

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

FORM 10-K/A
(Amendment No. 1)

(Mark One)

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

For the fiscal year ended January 2, 2021

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

(State or Other Jurisdiction of
Incorporation or Organization)

00-0000000

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

2655 Seely Avenue, Building 5, San Jose, California
(Address of Principal Executive Offices)

95134
(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
Common Stock, \$0.01 par value per share

Trading Symbol(s)
CDNS

Names of Each Exchange on which Registered
Nasdaq Global Select Market

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

None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

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

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

Indicate by check mark whether the registrant has submitted electronically 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 ☒

Non-accelerated Filer ☐

Accelerated Filer

Smaller Reporting Company

Emerging Growth Company

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

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

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

The aggregate market value of the voting and non-voting common equity held by non-affiliates computed by reference to the price at which the common equity was last sold as of the last business day of the registrant's most recently completed second fiscal quarter ended June 27, 2020 was approximately \$26,162,000,000.

On February 6, 2021, approximately 278,974,000 shares of the Registrant's Common Stock, \$0.01 par value, were outstanding.

CADENCE DESIGN SYSTEMS, INC.

Amendment No. 1 to the Annual Report on Form 10-K
For the year ended January 2, 2021
EXPLANATORY NOTE

Cadence Design Systems, Inc. ("Cadence") is filing this Amendment No. 1 on Form 10-K/A (this "Amendment") to its Annual Report on Form 10-K for the year ended January 2, 2021, as filed on February 22, 2021 (the "Original Form 10-K"), at the request of KPMG LLP ("KPMG"), solely to correct KPMG's administrative error in its audit report on Cadence's consolidated financial statements for the year ended December 28, 2019 (the "KPMG Audit Report"). The KPMG Audit Report in the Original Form 10-K did not include the correct signature date of February 24, 2020. Such change does not affect KPMG's unqualified opinion on Cadence's consolidated financial statements for the year ended December 28, 2019 included in the Original Form 10-K. Updated consents from each of KPMG and PricewaterhouseCoopers LLP with the current date are filed herewith as exhibits to this Amendment.

This Amendment includes Part II, Item 8, "Financial Statements and Supplementary Data" and Item 9A, "Controls and Procedures" in their entirety and without change from the Original Form 10-K. This Amendment also includes Part IV, Item 15, "Exhibits and Financial Statement Schedules" in its entirety and without change from the Original Form 10-K other than the correction of the signature date of the KPMG Audit Report.

Pursuant to Rule 12b-15 under the Securities Exchange Act of 1934, as amended, this Amendment also contains new certifications pursuant to Sections 302 and 906 of the Sarbanes-Oxley Act of 2002, which are attached hereto.

Except as described above, this Amendment does not amend, update or change any other items or disclosures in the Original Form 10-K. Further, this Amendment does not change any previously reported financial results, nor does it reflect subsequent events occurring after the filing date of the Original Form 10-K. This Amendment should be read in conjunction with the Original Form 10-K and our other filings with the Securities and Exchange Commission.

PART II.

Item 8. Financial Statements and Supplementary Data

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

Summary Quarterly Data-Unaudited

	2020				2019			
	4 th	3 rd	2 nd	1 st	4 th	3 rd	2 nd	1 st
(In thousands, except per share amounts)								
Revenue ⁽¹⁾	\$ 759,909	\$ 666,607	\$ 638,418	\$ 617,957	\$ 599,555	\$ 579,603	\$ 580,419	\$ 576,742
Cost of revenue ⁽¹⁾	73,536	82,284	75,215	74,463	73,328	60,975	61,469	70,585
Net income ^{(1) (2)}	173,738	161,630	131,288	123,988	659,675	101,514	107,235	120,555
Net income per share –basic ⁽¹⁾ ₍₂₎	0.63	0.59	0.48	0.45	2.41	0.37	0.39	0.44
Net income per share –diluted ⁽¹⁾ ₍₂₎	0.62	0.58	0.47	0.44	2.36	0.36	0.38	0.43

⁽¹⁾ Fiscal 2020 was a 53-week year, compared to 2019, which was a 52-week fiscal year. The additional week in fiscal 2020 resulted in additional revenue of approximately \$45 million and additional expense, including stock-based compensation and amortization of acquired intangibles, of approximately \$35 million in the fourth quarter of fiscal 2020.

⁽²⁾ During the fourth quarter of fiscal 2019, we completed intercompany transfers of certain intangible property rights to our Irish subsidiary, which resulted in the establishment of a net deferred tax asset and the recognition of an income tax benefit of \$575.6 million. For further discussion regarding the realignment of our international operating structure, see Note 6 in the notes to the consolidated financial statements.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

As required by Rule 13a-15 of the Securities Exchange Act of 1934, as amended (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 January 2, 2021.

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

Based on their evaluation as of January 2, 2021, our CEO and CFO have concluded that our disclosure controls and procedures were effective to provide reasonable assurance that the information required to be disclosed by us in our reports filed or submitted under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and is accumulated and communicated to our management, including the CEO and CFO, as appropriate to allow timely decisions regarding required disclosure.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting during the fiscal quarter ended January 2, 2021 that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Inherent Limitations on Effectiveness of Controls

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

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act). Our management assessed the effectiveness of our internal control over financial reporting as of January 2, 2021. In making this assessment, our management used the criteria established in *Internal Control-Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"). Our management has concluded that, as of January 2, 2021, our internal control over financial reporting is effective based on these criteria. Our independent registered public accounting firm, PricewaterhouseCoopers LLP, has issued an attestation report on our internal control over financial reporting, which is included in Part IV, Item 15, "Exhibits and Financial Statement Schedules."

PART IV.

Item 15. Exhibits and Financial Statement Schedules

	Page
(a) 1. Financial Statements	
Report of Independent Registered Public Accounting Firm	6
Consolidated Balance Sheets as of January 2, 2021 and December 28, 2019	9
Consolidated Income Statements for the three fiscal years ended January 2, 2021	10
Consolidated Statements of Comprehensive Income for the three fiscal years ended January 2, 2021	11
Consolidated Statements of Stockholders' Equity for the three fiscal years ended January 2, 2021	12
Consolidated Statements of Cash Flows for the three fiscal years ended January 2, 2021	13
Notes to Consolidated Financial Statements	14
(a) 2. Financial Statement Schedules	
All financial statement schedules are omitted because they are not applicable, not required or the required information is shown in the consolidated financial statements or notes thereto.	
(a) 3. Exhibits	44

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

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

© 2021 Cadence Design Systems, Inc. All rights reserved worldwide. Cadence, the Cadence logo, and the other Cadence marks found at www.cadence.com/go/trademarks are trademarks or registered trademarks of Cadence Design Systems, Inc. All other trademarks are the property of their respective holders.

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Cadence Design Systems, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheet of Cadence Design Systems, Inc. and its subsidiaries (the "Company") as of January 2, 2021, and the related consolidated statements of income, of comprehensive income, of stockholders' equity and of cash flows for the year then ended, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of January 2, 2021, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of January 2, 2021, and the results of its operations and its cash flows for the year then ended in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of January 2, 2021, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control Over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audit of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

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

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

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Revenue Recognition – Identifying and Evaluating Terms and Conditions in Contracts

As described in Note 2 to the consolidated financial statements, the Company enters into contracts that can include various combinations of licenses, products, and services, some of which are distinct and are accounted for as separate performance obligations. For contracts with multiple performance obligations, management allocates the transaction price of the contract to each performance obligation and recognizes revenue upon transfer of control of promised products or services to customers. Management applies judgment in identifying and evaluating any terms and conditions in contracts which may impact revenue recognition. For the year ended January 2, 2021, the Company's total revenue was \$2.683 billion.

The principal considerations for our determination that performing procedures relating to revenue recognition, specifically the identification and evaluation of terms and conditions in contracts, is a critical audit matter are the significant judgment by management in identifying and evaluating terms and conditions in contracts that impact revenue recognition, which in turn led to a high degree of auditor judgment, subjectivity and effort in performing procedures and evaluating whether terms and conditions in contracts were appropriately identified and evaluated by management.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the revenue recognition process, including controls related to the identification and evaluation of terms and conditions in contracts that impact revenue recognition. These procedures also included, among others (i) testing management's process of identifying and evaluating the terms and conditions in contracts, including management's determination of the impact of those terms and conditions on revenue recognition and (ii) testing the completeness and accuracy of management's identification and evaluation of the terms and conditions in contracts by examining revenue arrangements on a test basis.

/s/ PricewaterhouseCoopers LLP

San Jose, California
February 22, 2021

We have served as the Company's auditor since 2020.

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Cadence Design Systems, Inc.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheet of Cadence Design Systems, Inc. and subsidiaries (the Company) as of December 28, 2019, the related consolidated statements of income, comprehensive income, stockholders' equity, and cash flows for each of the years in the two-year period ended December 28, 2019, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 28, 2019, and the results of its operations and its cash flows for each of the years in the two-year period ended December 28, 2019, in conformity with U.S. generally accepted accounting principles.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company changed its method of accounting for leases as of December 30, 2018, due to the adoption of Financial Accounting Standards Board ("FASB") Accounting Standards Update (ASU) 2016-02, Leases.

Basis for Opinion

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

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We served as the Company's auditor from 2002 to 2020.
Santa Clara, California
February 24, 2020

CADENCE DESIGN SYSTEMS, INC.
CONSOLIDATED BALANCE SHEETS
January 2, 2021 and December 28, 2019
(In thousands, except par value)

	As of	
	January 2, 2021	December 28, 2019
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 928,432	\$ 705,210
Receivables, net	338,487	304,546
Inventories	75,956	55,802
Prepaid expenses and other	135,712	103,785
Total current assets	1,478,587	1,169,343
Property, plant and equipment, net	311,125	275,855
Goodwill	782,087	661,856
Acquired intangibles, net	210,590	172,375
Deferred taxes	732,290	732,367
Other assets	436,106	345,429
Total assets	\$ 3,950,785	\$ 3,357,225
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Revolving credit facility	\$ —	\$ —
Accounts payable and accrued liabilities	349,951	316,908
Current portion of deferred revenue	446,857	355,483
Total current liabilities	796,808	672,391
Long-term liabilities:		
Long-term portion of deferred revenue	107,064	73,400
Long-term debt	346,793	346,019
Other long-term liabilities	207,102	162,521
Total long-term liabilities	660,959	581,940
Commitments and contingencies (Notes 6, 7 and 18)		
Stockholders' equity:		
Preferred stock – \$0.01 par value; authorized 400 shares, none issued or outstanding	—	—
Common stock – \$0.01 par value; authorized 600,000 shares; issued and outstanding shares: 278,941 and 279,855, respectively	2,217,939	2,046,237
Treasury stock, at cost; 50,219 shares and 49,304 shares, respectively	(2,057,829)	(1,668,105)
Retained earnings	2,350,333	1,761,688
Accumulated other comprehensive loss	(17,425)	(36,926)
Total stockholders' equity	2,493,018	2,102,894
Total liabilities and stockholders' equity	\$ 3,950,785	\$ 3,357,225

See notes to consolidated financial statements.

CADENCE DESIGN SYSTEMS, INC.
CONSOLIDATED INCOME STATEMENTS
For the three fiscal years ended January 2, 2021
(In thousands, except per share amounts)

	2020	2019	2018
Revenue:			
Product and maintenance	\$ 2,536,617	\$ 2,204,615	\$ 1,997,887
Services	146,274	131,704	140,135
Total revenue	2,682,891	2,336,319	2,138,022
Costs and expenses:			
Cost of product and maintenance	231,026	189,146	173,011
Cost of service	74,472	77,211	85,736
Marketing and sales	516,460	481,673	439,669
Research and development	1,033,732	935,938	884,816
General and administrative	154,425	139,806	133,406
Amortization of acquired intangibles	18,009	12,128	14,086
Restructuring and other charges	9,215	8,621	11,089
Total costs and expenses	2,037,339	1,844,523	1,741,813
Income from operations	645,552	491,796	396,209
Interest expense	(20,749)	(18,829)	(23,139)
Other income, net	7,945	6,001	3,320
Income before provision (benefit) for income taxes	632,748	478,968	376,390
Provision (benefit) for income taxes	42,104	(510,011)	30,613
Net income	\$ 590,644	\$ 988,979	\$ 345,777
Net income per share – basic	\$ 2.16	\$ 3.62	\$ 1.26
Net income per share – diluted	\$ 2.11	\$ 3.53	\$ 1.23
Weighted average common shares outstanding – basic	273,728	273,239	273,729
Weighted average common shares outstanding – diluted	279,641	280,515	281,144

See notes to consolidated financial statements.

