

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

FORM 10-K

(Mark One)

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

**For the fiscal year ended October 31, 2022
OR**

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

**For the transition period from to
Commission File Number 0-19807**

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SYNOPSYS, INC.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of
incorporation or organization)

690 East Middlefield Road, Mountain View, California

(Address of principal executive offices)

56-1546236

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

94043

(Zip Code)

(650) 584-5000

(Registrant's telephone number, including area code)

Securities Registered Pursuant to Section 12(b) of the Act:

<u>Title of Each Class</u>	<u>Trading Symbol(s)</u>	<u>Name of Each Exchange on Which Registered</u>
Common Stock (par value of \$0.01 per share)	SNPS	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.

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Large accelerated filer	<input checked="" type="checkbox"/>	Accelerated Filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

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 was approximately \$32.2 billion. Aggregate market value excludes an aggregate of approximately 40.8 million shares of the registrant's common stock, par value of \$0.01 per share (Common Stock) held by the registrant's executive officers and directors and by each person known by the registrant to own 5% or more of the outstanding common stock on such date. Exclusion of shares held by any of these persons should not be construed to indicate that such person possesses the power, direct or indirect, to direct or cause the direction of the management or policies of the registrant, or that such person is controlled by or under common control with the registrant.

On December 7, 2022, 152,417,194 shares of Common Stock were outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive Proxy Statement relating to the registrant's 2023 Annual Meeting of Stockholders, scheduled to be held on April 12, 2023, are incorporated by reference into Part III of this Annual Report on Form 10-K where indicated. Except as expressly incorporated by reference, the registrant's Proxy Statement shall not be deemed to be part of this report.

SYNOPSYS, INC.
ANNUAL REPORT ON FORM 10-K
Fiscal year ended October 31, 2022
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Cautionary Note Regarding Forward-Looking Statements

This Annual Report on Form 10-K (this Form 10-K) contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the Securities Act), Section 21E of the Securities Exchange Act of 1934, as amended (the Exchange Act), and the Private Securities Litigation Reform Act of 1995. Any statements herein that are not statements of historical fact are forward-looking statements. Words such as “may,” “will,” “could,” “would,” “can,” “should,” “anticipate,” “expect,” “intend,” “believe,” “estimate,” “project,” “continue,” “forecast,” “likely,” “potential,” “seek,” or the negatives of such terms and similar expressions are intended to identify forward-looking statements. This Form 10-K includes, among others, forward-looking statements regarding:

- our business, product and platform strategies and business outlook;
- the impact of macroeconomic conditions, rising global interest rates, legislative developments, trade disruptions, including export control restrictions, semiconductor shortages and supply chain disruptions on our business and our customers’ businesses;
- regulatory changes in the United States and other regions in which we operate;
- the impact of the ongoing COVID-19 pandemic;
- demand for our products and our customers’ products;
- the expected realization of our contracted but unsatisfied or partially unsatisfied performance obligations;
- customer license renewals;
- our ability to successfully compete in the markets in which we serve;
- our license mix, business model and variability in our revenue;
- the continuation of current industry trends towards customer and vendor consolidation, and the impact of such consolidation;
- prior and future acquisitions, including the expected benefits and risks of completed acquisitions;
- the completion of development of our unfinished products, or further development or integration of our existing products;
- technological trends in integrated circuit design;
- the status of litigation and/or regulatory investigations;
- our ability to protect our intellectual property;
- our ability to attract and retain senior management and key employees worldwide;
- the impact of tax laws and changes in such laws on our business;
- our cash, cash equivalents and cash generated from operations; and
- our future liquidity requirements.

These statements are based on our current expectations about future events and involve certain known and unknown risks, uncertainties and other factors that could cause our actual results, time frames or achievements to differ materially from those expressed or implied in our forward-looking statements. Accordingly, we caution readers not to place undue reliance on these statements. Such risks and uncertainties include, among others, those listed in Part I, Item 1A, *Risk Factors* and Item 3, *Legal Proceedings*; and Part II, Item 7, *Management’s Discussion and Analysis of Financial Condition and Results of Operations*, Item 7A, *Quantitative and Qualitative Disclosures About Market Risk* and Item 9A, *Controls and Procedures* of this Form 10-K. The information included herein represents our estimates and assumptions as of the date of this filing. Unless required by law, we undertake no obligation to update publicly any forward-looking statements, or to update the reasons actual results could differ materially from those anticipated in these forward-looking statements, even if new information becomes available in the future. All subsequent written or oral forward-looking statements attributable to Synopsys, Inc. or persons acting on our behalf are expressly qualified in their entirety by these cautionary statements. Readers are urged to carefully review and

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consider the various disclosures made in this report and in other documents we file from time to time with the Securities and Exchange Commission (SEC) that attempt to advise interested parties of the risks and factors that may affect our business.

Fiscal Year End

Our fiscal year ends on the Saturday nearest to October 31 and consists of 52 weeks, with the exception that approximately every five years, we have a 53-week year. When a 53-week year occurs, we include the additional week in the first quarter to realign fiscal quarters with calendar quarters. Fiscal 2022, 2021 and 2020 were 52-week years and ended on October 29, 2022, October 30, 2021 and October 31, 2020, respectively. Fiscal 2023 will be a 52-week year.

For presentation purposes, this Form 10-K refers to the closest calendar month end.

PART I

Item 1. *Business*

Company and Segment Overview

Synopsys, Inc. (Synopsys, we, our or us) provides products and services used across the entire Silicon to Software spectrum to bring Smart Everything to life. From engineers creating advanced semiconductors to product teams developing advanced electronic systems to software developers seeking to ensure the security and quality of their code, our customers trust that our technologies will enable them to meet new requirements for low power, reliability, mobility, security and more.

We are a global leader in supplying the electronic design automation (EDA) software that engineers use to design and test integrated circuits (ICs), also known as chips. We also offer semiconductor intellectual property (IP) products, which are pre-designed circuits that engineers use as components of larger chip designs rather than designing those circuits themselves. We provide software and hardware used to validate the electronic systems that incorporate chips and the software that runs on them. To complement these offerings, we provide technical services and support to help our customers develop advanced chips and electronic systems. These products and services are part of our Semiconductor & System Design segment.

We are also a leading provider of software tools and services that improve the security, quality and compliance of software in a wide variety of industries, including electronics, financial services, automotive, medicine, energy and industrials. These tools and services are part of our Software Integrity segment.

Corporate Information

We incorporated in 1986 in North Carolina and reincorporated in 1987 in Delaware. Our headquarters are located at 690 East Middlefield Road, Mountain View, California 94043, and our headquarters' telephone number is (650) 584-5000. Our website is <https://www.synopsys.com/>. We have approximately 125 offices worldwide.

Our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, Proxy Statements, including those relating to our Annual Meeting of Stockholders, and any amendments to such reports or other information filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act are available through the Investor Relations page of our website (<https://www.synopsys.com/company/investor-relations/financials.html>) free of charge as soon as reasonably practicable after we file them with, or furnish them to, the SEC (www.sec.gov). We use our Investor Relations page as a routine channel for distribution of important information, including news releases, investor presentations and financial information. The contents of our website are not part of this Form 10-K and shall not be deemed incorporated by reference.

Background

In this era of Smart Everything, we have seen a remarkable proliferation of consumer and wireless electronic products, particularly mobile devices. The growth of the Internet and cloud computing has provided people with new ways to create, store, and share information. At the same time, the increasing use of electronics in cars, buildings, appliances, and other consumer products is creating a connected landscape of smart devices. Numerous software applications have been developed to expand the potential of these connected devices. The increasing impact of artificial intelligence and machine learning is driving an increase in the activity of new and existing chip and system design companies around the world.

These developments have been fueled by innovation in the semiconductor and software industries. It is now common for a single chip to combine many components (processor, communications, memory, custom logic, input/output) and embedded software into a single system-on-chip (SoC), necessitating highly complex chip designs. The most complex chips today contain more than a billion transistors. Transistors are the basic building blocks for ICs, each of which may have features that are less than 1/1,000th the diameter of a human hair.

These devices are manufactured using masks to direct beams of light onto a wafer of silicon. At such small dimensions, the wavelength of light itself can become an obstacle to production, proving too big to create such dense features and requiring creative and complicated new approaches. Designers have turned to new manufacturing techniques to solve these problems, such as multiple-patterning lithography and FinFET 3D transistors, which in turn have introduced new challenges to design and production.

The popularity of mobile devices and other electronic products has increased demand for chips and systems with greater functionality and performance, reduced size, and lower power consumption. Our customers, who design those products, are facing intense pressure to deliver innovative offerings in shorter timeframes and at lower prices. In other words, innovation in chip and system design often hinges on providing products “better,” “sooner,” and “cheaper” than competitors. The design of these chips and systems is extremely complex and necessitates state-of-the-art solutions. Over the past several years, market verticals including artificial intelligence (AI), 5G, automotive and cloud computing infrastructure have contributed to the ongoing demand for our products and services.

A similar dynamic is at work in the software arena, whether the software is embedded on a chip or used in other applications. The pace of innovation often requires developers to deliver more secure, high-quality software, which can include millions of lines of code, in increasingly frequent release cycles. Bugs, defects and security vulnerabilities in code can be difficult to detect and expensive to fix. Despite these challenges, it is crucial to have high-quality, secure code to ensure consumers' privacy and safety, especially at a time when software is critical in many industries across a growing array of smart devices.

Our Role—As the Silicon to Software Partner

Synopsys' Silicon to Software technologies and services are designed to help our customers—chip and system engineers and software developers—to speed up time to market, achieve the highest quality of results, mitigate risk, and maximize profitability.

Chip and system designers must determine how best to design, locate and connect the building blocks of chips, and to verify that the resulting design behaves as intended and can be manufactured efficiently and cost-effectively. This is a complex, multi-step process that is both expensive and time-consuming. Our wide range of products help at different steps in the overall design process, from the design of individual ICs to the design of larger systems. Our products increase designer productivity and efficiency by automating tasks, keeping track of large amounts of data, adding intelligence to the design process, facilitating reuse of past designs and reducing errors. Our IP products offer proven, high-quality pre-configured circuits that are ready to use in a chip design, saving customers time and enabling them to direct resources to features that differentiate their products. Our global service and support engineers also provide expert technical support and design assistance to our customers.

Software developers are responsible for writing code that not only accomplishes its goals as efficiently as possible, but also runs securely and is free of defects. We offer products that can help developers write higher quality, more secure code by analyzing code for quality defects and known security vulnerabilities, adding intelligence and automation to the software testing process, and helping to eliminate defects in a systematic manner. As developers make use of open source software in their code, our products can help developers better manage the composition and security of the code. Our products enable software developers to catch flaws earlier in the development cycle, when they are less costly to fix.

Products and Services

Semiconductor & System Design Segment

Our Semiconductor & System Design segment includes the EDA, IP and System Integration and Other revenue categories.

EDA

Designing ICs involves many complex steps, including, among others architecture definition, register transfer level (RTL) design, functional/RTL verification, logic design or synthesis, gate-level verification, floorplanning, place and route, and physical verification. Designers use our EDA products to automate the IC design process, reduce errors and enable more powerful and robust designs.

As the availability and amount of cloud-based data storage grows, customer interest in accessing EDA on the cloud is also increasing as customers seek to benefit from the scalability and flexibility that cloud computing can offer to their flows and engineering teams. While many of our solutions have been used in cloud-based environments for years, such as in a customer's own server and/or cloud environment, in fiscal 2022 we launched a new Synopsys Cloud offering that provides customers additional options for accessing our EDA products.

Our solutions comprehensively address the design process, featuring a large number of EDA products that generally fall into the following categories:

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- Digital and custom IC design and field programmable gate array (FPGA) design, which includes software tools to design an IC;
- Verification, which includes technology to verify that an IC design behaves as intended; and
- Manufacturing, which includes products that both enable early manufacturing process development and convert IC design layouts into the masks used to manufacture the chips.

Digital and Custom IC Design

Our Digital Design Family provides customers with a comprehensive digital design implementation solution that includes industry-leading products and redefines conventional design tool boundaries to deliver a more integrated flow than ever before, with better quality and time to results. The platform gives designers the flexibility to integrate internally developed tools as well as those from third parties. With innovative technologies, a common foundation, and flexibility, our Digital Design Family helps reduce design times, decrease uncertainties in design steps, and minimize the risks inherent in advanced, complex IC design. The platform supports multiple technology nodes, including advanced nodes at 12nm, 10nm, 8/7nm, 6 nm, 5/4nm, and 3nm, with technology collaborations on next-generation process technologies.

Key design products, available as part of the Digital Design Family, include Fusion Compiler RTL to GDSII design implementation, Design Compiler® logic synthesis, IC Compiler II physical design, Synopsys TestMAXtest and diagnosis, PrimeTime® static timing analysis, StarRC parasitic extraction, IC Validator physical verification and 3DIC Compiler, the industry's first next-generation chip packaging solution, aimed at enabling customers to combine or stack multiple dice on a single chip. Many of our EDA solutions are bolstered by AI and machine learning capabilities. In addition, we offer DSO.ai, the first product in the market that brings AI to the entire design process. This groundbreaking solution autonomously learns through quickly exploring potential design alternatives, enabling engineers to develop superior design outcomes with our design tools.

Our Custom Design Family is a unified suite of design and verification tools that accelerates the transistor-level design of robust analog, mixed-signal, and custom-digital ICs. The platform features visually assisted layout automation, high-performance circuit simulation, reliability-aware verification, and natively integrated StarRC extraction and physical verification. This product family includes Custom Compiler layout and schematic editor, StarRC parasitic extraction, and IC Validator physical verification. It also includes PrimeSim, which was launched in fiscal 2021. The PrimeSim solution integrates PrimeSim SPICE, PrimeSim HSPICE, PrimeSim Pro and PrimeSim XA. The PrimeWave design environment is also included and provides comprehensive analysis and improved productivity and ease of use across all tools in PrimeSim.

