks that we face, and there may be additional risks or uncertainties that are currently unknown or not believed to be material that occur or become material.

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

In August 2022, our Board of Directors increased the prior authorization to repurchase shares of our common stock by authorizing an additional $1 billion. The actual timing and amount of repurchases are subject to business and market conditions, corporate and regulatory requirements, stock price, acquisition opportunities and other factors.

During the three months ended October 1, 2022, we repurchased approximately 0.9 million shares on the open market, for an aggregate purchase price of $150.0 million.

In June 2022, we also entered into an accelerated share repurchase ("ASR") agreement with Royal Bank of Canada to repurchase an aggregate of $100.0 million of our common stock. The ASR agreement was accounted for as two separate transactions (1) a repurchase of common stock and (2) an equity-linked contract on our own stock. In June 2022, we received an initial share delivery of approximately 0.5 million shares, which represented the number of shares at a market price equal to $70.0 million. An equity-linked contract for $30.0 million, representing the remaining shares to be delivered by Royal Bank of Canada under the ASR agreement, was recorded to stockholders' equity as of July 2, 2022. In September 2022, the ASR agreement settled and resulted in a delivery to us of approximately 0.1 million additional shares. In total, approximately 0.6 million shares were repurchased under the ASR agreement at an average price per share of $167.07.

As of October 1, 2022, approximately $1.4 billion of the share repurchase authorizations remained available to repurchase shares of our common stock.

The following table presents repurchases made under our publicly announced repurchase authorizations and shares surrendered by employees to satisfy income tax withholding obligations during the three months ended October 1, 2022:

Period	Total Number of Shares Purchased (1)	Average Price Paid Per Share (2)	Total Number of Shares Purchased as Part of Publicly Announced Plan or Program	Approximate Dollar Value of Shares that May Yet Be Purchased Under Publicly Announced Plan or Program (1) (In millions)
July 3, 2022 - August 6, 2022	104,054	$ 180.66	92,923	$ 510
August 7, 2022 - September 3, 2022	516,070	$ 187.51	369,344	$ 1,441
September 4, 2022 - October 1, 2022	508,244	$ 190.06	497,101	$ 1,377
Total	1,128,368	$ 188.03	959,368	

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

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

Item 3. Defaults Upon Senior Securities

None.

Item 4. Mine Safety Disclosures

Not applicable.

Item 5. Other Information

None.

Item 6. Exhibits

Exhibit Number		Exhibit Title	Incorporated by Reference Form	File No.	Exhibit No.	Filing Date	Provided Herewith
10.01		Loan Agreement, dated September 7, 2022, by and among Cadence Design Systems, Inc., Bank of America, N.A., and other lenders party thereto.	8-K	000-15867	10.01	9/8/2022	
10.02		First Amendment to Credit Agreement, dated September 7, 2022, by and among Cadence Design Systems, Inc., Bank of America, N.A. and other lenders party thereto.	8-K	000-15867	10.02	9/8/2022	
10.03	*	Form of Incentive Stock Award Agreement for Non-Executive Employees and Consultants, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.					X
10.04	*	Form of Restricted Stock Unit Agreement for Non-Executive Employees and Consultants, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.					X
31.01	*	Certification of the Registrant's Chief Executive Officer, Anirudh Devgan, pursuant to Rule 13a-14 of the Securities Exchange Act of 1934.					X
31.02	*	Certification of the Registrant's Chief Financial Officer, John M. Wall, pursuant to Rule 13a-14 of the Securities Exchange Act of 1934.					X
32.01	†	Certification of the Registrant's Chief Executive Officer, Anirudh Devgan, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.					X
32.02	†	Certification of the Registrant's Chief Financial Officer, John M. Wall, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.					X
101.INS	*	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.					
101.SCH	*	Inline XBRL Taxonomy Extension Schema Document.					X
101.CAL	*	Inline XBRL Taxonomy Extension Calculation Linkbase Document.					X
101.DEF	*	Inline XBRL Definition Linkbase Document.					X
101.LAB	*	Inline XBRL Taxonomy Extension Label Linkbase Document.					X
101.PRE	*	Inline XBRL Taxonomy Extension Presentation Linkbase Document.					X

104	Cover Page Interactive Data File - The cover page from this Quarterly Report on Form 10-Q is formatted in Inline XBRL (included as Exhibit 101).	X

* Filed herewith.
† Furnished herewith.

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.

			CADENCE DESIGN SYSTEMS, INC. **(Registrant)**
DATE:	October 24, 2022	By:	/s/ Anirudh Devgan
			Anirudh Devgan President and Chief Executive Officer
DATE:	October 24, 2022	By:	/s/ John M. Wall
			John M. Wall Senior Vice President and Chief Financial Officer