CADENCE DESIGN SYSTEMS, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
For the three fiscal years ended January 2, 2021
(In thousands)

	2020	2019	2018
Net income	\$ 590,644	\$ 988,979	\$ 345,777
Other comprehensive income (loss), net of tax effects:			
Foreign currency translation adjustments	18,373	(8,642)	(17,885)
Changes in defined benefit plan liabilities	1,128	(3,504)	(627)
Total other comprehensive income (loss), net of tax effects	19,501	(12,146)	(18,512)
Comprehensive income	\$ 610,145	\$ 976,833	\$ 327,265

See notes to consolidated financial statements.

CADENCE DESIGN SYSTEMS, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
For the three fiscal years ended January 2, 2021
(In thousands)

	Common Stock					Accumulated Other Comprehensive	
	Shares	Par Value and Capital in Excess of Par	Treasury Stock	Retained Earnings	Income (Loss)	Total	
Balance, December 30, 2017	282,067	\$ 1,829,950	\$ (1,178,121)	\$ 341,003	\$ (3,630)	\$	989,202
Cumulative effect adjustment	—	—	—	85,929	(2,638)	\$	83,291
Net income	—	—	—	345,777	—	\$	345,777
Other comprehensive loss, net of taxes	—	—	—	—	(18,512)	\$	(18,512)
Purchase of treasury stock	(5,934)	—	(250,059)	—	—	\$	(250,059)
Issuance of common stock and reissuance of treasury stock under equity incentive plans, net of forfeitures	5,274	(50,570)	91,478	—	—	\$	40,908
Stock received for payment of employee taxes on vesting of restricted stock	(1,392)	(10,971)	(58,950)	—	—	\$	(69,921)
Stock-based compensation expense	—	167,715	—	—	—	\$	167,715
Balance, December 29, 2018	280,015	\$ 1,936,124	\$ (1,395,652)	\$ 772,709	\$ (24,780)	\$	1,288,401
Net income	—	—	—	988,979	—	\$	988,979
Other comprehensive loss, net of taxes	—	—	—	—	(12,146)	\$	(12,146)
Purchase of treasury stock	(4,841)	—	(306,148)	—	—	\$	(306,148)
Issuance of common stock and reissuance of treasury stock under equity incentive plans, net of forfeitures	5,923	(57,763)	110,604	—	—	\$	52,841
Stock received for payment of employee taxes on vesting of restricted stock	(1,242)	(13,671)	(76,909)	—	—	\$	(90,580)
Stock-based compensation expense	—	181,547	—	—	—	\$	181,547
Balance, December 28, 2019	279,855	\$ 2,046,237	\$ (1,668,105)	\$ 1,761,688	\$ (36,926)	\$	2,102,894
Cumulative effect adjustment	—	—	—	(1,999)	—	\$	(1,999)
Net income	—	—	—	590,644	—	\$	590,644
Other comprehensive income, net of taxes	—	—	—	—	19,501	\$	19,501
Purchase of treasury stock	(4,247)	—	(380,064)	—	—	\$	(380,064)
Issuance of common stock and reissuance of treasury stock under equity incentive plans, net of forfeitures	4,352	(7,934)	82,736	—	—	\$	74,802
Stock received for payment of employee taxes on vesting of restricted stock	(1,019)	(17,632)	(92,396)	—	—	\$	(110,028)
Stock-based compensation expense	—	197,268	—	—	—	\$	197,268
Balance, January 2, 2021	278,941	\$ 2,217,939	\$ (2,057,829)	\$ 2,350,333	\$ (17,425)	\$	2,493,018

See notes to consolidated financial statements.

CADENCE DESIGN SYSTEMS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
For the three fiscal years ended January 2, 2021
(In thousands)

	2020	2019	2018
Cash and cash equivalents at beginning of year	\$ 705,210	\$ 533,298	\$ 688,087
Cash flows from operating activities:			
Net income	590,644	988,979	345,777
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	145,653	122,789	118,721
Amortization of debt discount and fees	1,053	1,001	1,196
Stock-based compensation	197,268	181,547	167,715
(Gain) loss on investments, net	4,954	4,090	(2,732)
Deferred income taxes	(26,117)	(576,738)	(11,676)
Provisions for losses on receivables	1,628	632	5,102
ROU asset amortization and change in operating lease liabilities	4,483	562	—
Other non-cash items	773	428	2,607
Changes in operating assets and liabilities, net of effect of acquired businesses:			
Receivables	(25,934)	(4,718)	(87,083)
Inventories	(25,685)	(33,024)	752
Prepaid expenses and other	(31,167)	(11,031)	(19,622)
Other assets	(71,606)	(8,011)	(14,606)
Accounts payable and accrued liabilities	18,394	33,915	1,553
Deferred revenue	110,173	27,498	100,696
Other long-term liabilities	10,408	1,681	(3,649)
Net cash provided by operating activities	904,922	729,600	604,751
Cash flows from investing activities:			
Purchases of non-marketable investments	—	(33,717)	(115,839)
Proceeds from the sale of non-marketable investments	217	2,952	3,497
Purchases of property, plant and equipment	(94,813)	(74,605)	(61,503)
Cash paid in business combinations and asset acquisitions, net of cash acquired	(197,562)	(338)	—
Net cash used for investing activities	(292,158)	(105,708)	(173,845)
Cash flows from financing activities:			
Proceeds from revolving credit facility	350,000	150,000	100,000
Payment on revolving credit facility	(350,000)	(250,000)	(85,000)
Principal payments on term loan	—	—	(300,000)
Proceeds from issuance of common stock	74,803	52,842	40,908
Stock received for payment of employee taxes on vesting of restricted stock	(110,028)	(90,580)	(69,921)
Payments for repurchases of common stock	(380,064)	(306,148)	(250,059)
Change in book overdraft	—	—	(3,867)
Net cash used for financing activities	(415,289)	(443,886)	(567,939)
Effect of exchange rate changes on cash and cash equivalents	25,747	(8,094)	(17,756)
Increase (decrease) in cash and cash equivalents	223,222	171,912	(154,789)
Cash and cash equivalents at end of year	\$ 928,432	\$ 705,210	\$ 533,298
Supplemental cash flow information:			
Cash paid for interest	\$ 19,778	\$ 17,842	\$ 23,018
Cash paid for income taxes, net	105,917	41,946	68,040

See notes to consolidated financial statements.

CADENCE DESIGN SYSTEMS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
For the three fiscal years ended January 2, 2021

NOTE 1. BUSINESS OVERVIEW

Cadence Design Systems, Inc. ("Cadence") provides solutions that enable its customers to design complex and innovative electronic products. Cadence's solutions are designed to give its customers a competitive edge in their development of integrated circuits ("ICs"), systems-on-chip ("SoCs") and increasingly sophisticated electronic devices and systems by optimizing performance, minimizing power consumption, shortening the time required for customers to bring their products to market, improving engineering productivity and reducing their design, development and manufacturing costs. Cadence's product offerings include software, hardware, services and reusable IC design blocks, which are commonly referred to as intellectual property ("IP"). Cadence also provides maintenance for its software, hardware, and IP product offerings.

NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Principles of Consolidation and Basis of Presentation

The consolidated financial statements include the accounts of Cadence and its subsidiaries after elimination of intercompany accounts and transactions. All consolidated subsidiaries are wholly owned by Cadence.

Cadence's fiscal years are 52- or 53-week periods ending on the Saturday closest to December 31. Fiscal 2020 was a 53- week year, while 2019 and 2018 were each 52-week fiscal years.

Use of Estimates

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

Recently Adopted Accounting Standards

Credit Losses

In June 2016, the FASB issued ASU 2016-13, "Measurement of Credit Losses on Financial Instruments," which required the establishment of an allowance for estimated credit losses on financial assets, including trade and other receivables, at each reporting date. Cadence adopted the new standard on December 29, 2019, the first day of fiscal 2020, and recorded a cumulative-effect adjustment to decrease retained earnings in the amount of \$2.0 million for expected credit losses on financial assets at the adoption date. The adoption of this standard required Cadence to modify its existing process for establishing credit losses on trade receivables, including receivables derived from leasing arrangements for its emulation and prototyping hardware.

Goodwill Impairment

In January 2017, the FASB issued ASU 2017-04, "Simplifying the Test for Goodwill Impairment," that eliminates "Step 2" from the goodwill impairment test. Cadence adopted the new standard on December 29, 2019, the first day of fiscal 2020. The new standard did not have an impact on Cadence's consolidated financial statements and related disclosures.

Fair Value Measurements

In August 2018, the FASB issued ASU 2018-13, "Disclosure Framework — Changes to the Disclosure Requirements for Fair Value Measurement," which modifies the disclosure requirements on fair value measurements. Cadence adopted the new standard on December 29, 2019, the first day of fiscal 2020. The new standard did not have a material impact on Cadence's consolidated financial statements and related disclosures.

Implementation Costs Incurred in a Cloud Computing Arrangement

In August 2018, the FASB issued ASU 2018-15, "Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract," which clarifies the accounting for implementation costs in cloud computing arrangements. The new standard aligns the treatment of implementation costs incurred by customers in cloud computing arrangements that are service contracts with the treatment of similar costs incurred to develop or obtain internal-use software. Under the new standard, implementation costs are deferred and presented in the same financial statement caption on the condensed consolidated balance sheet as a prepayment of related arrangement fees. The deferred costs are recognized over the term of the arrangement in the same financial statement caption in the condensed consolidated income statement as the related fees of the arrangement. Cadence adopted the new standard on December 29, 2019, the first day of fiscal 2020. The new standard did not have a material impact on Cadence's condensed consolidated financial statements and related disclosures.

New Accounting Standards Not Yet Adopted

Accounting for Income Taxes

In December 2019, the FASB issued ASU 2019-12, "Simplifying the Accounting for Income Taxes," which simplifies the accounting for income taxes, eliminates certain exceptions within ASC 740, Income Taxes, and clarifies certain aspects of the current guidance to promote consistency among reporting entities. The new standard is effective for fiscal years beginning after December 15, 2020. Most amendments within the standard are required to be applied on a prospective basis, while certain amendments must be applied on a retrospective or modified retrospective basis. Cadence is currently evaluating the impacts of the provisions of this standard on its financial condition, results of operations and cash flows.

Foreign Operations

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

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

Concentrations of Credit Risk

Financial instruments, including derivative financial instruments, that may potentially subject Cadence to concentrations of credit risk, consist principally of cash and cash equivalents, accounts receivable, investments and forward contracts. Credit exposure related to Cadence's foreign currency forward contracts is limited to the realized and unrealized gains on these contracts.

Cash and Cash Equivalents

Cadence considers all highly liquid investments with original maturities of three months or less on the date of purchase to be cash equivalents. Book overdraft balances are recorded in accounts payable and accrued liabilities in the consolidated balance sheets and are reported as a component of cash flows from financing activities in the consolidated statement of cash flows.

Receivables

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

Allowances for Doubtful Accounts

Cadence assesses its ability to collect outstanding receivables and provides customer-specific allowances, allowances for credit losses and general allowances for the portion of its receivables that are estimated to be uncollectible. The allowances are based on the current creditworthiness of its customers, historical experience, expected credit losses, changes in customer demand and the overall economic climate in the industries that Cadence serves. Provisions for these allowances are recorded in general and administrative expense in Cadence's consolidated income statements.

Inventories

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

Property, Plant and Equipment

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

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

Cadence capitalizes certain costs of software developed for internal use. Capitalization of software developed for internal use begins at the application development phase of the project. Amortization begins when the computer software is substantially complete and ready for its intended use. Amortization is recorded on a straight-line basis over the estimated useful life. Cadence capitalized costs of software developed for internal use of \$0.9 million, \$2.4 million, and \$3.6 million during fiscal 2020, 2019 and 2018, respectively.

Cadence recorded depreciation and amortization expense of \$67.6 million, \$63.3 million and \$60.4 million during fiscal 2020, 2019 and 2018, respectively, for property, plant and equipment.

Software Development Costs

Software development costs are capitalized beginning when a product's technological feasibility has been established by completion of a working model of the product and amortization begins when a product is available for general release to customers. The period between the achievement of technological feasibility and the general release of Cadence's products has typically been of short duration. Costs incurred during fiscal 2020, 2019 and 2018 were not material.