Our Silicon Lifecycle Management (SLM) Family is a new data analytics-driven platform that uses in-chip monitoring and sensing to optimize all phases of the silicon lifecycle—from design and manufacturing to in-field deployment and maintenance. The solution is integrated with the Digital Design Family for design calibration and analytics and includes Yield Explorer® for product ramp analytics, SiliconDash for test and production analytics, TestMAXALE (adaptive learning engine) for intelligent data extraction and communication to the SLM database and DesignWare PVT IP for in-chip monitoring and sensing.

FPGA Design

FPGAs are complex chips that can be customized or programmed to perform a specific function after they are manufactured. For FPGA design, we offer Synplify® (Pro® and Premier) implementation and Identify® debug software tools.

Verification

Our Verification Family is built from our industry-leading verification technologies, providing virtual prototyping, static and formal verification, simulation, emulation, FPGA-based prototyping, and debug in a unified environment with verification IP, planning, and coverage technology. By providing consistent compile, runtime and debug environments across the flow of verification tasks and by enabling seamless transitions across functions, the platform helps our customers accelerate chip verification, bring up software earlier, and get to market sooner with advanced SoCs.

The individual products included in the Verification Family are reported in our EDA and IP and System Integration revenue categories. The solutions reported in our EDA revenue include the following:

- VC SpyGlass family of static verification technologies including lint, CDC (clock domain crossing), RDC (reset domain crossing), Constraint Checking, Synopsys TestMAX Advisor, and low-power analysis and verification;
- VCS® functional verification solution, our comprehensive RTL and gate-level simulation technology, including Fine-Grained Parallelism;
- Verdi® automated debug system, the industry's most comprehensive SoC debug;
- VC Formal, our next-generation formal verification product;
- ZeBu® emulation systems, which use high-performance hardware to emulate SoC designs so that designers can accelerate hardware, software and power verification of large complex SoCs and perform earlier verification and optimization of the SoC together with software; and
- Other principal individual verification solutions, including the PrimeSim solution and the PrimeWave design environment.

The verification IP, virtual prototyping, and FPGA-based prototyping solutions that are part of our Verification Family are included in our IP and System Integration category and further described below.

Manufacturing

Our manufacturing solutions include Sentaurus technology computer-aided design device and process simulation products, Proteus mask synthesis tools, CATS® mask data preparation software, Yield Explorer® Odyssey, Yield-Manager® yield management solutions and QuantumATK atomic-scale modeling software.

We also provide consulting and design services that address all phases of the SoC development process, as well as a broad range of expert training and workshops on our latest tools and methodologies.

IP and System Integration

IP Products

As more functionality converges into a single chip or even a multi-die system, the number of third-party IP blocks incorporated into designs is rapidly increasing. We provide the broadest, most comprehensive portfolio of high-quality, silicon-proven IP solutions for SoCs. Our broad Synopsys IP portfolio includes:

- High-quality solutions for widely used wired and wireless interfaces such as USB, PCI Express, DDR, Ethernet, MIPI, HDMI, and Bluetooth Low Energy;
- Logic libraries and embedded memories, including memory compilers, non-volatile memory, and standard cells with integrated test and repair;
- Processor solutions, including configurable ARC® processors, Neural Network processors, Digital Signal Processor cores, and software and application-specific instruction-set processor tools for embedded applications;
- Security IP solutions, including cryptographic cores and software, security subsystems, platform security and secured interface IP;
- An industry-leading IP offering for the automotive market, optimized for strict functional safety and reliability standards such as ISO 26262; and
- SoC infrastructure IP, datapath and building block IP, mathematical and floating-point components, Arm® AMBA® interconnect fabric and peripherals, and verification IP.

Our IP Accelerated initiative augments our established, broad portfolio of silicon-proven Synopsys IP with IP Prototyping Kits and customized IP subsystems to accelerate prototyping, software development, and integration of IP into SoCs.

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We offer a broad portfolio of IP that has been optimized to address specific application requirements for the mobile, automotive, digital home, Internet of things, and cloud computing markets, enabling designers to quickly develop SoCs in these areas.

Our Verification IP portfolio, part of our Verification Family, is also part of the IP Products category.

System Integration Solutions

Our System Integration verification solutions include the following elements of our Verification Family:

- HAPS® FPGA-based prototyping systems, which are integrated and scalable hardware-software solutions for early software development and faster time to market;
- Virtualizer virtual prototyping solution, which addresses the increasing development challenges associated with software-rich semiconductor and electronic products by accelerating both the development and deployment of virtual prototypes; and
- Platform Architect solution, which provides for early analysis and optimization of multi-core SoC architectures for performance and power.

We also provide a series of tools used in the design of optical systems and photonic devices. Our CODE V® solution enables engineers to model, analyze and optimize designs for optical imaging and communication systems. Our LightTools® design and analysis software allows designers to simulate and improve the performance of a broad range of illumination systems, from vehicle lighting to projector systems.

Other

Our Other revenue category includes revenue from sales of products to academic and research institutions.

Software Integrity Segment

Our Software Integrity segment helps organizations align people, processes and technology to intelligently address software risks across their portfolio and at all stages of the application lifecycle. The testing tools, services, and programs enable our customers to manage open source license compliance and detect, prioritize, and remediate security vulnerabilities and defects across their entire software development lifecycle. Our offerings include security and quality testing products, managed services, programs and professional services, and training offered as on-premises and cloud-based delivery.

The Polaris Software Integrity Platform is designed to bring our products and services together into an integrated, easy-to-use solution that enables security and development teams to build secure, high-quality software faster.

Key offerings in this space include:

- Intelligent Orchestration solution, which enables DevOps to build a testing pipeline that enables a company to define—within its particular policy guidelines—the rules to determine which tests to run, including the Synopsys portfolio tests, third party products, or open source tests;
- Code Dx, which correlates and prioritizes findings from the Synopsys portfolio, third party products, and open source tools, providing a comprehensive view of software security risk;
- Coverity® static analysis tools, which analyze software code to find crash-causing bugs, incorrect program behavior, the latest security vulnerabilities, memory leaks and other performance-degrading flaws;
- Black Duck software composition analysis tools, which scan binary and source code for license and compliance issues and other known security vulnerabilities stemming from incorporated third-party and open source code;
- WhiteHat® Dynamic, our latest dynamic application security testing solution, which rapidly and accurately finds vulnerabilities in websites and applications;
- Seeker® IAST tool, which identifies exploitable security vulnerabilities while web applications are running, thereby verifying results and eliminating false positives; and

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- Defensics® fuzz testing tools, which examine security vulnerabilities in software binaries and libraries, particularly network protocols and file formats, by systematically sending invalid or unexpected inputs to the system under test.

Managed services allow developers to test code across many dimensions, and to rapidly respond to changing testing requirements and evolving threats. This includes mobile application security testing services to find vulnerabilities in mobile applications as well as dynamic application security testing services, which identify security vulnerabilities while web applications are running, without the need for source code.

Programs and professional services address unique security and quality needs with specialized consulting by skilled experts, including the Building Security in Maturity Mode, which measures the effectiveness of software security initiatives by assessing the current state as compared to industry benchmarks, and the Black Duck on demand audit services, which provides open source compliance and software vulnerability assessments as part of the due diligence process for mergers and acquisitions.

Finally, training includes eLearning and instructor-led training that prepares developers and security professionals to build security and quality into their software development process and remediate found vulnerabilities and defects.

Customer Service and Technical Support

A high level of customer service and support is critical to the adoption and successful use of our products. We provide technical support for our products through both field-based and corporate-based application engineering teams.

Post-contract customer support includes providing frequent updates to maintain the utility of the software due to rapid changes in technology. In our Semiconductor & System Design segment, post-contract customer support for our EDA and IP products also includes access to the SolvNet® Plus portal, where customers can explore our complete design knowledge database. Updated daily, the SolvNet Plus portal includes technical documentation, design tips and answers to user questions. Customers can also engage, for additional charges, with our worldwide network of applications consultants for additional support needs.

In our Software Integrity segment, post-contract customer support for our products includes access to our support community portal, where customers can access our product documentation, self-service training materials, customer forums and our product knowledge base. Customers can also raise support tickets, request replacement license keys and validate the terms of their active license keys through the portal. Our support community portal is frequently updated with new and supplemental materials on a variety of topics. Customers may engage dedicated support engineers for an additional charge.

In addition, we offer training workshops designed to increase customer design proficiency and productivity with our products. Workshops cover our EDA products and methodologies used in our design and verification flows, as well as specialized modules addressing system design, logic design, physical design, simulation and testing. We offer regularly scheduled public and private courses in a variety of locations worldwide, as well as online training (live or on-demand) through our Virtual Classrooms.

Product Warranties

We generally warrant our products to be free from defects in media and to substantially conform to material specifications for a period of 90 days for our software products and for up to six months for our hardware products. In certain cases, we also provide our customers with limited indemnification with respect to claims that their use of our software products infringes on patents, copyrights, trademarks or trade secrets. We have not experienced material warranty or indemnity claims to date.

Support for Industry Standards

We actively create and support standards that help our EDA and IP customers increase productivity, facilitate efficient design flows, improve interoperability of tools from different vendors and ensure connectivity, functionality and interoperability of IP building blocks. Standards in the electronic design industry can be established by formal accredited organizations, industry consortia, company licensing made available to all, de facto usage, or through open source licensing.

In our Semiconductor & System Design segment, our EDA products support many standards, including the most commonly used hardware description languages: SystemVerilog, Verilog, VHDL and SystemC®. Our products utilize

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numerous industry-standard data formats, APIs and databases for the exchange of design data among our tools, other EDA vendors' products and applications that customers develop internally. We also comply with a wide range of industry standards within our IP product family to ensure usability and interconnectivity.

In our Software Integrity segment, our solutions support several existing and emerging industry standards for software coding and security, such as the Motor Industry Software Reliability Association coding standards for the automotive industry. In addition, our products support multiple major programming languages, including C/C++, Objective C, C#, JavaScript (including many commonly used frameworks), and others. In addition, we support many common compilers, development environments, frameworks, and data and file formats.

Sales and Distribution

Our Semiconductor & System Design segment customers are primarily semiconductor and electronics systems companies. The customers for products in our Software Integrity segment include many of these companies as well as companies from a wider array of industries, including electronics, financial services, automotive, medicine, energy and industrials.

We market our products and services principally through direct sales in the United States and our principal foreign markets. Our Software Integrity segment continues to grow its indirect sales partner program, enabling our Software Integrity segment to engage geographies beyond the reach of our direct sales force and opening opportunities in targeted vertical markets. We typically distribute our software products and documentation to customers electronically, but provide physical media (e.g., DVD-ROMs) when requested by the customer.

We maintain sales and support centers throughout the United States. Outside the United States, we maintain sales, support or service offices in Canada, multiple countries in Europe, Israel and throughout Asia, including Japan, China, Korea, and Taiwan. Our offices are further described under Part I, Item 2, *Properties*.

Information relating to domestic and foreign operations, including revenue and long-lived assets by geographic area, is contained in Part II, Item 8, *Financial Statements and Supplementary Data*. Risks related to our foreign operations are described in Part I, Item 1A, *Risk Factors*.

Revenue Attributable to Product Categories and Segments

Revenue attributable to each of our four product categories (with EDA, IP & Systems Integration, and Other comprising our Semiconductor & System Design segment) is shown below as a percentage of our total revenue for those fiscal years.



Aggregate revenue derived from one of our customers and its subsidiaries through multiple agreements accounted for 11.7%, 10.6% and 12.4% of our total revenue in fiscal 2022, 2021 and 2020, respectively. In each such year, the revenue derived from such customer and its subsidiaries was primarily attributable to our Semiconductor & System Design segment.

Product Sales and Licensing Agreements

We typically license our software to customers under non-exclusive license agreements that restrict use of our software to specified purposes within specified geographical areas. The majority of licenses to our EDA products are network licenses that allow a number of individual users to access the software on a defined network, including, in some cases, regional or global networks. The majority of licenses to our Software Integrity products are capacity or user licenses that allow a number of users to access the software based on a specified number of team members or specified code-bases in a defined territory. License fees depend on the type of license, product mix, and number of copies of each product licensed.

For a full discussion of our software product offerings, see Part II, Item 7, *Management's Discussion and Analysis of Financial Condition and Results of Operations*.

We typically license Synopsys IP products under nonexclusive license agreements that provide usage rights for specific designs. Fees under these licenses are typically charged on a per design basis plus, in some cases, royalties. See Note 2 of the *Notes to Consolidated Financial Statements* for further information.

Our hardware products, which principally consist of our prototyping and emulation systems, are either sold or leased to our customers. Risks related to disruptions in our supply chain affecting our business are described in Part I, Item 1A, *Risk Factors*.

Our professional services team typically provides design consulting services to our customers under consulting agreements with statements of work specific to each project.

Competition

The EDA industry is highly competitive. We compete against other EDA vendors and against our customers' own design tools and internal design capabilities. In general, we compete principally on technology leadership, product quality and features (including ease-of-use), license terms, price and payment terms, post-contract customer support, flexibility of tool use, and interoperability with our own and other vendors' products. We also deliver a significant amount of engineering and design consulting for our products. No single factor drives an EDA customer's buying decision, and we compete on all fronts to capture a higher portion of our customers' budgets. Our competitors include EDA vendors that offer varying ranges of products and services, such as Cadence Design Systems, Inc. and Siemens EDA. We also compete with other EDA vendors, including new entrants to the marketplace, that offer products focused on one or more discrete phases of the IC design process, as well as with customers' internally developed design tools and capabilities.

Within our Semiconductor & System Design segment, Synopsys also competes against numerous other IP providers, including Cadence Design Systems, Inc., and our customers' internally developed IP. We generally compete on the basis of product quality, reliability, features, availability of titles for new manufacturing processes, ease of integration with customer designs, compatibility with design tools, license terms, price and payment terms, and customer support.

Our Software Integrity segment competes with numerous other solution providers, many of which focus on specific aspects of software security or quality analysis. We also compete with frequent new entrants, which include start-up companies and more established software companies. For example, competitors named in the Gartner Magic Quadrant for Application Security Testing include Checkmarx Ltd., Veracode, Inc. and Micro Focus International plc (now a part of Open Text Corporation).