Deferred Sales Commissions

Cadence records an asset for the incremental costs of obtaining a contract with a customer, including direct sales commissions that are earned upon execution of the contract. Cadence uses the portfolio method to recognize the amortization expense related to these capitalized costs related to initial contracts and renewals and such expense is recognized over a period associated with the revenue of the related portfolio, which is generally two to three years for Cadence's software arrangements and upon delivery for its hardware and IP arrangements. Incremental costs related to initial contracts and renewals are amortized over the period of the arrangement in each case because Cadence pays the same commission rate for both new contracts and renewals. Deferred sales commissions are tested for impairment on an ongoing basis when events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment is recognized to the extent that the amount of deferred sales commission exceeds the remaining expected gross margin (remaining revenue less remaining direct costs) on the goods and services to which the deferred sales commission relates. Total capitalized costs were \$36.7 million and \$31.6 million as of January 2, 2021, and December 28, 2019, respectively, and are included in other assets in Cadence's consolidated balance sheet. Amortization of these assets was \$34.6 million, \$29.4 million and \$26.5 million during fiscal 2020, 2019 and 2018, respectively, and is included in sales and marketing expense in Cadence's consolidated income statement.

Goodwill

Cadence conducts a goodwill impairment analysis annually and as necessary if changes in facts and circumstances indicate that the fair value of Cadence's single reporting unit may be less than its carrying amount. To assess for impairment, Cadence compares the estimated fair value of its single reporting unit to the carrying value of the reporting unit's net assets, including goodwill. If the fair value of the reporting unit is greater than the carrying value of its net assets, goodwill is not considered to be impaired and no further analysis is required. If the fair value of the reporting unit is less than the carrying value of its net assets, Cadence would be required to record an impairment charge.

Long-Lived Assets, Including Acquired Intangibles

Cadence's long-lived assets consist of property, plant and equipment, and acquired intangibles. Acquired intangibles with definite lives are amortized on a straight-line basis over the estimated economic life of the underlying products and technologies, which range from three to fourteen years. Acquired intangibles with indefinite lives, or in-process technology, consists of projects that had not reached technological feasibility by the date of acquisition. Upon completion of the project, the assets are amortized over their estimated useful lives. If the project is abandoned rather than completed, the asset is written off. In-process technology is tested for impairment annually and as necessary if changes in facts and circumstances indicate that the assets might be impaired.

Cadence reviews its long-lived assets, including acquired intangibles, for impairment whenever events or changes in circumstances indicate that the carrying amount of a long-lived asset or asset group may not be recoverable. Recoverability of an asset or asset group is measured by comparison of its carrying amount to the expected future undiscounted cash flows that the asset or asset group is expected to generate. If it is determined that the carrying amount of an asset group is not recoverable, an impairment loss is recorded in the amount by which the carrying amount of the asset or asset group exceeds its fair value.

Leases

Cadence adopted ASU 2016-02, "Leases (Topic 842)" ("Topic 842") on the first day of fiscal 2019 and the adoption of the standard did not have a material impact on Cadence's results from operations or cash flows.

Lessee Considerations

Cadence has operating leases primarily consisting of facilities with remaining lease terms of approximately one year to fifteen years. Cadence has options to terminate many of its leases early. The lease term represents the period up to the early termination date unless it is reasonably certain that Cadence will not exercise the early termination option. For certain leases, Cadence has options to extend the lease term for additional periods ranging from one year to ten years. These renewal options are not considered in the remaining lease term unless it is reasonably certain that Cadence will exercise such options.

At inception of a contract, Cadence determines an arrangement contains a lease if the arrangement conveys the right to use an identified asset and Cadence obtains substantially all of the economic benefits from the asset and has the ability to direct the use of the asset. Leases with an initial term of twelve months or less are not recorded on the balance sheet. For lease agreements entered into or reassessed after the adoption of Topic 842, Cadence combines the lease and non-lease components in determining the lease liabilities and right-of-use ("ROU") assets. Non-lease components primarily include common-area maintenance and other management fees.

Operating lease expense is generally recognized evenly over the term of the lease. Payments under Cadence's lease agreements are primarily fixed; however, certain agreements contain rental payments that are adjusted periodically based on changes in consumer price and other indices. Changes to payments resulting from changes in indices are expensed as incurred and not included in the measurement of lease liabilities and ROU assets. Cadence's lease agreements do not provide an implicit borrowing rate, therefore an internal incremental borrowing rate is determined based on information available at lease commencement date for purposes of determining the present value of lease payments. The incremental borrowing rate represents a comparable rate to borrow on a collateralized basis over a similar term and in the economic environment where the leased asset is located. Cadence used the incremental borrowing rate on the effective date of adoption of Topic 842 for all leases that commenced prior to that date.

Lessor Considerations

Although most of Cadence's revenue from its hardware business comes from sales of hardware, Cadence also leases its hardware products to some customers. Cadence determines the existence of a lease when the customer controls the use of the identified hardware for a period of time defined in the lease agreement.

Cadence's leases range in duration up to three years with payments generally collected in equal quarterly installments. Cadence's leases do not include termination rights or variable pricing and typically do not include purchase rights at the end of the lease. Short-term leases are usually less than two years and are classified as operating leases with revenue recognized and depreciation expensed on a straight-line basis over the term of the lease. Long-term leases are typically for three years and are classified as sales-type leases with revenue and cost of sales recognized upon delivery.

Cadence's operating leases and sales-type leases contain both lease and non-lease components. Because the pattern of revenue recognition is the same for both the lease and non-lease components in Cadence's operating leases, Cadence has elected the practical expedient to not separate lease and related non-lease components and accounts for both components under Topic 842. Cadence allocates value to the lease and non-lease components in its sales-type leases using standalone selling prices ("SSPs") similar to those used under ASU 2014-09, "Revenue from Contracts with Customers (Topic 606)," the current accounting standard governing revenue recognition. When Cadence leases its hardware in the same arrangement as software or IP, Cadence allocates value to each performance obligation using SSPs.

Investments in Equity Securities

Cadence's investments in marketable equity securities are carried at fair value as a component of prepaid expenses and other in the consolidated balance sheets. Cadence records realized and unrealized holding gains or losses as part of other income, net in the consolidated income statements.

Cadence's non-marketable investments include its investments in privately held companies. These investments are initially recorded at cost and are included in other assets in the consolidated balance sheets. Cadence accounts for these investments using the measurement alternative when the fair value of the investment is not readily determinable and Cadence does not have the ability to exercise significant influence or the equity method of accounting when it is determined that Cadence has the ability to exercise significant influence. For investments accounted for using the equity method of accounting, Cadence records its proportionate share of the investee's income or loss, net of the effects of any basis differences, to other income, net on a one-quarter lag in Cadence's consolidated income statements.

Cadence reviews its non-marketable investments on a regular basis to determine whether its investments in these companies are impaired. Cadence considers investee financial performance and other information received from the investee companies, as well as any other available estimates of the fair value of the investee companies in its review. If Cadence determines the carrying value of an investment exceeds its fair value, the book value of the investment is adjusted to its fair value. Cadence records investment write-downs in other income, net, in the consolidated income statements.

Derivative Financial Instruments

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

Nonqualified Deferred Compensation Trust

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

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

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

Treasury Stock

Cadence generally issues shares related to its stock-based compensation plans from shares held in treasury. When treasury stock is reissued at an amount higher than its cost, the difference is recorded as a component of capital in excess of par in the consolidated statements of stockholders' equity. When treasury stock is reissued at an amount lower than its cost, the difference is recorded as a component of capital in excess of par to the extent that gains exist to offset the losses. If there are no accumulated treasury stock gains in capital in excess of par, the losses upon reissuance of treasury stock are recorded as a component of retained earnings in the consolidated statements of stockholders' equity. There were no losses recorded as a component of retained earnings by Cadence on the reissuance of treasury stock during fiscal 2020, 2019 or 2018.

Revenue Recognition

Revenue is recognized upon transfer of control of promised products or services to customers in an amount that reflects the consideration to which Cadence expects to be entitled in exchange for promised goods or services. Cadence's performance obligations are satisfied either over time or at a point in time. In any fiscal year, between 85% and 90% of revenue is characterized as recurring revenue. Revenue characterized as recurring includes revenue recognized over time from Cadence's software arrangements, services, royalties, maintenance on IP licenses and hardware, and operating leases of hardware and revenue recognized at varying points in time over the term of our IP Access Agreements ("IPAA"). The remainder of Cadence's revenue is characterized as up-front revenue. Up-front revenue is primarily generated by sales of emulation and prototyping hardware and individual IP licenses.

Product and maintenance revenue includes Cadence's licenses of software and IP, sales of emulation hardware and the related maintenance on these licenses and sales.

Service revenue includes revenue received for performing engineering services (which are generally not related to the functionality of other licensed products), customized IP on a fixed fee basis, and sales from cloud-based solutions that provide customers with software and services over a period of time.

Cadence enters into contracts that can include various combinations of licenses, products and services, some of which are distinct and are accounted for as separate performance obligations. For contracts with multiple performance obligations, Cadence allocates the transaction price of the contract to each performance obligation, generally on a relative basis using its SSP. We generate revenue from contracts with customers and apply judgement in identifying and evaluating any terms and conditions in contracts which may impact revenue recognition. Revenue is recognized net of any taxes collected from customers that are subsequently remitted to governmental authorities.

Software Revenue Recognition

Cadence's time-based license arrangements grant customers the right to access and use all of the licensed products at the outset of an arrangement and updates are generally made available throughout the entire term of the arrangement, which is generally two to three years. Cadence's updates provide continued access to evolving technology as customers' designs migrate to more advanced nodes and as its customers' technological requirements evolve. In addition, certain time-based license arrangements include remix rights and unspecified additional products that become commercially available during the term of the agreement. Payments are generally received in equal or near equal installments over the term of the agreement.

Multiple software licenses, related updates, and technical support in these time-based arrangements constitute a single, combined performance obligation and revenue is recognized over the term of the license, commencing upon the later of the effective date of the arrangement or transfer of the software license. Remix rights are not an additional promised good or service in the contract, and where unspecified additional software product rights are part of the contract with the customer, such rights are accounted for as part of the single performance obligation that includes the licenses, updates, and technical support because such rights are provided for the same period of time and have the same time-based pattern of transfer to the customer.

Hardware Revenue Recognition

Cadence generally has two performance obligations in arrangements involving the sale or lease of hardware products. The first performance obligation is to transfer the hardware product (which includes software integral to the functionality of the hardware product). The second performance obligation is to provide maintenance on hardware and its embedded software, which includes rights to technical support, hardware repairs and software updates that are all provided over the same term and have the same time-based pattern of transfer to the customer. The transaction price allocated to the hardware product is generally recognized as revenue at the time of delivery because the customer obtains control of the product at that point in time. Cadence has concluded that control generally transfers at that point in time because the customer has title to the hardware, physical possession, and a present obligation to pay for the hardware. The transaction price allocated to maintenance is recognized as revenue ratably over the maintenance term. Payments for hardware contracts are generally received upon delivery of the hardware product. Shipping and handling costs are considered fulfillment costs and are included in cost of product and maintenance in Cadence's consolidated income statements.

IP Revenue Recognition

Cadence generally licenses IP under nonexclusive license agreements that provide usage rights for specific designs. In addition, for certain of Cadence's IP license agreements, royalties are collected as customers ship their own products that incorporate Cadence IP. These arrangements generally have two performance obligations—transferring the licensed IP and associated maintenance, which includes rights to technical support, and software updates that are all provided over the maintenance term and have a time-based pattern of transfer to the customer.

Some customers enter into a non-cancellable IPAA 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 IP 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 IPAA is treated as an individual contract and accounted for based on the respective performance obligations.

Revenue allocated to the IP license is recognized at a point in time upon the later of the delivery of the IP or the beginning of the license period and revenue allocated to the maintenance is recognized over the maintenance term. Royalties are recognized as revenue in the quarter in which the applicable Cadence customer ships its products that incorporate Cadence IP. Payments for IP contracts are generally received upon delivery of the IP. Cadence customizes certain IP and revenue related to this customization is recognized as services revenue as described below.

Services Revenue Recognition

Revenue from service contracts is recognized over time, generally using costs incurred or hours expended to measure progress. Cadence has a history of accurately estimating project status and the costs necessary to complete projects. A number of internal and external factors can affect these estimates, including labor rates, utilization and efficiency variances and specification and testing requirement changes. Payments for services are generally due upon milestones in the contract or upon consumption of the hourly resources.

Stock-Based Compensation

Cadence recognizes the cost of awards of equity instruments granted to employees in exchange for their services as stock-based compensation expense. Stock-based compensation expense is measured at the grant date based on the value of the award and is recognized as expense over the requisite service period, which is typically the vesting period. Cadence recognizes stock-based compensation expense on the straight-line method for awards that only contain a service condition and on the graded-vesting method for awards that contain both a service and performance condition. Cadence recognizes the impact of forfeitures on stock-based compensation expense as they occur.