Risks related to competitive factors affecting our business are described in Part I, Item 1A, *Risk Factors*.

Proprietary Rights

We primarily rely upon a combination of copyright, patent, trademark, and trade secret laws and license and non-disclosure agreements to establish and protect our proprietary rights. We have a diversified portfolio of more than 3,400 United States and foreign patents issued, and we will continue to pursue additional patents in the future. Our issued patents have expiration dates through 2041. Our patents primarily relate to our products and the technology used in connection with our products. Our source code is protected both as a trade secret and as an unpublished copyrighted work. However, third parties may independently develop similar technology. In addition, effective copyright and trade secret protection may be unavailable or limited in some foreign countries. While protecting our proprietary technology is important to our success, our business as a whole is not significantly dependent upon any single patent, copyright, trademark, or license.

In many cases, under our customer agreements and other license agreements, we offer to indemnify our customers if the licensed products infringe on a third party's intellectual property rights. As a result, we may from time to time need to defend claims that our customers' use of our products infringes on these third-party rights. We license software and other intellectual property from third parties, including, in several instances, for inclusion in our products. Risks related to our use of third-party technology are described in Part I, Item 1A, *Risk Factors*.

Corporate Social Responsibility at Synopsys

Sustainable, just and secure business practices are at the core of who we are as a company and influence our behavior as individuals. Our "Smart Future" Corporate Social Responsibility (CSR) strategy provides a framework for how we manage our own operational impact, so that we can conduct business in a manner that we believe both drives commercial success and contributes to a better world. Through CSR, we are taking action on important Environmental, Social and Governance (ESG) matters to build a more sustainable business, including initiatives to procure more renewable energy and to reduce our operational footprint, as well as driving a culture of inclusion and diversity throughout our workforce and on our Board of Directors.

We aim to influence positive social and environmental change across our ecosystem by applying our resources, competencies, and team-based problem-solving approach. Our technology is in action in countless ways, from bringing safety and security to the driverless car revolution to enabling the technologies that are an

increasingly vital component of protecting human health and well-being. As the role of computing increases exponentially, the Internet of things (IoT), 5G and machine learning applications risk driving similarly exponential energy consumption and carbon emissions. This makes our work to enable low-power computing at the device level and in the cloud especially critical to the industry's sustainability.

Additional information about our approach to CSR and ESG issues is available on our CSR website, including our Environmental Policy, our CSR Report, and our CDP Climate Change Questionnaire. The contents of our website, CSR Report and CDP Climate Change Questionnaire are referenced for general information only and are not incorporated into this Form 10-K.

Human Capital Resources

At Synopsys, we are helping our employees pursue their passion and make their mark on the world of Smart Everything. We believe this creates value for us, our stockholders, and the lives of the people we impact every day. Our commitment to attracting, developing and retaining the brightest and best talent makes this goal possible. As of our fiscal year-end, Synopsys had approximately 19,000 employees, with approximately 26% in the United States and 74% in other locations around the world. Approximately 80% of our employees are engineers, and over half of those employees hold Masters' or PhD degrees. The human capital measures and objectives that we focus on include employee health, safety and wellbeing, talent acquisition and retention, employee engagement, development and training, inclusion and diversity, and compensation and pay equity.

Risks related to our human capital are described in Part I, Item 1A, *Risk Factors*.

Health, Safety and Wellbeing

The health and safety of our employees and their families remains a top priority. In fiscal 2022, we held employee vaccination clinics in our offices and as the year progressed our focus shifted from supporting our employees during a pandemic to helping them thrive in the new hybrid work environment.

With employee wellness at the forefront of our efforts, we provided our employees with a variety of benefits and resources to address the inherent challenges of working remotely, transitioning to a hybrid work environment, or returning to the office full-time. This included a focus on building skills to navigate a hybrid work environment in a way that enables employees to be successful at work and in their personal lives. We also continued our Stronger Through Wellbeing campaign, focused on the importance of employees prioritizing their health and overall wellbeing. As part of this campaign, employees were encouraged to participate in four global recharge days which were designed to help them unplug and unwind.

Recruitment and Retention

Our workforce is representative of the industry we serve. In fiscal 2022, we increased our employee headcount by approximately 16%, with a continued focus on increasing the number of women in technical positions and ensuring a vibrant talent pipeline with early career hiring and investment in training and development. As with many other companies in the technology industry, we experienced an increase in total employee turnover in fiscal 2022. As of our fiscal year-end, our undesired turnover rate was 6.9%. We calculate undesired turnover rate by dividing the number of undesired exits from Synopsys by the average headcount for fiscal 2022, and we define undesired turnover as exits by high-performing employees who resigned from Synopsys (or its subsidiaries) to pursue other work opportunities. Undesired turnover does not include employees with low performance or whose resignation was mutual or due to personal reasons, such as retirement and returning to school. We attribute the strong retention of our talented workforce to a number of factors, including exciting and challenging assignments, strong leadership and management, a culture of integrity, the opportunity to learn new skills and advance careers, our commitment to inclusion and diversity, and the strength of our technology and customer relationships, along with competitive and equitable total rewards.

Inclusion and Diversity

Inclusion and diversity run through our corporate values at every level—from our foundation of integrity to our execution excellence, from our dedicated leadership to our united passion for a better tomorrow. We have always strived to be a company where different perspectives and backgrounds are celebrated, which we believe helps make Synopsys stronger. We care deeply about the diversity of our teams, talent pipelines and pay and development programs, with a goal to ensure inclusive, equitable practices. We carefully study retention trends and feedback from diverse groups to identify areas where we can improve.

In fiscal 2022, we continued to increase the representation of women in our workforce globally and increased representation of Black, Latinx and Indigenous individuals in our U.S. employee base. As of our fiscal year-end:

- Women comprised 24.9% of our global organization;
- Women in senior level positions comprised 12.4% of all senior level positions at the company; and
- U.S. Black, Latinx, and Indigenous persons comprised 5.8% of our U.S. workforce.

We provide leadership training designed to promote inclusion and diversity in attracting, retaining and developing our workforce. In addition, the employee resource groups continue to meet regularly, host events and implement actions to attract diverse talent and foster an inclusive workplace.

In fiscal 2022, we added workforce metrics such as diversity, employee retention and leadership succession planning as performance criteria that are considered by our Compensation and Organizational Development Committee when establishing incentive goals for our executive officers. This reinforces that inclusion and diversity are a key part of our culture and amplifies the importance of executive involvement to advance our progress.

Total Rewards

To ensure a compelling total rewards philosophy, we have practices in place to deliver fair and equitable compensation for employees based on their contribution and performance. We benchmark market practices and regularly review our compensation against the market to ensure it remains competitive. We also offer a comprehensive and tailored set of benefits for employees and their families, providing protection from unexpected losses or medical expenses. Our compensation and benefit programs are tailored to the various geographies in which we operate, and for eligible employees, may include:

- Market-competitive salary and cash bonus opportunity;
- Robust medical, dental, vision, and wellness benefits;
- Financial planning tools and employee assistance plans;
- Comprehensive leave alternatives;
- Employee Stock Purchase Plan;
- Equity compensation for eligible employees;
- Life insurance options;
- Retirement plans and associated benefits;
- Student loan repayment assistance; and
- Parental resources and adoption benefits.

Employee Engagement

We use employee feedback to drive and improve processes that support our customers and ensure a deep understanding of our culture and vision among our employees. Through our semi-annual SHAPE Synopsys surveys, we obtain employee insights on our values, manager effectiveness, ability to innovate, perceptions on inclusion and diversity, and other critical factors. By inviting employees to share their experiences, we create space for important conversations about who we are, where we are going, and how we can connect with each other and our work.

At mid-year fiscal 2022, approximately 90% of our employee population participated in the SHAPE survey. Results showed our global workforce to be highly engaged, with our overall score outpacing the industry engagement benchmark. We saw strong scores from our people regarding their connection to our culture, their personal investment in Synopsys' strategies and objectives, and their team's ability to innovate. As we grow, we aspire to maintain our results-oriented culture by balancing productivity with smart investments in our people's development, while also supporting individual wellbeing.

Ongoing performance feedback encourages greater engagement in our business and improved individual performance. Each year, our employees participate in our performance development process that summarizes key accomplishments for the preceding year, establishes new stretch goals, and identifies critical capabilities for development. As part of this process, we encourage managers to solicit and share supportive multi-rater feedback, further strengthening the focus on teamwork and team success.

Talent Development and Succession Planning

We provide several leadership programs to address the career advancement and associated business impact of our employees. Through our digital learning platform, which was heavily utilized in fiscal 2022, we foster and support an “always learning” culture where employees can access training, external articles, videos and blogs. In addition, we hosted a series of in-person and on-demand learning sessions designed to build capability and adaptability required for the future. As employees advance in their careers, our training framework builds new capabilities on established foundational skills.

Based upon the belief that our employees deserve great managers, our management training is designed to increase capability in the areas of communication, engagement, coaching, inclusion and diversity, hiring and on-boarding, business skills and ensuring an ethical and supportive work environment free from bias and harassment. In fiscal 2022, we also focused on training and resources for our managers to help them effectively manage and lead hybrid teams to enable effective team dynamics as more team members transition back to the office. In addition, our regions and business teams customize development programs for their specific needs.

We remain committed to equipping leaders for the future. Because the depth and readiness of our leadership pipeline is critically important to our business, in fiscal 2022 we identified key roles across our enterprise, ensured qualified successors were in place for those roles and have committed to establishing development plans that will be tracked, assessed for effectiveness, and adjusted as we move ahead. We believe these actions will enable us to sustain a culture that honors the importance of learning, leading and growing.

Information about our Executive Officers

The executive officers of Synopsys and their ages as of December 12, 2022 were as follows:

Name	Age	Position
Aart J. de Geus	68	Chief Executive Officer and Chairman of the Board of Directors
Sassine Ghazi	52	President and Chief Operating Officer
Shelagh Glaser	58	Chief Financial Officer
Richard Mahoney	60	Chief Revenue Officer
John F. Runkel, Jr.	67	General Counsel and Corporate Secretary

Aart J. de Geus co-founded Synopsys and has served as Chairman of our Board of Directors since February 1998 and Chief Executive Officer since January 1994. He served as Co-Chief Executive Officer with Dr. Chi-Foon Chan from May 2012 until April 2022. Since the inception of Synopsys in December 1986, Dr. de Geus has held a variety of positions, including President, Senior Vice President of Engineering and Senior Vice President of Marketing. He has served as a member of Synopsys’ Board of Directors since 1986, and served as Chairman of our Board of Directors from 1986 to 1992 and again from 1998 until present. Dr. de Geus has also served on the board of directors of Applied Materials, Inc. since July 2007. Dr. de Geus holds an M.S.E.E. from the Swiss Federal Institute of Technology in Lausanne, Switzerland and a Ph.D. in Electrical Engineering from Southern Methodist University.

Sassine Ghazi has served as our Chief Operating Officer since August 2020 and became our President in November 2021. Mr. Ghazi joined Synopsys in March 1998 as an Application Engineer and most recently served as General Manager of the Design Group. Prior to joining Synopsys, Mr. Ghazi was a design engineer at Intel Corporation. Mr. Ghazi received his bachelor’s degree in Business Administration from Lebanese American University; a B.S.E.E from the Georgia Institute of Technology in 1993; and an M.S.E.E. from the University of Tennessee in 1995.

Shelagh Glaser joined Synopsys as our Chief Financial Officer on December 2, 2022 and succeeds Trac Pham, our former Chief Financial Officer. Prior to joining Synopsys, Ms. Glaser served as Chief Financial Officer of Zendesk, Inc. from May 2021 to November 2022. Ms. Glaser previously served in senior finance roles at Intel Corporation, a multinational technology company, including serving as its Corporate Vice President and Chief Financial Officer and Chief Operating Officer for its Data Platform Group since July 2019 and serving as its Corporate Vice President and Chief Financial Officer and in various other senior roles in its Client Computing Group from December 2013 to July

2019. Ms. Glaser has served as a director and member of the Audit Committee at PubMatic, Inc. since June 2022. Ms. Glaser holds a B.A. in Economics from the University of Michigan and an M.B.A. in Finance from Carnegie Mellon University.

Richard Mahoney has served as our Chief Revenue Officer since November 2022. Mr. Mahoney succeeds Joseph W. Logan, who served as our Chief Revenue Officer during fiscal 2022. Mr. Mahoney joined Synopsys as a Special Projects Advisor in May 2022. Prior to joining Synopsys, Mr. Mahoney held several senior management positions with Ansys, Inc. from 2016 to 2022, including most recently as Senior Vice President of Worldwide Sales, Marketing and Customer Excellence from December 2016 to May 2022. Prior to joining Ansys, from 2014 to 2016, Mr. Mahoney was Senior Vice President, Design Enablement and International Sales, at Global Foundries, a semiconductor manufacturing company. Mr. Mahoney holds an A.S. in Computer Science from the Maxwell Institute of Technology.

John F. Runkel, Jr. has served as our General Counsel and Corporate Secretary since May 2014. From October 2008 to March 2013, he was Executive Vice President, General Counsel, and Corporate Secretary of Affymetrix, Inc. He served as Senior Vice President, General Counsel and Corporate Secretary of Intuitive Surgical, Inc. from 2006 to 2007. Mr. Runkel served in several roles at VISX, Inc. from 2001 to 2005, most recently as Senior Vice President of Business Development and General Counsel. Mr. Runkel was also a partner at the law firm of Sheppard, Mullin, Richter & Hampton LLP for 11 years. Mr. Runkel holds a Bachelor of Arts and a Juris Doctorate from the University of California, Los Angeles.

There are no family relationships among any Synopsys executive officers or directors.

Item 1A. Risk Factors

A description of the risk factors associated with our business is set forth below. Some of these risks are highlighted in the following discussion, and in Management's Discussion and Analysis of Financial Condition and Results of Operations, Legal Proceedings, and Quantitative and Qualitative Disclosures About Market Risk. The occurrence of any of these risks or additional risks and uncertainties not presently known to us or that we currently believe to be immaterial could materially and adversely affect our business, financial condition, operating results and stock price. These risks and uncertainties could cause our actual results to differ materially from the results contemplated by the forward-looking statements contained in this report. Investors should carefully consider all relevant risks and uncertainties before investing in our common stock.

Industry Risks

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

Uncertainty caused by the recent challenging global economic conditions, including due to the effects of the recent rise in inflation and interest rates and the continuing COVID-19 pandemic, could lead some of our customers to postpone their decision-making, decrease their spending and/or delay their payments to us. Such caution by customers could, among other things, limit our ability to maintain or increase our sales or recognize revenue from committed contracts.

Economic conditions could continue to deteriorate in the future, and, in particular, the semiconductor and electronics industries could fail to grow, including as a result of the effects of, among other things, rising inflation and interest rates, a sustained global semiconductor shortage, supply chain disruptions, the COVID-19 pandemic, and any disruption of international trade relationships such as tariffs, export licenses or other government trade restrictions. Furthermore, China's stated policy of becoming a global leader in the semiconductor industry may lead to increased competition and further disruption of international trade relationships, including, but not limited to, additional government trade restrictions. For more on risks related to government export and import restrictions such as the U.S. government's Entity List and Export Regulations (as defined below), see "*Industry Risks – We are subject to governmental export and import requirements that could subject us to liability and restrict our ability to sell our products and services, which could impair our ability to compete in international markets.*"

Adverse economic conditions affect demand for devices that our products help create, such as the ICs incorporated in personal computers, smartphones, automobiles and servers. Longer-term reduced demand for these or other products could result in reduced demand for design solutions and significant decreases in our average selling prices and product sales over time. Future economic downturns could also adversely affect our business. In addition, if our customers or distributors build elevated inventory levels, we could experience a decrease in short-term and/or long-term demand for our products. If any of these events or disruptions were to occur, the demand for our products and services could be adversely affected along with our business, operating results and financial condition. Further, the negative impact of these events or disruptions may be deferred due to our business model.

Further economic instability could also adversely affect the banking and financial services industry and result in credit downgrades of the banks we rely on for foreign currency forward contracts, credit and banking transactions, and deposit services, or cause them to default on their obligations. Additionally, the banking and financial services industries are subject to complex laws and are heavily regulated. There is uncertainty regarding how proposed, contemplated or future changes to the laws, policies and regulations governing our industry, the banking and financial services industry and the economy could affect our business, including rising global interest rates. A deterioration of conditions in worldwide credit markets could limit our ability to obtain external financing to fund our operations and capital expenditures. In addition, difficult economic conditions may also result in a higher rate of losses on our accounts receivable due to credit defaults. Any of the foregoing could cause adverse effects on our business, operating results and financial condition, and could cause our stock price to decline.

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

The growth of the EDA industry as a whole, our Semiconductor & System Design segment product sales, and, to some extent, our Software Integrity segment product sales, are dependent on the semiconductor and electronics industries. A substantial portion of our business and revenue depends upon the commencement of new design projects by semiconductor manufacturers, systems companies and their customers. The increasing complexity of designs of SoCs, ICs, electronic systems and customers' concerns about managing costs have previously led to, and in the future could lead to, a decrease in design starts and design activity in general. For example, in response

to this increasing complexity, some customers may choose to focus on one discrete phase of the design process or opt for less advanced, but less risky, manufacturing processes that may not require the most advanced EDA products. Demand for our products and services could decrease and our financial condition and results of operations could be adversely affected if growth in the semiconductor and electronics industries slows or stalls, including due to rising inflation and global interest rates, a continued or worsening global supply chain disruption, or the impact of the COVID-19 pandemic. Additionally, as the EDA industry has matured, consolidation has resulted in stronger competition from companies better able to compete as sole source vendors. This increased competition may cause our revenue growth rate to decline and exert downward pressure on our operating margins, which may have an adverse effect on our business and financial condition.

Furthermore, the semiconductor and electronics industries have become increasingly complex ecosystems. Many of our customers outsource the manufacturing of their semiconductor designs to foundries. Our customers also frequently incorporate third-party IP, whether provided by us or other vendors, into their designs to improve the efficiency of their design process. We work closely with major foundries to ensure that our EDA, IP and manufacturing solutions are compatible with their manufacturing processes. Similarly, we work closely with other major providers of semiconductor IP, particularly microprocessor IP, to optimize our EDA tools for use with their IP designs and to assure that their IP and our own IP products work effectively together, as we may each provide for the design of separate components on the same chip. If we fail to optimize our EDA and IP solutions for use with major foundries' manufacturing processes or major IP providers' products, or if our access to such foundry processes or third-party IP products is hampered, then our solutions may become less desirable to our customers, resulting in an adverse effect on our business and financial condition.

We operate in highly competitive industries, and if we do not continue to meet our customers' demand for innovative technology at lower costs, our products may not be competitive or may become obsolete.

In our Semiconductor & System Design segment, we compete against EDA vendors that offer a variety of products and services, such as Cadence Design Systems, Inc. and Siemens EDA. We also compete with other EDA vendors, including new entrants to the marketplace, that offer products focused on one or more discrete phases of the IC design process. Moreover, our customers internally develop design tools and capabilities that compete with our products, including internal designs that compete with our IP products. In the area of IP products, we compete against a growing number of IP providers as well as our customers' internally developed IP.

In our Software Integrity segment, we compete with numerous other solution providers, many of which focus on specific aspects of software security or quality analysis. We also compete with frequent new entrants, which include start-up companies and more established software companies.

The industries in which we operate are highly competitive, with new competitors entering these markets both domestically and internationally. For example, China has implemented national policies and investment funds to try to build independent EDA capabilities and compete internationally in the semiconductor industry. The demand for our products and services is dynamic and depends on a number of factors, including demand for our customers' products, design starts and our customers' budgetary constraints. Technology in these industries evolves rapidly and is characterized by frequent product introductions and improvements as well as changes in industry standards and customer requirements. For example, the adoption of cloud computing and artificial intelligence technologies can bring new demands and also challenges in terms of disruption to both business models and our existing technology offerings. Semiconductor device functionality requirements continually increase while feature widths decrease, substantially increasing the complexity, cost and risk of chip design and manufacturing. At the same time, our customers and potential customers continue to demand an overall lower total cost of design, which can lead to the consolidation of their purchases with one vendor. In order to succeed in this environment, we must successfully meet our customers' technology requirements and increase the value of our products, while also striving to reduce their overall costs and our own operating costs.

We compete principally on the basis of technology, product quality and features (including ease-of-use), license or usage terms, post-contract customer support, interoperability among products and price and payment terms. Specifically, we believe the following competitive factors affect our success:

- Our ability to anticipate and lead critical development cycles and technological shifts, innovate rapidly and efficiently, improve our existing software and hardware products and successfully develop or acquire such new products;
- Our ability to offer products that provide both a high level of integration into a comprehensive platform and a high level of individual product performance;

- Our ability to enhance the value of our offerings through more favorable terms such as expanded license usage, future purchase rights, price discounts and other differentiating rights, such as multiple tool copies, post-contract customer support, “re-mix” rights that allow customers to exchange the software they initially licensed for other Synopsys products and the ability to purchase pools of technology;
- Our ability to manage an efficient supply chain to ensure availability of hardware products;
- Our ability to compete on the basis of payment terms; and
- Our ability to provide engineering and design consulting for our products.

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

We are subject to governmental export and import requirements that could subject us to liability and restrict our ability to sell our products and services, which could impair our ability to compete in international markets.

We are subject to export controls, laws and regulations that restrict selling, shipping or transmitting certain of our products and services and transferring certain of our technology outside the United States. These requirements also restrict domestic release of software and technology to certain foreign nationals. In addition, we are subject to customs and other import requirements that regulate imports that may be important for our business.

If we fail to comply with the U.S. Export Administration Regulations or other U.S. or non-U.S. export requirements (collectively, the Export Regulations), we could be subject to substantial civil and criminal penalties, including fines for the company and the possible loss of the ability to engage in exporting and other international transactions. Due to the nature of our business and technology, the Export Regulations may also subject us to governmental inquiries regarding transactions between us and certain foreign entities. For example, we have received administrative subpoenas from the U.S. Bureau of Industry and Security (the BIS) requesting production of information and documentation relating to transactions with certain Chinese entities. We believe that we are in full compliance with all applicable regulations and are working with the BIS to respond to its subpoenas. However, we cannot predict the outcome of the inquiries or their potential effect on our operations or financial condition.

We believe that current Export Regulations do not materially impact our business at this time, but we cannot predict the impact that additional regulatory changes may have on our business in the future. The United States has published significant changes to Export Regulations with respect to Russia and China, and we anticipate additional changes to the Export Regulations in the future. For example, the United States government has implemented controls on advanced computing ICs, computer commodities that contain such ICs, and certain semiconductor manufacturing items, as well as controls on transactions involving items for supercomputer and semiconductor manufacturing end-users. The new controls expand the scope of foreign-produced items subject to license requirements for certain entities on the U.S. government's Entity List. Future changes in the Export Regulations, including changes in the enforcement and scope of such regulations, may create delays in the introduction of our products or services in international markets or could prevent our customers with international operations from deploying our products or services globally. In some cases, such changes could prevent the export or import of our products.

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

A number of business combinations and strategic partnerships among our customers in the semiconductor and electronics industries have occurred over the last several years, and more could occur in the future. Consolidation among our customers could lead to fewer customers or the loss of customers, increased customer bargaining power or reduced customer spending on software and services. Further, we depend on a relatively small number of large customers, and on such customers continuing to renew licenses and purchase additional products from us, for a large portion of our revenues. Consolidation among our customers could also reduce demand for our products and services if customers streamline research and development or operations, or reduce or delay purchasing decisions.

Reduced customer spending or the loss of customers, particularly our large customers, could adversely affect our business and financial condition. In addition, we and our competitors may acquire businesses and technologies to

complement and expand our respective product offerings. Consolidated competitors could have considerable financial resources and channel influence as well as broad geographic reach, which would enable them to be more competitive in product differentiation, pricing, marketing, services, support and more. If our competitors consolidate or acquire businesses and technologies that we do not offer, they may be able to offer a larger technology portfolio, additional support and service capability or lower prices, which could negatively impact our business and operating results.

Business Operations Risks

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

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

- Ineffective or weaker legal protection of intellectual property rights;
- Uncertain economic, legal and political conditions in China, Europe and other regions where we do business, including, for example, changes in China-Taiwan relations, the military conflict between Russia and Ukraine and the related sanctions and other penalties imposed on Russia by the United States, the European Union, the United Kingdom and other countries;
- Economic recessions or uncertainty in financial markets, including the impact of rising inflation and global interest rates;
- Government trade restrictions, including tariffs, export controls or other trade barriers, and changes to existing trade arrangements between various countries such as China;
- Difficulties in adapting to cultural differences in the conduct of business, which may include business practices in which we are prohibited from engaging by the Foreign Corrupt Practices Act or other anti-corruption laws;
- Financial risks such as longer payment cycles, changes in currency exchange rates and difficulty in collecting accounts receivable;
- Inadequate local infrastructure that could result in business disruptions;
- Additional taxes, interest and potential penalties and uncertainty around changes in tax laws of various countries; and
- Other factors beyond our control such as natural disasters, terrorism, civil unrest, war and infectious diseases and pandemics, including COVID-19 and its variants.

Furthermore, if any of the foreign economies in which we do business deteriorate or if we fail to effectively manage our global operations, our business and results of operations will be harmed.

There is inherent risk, based on the complex relationships between certain Asian countries such as China, where we derive a growing percentage of our revenue, and the United States, that political, diplomatic or military events could result in trade disruptions, including tariffs, trade embargoes, export restrictions and other trade barriers. A significant trade disruption, export restriction, or the establishment or increase of any trade barrier in any area where we do business could reduce customer demand and cause customers to search for substitute products and services, make our products and services more expensive or unavailable for customers, increase the cost of our products and services, have a negative impact on customer confidence and spending, make our products less competitive, or otherwise have a materially adverse impact on our future revenue and profits, our customers' and suppliers' businesses, and our results of operations. For example, the ongoing geopolitical and economic uncertainty between the U.S. and China, the unknown impact of current and future U.S. and Chinese trade regulations as described above, and other geopolitical risks with respect to China and Taiwan may cause disruptions in the markets and industries we serve and our supply chain, decrease demand from customers for products using our solutions or cause other disruptions which could, directly or indirectly, materially harm our

business, financial condition and results of operations. For more on risks related to government export and import restrictions such as the U.S. government's Entity List and Export Regulations see *"Industry Risks – We are subject to governmental export and import requirements that could subject us to liability and restrict our ability to sell our products and services, which could impair our ability to compete in international markets."*

In response to the U.S. adopting tariffs and trade barriers or taking other actions, other countries may also adopt tariffs and trade barriers that could limit our ability to offer our products and services. Current and potential customers who are concerned or affected by such tariffs or restrictions may respond by developing their own products or replacing our solutions, which would have an adverse effect on our business. In addition, government or customer efforts, attitudes, laws or policies regarding technology independence may lead to non-U.S. customers favoring their domestic technology solutions that could compete with or replace our products, which would also have an adverse effect on our business.

In addition to tariffs and other trade barriers, our global operations are subject to numerous U.S. and foreign laws and regulations such as those related to anti-corruption, tax, corporate governance, imports and exports, financial and other disclosures, privacy and labor relations. These laws and regulations are complex and may have differing or conflicting legal standards, making compliance difficult and costly. In addition, there is uncertainty regarding how proposed, contemplated or future changes to these complex laws and regulations could affect our business. We may incur substantial expense in complying with the new obligations to be imposed by these laws and regulations, and we may be required to make significant changes in our business operations, all of which may adversely affect our revenues and our business overall. If we violate these laws and regulations, we could be subject to fines, penalties or criminal sanctions, and may be prohibited from conducting business in one or more countries. Although we have implemented policies and procedures to help ensure compliance with these laws and regulations, there can be no assurance that our employees, contractors, agents or partners will not violate such laws and regulations. Any violation individually or in the aggregate could have a material adverse effect on our operations and financial condition.