The fair value of stock options and purchase rights issued under Cadence's Employee Stock Purchase Plan ("ESPP") are calculated using the Black-Scholes option pricing model. The computation of the expected volatility assumption used for new awards is based on implied volatility when the remaining maturities of the underlying traded options are at least one year. When the remaining maturities of the underlying traded options are less than one year, expected volatility is based on a weighting of historical and implied volatilities. When determining the expected term, Cadence reviews historical employee exercise behavior from options having similar vesting periods. The risk-free interest rate for the period within the expected term of the option is based on the yield of United States Treasury notes for the comparable term in effect at the time of grant. The expected dividend yield used in the calculation is zero because Cadence has not historically paid and currently does not expect to pay dividends in the foreseeable future.

Advertising

Cadence expenses the costs of advertising as incurred. Total advertising expense, including marketing programs and events, was \$7.1 million, \$8.4 million and \$7.6 million during fiscal 2020, 2019 and 2018, respectively, and is included in marketing and sales in the consolidated income statements.

Restructuring Charges

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

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

Accounting for Income Taxes

Cadence accounts for the effect of income taxes in its consolidated financial statements using the asset and liability method. This process involves estimating actual current tax liabilities together with assessing carryforwards and temporary differences resulting from differing treatment of items, such as depreciation, for tax and accounting purposes. These differences result in deferred tax assets and liabilities, measured using enacted tax rates expected to apply to taxable income in the years when those temporary differences are expected to be recovered or settled. Cadence accounts for the United States global intangible low-taxed income as a period expense.

Cadence then records a valuation allowance to reduce the deferred tax assets to the amount that Cadence believes is more likely than not to be realized based on its judgment of all available positive and negative evidence. The weight given to the potential effect of negative and positive evidence is commensurate with the extent to which the strength of the evidence can be objectively verified. This assessment, which is completed on a taxing jurisdiction basis, takes into account a number of types of evidence, including the following:

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

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

For additional discussion of income taxes, see Note 6 in the notes to the consolidated financial statements.

NOTE 3. DEBT

Cadence's outstanding debt as of January 2, 2021 and December 28, 2019 was as follows:

	January 2, 2021			December 28, 2019		
	(In thousands)					
	Principal	Unamortized Discount	Carrying Value	Principal	Unamortized Discount	Carrying Value
Revolving Credit Facility	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —
2024 Notes	350,000	(3,207)	346,793	350,000	(3,981)	346,019
Total outstanding debt	\$ 350,000	\$ (3,207)	\$ 346,793	\$ 350,000	\$ (3,981)	\$ 346,019

Revolving Credit Facility

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

Interest accrues on borrowings under the credit facility at either LIBOR plus a margin between 1.250% and 1.875% per annum or at the base rate plus a margin between 0.25% and 0.875% per annum. Interest is payable quarterly. A commitment fee ranging from 0.15% to 0.30% is assessed on the daily average undrawn portion of revolving commitments.

The credit facility contains customary negative covenants that, among other things, restrict Cadence's ability to incur additional indebtedness, grant liens, make certain investments (including acquisitions), dispose of certain assets and make certain payments, including share repurchases and dividends. In addition, the credit facility contains financial covenants that require Cadence to maintain a funded debt to EBITDA ratio not greater than 3.00 to 1, with a step up to 3.50 to 1 for one year following an acquisition by Cadence of at least \$250.0 million that results in a pro forma leverage ratio between 2.75 to 1 and 3.25 to 1. As of January 2, 2021 and December 28, 2019, Cadence was in compliance with all financial covenants associated with the revolving 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 fair value of the 2024 Notes was approximately \$393.2 million as of January 2, 2021.

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.

NOTE 4. RECEIVABLES, NET

Cadence's current and long-term receivables balances as of January 2, 2021 and December 28, 2019 were as follows:

	As of	
	January 2, 2021	December 28, 2019
(In thousands)		
Accounts receivable	\$ 196,990	\$ 179,250
Unbilled accounts receivable	144,364	126,165
Long-term receivables	3,655	3,082
Total receivables	345,009	308,497
Less allowance for doubtful accounts	(2,867)	(869)
Total receivables, net	\$ 342,142	\$ 307,628

Cadence's customers are primarily concentrated within the semiconductor and electronics systems industries. As of January 2, 2021 and December 28, 2019, no customer accounted for 10% or more of Cadence's total receivables.

Allowance for doubtful accounts

Cadence's provisions for losses on its accounts receivable during fiscal 2020, 2019 and 2018 were as follows:

	Balance at Beginning of Period*	Charged to Costs and Expenses	Charged to Other Accounts	Uncollectible Accounts Written Off, Net	Balance at End of Period
Year ended January 2, 2021	\$ 2,868	\$ 1,628	\$ 225	\$ (1,854)	\$ 2,867
Year ended December 28, 2019	3,936	632	—	(3,699)	869
Year ended December 29, 2018	\$ —	\$ 5,102	\$ —	\$ (1,166)	\$ 3,936

* Beginning balance for fiscal 2020 reflects the cumulative-effect adjustment recorded in connection with the adoption of ASU 2016-13, "Measurement of Credit Losses on Financial Instruments" on the first day of fiscal 2020. For additional discussion of recently adopted accounting standards, see Note 2 in the notes to the consolidated financial statements.

NOTE 5. REVENUE

Cadence groups its products into five categories related to major design activities. The following table shows the percentage of product and related maintenance revenue contributed by each of Cadence's five product categories and services for fiscal 2020 and 2019:

	2020	2019	2018
Custom IC Design and Simulation	25 %	25 %	26 %
Digital IC Design and Signoff	29 %	30 %	29 %
Functional Verification, including Emulation and Prototyping Hardware*	22 %	23 %	24 %
IP	14 %	13 %	12 %
System Design and Analysis	10 %	9 %	9 %
Total	100 %	100 %	100 %

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

Revenue by product category fluctuates from period to period based on demand for products and services, and Cadence's available resources to deliver them. 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.

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 SSP. Judgment is required to determine 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 the 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 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 presented as prepaid expenses and other in the consolidated balance sheet 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 January 2, 2021 and December 28, 2019 were as follows:

	As of	
	January 2, 2021	December 28, 2019
	(In thousands)	
Contract assets	\$ 9,709	\$ 10,209
Deferred revenue	553,921	428,883

Cadence recognized revenue of \$345.9 million, \$311.8 million and \$284.3 million during fiscal 2020, 2019 and 2018, respectively, that was included in the deferred revenue balance at the beginning of each fiscal year. All other activity in deferred revenue 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 \$3.9 billion as of January 2, 2021, which included \$133.6 million of non-cancellable IPAA commitments from customers where actual product selection and quantities of specific products or services are to be determined by customers at a later date. Contracted but unsatisfied performance obligations were approximately \$3.6 billion as of December 28, 2019, which included \$205.7 million of non-cancellable IPAA commitments from customers. As of January 2, 2021, Cadence expected to recognize approximately 55% of the contracted but unsatisfied performance obligations, excluding non-cancellable IPAA commitments, as revenue over the next 12 months and the remainder thereafter.

Cadence recognized revenue of \$51.2 million, \$40.4 million and \$34.3 million during fiscal 2020, 2019 and 2018, respectively, 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 6. INCOME TAXES

Cadence's income before provision (benefit) for income taxes included income from the United States and from foreign subsidiaries for fiscal 2020, 2019 and 2018, was as follows:

	2020	2019	2018
	(In thousands)		
United States	\$ 256,032	\$ 139,306	\$ 58,963
Foreign subsidiaries	376,716	339,662	317,427
Total income before provision (benefit) for income taxes	<u>\$ 632,748</u>	<u>\$ 478,968</u>	<u>\$ 376,390</u>

Cadence's provision (benefit) for income taxes was comprised of the following items for fiscal 2020, 2019 and 2018:

	2020	2019	2018
	(In thousands)		
Current:			
Federal	\$ 15,083	\$ 15,282	\$ 902
State and local	6,401	2,716	(1,270)
Foreign	46,737	48,729	42,657
Total current	68,221	66,727	42,289
Deferred:			
Federal	(11,155)	(9,001)	(10,324)
State and local	(24,186)	6,593	886
Foreign	9,224	(574,330)	(2,238)
Total deferred	(26,117)	(576,738)	(11,676)
Total provision (benefit) for income taxes	\$ 42,104	\$ (510,011)	\$ 30,613

During the third quarter of fiscal 2020, the State of California enacted legislation that, for a three-year period beginning in fiscal 2020, will limit Cadence's utilization of California research and development tax credits to \$5 million annually and will suspend the use of California net operating loss deductions. Cadence accounted for the effects of the California tax law change in the period of enactment. Cadence recognized a tax benefit of approximately \$22.2 million due to a partial release of the valuation allowance on our California research and development tax credit deferred tax assets as a result of certain tax elections made in Cadence's 2019 California tax return.

During the fourth quarter of fiscal 2019, Cadence completed intercompany transfers of certain intangible property rights to its Irish subsidiary, which resulted in the establishment of a deferred tax asset and the recognition of an income tax benefit of \$575.6 million. Cadence expected to realize the Irish deferred tax asset in future years and did not provide for a valuation allowance. Cadence considered all available positive and negative evidence, including its past operating results, forecasted earnings, future taxable income, and any prudent and feasible tax planning strategies in making this determination.

The provision for income taxes differs from the amount estimated by applying the United States statutory federal income tax rates of 21% to income before provision (benefit) for income taxes for fiscal 2020, 2019, and 2018 as follows:

	2020	2019	2018
	(In thousands)		
Provision computed at federal statutory income tax rate	\$ 132,877	\$ 100,583	\$ 79,042
State and local income tax, net of federal tax effect	20,936	23,221	15,540
Intercompany transfers of intangible property rights	—	(575,618)	—
Foreign income tax rate differential	(32,589)	(37,786)	(37,031)
Deemed repatriation transition tax	—	—	(1,409)
U.S. tax on foreign entities	43,615	57,225	28,846
Stock-based compensation	(51,226)	(29,785)	(13,539)
Change in deferred tax asset valuation allowance	(9,101)	16,796	13,234
Tax credits	(89,684)	(87,793)	(72,815)
Non-deductible research and development expense	5,163	4,363	4,700
Tax effects of intra-entity transfer of assets	392	895	79
Withholding taxes	17,189	15,865	11,535
Tax settlements, foreign	1,193	458	—
Increase (decrease) in unrecognized tax benefits	159	(1,303)	(1,545)
Other	3,180	2,868	3,976
Provision (benefit) for income taxes	<u>\$ 42,104</u>	<u>\$ (510,011)</u>	<u>\$ 30,613</u>
Effective tax rate	7 %	(106)%	8 %

The components of deferred tax assets and liabilities consisted of the following as of January 2, 2021 and December 28, 2019:

	As of	
	January 2, 2021	December 28, 2019
	(In thousands)	
Deferred tax assets:		
Tax credit carryforwards	\$ 197,436	\$ 206,008
Reserves and accruals	60,272	47,562
Intangible assets	578,267	583,323
Capitalized research and development expense for income tax purposes	39,427	18,477
Operating loss carryforwards	5,935	6,201
Deferred income	21,170	16,704
Capital loss carryforwards	16,944	17,320
Stock-based compensation costs	14,656	15,097
Depreciation and amortization	4,402	8,721
Investments	2,521	2,459
Lease liability	31,278	25,016
Total deferred tax assets	972,308	946,888
Valuation allowance	(116,419)	(125,520)
Net deferred tax assets	855,889	821,368
Deferred tax liabilities:		
Intangible assets	(44,549)	(24,907)
Undistributed foreign earnings	(41,957)	(31,916)
ROU assets	(31,278)	(25,016)
Other	(10,749)	(8,350)
Total deferred tax liabilities	(128,533)	(90,189)
Total net deferred tax assets	\$ 727,356	\$ 731,179

During fiscal 2020, 2019 and 2018 Cadence maintained valuation allowances of \$116.4 million, \$125.5 million, and \$108.7 million, respectively, on certain federal, state and foreign deferred tax assets because the realization of these deferred tax assets require future income of a specific character or amount that Cadence considered uncertain. The valuation allowance primarily relates to the following:

- Tax credits in certain states that are accumulating at a rate greater than Cadence's capacity to utilize the credits and tax credits in certain states where it is likely the credits will expire unused;
- Federal, state and foreign deferred tax assets related to investments and capital losses that can only be utilized against gains that are capital in nature; and
- Foreign tax credits that can only be fully utilized if Cadence has sufficient income of a specific character in the future.