Our financial results are also affected by fluctuations in foreign currency exchange rates. A weakening U.S. dollar relative to other currencies increases expenses of our foreign subsidiaries when they are translated into U.S. dollars in our consolidated statements of income. Likewise, a strengthening U.S. dollar relative to other currencies, including the renminbi or Yen, reduces revenue of our foreign subsidiaries upon translation and consolidation. Exchange rates are subject to significant and rapid fluctuations due to a number of factors, including interest rate changes and political and economic uncertainty. Therefore, we cannot predict the prospective impact of exchange rate fluctuations. Although we engage in foreign currency hedging activity, we may be unable to hedge all of our foreign currency risk, which could have a negative impact on our results of operations.

The ongoing COVID-19 pandemic could have a material adverse effect on our business, operations and financial condition.

The ongoing COVID-19 pandemic has caused minor disruptions to our business operations to date, but could have a material adverse effect on our business, operations and financial condition in the future. For example, we have previously experienced limited hardware supply chain and logistical challenges as well as a slowdown in customer commitments in our Software Integrity segment. In response to the COVID-19 pandemic, governments and businesses imposed restrictions, which significantly curtailed global, regional and national economic activity and have caused substantial volatility and disruption in global financial markets. We are continuing to transition employees back into offices worldwide while maintaining compliance with applicable local, state and national requirements. Although we have been able to navigate workplace restrictions and limitations with minimal disruptions to our business operations to date, we cannot be certain that these measures will continue to be successful and we may need to further modify our business practices and real estate needs in response to the risks and negative impacts caused by the COVID-19 pandemic.

The extent to which the COVID-19 pandemic impacts our business operations in future periods will depend on multiple uncertain factors, including the duration and scope of the pandemic, its overall negative impact on the global economy and, in some cases, the regional and national economies of areas experiencing localized surges in COVID-19 cases, continued responses by governments and businesses to COVID-19 and its variants, acceptance and effectiveness of vaccines, the ability of our business partners and third-party providers to fulfill their responsibilities and commitments, the ability to secure adequate and timely supply of equipment and materials from suppliers for our hardware products, and the ability to develop and deliver our products. In addition, continued and worsening weak economic conditions may result in impairment in value of our tangible and intangible assets. The

impact of the ongoing COVID-19 pandemic may also have the effect of heightening many of the other risks and uncertainties described in this *Risk Factors* section.

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

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

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

- Changes in demand for our products—especially products, such as hardware, generating upfront revenue—due to fluctuations in demand for our customers' products and due to constraints in our customers' budgets for research and development and EDA products and services;
- Changes in demand for our products due to customers reducing their expenditures, whether as a cost-cutting measure or a result of their insolvency or bankruptcy, and whether due to inflationary pressures, rising global interest rates, a sustained global semiconductor shortage, the ongoing COVID-19 pandemic or other reasons;
- Product competition in the EDA industry, which can change rapidly due to industry or customer consolidation and technological innovation;
- Our ability to innovate and introduce new products and services or effectively integrate products and technologies that we acquire;
- Failures or delays in completing sales due to our lengthy sales cycle, which often includes a substantial customer evaluation and approval process because of the complexity of our products and services;
- Our ability to implement effective cost control measures;
- Our dependence on a relatively small number of large customers, and on such customers continuing to renew licenses and purchase additional products from us, for a large portion of our revenue;
- Changes to the amount, composition and valuation of, and any impairments to or write-offs of, our inventory;
- Changes in the mix of our products sold, as increased sales of our products with lower gross margins, such as our hardware products, may reduce our overall margins;
- Expenses related to our acquisition and integration of businesses and technologies;
- Changes in tax rules, as well as changes to our effective tax rate, including the tax effects of infrequent or unusual transactions and tax audit settlements;
- Delays, increased costs or quality issues resulting from our reliance on third parties to manufacture our hardware products, which includes a sole supplier for certain hardware components;
- Natural variability in the timing of IP drawdowns, which can be difficult to predict;
- General economic and political conditions that affect the semiconductor and electronics industries, such as disruptions to international trade relationships, including tariffs, export licenses, or other trade barriers affecting our or our suppliers' products, as well as impacts due to the ongoing COVID-19 pandemic; and
- Changes in accounting standards, which may impact the way we recognize our revenue and costs and impact our earnings.

The timing of revenue recognition may also cause our revenue and earnings to fluctuate. The timing of revenue recognition is affected by factors that include:

- Cancellations or changes in levels of orders or the mix between upfront products revenue and time-based products revenue;
- Delay of one or more orders for a particular period, particularly orders generating upfront products revenue, such as hardware;

- Delay in the completion of professional services projects that require significant modification or customization and are accounted for using the percentage of completion method;
- Delay in the completion and delivery of IP products in development as to which customers have paid for early access;
- Customer contract amendments or renewals that provide discounts or defer revenue to later periods; and
- The levels of our hardware and IP revenues, which are recognized upfront and are primarily dependent upon our ability to provide the latest technology and meet customer requirements.

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

Cybersecurity threats or other security breaches could compromise sensitive information belonging to us or our customers and could harm our business and our reputation, particularly that of our security testing solutions.

We store sensitive data, including intellectual property, our proprietary business information and that of our customers, and confidential employee information, in our data centers, on our networks or on the cloud. These systems may be vulnerable to attacks by hackers or compromised due to employee error, malfeasance or other disruptions that could result in unauthorized disclosure or loss of sensitive information. Many employees continue to work remotely based on a hybrid work model, which magnifies the importance of maintaining the integrity of our remote access security measures.

For example, we discovered unauthorized third-party access to our products and product license files hosted on our SolvNet Plus customer license and product delivery system in 2015. While we identified and remediated the incident, it is possible that our security measures may be circumvented again in the future, and any such breach could adversely impact our business, operations and reputation. The techniques used to obtain unauthorized access to networks, or to sabotage systems, change frequently and generally are not recognized until launched against a target. We may be unable to anticipate these techniques, react in a timely manner or implement adequate preventative measures. Furthermore, in the operation of our business we also use third-party vendors that have access to our network and store certain sensitive data, including confidential information about our employees, and these third parties are subject to their own cybersecurity threats. Our standard vendor terms and conditions include provisions requiring the use of appropriate security measures to prevent unauthorized use or disclosure of our data, as well as other safeguards. However, that is no guarantee that a breach will not still occur. In addition, if we select a vendor that uses cloud storage of information as part of their service or product offerings, or if we are selected as a vendor for our cloud-based solutions, our proprietary information could be misappropriated by third parties despite our attempts to validate the security of such services. Any security breach of our own or a third-party vendor's systems could cause us to be non-compliant with applicable laws or regulations, subject us to legal claims or proceedings, disrupt our operations, damage our reputation, and cause a loss of confidence in our products and services, any of which could adversely affect our business and our ability to sell our products and services.

Our software products, hosted solutions, and software security and quality testing solutions may also be vulnerable to attacks, including phishing, exploits of our code or our system configurations, malicious code (such as viruses and worms), distributed denial-of-service attacks, sophisticated attacks conducted or sponsored by nation-states, advanced persistent threat intrusions, ransomware and other malware. Furthermore, the risk of state-supported and geopolitical-related cybersecurity incidents may increase due to geopolitical incidents, such as the Russia-Ukraine conflict. An attack could disrupt the proper functioning of our software, cause errors in the output of our customers' work, allow unauthorized access to our or our customers' proprietary information or cause other destructive outcomes.

We also offer software security and quality testing solutions. If we fail to identify new and increasingly sophisticated methods of cyber attacks or fail to invest sufficient resources in research and development regarding new threat vectors, our security testing products and services may fail to detect vulnerabilities in our customers' software code. An actual or perceived failure to identify security flaws may harm the perceived reliability of our security testing products and services, and could result in a loss of customers or sales, or an increased cost to remedy a problem. Furthermore, our growth and recent acquisitions in the software security and quality testing space may increase our

visibility as a security-focused company and may make us a more attractive target for attacks on our own information technology infrastructure. If any of the foregoing were to occur, we could experience negative publicity and our reputation could suffer, customers could stop buying our products, we could face lawsuits and potential liability, and our financial performance could be negatively impacted.

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

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

From time to time, we may need to commence litigation or other legal proceedings in order to:

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

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

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

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

- Potential negative impact on our earnings per share;
- Failure of acquired products to achieve projected sales;
- Problems in integrating the acquired products with our products;
- Difficulties entering into new markets in which we are not experienced or where competitors may have stronger positions;
- Potential downward pressure on operating margins due to lower operating margins of acquired businesses, increased headcount costs, and other expenses associated with adding and supporting new products;
- Difficulties in retaining and integrating key employees;
- Substantial reductions of our cash resources and/or the incurrence of debt, which may be at higher than anticipated interest rates;
- Failure to realize expected synergies or cost savings;
- Difficulties in integrating or expanding sales, marketing and distribution functions and administrative systems, including information technology and human resources systems;

- Dilution of our current stockholders through the issuance of common stock as part of the merger consideration;
- Difficulties in negotiating, governing and realizing value from strategic investments;
- Assumption of unknown liabilities, including tax, litigation, cybersecurity and commercial-related risks, and the related expenses and diversion of resources;
- Incurrence of costs and use of additional resources to remedy issues identified prior to or after an acquisition;
- Disruption of ongoing business operations, including diversion of management's attention and uncertainty for employees and customers, particularly during the post-acquisition integration process;
- Potential negative impacts on our relationships with customers, distributors and business partners;
- Exposure to new operational risks, regulations and business customs to the extent acquired businesses are located in regions where we are not currently conducting business;
- The need to implement controls, processes and policies appropriate for a public company at acquired companies that may have previously lacked such controls, processes and policies in areas such as cybersecurity, information technology, privacy and more;
- Negative impact on our net income resulting from acquisition or investment-related costs; and
- Requirements imposed by government regulators in connection with their review of an acquisition, including required divestitures or restrictions on the conduct of our business or the acquired business.

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

We may pursue new product and technology initiatives, and if we fail to successfully carry out these initiatives, we could be adversely impacted.

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

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

- Our ability to attract a new customer base, including in industries in which we have less experience;
- Our successful development of new sales and marketing strategies to meet customer requirements;
- Our ability to accurately predict, prepare for and promptly respond to technological developments in new fields, including, in the case of our software quality testing and security tools and services, identifying new security vulnerabilities in software code and ensuring support for a growing number of programming languages;
- Our ability to compete with new and existing competitors in these new industries, many of which may have more financial resources, industry experience, brand recognition, relevant intellectual property rights or established customer relationships than we currently do, and could include free and open source solutions that provide similar software quality testing and security tools without fees;
- Our ability to skillfully balance our investment in adjacent markets with investment in our existing products and services;

- Our ability to attract and retain employees with expertise in new fields;
- Our ability to sell and support consulting services at profitable margins; and
- Our ability to manage our revenue model in connection with hybrid sales of licensed products and consulting services.

Difficulties in any of our new product development efforts or our efforts to enter adjacent markets, including as a result of delays or disruptions, new export control restrictions or the ongoing COVID-19 pandemic, could adversely affect our operating results and financial condition.

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

We devote substantial resources to research and development. New competitors, technological advances in the semiconductor industry or by competitors, our acquisitions, our entry into new markets or other competitive factors may require us to invest significantly greater resources than we anticipate. If we are required to invest significantly greater resources than anticipated without a corresponding increase in revenue, our operating results could decline. If customers reduce or slow the need to upgrade or enhance their product offerings, our revenue and operating results may be adversely affected. Additionally, our periodic research and development expenses may be independent of our level of revenue, which could negatively impact our financial results. New products may not adequately address the changing needs of the marketplace. New software products may contain undetected errors, defects or vulnerabilities. The occurrence of any defects or errors in our products could result in lost or delayed market acceptance and sales of our products, delays in payment by customers, loss of customers or market share, product returns, damage to our reputation, diversion of our resources, increased service and warranty expenses or financial concessions, increased insurance costs and potential liability for damages. Finally, there can be no guarantee that our research and development investments will result in products that create additional revenue.

Product errors or defects could expose us to liability and harm our reputation and we could lose market share.

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

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

The growth in sales of our hardware products subjects us to several risks, including:

- Increased dependence on a sole supplier for certain hardware components, which may reduce our control over product quality and pricing and may lead to delays in production and delivery of our hardware products, should our supplier fail to deliver sufficient quantities of acceptable components in a timely fashion;
- Increasingly variable revenue and less predictable revenue forecasts, due to fluctuations in hardware revenue, which is recognized upfront upon shipment, as opposed to most sales of software products for which revenue is recognized over time;
- Potential reductions in overall margins, as the gross margin for our hardware products, is typically lower than those of our software products;
- Longer sales cycles, which create risks of insufficient, excess or obsolete inventory and variations in inventory valuation, which can adversely affect our operating results;

- Decreases or delays in customer purchases in favor of next-generation releases, which may lead to excess or obsolete inventory or require us to discount our older hardware products;
- Longer warranty periods than those of our software products, which may require us to replace hardware components under warranty, thus increasing our costs; and
- Potential impacts on our supply chain, including due to the effects of increasing inflationary pressures and rising global interest rates, a sustained global semiconductor shortage and the COVID-19 pandemic.

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

We depend in large part upon the services of our senior management team to drive our future success, and certain team members depart our company from time to time. If we were to lose the services of any member of our senior management team without adequate notice, our business could be adversely affected.

To be successful, we must also attract and retain key employees who join us organically and through acquisitions. There are a limited number of qualified engineers. Competition for these individuals and other qualified employees is intense and has increased globally, including in major markets such as Asia. Our employees are often recruited aggressively by our competitors and our customers worldwide. Any failure to recruit and retain key employees could harm our business, results of operations and financial condition, and our recruiting and retention efforts may be negatively impacted by the ongoing COVID-19 pandemic. Additionally, efforts to recruit and retain qualified employees could be costly and negatively impact our operating expenses.

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

From time to time, we are subject to claims that our products infringe on third-party intellectual property rights.

We are from time to time subject to claims alleging our infringement of third-party intellectual property rights, including patent rights. Under our customer agreements and other license agreements, we agree in many cases to indemnify our customers if our products are alleged to infringe a third party's intellectual property rights. Infringement claims can result in costly and time-consuming litigation, require us to enter into royalty arrangements, subject us to damages or injunctions restricting our sale of products, invalidate a patent or family of patents, require us to refund license fees to our customers or to forgo future payments, or require us to redesign certain of our products, any one of which could harm our business and operating results. For example, some customers have requested we defend and indemnify them against claims for patent infringement asserted in various district courts and at the U.S. International Trade Commission by Bell Semiconductor LLC (Bell Semic), a patent monetization entity, based on Bell Semic's allegation that the customers' use of one or more features of certain of our products infringes one or more of six patents held by Bell Semic. We have offered to defend some of our customers consistent with the terms of our End User License Agreement.

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

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

The inclusion of third-party intellectual property in our products can also subject us and our customers to infringement claims. Although we seek to mitigate this risk contractually, we may not be able to sufficiently limit our

potential liability. Regardless of outcome, infringement claims may require us to use significant resources and may divert management's attention from the operation of our business.

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

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

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

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

As of October 31, 2022, approximately 48% of our worldwide cash and cash equivalents balance is held by our international subsidiaries. We intend to meet our U.S. cash spending needs primarily through our existing U.S. cash balances, ongoing U.S. cash flows, and available credit under our term loan and revolving credit facilities. Should our cash spending needs in the U.S. rise and exceed these liquidity sources, we may be required to incur additional debt at higher than anticipated interest rates or access other funding sources, which could negatively affect our results of operations, capital structure or the market price of our common stock.

Legal and Regulatory Risks

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

Our operations are subject to income and transaction taxes in the United States and in multiple foreign jurisdictions. Because we have a wide range of statutory tax rates in the multiple jurisdictions in which we operate, any changes in our geographical earnings mix, including those resulting from our intercompany transfer pricing or from changes in the rules governing transfer pricing, could materially impact our effective tax rate. Furthermore, a change in the tax law of the jurisdictions where we do business, including an increase in tax rates, an adverse change in the treatment of an item of income or expense, or limitations on our ability to utilize tax credits, could result in a material increase in our tax expense and impact our financial position and cash flows. For example, in response to the fiscal impact of the COVID-19 pandemic, the State of California enacted legislation on June 29, 2020 that suspends the use of certain corporate research and development tax credits for a three-year period beginning in our fiscal 2021, which resulted in an impact to our tax expense. On February 9, 2022, California Governor Newsom signed into law 2022 CA SB 113, which shortened the previously enacted suspension on the use of research and development tax credits to a two-year period covering our fiscal 2021 and 2022.

On December 22, 2017, the Tax Cuts and Jobs Act (Tax Act) was enacted, which significantly changed prior U.S. tax law and includes numerous provisions that affect our business. The Tax Act includes certain provisions that began to affect our income in the first quarter of fiscal 2019, while other sections of the Tax Act and related regulations will begin to affect our business in the first quarter of fiscal 2023. There are various proposals in Congress to amend certain provisions of the Tax Act. The state of these proposals and other future legislation remains uncertain and, if enacted, may materially affect our financial position.

On August 16, 2022, the Inflation Reduction Act of 2022 (IR Act) was enacted in the United States. The IR Act includes a minimum tax rate of 15%, as well as tax credit incentives for reductions in greenhouse gas emissions. The details of the computation of the tax and implementation of the incentives will be subject to regulations to be issued by the U.S. Department of the Treasury. On August 9, 2022, the CHIPS and Science Act of 2022 (CHIPS Act) was enacted in the United States to provide certain financial incentives to the semiconductor industry, primarily for manufacturing activities within the United States. We are continuing to monitor the IR Act and CHIPS Act and related regulatory developments to evaluate their potential impact on our business and operating results.

On October 8, 2021, the Organization for Economic Co-operation and Development (OECD) announced the OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (Framework) which agreed to a two-pillar solution to address tax challenges arising from digitalization of the economy. On December 20, 2021, the OECD released Pillar Two Model Rules defining the global minimum tax rules, which contemplate a minimum tax rate of 15%. The OECD continues to release additional guidance on these rules and the Framework calls for law enactment by OECD and G20 members to take effect in 2023 and 2024. These changes, when enacted by various countries in which we do business, may increase our taxes in these countries. Changes to these and other areas in relation to international tax reform, including future actions taken by foreign governments in response to the Tax Act, could increase uncertainty and may adversely affect our tax rate and cash flow in future years. Our income and non-income tax filings are subject to review or audit by the Internal Revenue Service and state, local and foreign taxing authorities. We exercise significant judgment in determining our worldwide provision for income taxes and, in the ordinary course of our business, there may be transactions and calculations where the ultimate tax determination is uncertain. We may also be liable for potential tax liabilities of businesses we acquire, including future taxes payable related to the transition tax on earnings from their foreign operations, if any, under the Tax Act. Although we believe our tax estimates are reasonable, the final determination in an audit may be materially different than the treatment reflected in our historical income tax provisions and accruals. An assessment of additional taxes because of an audit could adversely affect our income tax provision and net income in the periods for which that determination is made. For further discussion on our ongoing audit, see Note 15 of the *Notes to Consolidated Financial Statements* under the heading "Non-U.S. Examinations."

We maintain significant deferred tax assets related to certain tax credits. Our ability to use these credits is dependent upon having sufficient future taxable income in the relevant jurisdiction and in the case of foreign tax credits, how such credits are treated under current and potential future tax law. Changes to the Tax Act, other regulatory changes, and changes in our forecasts of future income could result in an adjustment to the deferred tax asset and a related charge to earnings that could materially affect our financial results.

Our business is subject to evolving corporate governance and public disclosure regulations and expectations, including with respect to environmental, social and governance matters that could expose us to numerous risks.

We are subject to changing rules and regulations promulgated by a number of governmental and self-regulatory organizations, including the SEC, the Nasdaq Stock Market and the Financial Accounting Standards Board (FASB). These rules and regulations continue to evolve in scope and complexity and many new requirements have been created in response to laws enacted by Congress, making compliance difficult and uncertain. In addition, increasingly regulators, customers, investors, employees and other stakeholders are focusing on environmental, social and governance (ESG) matters and related disclosures. These changing rules, regulations and stakeholder expectations have resulted in, and are likely to continue to result in, increased general and administrative expenses and increased management time and attention spent complying with or meeting such regulations and expectations. For example, developing and acting on ESG initiatives, and collecting, measuring, and reporting ESG information and metrics can be costly, difficult and time consuming and is subject to evolving reporting standards, including the SEC's proposed climate-related reporting requirements. We may also communicate certain initiatives and goals regarding environmental matters, diversity, responsible sourcing, social investments and other ESG matters in our SEC filings or in other public disclosures. These initiatives and goals could be difficult and expensive to implement, the technologies needed to implement them may not be cost effective and may not advance at a sufficient pace, and ensuring the accuracy, adequacy, or completeness of the disclosure of our ESG initiatives can be costly, difficult and time-consuming. Further, statements about our ESG initiatives and goals, and progress against those goals, may be based on standards for measuring progress that are still developing, internal controls and processes that continue to evolve, and assumptions that are subject to change. In addition, we could face scrutiny from certain stakeholders for the scope or nature of such initiatives or goals, or for any revisions to these goals. If our ESG-related data, processes and reporting are incomplete or inaccurate, or if we fail to achieve progress with respect to our ESG goals on a timely basis, or at all, our business, financial performance and growth could be adversely affected.

Changes in the U.S. generally accepted accounting principles (U.S. GAAP) could adversely affect our financial results and may require significant changes to our internal accounting systems and processes.

We prepare our consolidated financial statements in conformity with U.S. GAAP. These principles are subject to interpretation by the FASB, the SEC and various bodies formed to interpret and create appropriate accounting principles and guidance. The FASB periodically issues new accounting standards on a variety of topics, including, for example, revenue recognition and accounting for leases. These and other such standards generally result in different accounting principles, which may significantly impact our reported results or could result in variability of our financial results.

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

We may be subject to legal claims or regulatory matters involving stockholder, consumer, employment, customer, supplier, competition and other issues on a global basis. Litigation is subject to inherent uncertainties, and unfavorable rulings could occur. An unfavorable ruling could include monetary damages or, in cases for which injunctive relief is sought, an injunction prohibiting us from manufacturing or selling one or more products. If we were to receive an unfavorable ruling on a matter, our business and results of operations could be materially harmed. Further information regarding certain of these matters is contained in Part I, Item 3, *Legal Proceedings*.

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

Regardless of how well designed and operated it is, a control system can provide only reasonable assurance that its objectives will be met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, have been detected. Moreover, although we have implemented compliance programs and compliance training for employees, such measures may not prevent our employees, contractors or agents from breaching or circumventing our policies or violating applicable laws and regulations. Failure of our control systems and compliance programs to prevent error, fraud or violations of law could have a material adverse impact on our business.

General Risks

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

From time to time, our cash equivalent and short-term investment portfolio consists of investment-grade U.S. government agency securities, asset-backed securities, corporate debt securities, commercial paper, certificates of deposit, money market funds, municipal securities and other securities and bank deposits. Our investment portfolio carries both interest rate risk and credit risk and may be negatively impacted by deteriorating economic conditions and rising global interest rates. Fixed rate debt securities may have their market value adversely impacted due to a credit downgrade or a rise in interest rates, while floating rate securities may produce less income than expected if interest rates fall or a credit downgrade occurs.

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

Catastrophic events and the effects of climate change may disrupt our business and harm our operating results.

Due to the global nature of our business, our operating results may be negatively impacted by catastrophic events and the effects of climate change throughout the world. We rely on a global network of infrastructure applications, enterprise applications and technology systems for our development, marketing, operational, support and sales activities. A disruption or failure of these systems in the event of a major earthquake, fire, extreme temperatures, drought, flood, telecommunications failure, cybersecurity attack, terrorist attack, epidemic or pandemic (including the ongoing COVID-19 pandemic), or other catastrophic events or climate change-related events could cause system interruptions, delays in our product development and loss of critical data and could prevent us from fulfilling our customers' orders. In particular, our sales and infrastructure are vulnerable to regional or worldwide health conditions, including the effects of the outbreak of contagious diseases such as the COVID-19 pandemic. Moreover, our corporate headquarters, a significant portion of our research and development activities, our data centers, and

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certain other critical business operations are located in California, near major earthquake faults and sites of recent wildfires, which may become more frequent, along with other extreme weather events, due to climate change. A catastrophic event or other extreme weather event that results in the destruction or disruption of our data centers or our critical business or information technology systems would severely affect our ability to conduct normal business operations and, as a result, our operating results would be adversely affected.

Item 1B. *Unresolved Staff Comments*

None.

Item 2. *Properties*

Our principal offices are currently located in Mountain View, California. We currently lease approximately 1 million square feet of space in 33 offices throughout the United States, inclusive of our principal offices, but excluding 407,000 square feet which are currently sublet to third parties and 120,000 square feet, which we own and currently lease to third parties. We own buildings in Oregon and California. These offices are used primarily for sales and support, marketing, and administrative activities as well as research and development for our business segments.

We currently lease approximately 2.6 million square feet of space in 29 countries other than the United States, and own buildings in Wuhan, China and Hsinchu, Taiwan as well as office space in Xiamen, China and Yongin-si, South Korea. These offices are used primarily for sales and support, service, and research and development activities for our business segments.

As our needs change, from time to time, we may relocate, expand, and/or otherwise increase or decrease the size of our operations, offices or personnel. We believe that our existing facilities, including both owned and leased properties, are in good condition and suitable for our current needs and that suitable additional or substitute space will be available on commercially reasonable terms as needed to accommodate any expansion of our operations.

Item 3. *Legal Proceedings*

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

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

Hungarian Tax Matter

In 2017, the Hungarian Tax Authority (the HTA) assessed withholding taxes of approximately \$25.0 million and interest and penalties of \$11.0 million against our Hungary subsidiary (Synopsys Hungary). Synopsys Hungary contested the assessment with the Hungarian Administrative Court (Administrative Court). In 2019, as required under Hungarian law, Synopsys Hungary paid the assessment and recorded a tax expense due to an unrecognized tax benefit of \$17.4 million, which is net of estimated U.S. foreign tax credits. The Administrative Court found against Synopsys Hungary, and we appealed to the Hungarian Supreme Court. During 2021, the Hungarian Supreme Court heard our appeal and remanded the case to the Administrative Court for further proceedings. The Administrative Court once again ruled against Synopsys Hungary, and we filed another appeal with the Hungarian Supreme Court. The Hungarian Supreme Court heard our appeal on January 27, 2022, vacated the lower court's decision and remanded the case back to the Administrative Court for further proceedings. Hearings with the Administrative Court were held on June 30, 2022 and September 22, 2022. In response to a request by the Administrative Court, we filed an additional brief on November 23, 2022. We expect a hearing to be scheduled in early 2023.

For further discussion of the Hungary audit, see Note 15 of the *Notes to Consolidated Financial Statements* under the heading “Non-U.S. Examinations.”

Bell Semic Actions

On April 27, 2022, Bell Semiconductor LLC (Bell Semic), a patent monetization entity, began filing a series of patent infringement lawsuits against certain technology companies alleging that certain semiconductor devices designed using certain design tools offered by electronic design automation (EDA) vendors, including Synopsys, infringe upon one or more patents held by Bell Semic. Bell Semic seeks money damages, attorneys’ fees and costs, and a permanent injunction prohibiting the defendants from using allegedly infringing EDA design tools.