The valuation allowance decreased by \$9.1 million during fiscal 2020 and increased by \$16.8 million and \$13.2 million, during fiscal 2019 and fiscal 2018, respectively. The valuation allowance activity was primarily related to California research and development tax credits and certain foreign tax credits.

As of January 2, 2021, Cadence's operating loss carryforwards were as follows:

	Amount (In thousands)	Expiration Periods
Federal	\$ 743	from 2021 through 2029
California	27,093	from 2030 through 2039
Other states (tax effected, net of federal benefit)	1,564	from 2021 through 2037
Foreign (tax effected)	2,322	from 2025 through indefinite

As of January 2, 2021, Cadence had tax credit carryforwards of:

	Amount (In thousands)	Expiration Periods
Federal*	\$ 96,417	from 2038 through 2040
California	63,130	indefinite
Other states	12,023	from 2021 through indefinite
Foreign	25,866	from 2035 through indefinite

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

Examinations by Tax Authorities

Taxing authorities regularly examine Cadence's income tax returns. As of January 2, 2021, Cadence's earliest tax years that remain open to examination and the assessment of additional tax include:

Jurisdiction	Earliest Tax Year Open to Examination
United States – Federal	2015
United States – California	2016
Ireland	2016

Unrecognized Tax Benefits

The changes in Cadence's gross amount of unrecognized tax benefits during fiscal 2020, 2019 and 2018 are as follows:

	2020	2019	2018
	(In thousands)		
Unrecognized tax benefits at the beginning of the fiscal year	\$ 106,041	\$ 101,857	\$ 110,179
Gross amount of the increases (decreases) in unrecognized tax benefits of tax positions taken during a prior year*	5,037	(3,143)	(4,183)
Gross amount of the increases in unrecognized tax benefits as a result of tax positions taken during the current year	3,344	8,951	2,370
Amount of decreases in unrecognized tax benefits relating to settlements with taxing authorities, including the utilization of tax attributes	(1,316)	(380)	—
Reductions to unrecognized tax benefits resulting from the lapse of the applicable statute of limitations	(676)	(1,692)	(5,179)
Effect of foreign currency translation	591	448	(1,330)
Unrecognized tax benefits at the end of the fiscal year	<u>\$ 113,021</u>	<u>\$ 106,041</u>	<u>\$ 101,857</u>
Total amounts of unrecognized tax benefits that, if upon resolution of the uncertain tax positions would reduce Cadence's effective tax rate	\$ 66,010	\$ 61,527	\$ 58,022

* Includes unrecognized tax benefits of tax positions recorded in connection with acquisitions

It is reasonably possible that the amount of unrecognized tax positions could decrease by approximately \$10.5 million during the next 12 months. The potential decrease could be primarily driven by settlements with tax authorities. The actual amount could vary significantly depending on the ultimate timing and nature of any settlements.

The total amounts of interest, net of tax, and penalties recognized in the consolidated income statements as provision (benefit) for income taxes for fiscal 2020, 2019 and 2018 were as follows:

	2020	2019	2018
	(In thousands)		
Interest	\$ 473	\$ 490	\$ 585
Penalties	(3)	19	342

The total amounts of gross accrued interest and penalties recognized in the consolidated balance sheets as of January 2, 2021 and December 28, 2019 were as follows:

	As of	
	January 2, 2021	December 28, 2019
	(In thousands)	
Interest	\$ 3,555	\$ 3,500
Penalties	12	12

NOTE 7. LEASES

Operating lease expense, which includes immaterial amounts of short-term leases, variable lease costs and sublease income, was as follows during fiscal 2020, 2019 and 2018:

	2020	2019	2018
	(In thousands)		
Operating lease expense	\$ 39,731	\$ 34,709	\$ 33,717

Additional activity related to Cadence's leases during fiscal 2020 and 2019 was as follows:

	2020	2019
	(In thousands)	
Cash paid for amounts included in the measurement of operating lease liabilities	\$ 34,723	\$ 34,961
ROU assets obtained in exchange for operating lease obligations	63,057	38,090

ROU lease assets and lease liabilities for Cadence's operating leases were recorded in the consolidated balance sheet as follows:

	As of	
	January 2, 2021	December 28, 2019
	(In thousands)	
Other assets	\$ 133,354	\$ 100,343
Accounts payable and accrued liabilities	33,920	25,558
Other long-term liabilities	113,916	84,782
Total lease liabilities	\$ 147,836	\$ 110,340
Weighted average remaining lease term (in years)	6.7	5.1
Weighted average discount rate	3.8 %	4.5 %

Future lease payments included in the measurement of lease liabilities on the consolidated balance sheet as of January 2, 2021, for the following five fiscal years and thereafter were as follows:

	Operating Leases (In thousands)
2021	\$ 38,173
2022	29,229
2023	21,517
2024	18,496
2025	15,975
Thereafter	44,251
Total future lease payments	167,641
Less imputed interest	(19,805)
Total lease liability balance	\$ 147,836

As of January 2, 2021, Cadence had additional operating lease obligations of approximately \$5.9 million for a facility lease that will commence in the first quarter of fiscal 2021.

NOTE 8. INVESTMENTS

Cadence has a portfolio of equity investments that includes investments in both marketable and non-marketable securities. These investments primarily consist of cash investments in companies with technologies or services that are potentially strategically important to Cadence.

Marketable Equity Investments

Cadence's investment in marketable equity securities consists of purchased shares of a publicly held company and is included in prepaid expenses and other in Cadence's consolidated balance sheets. Changes in the fair value of these investments is recorded to other income, net in Cadence's consolidated income statements.

Non-Marketable Equity Investments

Cadence's investments in non-marketable equity securities generally consist of stock, convertible debt or other instruments of privately held entities and are included in other assets on Cadence's consolidated balance sheets. Cadence holds a 16% interest in a privately held company that is accounted for using the equity method of accounting. The carrying value of this investment was \$130.7 million and \$136.3 million as of January 2, 2021 and December 28, 2019, respectively. During fiscal 2020 and fiscal 2019, Cadence recorded losses of \$4.6 million and \$6.9 million, respectively, to other income, net in Cadence's consolidated income statements, which represented Cadence's proportionate share of net income from the investee, offset by amortization of basis differences.

Cadence also holds other non-marketable investments in privately held companies where Cadence does not have the ability to exercise significant influence and the fair value of the investments is not readily determinable. The carrying value of these investments was \$1.6 million and \$1.9 million as of January 2, 2021 and December 28, 2019, respectively. Gains and losses on these investments are recorded to other income, net in Cadence's consolidated income statements and were not material to Cadence's consolidated financial statements for fiscal 2020, 2019 or 2018.

NOTE 9. ACQUISITIONS

On January 15, 2020, Cadence acquired all of the outstanding equity of AWR Corporation ("AWR"). On February 6, 2020, Cadence also acquired all of the outstanding equity of Integrand Software, Inc. ("Integrand"). These acquisitions enhance Cadence's technology portfolio to address growing radio frequency design activity, driven by expanding use of 5G communications.

The aggregate cash consideration for these acquisitions was \$195.6 million, after taking into account cash acquired of \$1.5 million. The total purchase consideration was allocated to the assets acquired and liabilities assumed based on their respective estimated fair values on the acquisition dates. Cadence will also make payments to certain employees, subject to continued employment and other performance-based conditions, through the first quarter of fiscal 2023.

With its acquisition of AWR and Integrand, Cadence recorded \$101.3 million of definite-lived intangible assets, primarily related to existing technology and customer agreements and relationships. The weighted-average amortization period for definite-lived intangible assets acquired is approximately 9 years. Cadence also recorded \$119.4 million of goodwill and \$25.1 million of net liabilities, consisting primarily of deferred tax liabilities, assumed deferred revenue and trade accounts receivable. The recorded goodwill is primarily related to the acquired assembled workforce and expected synergies from combining operations of the acquired companies with Cadence. None of the goodwill related to the acquisitions of AWR and Integrand will be deductible for tax purposes.

Cadence completed one additional acquisition during fiscal 2020. This acquisition is not material to the consolidated financial statements. Cadence has not presented pro forma financial information for any of the businesses it acquired during fiscal 2020 because the results of operations for these businesses are not material to Cadence's consolidated financial statements.

Acquisition-Related Transaction Costs

Transaction costs associated with acquisitions were \$2.4 million, \$2.3 million and \$0.6 million during fiscal 2020, 2019 and 2018, respectively. These costs consist of professional fees and administrative costs and were expensed as incurred in Cadence's consolidated income statements.

NOTE 10. GOODWILL AND ACQUIRED INTANGIBLES

Goodwill

The changes in the carrying amount of goodwill during fiscal 2020 and 2019 were as follows:

	Gross Carrying Amount (In thousands)
Balance as of December 29, 2018	\$ 662,272
Effect of foreign currency translation	(416)
Balance as of December 28, 2019	661,856
Goodwill resulting from acquisitions	120,564
Effect of foreign currency translation	(333)
Balance as of January 2, 2021	\$ 782,087

Cadence completed its annual goodwill impairment test during the third quarter of fiscal 2020 and determined that the fair value of Cadence's single reporting unit exceeded the carrying amount of its net assets and that no impairment existed.

Acquired Intangibles, Net

Acquired intangibles as of January 2, 2021 were as follows, excluding intangibles that were fully amortized as of December 28, 2019:

	Gross Carrying Amount	Accumulated Amortization	Acquired Intangibles, Net (In thousands)
Existing technology	\$ 370,838	\$ (230,654)	\$ 140,184
Agreements and relationships	180,023	(113,629)	66,394
Tradenames, trademarks and patents	10,590	(6,578)	4,012
Total acquired intangibles with definite lives	561,451	(350,861)	210,590

During fiscal 2020, Cadence completed certain projects previously included in in-process technology and transferred \$19.5 million to existing technology.

Acquired intangibles as of December 28, 2019 were as follows, excluding intangibles that were fully amortized as of December 29, 2018:

	Gross Carrying Amount	Accumulated Amortization	Acquired Intangibles, Net (In thousands)
Existing technology	\$ 363,142	\$ (245,902)	\$ 117,240
Agreements and relationships	146,395	(112,565)	33,830
Tradenames, trademarks and patents	7,600	(5,795)	1,805
Total acquired intangibles with definite lives	517,137	(364,262)	152,875
In-process technology	19,500	—	19,500
Total acquired intangibles	\$ 536,637	\$ (364,262)	\$ 172,375

Amortization expense from existing technology and maintenance agreements is included in cost of product and maintenance. Amortization expense for fiscal 2020, 2019 and 2018, by consolidated income statement caption, was as follows:

	2020	2019	2018
	(In thousands)		
Cost of product and maintenance	\$ 46,184	\$ 40,951	\$ 39,247
Amortization of acquired intangibles	18,009	12,128	14,086
Total amortization of acquired intangibles	<u>\$ 64,193</u>	<u>\$ 53,079</u>	<u>\$ 53,333</u>

As of January 2, 2021, the estimated amortization expense for intangible assets with definite lives was as follows for the following five fiscal years and thereafter:

	(In thousands)
2021	\$ 61,706
2022	43,401
2023	27,870
2024	26,408
2025	15,767
Thereafter	35,438
Total estimated amortization expense	<u>\$ 210,590</u>

NOTE 11. STOCK COMPENSATION PLANS AND STOCK-BASED COMPENSATION

Equity Incentive Plans

Cadence's Omnibus Plan provides for the issuance of both incentive and non-qualified options, restricted stock awards, restricted stock units, stock bonuses and the rights to acquire restricted stock to both executive and non-executive employees. During fiscal 2020, Cadence's stockholders approved an amendment to the Omnibus Plan to increase the number of shares of common stock authorized for issuance by 9.0 million. As of January 2, 2021, the total number of shares available for future issuance under the Omnibus Plan was 16.2 million. Options granted under the Omnibus Plan have an exercise price not less than the fair market value of the stock on the date of grant. Options and restricted stock generally vest over a period of three years to four years. Options granted under the Omnibus Plan expire seven years from the date of grant. Vesting of restricted stock awards granted under the Omnibus Plan may require the attainment of specified performance criteria.

Cadence's 1995 Directors Stock Incentive Plan (the "Directors Plan") provides for the issuance of non-qualified options, restricted stock awards and restricted stock units to its non-employee directors. Options granted under the Directors Plan have an exercise price not less than the fair market value of the stock on the date of grant. As of January 2, 2021, the total number of shares available for future issuance under the Directors Plan was 0.5 million. Options granted under the Directors Plan expire after ten years, and options, restricted stock awards and restricted stock units vest one year from the date of grant.

Cadence has assumed certain options granted to employees of acquired companies ("Acquired Options"). The Acquired Options were assumed by Cadence outside of its stock option plans, and each option is administered under the terms of the respective original plans of the acquired companies. All of the Acquired Options have been adjusted for the price conversion under the terms of the acquisition agreement between Cadence and the relevant acquired company. If the Acquired Options are canceled, forfeited or expire, they do not become available for future grant.

Stock-Based Compensation

Stock-based compensation expense and the related income tax benefit recognized in connection with stock options, restricted stock and the ESPP during fiscal 2020, 2019 and 2018 were as follows:

	2020	2019	2018
	(In thousands)		
Stock options	\$ 8,062	\$ 6,806	\$ 5,581
Restricted stock	173,193	164,078	153,348
ESPP	16,013	10,663	8,786
Total stock-based compensation expense	<u>\$ 197,268</u>	<u>\$ 181,547</u>	<u>\$ 167,715</u>
Income tax benefit	\$ 31,857	\$ 30,118	\$ 32,830

Stock-based compensation expense is reflected in Cadence's consolidated income statements during fiscal 2020, 2019 and 2018 as follows:

	2020	2019	2018
	(In thousands)		
Cost of product and maintenance	\$ 2,922	\$ 2,759	\$ 2,631
Cost of services	3,720	3,510	3,714
Marketing and sales	42,096	39,088	34,665
Research and development	124,999	114,656	104,353
General and administrative	23,531	21,534	22,352
Total stock-based compensation expense	<u>\$ 197,268</u>	<u>\$ 181,547</u>	<u>\$ 167,715</u>

Stock Options

The exercise price of each stock option granted under Cadence's employee equity incentive plans is equal to or greater than the closing price of Cadence's common stock on the date of grant. The fair value of each option grant is estimated on the date of grant using the Black-Scholes option pricing model. The weighted-average grant date fair value of options granted and the weighted-average assumptions used in the model for fiscal 2020, 2019 and 2018 were as follows:

	2020	2019	2018
Dividend yield	None	None	None
Expected volatility	25.1 %	24.4 %	24.3 %
Risk-free interest rate	1.36 %	2.47 %	2.54 %
Expected term (in years)	4.8	4.8	4.8
Weighted-average fair value of options granted	\$ 19.38	\$ 14.58	\$ 10.24

A summary of the changes in stock options outstanding under Cadence's equity incentive plans during fiscal 2020 is presented below:

	Shares (In thousands)	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Terms (Years)	Aggregate Intrinsic Value (In thousands)
Options outstanding as of December 28, 2019	4,933	\$ 26.38		
Granted	534	79.82		
Exercised	(1,497)	17.69		
Forfeited	(36)	49.97		
Options outstanding as of January 2, 2021	<u>3,934</u>	\$ 36.72	3.4	\$ 392,240
Options vested as of January 2, 2021	<u>2,974</u>	\$ 28.37	2.7	\$ 321,425

Cadence had total unrecognized compensation expense related to stock option grants of \$15.0 million as of January 2, 2021, which will be recognized over the remaining vesting period. The remaining weighted-average vesting period of unvested awards is 2.3 years.

The total intrinsic value of and cash received from options exercised during fiscal 2020, 2019 and 2018 was:

	2020	2019	2018
	(In thousands)		
Intrinsic value of options exercised	\$ 109,193	\$ 51,625	\$ 31,109
Cash received from options exercised	26,474	14,553	11,748

Restricted Stock

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

Certain long-term, market-based performance stock awards granted to executives vest over three to five years and are subject to certain market conditions and the executive's continuing service to Cadence. Stock-based compensation expense is recognized straight-line over the vesting term. If the market-based performance conditions are not ultimately met, compensation expense previously recognized is not reversed. As of January 2, 2021, Cadence had 1.8 million shares of unvested long-term, market-based performance stock awards outstanding.

Stock-based compensation expense related to performance-based and market-based performance restricted stock grants for fiscal 2020, 2019 and 2018 was as follows:

	2020	2019	2018
	(In thousands)		
Stock-based compensation expense related to performance-based restricted stock	\$ 14,859	\$ 12,640	\$ 12,868
Stock-based compensation expense related to market-based performance stock awards	8,335	7,019	2,300

A summary of the changes in restricted stock outstanding under Cadence's equity incentive plans during fiscal 2020 is presented below:

	Shares	Weighted-Average Grant Date Fair Value	Weighted-Average Remaining Vesting Terms (Years)	Aggregate Intrinsic Value
	(In thousands)			(In thousands)
Unvested shares as of December 28, 2019	8,393	\$ 42.55		
Granted	2,180	101.80		
Vested	(3,865)	42.14		
Forfeited	(469)	47.74		
Unvested shares as of January 2, 2021	6,239	\$ 63.12	1.1	\$ 851,087

Cadence had total unrecognized compensation expense related to restricted stock grants of \$316.0 million as of January 2, 2021, which will be recognized over the remaining vesting period. The remaining weighted-average vesting period of unvested awards is 2.1 years.

The total fair value realized by employees upon vesting of restricted stock during fiscal 2020, 2019 and 2018 was:

	2020	2019	2018
	(In thousands)		
Fair value of restricted stock realized upon vesting	\$ 358,261	\$ 298,320	\$ 232,099

Employee Stock Purchase Plan

Cadence provides an ESPP, as amended from time to time. A majority of Cadence employees are eligible to participate in the ESPP. Under the terms of the ESPP, for the offering period that commenced February 1, 2020, eligible employees may purchase Cadence's common stock at a price equal to 85% of the lower of the fair market value at the beginning or the end of the applicable offering period, in an amount not to exceed 12% of their annual base earnings plus bonuses and commissions, and subject to a limit in any calendar year of \$12,000. Each offering period has a duration of six months beginning on either February 1 or August 1. The purchase dates fall on the last days of the six-month offering periods. Under the ESPP for the periods August 1, 2018 through the January 31, 2020 purchase date, participating employees could contribute up to 10% of their annual base earnings plus bonuses and commissions, and subject to a limit in any calendar year of \$10,000. Under the ESPP and through the July 31, 2018 purchase date, participating employees could contribute up to 7% of their annual base earnings plus bonuses and commissions, subject to a limit in any calendar year of \$8,000. As of January 2, 2021, the total number of shares available for future issuance under the ESPP was 5.3 million.

Compensation expense is calculated using the fair value of the employees' purchase rights under the Black-Scholes option pricing model. The weighted-average grant date fair value of purchase rights granted under the ESPP and the weighted-average assumptions used in the model for fiscal 2020, 2019 and 2018 were as follows:

	2020	2019	2018
Dividend yield	None	None	None
Expected volatility	32.6 %	27.9 %	21.1 %
Risk-free interest rate	0.8 %	2.23 %	2.05 %
Expected term (in years)	0.5	0.5	0.5
Weighted-average fair value of options granted	\$ 23.08	\$ 14.37	\$ 9.24

Shares of common stock issued under the ESPP for fiscal 2020, 2019 and 2018 were as follows:

	2020	2019	2018
	(In thousands, except per share amounts)		
Cadence shares purchased under the ESPP	785	988	892
Cash received for the purchase of shares under the ESPP	\$ 48,328	\$ 38,290	\$ 29,160
Weighted-average purchase price per share	\$ 61.55	\$ 38.74	\$ 32.69

Reserved for Future Issuance

As of January 2, 2021, Cadence had reserved the following shares of authorized but unissued common stock for future issuance:

	Shares (In thousands)
Employee equity incentive plans*	21,365
Employee stock purchase plans	5,254
Directors stock plans*	730
Total	27,349

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

NOTE 12. STOCK REPURCHASE PROGRAMS

As of the end of fiscal 2019, approximately \$369 million remained available under Cadence's previously announced authorization to repurchase shares of Cadence common stock. In July 2020, Cadence's Board of Directors increased the previously announced authorization to repurchase shares of Cadence common stock by an additional \$750 million. 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 January 2, 2021, approximately \$739 million 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 fiscal 2020, 2019 and 2018 were as follows:

	2020	2019	2018
	(In thousands)		
Shares repurchased	4,247	4,841	5,934
Total cost of repurchased shares	\$ 380,064	\$ 306,148	\$ 250,059

NOTE 13. RESTRUCTURING AND OTHER CHARGES

Cadence has initiated restructuring plans in an effort to better align its resources with its business strategy. The charges associated with these restructuring plans have primarily been comprised of severance payments and termination benefits related to headcount reductions, estimated lease losses related to facilities vacated and charges related to abandoned assets. During the fourth quarter of fiscal 2020, Cadence initiated a restructuring plan (the "2020 Restructuring Plan") and recorded restructuring and other charges of \$10.8 million related to severance payments, termination benefits and charges related to vacated facilities. As of January 2, 2021, total liabilities related to the 2020 Restructuring Plan were \$8.6 million.

Cadence has also initiated restructuring plans in prior years, including both fiscal 2019 and fiscal 2018 (the "prior restructuring plans"). During fiscal 2020, Cadence revised certain estimates made in connection with the prior restructuring plans and recorded credits of \$1.6 million. As of January 2, 2021, total liabilities related to the prior restructuring plans were \$0.1 million.

The following table presents activity for Cadence's restructuring plans during fiscal 2020, 2019 and 2018:

	Severance and Benefits	Excess Facilities	Total
	(In thousands)		
Balance, December 30, 2017	\$ 13,535	\$ 249	\$ 13,784
Restructuring and other charges, net	10,268	821	11,089
Cash payments	(12,688)	(192)	(12,880)
Effect of foreign currency translation	61	(30)	31
Balance, December 29, 2018	\$ 11,176	\$ 848	\$ 12,024
Restructuring and other charges, net	8,649	(28)	8,621
Cash payments	(10,714)	(420)	(11,134)
Effect of foreign currency translation	118	9	127
Balance, December 28, 2019	\$ 9,229	\$ 409	\$ 9,638
Restructuring and other charges, net	7,476	1,739	9,215
Cash payments	(9,424)	(773)	(10,197)
Effect of foreign currency translation	40	(3)	37
Balance, January 2, 2021	\$ 7,321	\$ 1,372	\$ 8,693

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

	As of January 2, 2021 (In thousands)
Accounts payable and accrued liabilities	\$ 8,653
Other long-term liabilities	40
Total liabilities	\$ 8,693

All liabilities for severance and related benefits under Cadence's restructuring plans are included in accounts payable and accrued liabilities on Cadence's consolidated balance sheet as of January 2, 2021. Restructuring liabilities included in other long-term liabilities represent liabilities from vacated facilities, and Cadence expects to make cash payments to settle these liabilities through fiscal 2022.

NOTE 14. OTHER INCOME, NET

Cadence's other income, net, for fiscal 2020, 2019 and 2018 was as follows:

	2020	2019	2018
	(In thousands)		
Interest income	\$ 3,817	\$ 9,509	\$ 8,070
Gains (losses) on marketable equity investments	(148)	713	(551)
Gains (losses) on non-marketable equity investments	(4,806)	(4,802)	3,300
Gains (losses) on securities in NQDC trust	4,881	5,402	(1,471)
Gains (losses) on foreign exchange	4,429	(4,111)	(5,557)
Other expense, net	(228)	(710)	(471)
Total other income, net	\$ 7,945	\$ 6,001	\$ 3,320

NOTE 15. NET INCOME PER SHARE

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

The calculations for basic and diluted net income per share for fiscal 2020, 2019 and 2018 are as follows:

	2020	2019	2018
	(In thousands, except per share amounts)		
Net income	\$ 590,644	\$ 988,979	\$ 345,777
Weighted-average common shares used to calculate basic net income per share	273,728	273,239	273,729
Stock-based awards	5,913	7,276	7,415
Weighted-average common shares used to calculate diluted net income per share	279,641	280,515	281,144
Net income per share – basic	\$ 2.16	\$ 3.62	\$ 1.26
Net income per share – diluted	\$ 2.11	\$ 3.53	\$ 1.23

The following table presents shares of Cadence's common stock outstanding for fiscal 2020, 2019 and 2018 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:

	2020	2019	2018
	(In thousands)		
Long-term market-based awards	383	1,097	50
Options to purchase shares of common stock	201	359	637
Non-vested shares of restricted stock	58	727	290
Total potential common shares excluded	642	2,183	977

NOTE 16. BALANCE SHEET COMPONENTS

A summary of certain balance sheet components as of January 2, 2021 and December 28, 2019 is as follows:

	As of	
	January 2, 2021	December 28, 2019
	(In thousands)	
Inventories:		
Raw materials	\$ 63,647	\$ 36,637
Finished goods	12,309	19,165
Inventories	<u>\$ 75,956</u>	<u>\$ 55,802</u>
Property, plant and equipment:		
Computer equipment and related software	\$ 616,836	\$ 554,874
Buildings	126,666	126,795
Land	55,848	55,820
Leasehold, building and land improvements	129,155	106,456
Furniture and fixtures	27,064	23,425
Equipment	38,732	38,955
In-process capital assets	10,774	4,706
Total cost	1,005,075	911,031
Less: Accumulated depreciation and amortization	(693,950)	(635,176)
Property, plant and equipment, net	<u>\$ 311,125</u>	<u>\$ 275,855</u>
Other assets:		
Non-marketable investments	\$ 132,226	\$ 138,212
ROU lease assets	133,354	100,343
Other long-term assets	170,526	106,874
Other assets	<u>\$ 436,106</u>	<u>\$ 345,429</u>
Accounts payable and accrued liabilities:		
Payroll and payroll-related accruals	\$ 219,289	\$ 200,163
Other accrued operating liabilities	130,662	116,745
Accounts payable and accrued liabilities	<u>\$ 349,951</u>	<u>\$ 316,908</u>
Other long-term liabilities:		
Operating lease liabilities	\$ 113,916	\$ 84,782
Other accrued liabilities	93,186	77,739
Other long-term liabilities	<u>\$ 207,102</u>	<u>\$ 162,521</u>

NOTE 17. 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.