On April 29, 2022, Bell Semic also began filing a series of complaints with the U.S. International Trade Commission (ITC) alleging violations of Section 337 of the Tariff Act of 1930 and seeking limited exclusion orders preventing the respondents from importing into the United States semiconductor devices designed using certain design tools offered by EDA vendors, including Synopsys, and cease-and-desist orders prohibiting respondents from importing, selling, offering for sale, advertising, or transferring products made using certain design tools offered by EDA vendors, including Synopsys. On November 8, 2022, the ITC instituted the investigations.

Synopsys is not named as a respondent or defendant in any of the aforementioned actions; however, certain of the respondents and defendants are Synopsys customers and have sought defense and indemnity from Synopsys under their End User License Agreements in response to Bell Semic’s allegations. Synopsys has offered to defend some of its customers consistent with the terms of its End User License Agreement.

On November 18, 2022, Synopsys and another EDA vendor filed an action for Declaratory Judgment of invalidity and non-infringement as to each of the six patents asserted by Bell Semic in the aforementioned actions. On November 28, 2022, Synopsys and another EDA vendor also filed a Motion for Preliminary Injunction seeking to enjoin Bell Semic from proceeding with the ITC investigations.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

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


Our common stock trades on the Nasdaq Global Select Market under the symbol "SNPS." As of December 7, 2022, we had 227 stockholders of record.

Performance Graph

The following graph compares the five-year total return to stockholders of our common stock relative to the cumulative total returns of the S&P 500 Index, the S&P Information Technology Index and the Nasdaq Composite Index. The graph assumes that \$100 was invested in Synopsys common stock on October 27, 2017 (the last trading day before the beginning of our fifth preceding fiscal year) and in each of the indexes on October 27, 2017 (the closest month end) and that all dividends were reinvested. No cash dividends were declared on our common stock during such time. The comparisons in the table are not intended to forecast or be indicative of possible future performance of our common stock.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN*

snps-20221031_g3.jpg



*\$100 invested on October 27, 2017 in stock or index, including reinvestment of dividends. Fiscal year ending October 29.

The information presented above in the stock performance graph shall not be deemed to be "soliciting material" or to be "filed" with the SEC or subject to Regulation 14A or 14C, except to the extent that we subsequently specifically request that such information be treated as soliciting material or specifically incorporate it by reference into a filing under the Securities Act or Exchange Act.

Dividends

We have not paid cash dividends on our common stock.

Stock Repurchase Program

Our Board of Directors (the Board) previously approved a stock repurchase program (the Program) with authorization to purchase up to \$1.0 billion of our common stock in December 2021. The Board approved a replenishment of the Program with authorization to purchase up to \$1.5 billion in September 2022. As of October 31, 2022, \$1.4 billion remained available for future repurchases under the program.

In August 2022, we entered into an accelerated share repurchase agreement (the August 2022 ASR) to repurchase an aggregate of \$240.0 million of our common stock. Pursuant to the August 2022 ASR, we made a prepayment of \$240.0 million to receive initial deliveries of shares valued at \$192.0 million. The remaining balance of \$48.0 million was settled in October 2022. Total shares purchased under the August 2022 ASR were approximately 0.8 million shares, at an average purchase price of \$307.60 per share.

The table below sets forth information regarding our repurchases of our common stock during the three months ended October 31, 2022:

Period	Total number of shares purchased ⁽¹⁾	Average price paid per share ⁽¹⁾	Total number of shares purchased as part of publicly announced programs	Maximum dollar value of shares that may yet be purchased under the programs
Month #1				
July 31, 2022 through September 3, 2022	644,623	\$ 364.14	637,013	\$ 1,500,000,000
Month #2				
September 4, 2022 through October 1, 2022	191,624	\$ 313.09	—	\$ 1,440,005,356
Month #3				
October 2, 2022 through October 29, 2022	372,813	\$ 236.06	244,954	\$ 1,400,000,207
Total	<u>1,209,060</u>		<u>881,967</u>	<u>\$ 1,400,000,207</u>

⁽¹⁾ Amounts are calculated based on the settlement date.

Item 6. [Reserved]

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

Overview

The following overview is qualified in its entirety by the more complete discussion contained in this Item 7, the risk factors set forth in Item 1A of this Form 10-K, and our consolidated financial statements and the notes thereto set forth in Item 8 of this Form 10-K. Please also see the cautionary language at the beginning of Part I of this Form 10-K regarding forward-looking statements.

Business Summary

Synopsys provides products and services used across the entire Silicon to Software spectrum, from engineers creating advanced semiconductors to product teams developing advanced electronic systems to software developers seeking to ensure the security and quality of their code. We are a global leader in electronic design automation (EDA) software that engineers use to design and test integrated circuits (ICs), also known as chips. We also offer semiconductor intellectual property (IP) products, which are pre-designed circuits that engineers use as components of larger chip designs rather than designing those circuits themselves. We provide software and hardware used to validate the electronic systems that incorporate chips and the software that runs on them. We also provide technical services and support to help our customers develop advanced chips and electronic systems. These products and services are part of our Semiconductor & System Design segment.

We are also a leading provider of software tools and services that improve the security, quality and compliance of software in a wide variety of industries, including electronics, financial services, automotive, medicine, energy and industrials. These tools and services are part of our Software Integrity segment.

Our EDA and IP customers are generally semiconductor and electronics systems companies. Our solutions help these companies overcome the challenges of developing increasingly advanced electronics products while also helping them reduce their design and manufacturing costs. While our products are an important part of our customers' development process, our sales could be affected based on their research and development budgets, and our customers' spending decisions may be affected by their business outlook and willingness to invest in new and increasingly complex chip designs.

Our Software Integrity segment delivers products and services that enable software developers to test their code - while it is being written - for known security vulnerabilities and quality defects, as well as testing for open source security vulnerabilities and license compliance. Our Software Integrity customers are software developers across many industries, including, but also well beyond, the semiconductor and systems industries. Our Software Integrity products and services form a platform that helps our customers build security into the software development lifecycle and across the entire cyber supply chain.

We have consistently grown our revenue since 2005, despite periods of global economic uncertainty. We achieved these results because of our solid execution, leading technologies and strong customer relationships, and because we generally recognize our revenue for software licenses over the arrangement period, which typically approximates three years. See Note 2 of the *Notes to Consolidated Financial Statements* for a discussion on our revenue recognition policy. The revenue we recognize in a particular period generally results from selling efforts in prior periods rather than the current period. As a result, decreases as well as increases in customer spending do not immediately affect our revenues in a significant way.

Our growth strategy is based on maintaining and building on our leadership in our EDA products, expanding and proliferating our IP offerings, driving growth in the software security and quality market, and continuing to expand our product portfolio and our total addressable market. Our revenue growth from period to period is expected to vary based on the mix of our time based and upfront products. Based on our leading technologies, customer relationships, business model, diligent expense management, and acquisition strategy, we believe that we will continue to execute our strategies successfully.

Recent Developments

Developments in Export Control Regulations

On October 7, 2022, the Bureau of Industry and Security (BIS) of the U.S. Department of Commerce published changes to U.S. export control regulations (U.S. Export Regulations), including new restrictions on Chinese entities' ability to obtain advanced computing chips, develop and maintain supercomputers, and manufacture advanced semiconductors. Further, on October 14, 2022, a new rule went into effect imposing U.S. export controls on additional technologies, including electronic computer-aided design software specially designed for the development of ICs with Gate-All-Around Field-Effect Transistor structures. Based on our current understanding, we believe these regulations will not have a material impact on our business. We anticipate additional changes to U.S. Export Regulations in the future, but we cannot forecast the scope or timing of such changes. We will continue to monitor such developments, including potential additional trade restrictions, and other regulatory or policy changes by the U.S. and foreign governments.

For more on risks related to government export and import restrictions such as the U.S. government's Entity List and other U.S. Export Regulations, see Part I, Item 1A, Risk Factors, "*Industry Risks – We are subject to governmental export and import requirements that could subject us to liability and restrict our ability to sell our products and services, which could impair our ability to compete in international markets.*"

Impact of the Current Macroeconomic Environment and COVID-19

Uncertainty in the macroeconomic environment, including due to the effects of the recent rise in global inflation and interest rates, supply chain disruptions, geopolitical pressures, including the unknown impact of current and future U.S. and Chinese trade regulations, changes in China-Taiwan relations and the war in Ukraine, fluctuation in foreign exchange rates, and associated global economic conditions have resulted in volatility in credit, equity and foreign currency markets.

These uncertain macroeconomic conditions could lead some of our customers to postpone their decision-making, decrease their spending and/or delay their payments to us. For example, in the fourth quarter of fiscal 2022, we experienced a minor impact from the current macroeconomic environment in our Software Integrity segment as customers applied elevated levels of scrutiny to purchasing decisions, which has, in some cases, caused some customers to elect shorter term contracts due to their own budget uncertainty. If these uncertain macroeconomic conditions persist, they may continue to have an adverse impact on certain aspects of our business.

Additionally, the ongoing COVID-19 pandemic has impacted worldwide economic activity and financial markets and significantly increased economic volatility and uncertainty. Despite this widespread volatility and uncertainty, the COVID-19 pandemic has caused only minor disruptions to our business operations with a limited impact on our operating results thus far. The extent to which the COVID-19 pandemic impacts our business operations in future periods will depend on multiple uncertain factors, including the duration of the pandemic and its overall negative impact on the global economy generally and the semiconductor and electronics industries specifically. We have not identified trends that we expect will materially impact our future operating results at this time and continue to consider the impacts of the COVID-19 pandemic on our business operations.

While our time-based business model provides stability to our business, operating results and overall financial position, the broader implications of these macroeconomic events, particularly in the long term, remain uncertain. Further, the negative impact of these events or disruptions may be deferred due to our business model.

See Part I, Item 1A, *Risk Factors* for further discussion of the impact of global economic uncertainty and ongoing COVID-19 pandemic on our business, operations and financial condition.

Business Segments

Semiconductor & System Design. This segment includes our advanced silicon design, verification products and services, and semiconductor IP portfolio, which encompasses products and services that serve companies primarily in the semiconductor and electronics industries. EDA includes digital, custom and field programmable gate array (FPGA) IC design software, verification products, and manufacturing software products. Designers use these products to automate the highly complex IC design process and to reduce defects that could lead to expensive design or manufacturing re-spins or suboptimal end products. For IP, we are a leading provider of high-quality, silicon-proven IP solutions for system-on-chips (SoCs). This includes IP that has been optimized to address specific application requirements for the mobile, automotive, digital home, IoT, and cloud computing markets, enabling designers to quickly develop SoCs in these areas.

Software Integrity. This segment includes a broad portfolio of products and services to intelligently address software risks across the customer's portfolio and at all stages of the application lifecycle. The testing tools, services, and programs enable our customers to manage open source license compliance and detect, prioritize, and remediate security vulnerabilities and defects across their entire software development lifecycle. Our offerings include security and quality testing products, managed services, programs and professional services, and training.

Fiscal Year End

Our fiscal year ends on the Saturday nearest to October 31 and consists of 52 weeks, with the exception that approximately every five years, we have a 53-week year. When a 53-week year occurs, we include the additional week in the first quarter to realign fiscal quarters with calendar quarters. Fiscal 2022, 2021 and 2020 were 52-week years ending on October 29, 2022, October 30, 2021, and October 31, 2020, respectively. Fiscal 2023 will be a 52-week year.

For presentation purposes, this Form 10-K refers to the closest calendar month end.

Critical Accounting Estimates

Our consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles. In preparing these financial statements, we make assumptions, judgments and estimates that can affect the reported amounts of assets, liabilities, revenues and expenses, and net income. On an ongoing basis, we evaluate our estimates based on historical experience and various other assumptions we believe are reasonable under the circumstances. Our actual results may differ from these estimates. See Note 2 of the *Notes to Consolidated Financial Statements* for further information on our significant accounting policies.

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

- Revenue recognition; and
- Business combinations.

Revenue Recognition

Our contracts with customers often include promises to transfer multiple products and services to a customer. Arrangements with customers can involve multiple products and various license rights. Customers can negotiate for a broad portfolio of solutions, and favorable terms along with future purchase options to manage their overall costs. Analysis of the terms and conditions in these contracts and their effect on revenue recognition may require significant judgment.

We have concluded that our EDA software licenses in Technology Subscription License (TSL) contracts are not distinct from our obligation to provide unspecified software updates to the licensed software throughout the license term, because those promises represent inputs to a single, combined performance obligation. Where unspecified additional software product rights are part of the contract with the customer, those rights are accounted for as part of the single performance obligation that includes the licenses, updates, and technical support, because such rights are provided during the same period of time and have the same time-based pattern of transfer to the customer.

For our IP licensing arrangements, we have concluded that the licenses and support services are distinct from each other, and therefore treated as separate performance obligations. Revenues from IP licenses are recognized at a point in time upon transfer of control of the IP license, and support services are recognized over the support period as a stand ready obligation to the customer.

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

Business Combinations

We allocate the purchase price of acquired companies to the tangible and intangible assets acquired and liabilities assumed based upon their estimated fair values on the acquisition date with the exception of contract assets and contract liabilities (deferred revenue) which are recognized and measured on the acquisition date in accordance with our "Revenue Recognition" policy in Note 2. *Summary of Significant Accounting Policies*, as if we had originated the contracts. The excess of the fair value of the purchase price over the fair values of these net tangible and intangible assets acquired is recorded as goodwill.

Accounting for business combinations requires management to make significant estimates and assumptions including our estimates for intangible assets. Although we believe the assumptions and estimates we have made are reasonable, they are based in part on historical experience, market conditions and information obtained from management of the acquired companies and are inherently uncertain. Examples of critical estimates in valuing certain of the intangible assets we have acquired or may acquire in the future include, but are not limited to:

- future expected cash flows from software license sales, subscriptions, support agreements, consulting contracts and acquired developed technologies and patents;
- historical and expected customer attrition rates and anticipated growth in revenue from acquired customers;
- estimated obsolescence rates used in valuing technology related intangible assets;
- the expected use of the acquired assets; and
- discount rates used to discount expected future cash flows to present value, which are typically derived from a weighted-average cost of capital analysis and adjusted to reflect inherent risks.

The fair value of the definite-lived intangibles was determined using variations of the income approach.