The valuation techniques used to determine the fair value of Cadence's 2024 Notes are classified within Level 2 of the fair value hierarchy. For additional information relating to Cadence's debt arrangements, see Note 3 in the notes to consolidated financial statements.

This hierarchy requires Cadence to minimize the use of unobservable inputs and to use observable market data, if available, when determining fair value. Cadence recognizes transfers between levels of the hierarchy based on the fair values of the respective financial instruments at the end of the reporting period in which the transfer occurred. There were no transfers between levels of the fair value hierarchy during fiscal 2020.

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 January 2, 2021 and December 28, 2019:

Fair Value Measurements as of January 2, 2021:					
	Total	Level 1	Level 2	Level 3	
(In thousands)					
<u>Assets</u>					
Cash equivalents:					
Money market funds	\$ 541,386	\$ 541,386	\$ —	\$ —	
Marketable equity securities	4,452	4,452	—	—	
Securities held in NQDC trust	42,769	42,769	—	—	
Foreign currency exchange contracts	8,868	—	8,868	—	
Total Assets	<u>\$ 597,475</u>	<u>\$ 588,607</u>	<u>\$ 8,868</u>	<u>\$ —</u>	

As of January 2, 2021, Cadence did not have any financial liabilities requiring a recurring fair value measurement.

Fair Value Measurements as of December 28, 2019:					
	Total	Level 1	Level 2	Level 3	
(In thousands)					
<u>Assets</u>					
Cash equivalents:					
Money market funds	\$ 445,942	\$ 445,942	\$ —	\$ —	
Marketable equity securities	4,600	4,600	—	—	
Securities held in NQDC trust	34,096	34,096	—	—	
Foreign currency exchange contracts	3,557	—	3,557	—	
Total Assets	<u>\$ 488,195</u>	<u>\$ 484,638</u>	<u>\$ 3,557</u>	<u>\$ —</u>	

As of December 28, 2019, Cadence did not have any financial liabilities requiring a recurring fair value measurement.

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 and 2024 Notes are classified within Level 2 of the fair value hierarchy. For additional information relating to Cadence's debt arrangements, see Note 3 in the notes to consolidated financial statements.

Level 3 Measurements

Cadence acquired intangible assets of \$101.3 million during the first quarter of fiscal 2020 with its acquisition of AWR and Integrand. The fair value of the definite-lived intangible assets acquired with these acquisitions was determined using variations of the income approach, which include level 3 inputs.

For existing technology, 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 existing technology over the estimated remaining life of the technology, including the effect of technological obsolescence which was estimated at rate between 5% and 7.5% annually, before applying an assumed royalty rate of 20%. The present value of after-tax royalty savings were determined using discount rates ranging from 10% to 11.5%.

The fair value for customer contracts and related relationships 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 considered customer retention rates ranging between 85% and 95%. The present value of operating cash flows from existing customers was determined using discount rates 10% and 11.5%.

Cadence also assumed obligations related to deferred revenue of \$6.9 million during the first quarter of fiscal 2020 with its acquisition of AWR. The fair value of these obligations was estimated using the cost build-up approach. The cost build-up approach determines fair value using estimates of the costs required to fulfill the contracted obligations plus an assumed profit margin, which approximates the amount that AWR would be required to pay a third party to assume the obligation.

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

NOTE 18. COMMITMENTS AND CONTINGENCIES

Purchase Obligations

Cadence had purchase obligations of \$46.8 million as of January 2, 2021 that were associated with agreements or commitments for purchases of goods or services.

Legal Proceedings

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

Other Contingencies

Cadence provides its customers with a warranty on sales of hardware products, generally for a 90-day period. Cadence did not incur any significant costs related to warranty obligations during fiscal 2020, 2019 or 2018.

Cadence's product license and services agreements typically include a limited indemnification provision for claims from third parties relating to Cadence's intellectual property. If the potential loss from any indemnification claim is considered probable and the amount or the range of loss can be estimated, Cadence accrues a liability for the estimated loss. The indemnification is generally limited to the amount paid by the customer. Cadence did not incur any significant losses from indemnification claims during fiscal 2020, 2019 or 2018.

NOTE 19. EMPLOYEE AND DIRECTOR BENEFIT PLANS

Cadence maintains various defined contribution plans for its eligible U.S. and non-U.S. employees. For employees in the United States, Cadence maintains a 401(k) savings plan to provide retirement benefits through tax-deferred salary deductions and may make discretionary contributions, as determined by the Board of Directors, which cannot exceed a specified percentage of the annual aggregate salaries of those employees eligible to participate. Cadence's total contributions made to these plans during fiscal 2020, 2019 and 2018 were as follows:

	2020	2019	2018
	(In thousands)		
Contributions to defined contribution plans	\$ 27,152	\$ 25,269	\$ 25,731

Executive Officers and Directors may also elect to defer compensation payable to them under Cadence's NQDC. Deferred compensation payments are held in investment accounts and the values of the accounts are adjusted each quarter based on the fair value of the investments held in the NQDC. These investments are classified in other assets in the consolidated balance sheets and gains and losses are recognized as other income, net in the consolidated income statements.

Certain of Cadence's international subsidiaries sponsor defined benefit retirement plans. The unfunded projected benefit obligation for Cadence's defined benefit retirement plans is recorded in other long-term liabilities in the consolidated balance sheets.

NOTE 20. 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 consolidated statements of comprehensive income.

Accumulated other comprehensive loss was comprised of the following as of January 2, 2021, and December 28, 2019:

	As of	
	January 2, 2021	December 28, 2019
	(In thousands)	
Foreign currency translation loss	\$ (11,130)	\$ (29,503)
Changes in defined benefit plan liabilities	(6,295)	(7,423)
Total accumulated other comprehensive loss	\$ (17,425)	\$ (36,926)

For fiscal 2020, 2019 and 2018, there were no significant amounts related to foreign currency translation loss or changes in defined benefit plan liabilities reclassified to net income from accumulated other comprehensive loss.

NOTE 21. 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. Property, plant and equipment assets are attributed to geography based on the country where the assets are located.

The following table presents a summary of revenue by geography for fiscal 2020, 2019 and 2018:

	2020	2019	2018
	(In thousands)		
Americas:			
United States	\$ 1,096,263	\$ 982,380	\$ 924,644
Other Americas	43,652	43,473	32,531
Total Americas	1,139,915	1,025,853	957,175
Asia:			
China	406,645	241,474	210,194
Other Asia	487,362	459,028	395,221
Total Asia	894,007	700,502	605,415
Europe, Middle East and Africa	469,804	433,314	406,877
Japan	179,165	176,650	168,555
Total	\$ 2,682,891	\$ 2,336,319	\$ 2,138,022

The following table presents a summary of property, plant and equipment assets by geography as of January 2, 2021, December 28, 2019 and December 29, 2018:

	As of		
	January 2, 2021	December 28, 2019	December 29, 2018
	(In thousands)		
Americas:			
United States	\$ 248,292	\$ 220,023	\$ 200,025
Other Americas	753	728	475
Total Americas	249,045	220,751	200,500
Asia:			
China	16,416	15,729	9,608
Other Asia	28,668	27,890	30,021
Total Asia	45,084	43,619	39,629
Europe, Middle East and Africa	16,304	10,474	11,784
Japan	692	1,011	717
Total*	\$ 311,125	\$ 275,855	\$ 252,630

NOTE 22. SUBSEQUENT EVENT

On January 18, 2021, Cadence entered into a definitive agreement to acquire all of the outstanding equity of Belgium-based Numerical Mechanics Applications International SA ("NUMECA"), a leader in computational fluid dynamics ("CFD"), mesh generation, multi-physics simulation and optimization. This addition of NUMECA's technologies and talent supports Cadence's Intelligent System Design™ strategy and broadens its System Design and Analysis technology portfolio with the addition of CFD solutions. The acquisition of NUMECA is expected to close during the first quarter of fiscal 2021, subject to customary closing conditions, and is expected to be funded through cash on hand.

Due to the timing of the acquisition, the initial accounting for the acquisition is incomplete. As such, Cadence is not able to disclose certain information relating to the acquisition, including the preliminary fair value of assets acquired and liabilities assumed.

EXHIBIT INDEX

Exhibit Number	Exhibit Title	Form	Incorporated by Reference			Provided Herewith
			File No.	Exhibit No.	Filing Date	
3.01	The Registrant's Restated Certificate of Incorporation, as filed with the Secretary of State of the State of Delaware on May 3, 2019.	10-Q	000-15867	3.01	7/22/2019	
3.02	The Registrant's Amended and Restated Bylaws, effective as of February 10, 2021.	8-K	000-15867	3.01	2/12/2021	
4.01	Specimen Certificate of the Registrant's Common Stock.	S-4	033-43400	4.01	10/17/1991	
4.02	Base Indenture, dated October 9, 2014, between the Registrant and Wells Fargo Bank, N.A., as trustee.	8-K	000-15867	4.01	10/9/2014	
4.03	First Supplemental Indenture, dated October 9, 2014, between the Registrant and Wells Fargo Bank, N.A., as trustee (including the Form of 4.375% Senior Notes due 2024).	8-K	000-15867	4.02	10/9/2014	
4.04	Description of the Registrant's Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934.	10-K	000-15867	4.04	2/24/2020	
10.01*	The Registrant's Amended and Restated 1987 Stock Incentive Plan.	S-8	333-174201	99.1	5/13/2011	
10.02*	Form of Stock Option Agreement and Form of Stock Option Exercise Request under the Registrant's 1987 Stock Incentive Plan, as amended and restated.	10-Q	001-10606	10.02	8/10/2004	
10.03*	Form of Nonstatutory Incentive Stock Award Agreement under the Registrant's 1987 Stock Incentive Plan, as amended and restated.	10-K	001-10606	10.03	3/16/2005	
10.04*	Form of Incentive Stock Award Agreement for performance-based Incentive Stock Awards granted prior to July 29, 2008, as amended and restated, under the Registrant's 1987 Stock Incentive Plan, as amended and restated.	10-Q	001-10606	10.02	12/11/2008	
10.05*	Form of Incentive Stock Award Agreement for performance-based Incentive Stock Awards to be granted subsequent to July 29, 2008 under the Registrant's 1987 Stock Incentive Plan, as amended and restated.	10-Q	001-10606	10.03	12/11/2008	
10.06*	Form of Stock Option Agreement under the Registrant's 1987 Stock Incentive Plan, as amended and restated.	10-Q	001-10606	10.01	5/1/2009	
10.07*	Form of Incentive Stock Award Agreement for performance-based Incentive Stock Awards under the Registrant's 1987 Stock Incentive Plan, as amended and restated.	10-Q	001-10606	10.02	5/1/2009	
10.08*	The Registrant's 1995 Directors Stock Incentive Plan.	10-Q	001-15867	10.01	7/26/2012	
10.09*	Form of Stock Option Agreement, as currently in effect under the Registrant's 1995 Directors Stock Incentive Plan.	10-K	000-15867	10.76	2/21/2013	
10.10*	Form of Incentive Stock Award Agreement, as currently in effect under the Registrant's 1995 Directors Stock Incentive Plan.	10-K	000-15867	10.77	2/21/2013	
10.11*	The Registrant's Amended and Restated 2000 Equity Incentive Plan.	S-8	333-174200	99.1	5/13/2011	
10.12*	Form of Incentive Stock Award Agreement under the Registrant's Amended and Restated 2000 Equity Incentive Plan.	10-Q	001-10606	10.02	10/28/2011	

<u>10.13*</u>	<u>Form of Restricted Stock Unit Award Agreement under the Registrant's Amended and Restated 2000 Equity Incentive Plan.</u>	10-Q	001-10606	10.03	10/28/2011
<u>10.14*</u>	<u>Form of Stock Option Agreement under the Registrant's Amended and Restated 2000 Equity Incentive Plan.</u>	10-Q	001-10606	10.04	10/28/2011
<u>10.15*</u>	<u>The Registrant's Omnibus Equity Incentive Plan, as amended and restated.</u>	S-8	333-240302	99.1	8/3/2020
<u>10.16*</u>	<u>Form of Incentive Stock Award Agreement for Non-Executive Employees and Consultants, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.</u>	10-K	000-15867	10.16	2/22/2021
<u>10.17*</u>	<u>Form of Restricted Stock Unit Agreement for Non-Executive Employees and Consultants, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.</u>	10-K	000-15867	10.17	2/22/2021
<u>10.18*</u>	<u>Form of Stock Option Agreement for Non-Executive Employees and Consultants, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.</u>	S-8	333-195771	99.04	5/7/2014
<u>10.19*</u>	<u>Form of Incentive Stock Award Agreement for Executives, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.</u>	S-8	333-195771	99.05	5/7/2014
<u>10.20*</u>	<u>Form of Restricted Stock Unit Agreement for Executives, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.</u>	S-8	333-195771	99.06	5/7/2014
<u>10.21*</u>	<u>Form of Stock Option Agreement for Executives, as currently in effect under the Registrant's Omnibus Equity Incentive Plan.</u>	S-8	333-195771	99.07	5/7/2014
<u>10.22*</u>	<u>The Registrant's Amended and Restated Employee Stock Purchase Plan.</u>	S-8	333-226293	99.01	7/23/2018
<u>10.23*</u>	<u>The Registrant's 1996 Deferred Compensation Venture Investment Plan, as amended and restated effective January 1, 2001.</u>	10-K	001-10606	10.09	3/12/2002
<u>10.24*</u>	<u>The Registrant's 2002 Deferred Compensation Venture Investment Plan, as amended.</u>	10-Q	001-10606	10.32	8/10/2004
<u>10.25*</u>	<u>The Registrant's 1994 Deferred Compensation Plan, as amended and restated effective November 20, 2003 (409A Grandfathered Plan).</u>	10-K	001-10606	10.10	2/26/2008
<u>10.26*</u>	<u>The Registrant's 2009 Deferred Compensation Plan, as amended and restated on February 5, 2019.</u>	10-K	000-15867	10.26	2/24/2020
<u>10.27*</u>	<u>The Senior Executive Bonus Plan.</u>	8-K	000-15867	10.01	2/8/2019
<u>10.28*</u>	<u>The Registrant's Executive Severance Plan.</u>	8-K	001-15867	10.01	5/11/2016
<u>10.29*</u>	<u>Director Medical and Prescription Benefits Coverage Reimbursement Plan.</u>	10-Q	001-10606	10.02	4/29/2011
<u>10.30</u>	<u>Altos Design Automation, Inc. 2006 Stock Plan, as amended December 23, 2009.</u>	S-8	333-174202	99.1	5/13/2011
<u>10.31</u>	<u>Tensilica, Inc. 2007 Stock Incentive Plan.</u>	S-8	333-188452	99.01	5/8/2013
<u>10.32</u>	<u>C2 Design Automation (d/b/a/ Forte Design Systems) 2010 Stock Option Plan.</u>	S-8	333-194102	99.01	2/24/2014
<u>10.33*</u>	<u>Form of Indemnity Agreement between the Registrant and its directors and executive officers, as amended and restated.</u>	10-Q	000-15867	10.01	7/25/2016
<u>10.34*</u>	<u>Employment Agreement, effective as of July 29, 2008, between the Registrant and James J. Cowie.</u>	10-K	001-10606	10.92	3/2/2009

10.35*	Employment Agreement, effective as of January 8, 2009, between the Registrant and Lip-Bu Tan.	10-K	001-10606	10.93	3/2/2009	
10.36*	Employment Agreement, effective as of February 23, 2009, between the Registrant and Nimish H. Modi.	10-K	001-10606	10.96	3/2/2009	
10.37*	Form of First Amendment to Employment Agreement between the Registrant and the Registrant's named executive officers.	10-Q	001-10606	10.02	7/31/2009	
10.38*	Form of Second Amendment to Employment Agreement between the Registrant and the Registrant's named executive officers.	10-K	001-10606	10.94	2/26/2010	
10.39*	Second Amendment to Employment Agreement, effective as of March 1, 2010, between the Registrant and Lip-Bu Tan.	10-K	001-10606	10.95	2/26/2010	
10.40*	Employment Agreement, effective as of September 20, 2012, between the Registrant and Thomas P. Beckley.	10-K	000-15867	10.44	2/20/2014	
10.41*	Employment Agreement, effective as of March 16, 2015, between the Registrant and Anirudh Devgan.	10-Q	000-15867	10.01	4/27/2015	
10.42*	Letter, dated September 1, 2015, between the Registrant and Neil Zaman.	10-K	000-15867	10.49	2/18/2016	
10.43*	Offer Letter, dated January 12, 2017, between the Registrant and Surendra Babu Mandava.	10-K	000-15867	10.51	2/10/2017	
10.44*	First Amendment to Employment Agreement, effective November 16, 2017, between the Registrant and Anirudh Devgan.	8-K	000-15867	10.01	11/17/2017	
10.45	Credit Agreement, dated as of January 30, 2017, by and among the Registrant, JPMorgan Chase Bank, N.A. and other lenders party thereto.	8-K	000-15867	10.01	2/1/2017	
10.46*	Third Amendment to Employment Agreement, effective as of March 22, 2018, between the Registrant and Lip-Bu Tan.	10-Q	000-15867	10.01	4/25/2018	
10.47*	nusemi inc. 2015 Equity Incentive Plan.	S-8	333-226294	99.01	7/23/2018	
10.48	Second Amendment to Employment Agreement, effective March 31, 2020, between Registrant and Anirudh Devgan.	10-Q	000-15867	10.01	4/20/2020	
16.01	Letter from KPMG LLP dated March 3, 2020	8-K	000-15867	16.01	3/3/2020	
21.01	Subsidiaries of the Registrant.	10-K	000-15867	21.01	2/22/2021	
23.01	Consent of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm					X
23.02	Consent of KPMG LLP, Independent Registered Public Accounting Firm					X
31.01	Certification of the Registrant's Chief Executive Officer, Lip-Bu Tan, pursuant to Rule 13a-14 of the Securities Exchange Act of 1934.					X
31.02	Certification of the Registrant's Chief Financial Officer, 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, Lip-Bu Tan, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.					X
32.02†	Certification of the Registrant's Chief Financial Officer, 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.	X
101.SCH	Inline XBRL Taxonomy Extension Schema Document.	X
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document.	X
101.DEF	Inline XBRL Taxonomy Extension 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 Amendment is formatted in iXBRL.	

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

† In accordance with Item 601(b)(32)(ii) of Regulation S-K, the certifications furnished in Exhibits 32.01 and 32.02 hereto will not be deemed "filed" for purposes of Section 18 of the Exchange Act or incorporated by reference into any filings under the Securities Act or the Exchange Act (except to the extent that the registrant specifically incorporates it by reference).

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

CADENCE DESIGN SYSTEMS, INC.

/s/ Lip-Bu Tan

Lip-Bu Tan

Chief Executive Officer and Director

Dated: May 14, 2021

Consent of Independent Registered Public Accounting Firm

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-240302, 333-232761, 333-226294, 333-226293, 333-226292, 333-219432, 333-212669, 333-204278, 333-197579, 333-195771, 333-194102, 333-188452, 333-188449, 333-184595, 333-174202, 333-174201, 333-174200, 333-159486, 333-150948, 333-149877, 333-145891, 333-144972, 333-135003, 333-132754, 333-132753, 333-124025, 333-119335, 333-116681, 333-115351, 333-115349, 333-108251, 333-105492, 333-105481, 333-104720, 333-103657, 333-103250, 333-102648, 333-101693, 333-88390, 333-87674, 333-85080, 333-82044, 333-75874, 333-65116, 333-56898, 333-69589, 333-33330, 333-93609, 333-85591, 333-71717, 333-65529, 333-61029, 333-34599, 333-27109, and 333-18963) of Cadence Design Systems, Inc. of our report dated February 22, 2021 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in this Form 10-K, as amended.

/s/ PricewaterhouseCoopers LLP

San Jose, California
May 14, 2021

Consent of Independent Registered Public Accounting Firm

The Board of Directors
Cadence Design Systems, Inc.:

We consent to the incorporation by reference in the registration statement (Nos. 333-240302, 333-232761, 333-226294, 333-226293, 333-226292, 333-219432, 333-212669, 333-204278, 333-197579, 333-195771, 333-194102, 333-188452, 333-188449, 333-184595, 333-174202, 333-174201, 333-174200, 333-159486, 333-150948, 333-149877, 333-145891, 333-144972, 333-135003, 333-132754, 333-132753, 333-124025, 333-119335, 333-116681, 333-115351, 333-115349, 333-108251, 333-105492, 333-105481, 333-104720, 333-103657, 333-103250, 333-102648, 333-101693, 333-88390, 333-87674, 333-85080, 333-82044, 333-75874, 333-65116, 333-56898, 333-69589, 333-33330, 333-93609, 333-85591, 333-71717, 333-65529, 333-61029, 333-34599, 333-27109, and 333-18963) on Form S-8 of Cadence Design Systems, Inc. of our report dated February 24, 2020, with respect to the consolidated balance sheet of Cadence Design Systems, Inc. as of December 28, 2019, the related consolidated statements of income, comprehensive income, stockholders' equity, and cash flows for each of the years in the two-year period ended December 28, 2019, and the related notes (collectively, the consolidated financial statements), which report appears in the January 2, 2021 annual report on Form 10-K/A of Cadence Design Systems, Inc.

Our report on the consolidated financial statements refers to the adoption of Financial Accounting Standards Board ("FASB") Accounting Standards Update (ASU) 2016-02, *Leases*, as of December 30, 2018.

/s/ KPMG LLP
Santa Clara, California
May 14, 2021

CERTIFICATIONS

I, Lip-Bu Tan, certify that:

1. I have reviewed this Annual Report on Form 10-K/A of Cadence Design Systems, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

By: /s/ Lip-Bu Tan

Lip-Bu Tan
Chief Executive Officer
(Principal Executive Officer)

Date: May 14, 2021

CERTIFICATIONS

I, John M. Wall, certify that:

1. I have reviewed this Annual Report on Form 10-K/A of Cadence Design Systems, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

By:

/s/ John M. Wall

John M. Wall

Senior Vice President and Chief Financial Officer

(Principal Accounting and Financial Officer)

Date: May 14, 2021

**CERTIFICATION OF CHIEF EXECUTIVE OFFICER
PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO SECTION 906
OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report on Form 10-K/A for the fiscal year ended January 2, 2021 of Cadence Design Systems, Inc. (the "Company") as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Lip-Bu Tan, Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ Lip-Bu Tan

Lip-Bu Tan

Chief Executive Officer

(Principal Executive Officer)

Date: May 14, 2021

A signed original of this written statement required by Section 906 has been provided to Cadence Design Systems, Inc. and will be retained by Cadence and furnished to the Securities and Exchange Commission or its staff upon request.

**CERTIFICATION OF CHIEF FINANCIAL OFFICER
PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO SECTION 906
OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report on Form 10-K/A for the fiscal year ended January 2, 2021 of Cadence Design Systems, Inc. (the "Company") as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, John M. Wall, Senior Vice President and Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ John M. Wall

John M. Wall

Senior Vice President and Chief Financial Officer

(Principal Accounting and Financial Officer)

Date: May 14, 2021

A signed original of this written statement required by Section 906 has been provided to Cadence Design Systems, Inc. and will be retained by Cadence and furnished to the Securities and Exchange Commission or its staff upon request.