For acquired existing technology, the fair value was determined by applying the multi-period excess earnings method under the income approach, which involves isolating the net earnings attributable to the asset being measured based on present value of the incremental after-tax cash flows (excess earnings) attributable solely to the asset over its remaining useful life. The economic useful life was determined based on historical technology obsolescence patterns and prospective technology developments. For acquisitions completed in fiscal 2022, we assumed technological obsolescence ranging from 6 to 10 years. The present value of operating cash flows from the existing technology was determined using discount rates ranging from approximately 10% to 30%.

Customer relationships represent the fair value of the existing relationships with the acquired company's customers. Their fair value was determined using the distributor method of the income approach, a variation of the multi-period excess earnings method. The distributor method relies upon market-based distributor data to estimate the excess profits associated with the asset over its remaining useful life. The economic useful life was determined based on historical customer turnover rates. Projected income from existing customer relationships considered customer retention rates ranging from 92.5% to 97.5%. The present value of operating cash flows from existing customers was determined using discount rates ranging from approximately 10% to 15%.

We believe that our estimates and assumptions related to the fair value of acquired intangible assets are reasonable, but significant judgment is involved.

Results of Operations

The discussion of our consolidated results of operations includes year-over-year comparisons of fiscal 2022 changes compared to fiscal 2021. For a discussion of the fiscal 2021 changes compared to fiscal 2020, see the discussion in Item 7, *Management's Discussion and Analysis of Financial Condition and Results of Operations* in our Annual Report on Form 10-K for the fiscal year ended October 31, 2021, filed on December 13, 2021.

Fiscal 2022 Financial Performance Summary

Results of operations for fiscal 2022, compared to fiscal 2021, reflected the following:

- Revenues were \$5.1 billion, an increase of \$877.3 million or 21%, due to higher revenue resulting from growth across all products and geographies.
- Total cost of revenue and operating expenses were \$3.9 billion, an increase of \$450.1 million or 13%, primarily due to increases of \$379.2 million in employee-related costs resulting from headcount increases through organic growth and acquisitions.
- Operating income was \$1.2 billion, an increase of \$427.2 million or 58%, as revenue growth exceeded the growth in costs and expenses.

Revenue

Our revenues are generated from two business segments: the Semiconductor & System Design segment and the Software Integrity segment. See Note 17 of the *Notes to Consolidated Financial Statements* for additional information about our reportable segments and revenue by geographic regions.

Further disaggregation of the revenues into various products and services within these two segments is summarized as follows:

Semiconductor & System Design Segment

This segment is comprised of the following:

- EDA software includes digital, custom and FPGA IC design software, verification products and obligations to provide unspecified updates and support services. EDA products and services are typically sold through Technology Subscription License (TSL) arrangements that grant customers the right to access and use all of the licensed products at the outset of an arrangement; software updates are generally made available throughout the entire term of the arrangement. The duration of our TSL contracts is generally 3 years, though it may vary for specific arrangements. We have concluded that the software licenses in TSL contracts are not distinct from the obligation to provide unspecified software updates to the licensed software throughout the license term, because the multiple software licenses and support represent inputs to a single, combined offering, and timely, relevant software

updates are integral to maintaining the utility of the software licenses. We recognize revenue for the combined performance obligation under TSL contracts ratably over the term of the license.

- IP & System Integration includes our DesignWare® IP portfolio and system-level products and services. These arrangements generally have two performance obligations which consist of transferring of the licensed IP and providing related support, which includes rights to technical support and software updates that are provided over the support term and are transferred to the customer over time. Revenue allocated to the IP licenses is recognized at a point in time upon the later of the delivery date or the beginning of the license period, and revenue allocated to support is recognized over the support term. Royalties are recognized as revenue in the quarter in which the applicable customer sells its products that incorporate our IP. Payments for IP contracts are generally received upon delivery of the IP. Revenue related to the customization of certain IP is recognized as "Professional Services."
- In the case of arrangements involving the sale of hardware products, we generally have two performance obligations. 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 the 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 portion of the transaction price allocated to the hardware product is generally recognized as revenue at the time of shipment because the customer obtains control of the product at that point in time. We have concluded that control generally transfers at that point in time because the customer has the ability to direct the use of the asset and an obligation to pay for the hardware. The portion of the transaction price allocated to the maintenance obligation is recognized as revenue ratably over the maintenance term.
- Revenue from Professional Service contracts is recognized over time, generally using costs incurred or hours expended to measure progress. We have a history of reasonably 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.

Software Integrity Segment

- We sell Software Integrity products in arrangements that provide customers the right to software licenses, maintenance updates and technical support. Over the term of these arrangements, the customer expects us to provide integral maintenance updates to the software licenses, which help customers protect their own software from new critical quality defects and potential security vulnerabilities. The licenses and maintenance updates serve together to fulfill our commitment to the customer as both work together to provide functionality to the customer and represent a combined performance obligation. We recognize revenue for the combined performance obligation over the term of the arrangement.

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

Total Revenue

	Year Ended October 31,		\$ Change		% Change	
	2022	2021			2021 to 2022	
	(dollars in millions)					
Semiconductor & System Design Segment	\$ 4,615.7	\$ 3,810.4	\$ 805.3		21	%
Software Integrity Segment	465.8	393.8	72.0		18	%
Total	<u>\$ 5,081.5</u>	<u>\$ 4,204.2</u>	<u>\$ 877.3</u>		<u>21</u>	<u>%</u>

Our revenues are subject to fluctuations, primarily due to customer requirements including the timing and value of contract renewals. For example, we experience fluctuations in our revenues due to factors such as the timing of IP product sales, consulting projects, Flexible Spending Account (FSA) drawdowns, royalties, and hardware sales. As

revenues from IP products sales and hardware sales are recognized upfront, customer demand and timing requirements for such IP products and hardware could result in increased variability of our total revenues.

Contracted but unsatisfied or partially unsatisfied performance obligations as of October 31, 2022 were \$7.1 billion. The amount and composition of unsatisfied performance obligations will fluctuate period to period. We do not believe the amount of unsatisfied performance obligations is indicative of future sales or revenue, or that such obligations at the end of any given period correlates with actual sales performance of a particular geography or particular products and services. For more information regarding our revenue as of October 31, 2022, including our contract balances as of such date, see Note 3 of the *Notes to Consolidated Financial Statements*.

For fiscal 2022 compared to fiscal 2021, revenues increased due to the continued organic growth of our business in all product groups and geographies.

For a discussion of revenue by geographic areas, see Note 17 of the *Notes to Consolidated Financial Statements*.

Time-Based Products Revenue

	Year Ended October 31,		\$ Change	% Change
	2022	2021	2021 to 2022	
	(dollars in millions)			
Time-based products revenue	\$ 2,993.8	\$ 2,633.8	\$ 360.0	14 %
Percentage of total revenue	59 %	63 %		

The increase in time-based products revenue for fiscal 2022 compared to fiscal 2021 was primarily attributable to an increase in TSL license revenue and higher renewals from arrangements booked in prior periods.

Upfront Products Revenue

	Year Ended October 31,		\$ Change	% Change
	2022	2021	2021 to 2022	
	(dollars in millions)			
Upfront products revenue	\$ 1,226.7	\$ 861.1	\$ 365.6	42 %
Percentage of total revenue	24 %	20 %		

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

The increase in upfront products revenue for fiscal 2022 compared to fiscal 2021 was primarily due to an increase in the sale of IP products and hardware products driven by higher demand from customers.

Upfront products revenue as a percentage of total revenue will likely fluctuate based on the timing of IP products and hardware sales. Such fluctuations will continue to be impacted by the timing of shipments or FSA drawdowns due to customer requirements.

Maintenance and Service Revenue

	Year Ended October 31,		\$ Change	% Change
	2022	2021	2021 to 2022	
	(dollars in millions)			
Maintenance revenue	\$ 293.3	\$ 235.9	\$ 57.4	24 %
Professional service and other revenue	567.7	473.5	94.2	20 %
Total	\$ 861.0	\$ 709.4	\$ 151.6	21 %
Percentage of total revenue	17 %	17 %		

The increase in maintenance revenue for fiscal 2022 compared to fiscal 2021 was primarily due to an increase in the volume of hardware and IP arrangements that include maintenance.

The increase in professional services and other revenue for fiscal 2022 compared to fiscal 2021 was primarily due to an increase in the volume of IP consulting projects.

Cost of Revenue

	Year Ended October 31,		\$ Change	% Change
	2022	2021	2021 to 2022	
	(dollars in millions)			
Cost of products revenue	\$ 653.8	\$ 542.1	\$ 111.7	21 %
Cost of maintenance and service revenue	343.0	271.2	71.8	26 %
Amortization of intangible assets	66.9	48.5	18.4	38 %
Total	\$ 1,063.7	\$ 861.8	\$ 201.9	23 %
Percentage of total revenue	21 %	20 %		

We divide cost of revenue into three categories: cost of products revenue, cost of maintenance and service revenue, and amortization of intangible assets.

Cost of products revenue. Cost of products revenue includes costs related to products sold and software licensed, hardware-related costs, allocated operating costs related to product support and distribution, royalties paid to third-party vendors, and the amortization of capitalized software development costs.

Cost of maintenance and service revenue. Cost of maintenance and service revenue includes costs to deliver our maintenance and consulting services, such as hotline and on-site support, production services and documentation of maintenance updates.

Amortization of intangible assets. Amortization of intangible assets, included in cost of revenue, includes the amortization of core/developed technology and certain contract rights intangible assets.

The increase in cost of revenue for fiscal 2022 compared to fiscal 2021 was primarily due to \$102.7 million in employee-related costs as a result of headcount increases from organic growth and acquisitions, \$51.7 million in hardware-related costs, \$18.4 million in amortization of technology-related intangible assets, \$16.4 million in costs to fulfill IP consulting arrangements, and \$12.7 million in facility costs. These increases were partially offset by a decrease of \$11.5 million in the fair value of our executive deferred compensation plan assets.

Operating Expenses

Research and Development

	Year Ended October 31,		\$ Change	% Change
	2022	2021	2021 to 2022	
	(dollars in millions)			
	\$ 1,680.4	\$ 1,504.8	\$ 175.6	12 %
Percentage of total revenue	33 %	36 %		

The increase in research and development expenses for fiscal 2022 compared to fiscal 2021 was primarily due to higher employee-related costs of \$199.1 million as a result of headcount increases as we continue to expand and enhance our product portfolio, increases of \$19.2 million in facility costs, and \$15.5 million in consultant and contractor costs. These increases were partially offset by a decrease of \$86.5 million in the fair value of our executive deferred compensation plan assets.

Sales and Marketing

	Year Ended October 31,		\$ Change	% Change
	2022	2021	2021 to 2022	
	(dollars in millions)			
	\$ 779.8	\$ 712.5	\$ 67.3	9 %
Percentage of total revenue	15 %	17 %		

The increase in sales and marketing expenses for fiscal 2022 compared to fiscal 2021 was primarily due to increases of \$64.1 million in employee-related costs due to headcount increases and higher sales commissions, \$12.0 million in travel and marketing costs due to an increased number of in-person meetings and events, and \$3.0 million in facility costs. These increases were partially offset by a decrease of \$25.5 million in the fair value of our executive deferred compensation plan assets.

General and Administrative

	Year Ended October 31,		\$ Change	% Change
	2022	2021	2021 to 2022	
	(dollars in millions)			
	\$ 353.8	\$ 323.0	\$ 30.8	10 %
Percentage of total revenue	7 %	8 %		

The increase in general and administrative expenses for fiscal 2022 compared to fiscal 2021 was primarily due to increases of \$30.8 million in legal, consulting and other professional fees, \$18.6 million in maintenance and depreciation expenses, and \$13.3 million in personnel-related costs due to headcount increases from hiring. These increases were partially offset by a decrease of \$16.9 million in the fair value of our executive deferred compensation plan assets and bad debt recoveries of \$15.9 million.

Change in Fair Value of Deferred Compensation

The income or loss arising from the change in fair value of our non-qualified deferred compensation plan obligation is recorded in cost of sales and each functional operating expense, with the offsetting change in the fair value of the related assets recorded in other income (expense), net. These assets are classified as trading securities. There is no impact on our net income from the fair value changes in our deferred compensation plan obligation and related assets.

Amortization of Intangible Assets

Amortization of intangible assets included within operating expenses consists of the amortization of trademarks, trade names, and customer relationships related to acquisitions.

	Year Ended October 31,		\$ Change	% Change
	2022	2021	2021 to 2022	
	(dollars in millions)			
	29.8	33.9	(4.1)	(12) %
Percentage of total revenue	1 %	1 %		

The decrease in amortization of intangible assets for fiscal 2022 compared to fiscal 2021 was primarily due to certain intangible assets becoming fully amortized in fiscal 2022, partially offset by amortization expense related to intangible assets acquired during fiscal 2022.

Restructuring Charges

In the third quarter of fiscal 2021, our management approved, committed and initiated a restructuring plan (the 2021 Plan) as part of a business reorganization. Total charges under the 2021 Plan consisting primarily of severance, retirement benefits, and lease abandonment costs, were \$45.5 million, of which \$33.4 million was incurred in fiscal 2021 and \$12.1 million was incurred in fiscal 2022. The 2021 Plan was substantially completed in the first quarter of fiscal 2022.

The following is a summary of our restructuring liabilities:

Fiscal Year	Balance at Beginning of Period	Costs Incurred	Cash Payments	Balance at End of Period
	(dollars in millions)			
2022	\$ 14.2	\$ 12.1	\$ (26.3)	\$ —
2021	\$ 1.3	\$ 33.4	\$ (20.5)	\$ 14.2
2020	\$ 22.6	\$ 36.1	\$ (57.4)	\$ 1.3

See Note 18 of the *Notes to Consolidated Financial Statements* for additional information.

Other Income (Expense), Net

	Year Ended October 31,		\$ Change	% Change
	2022	2021	2021 to 2022	
	(dollars in millions)			
Interest income	\$ 8.5	\$ 2.4	\$ 6.1	254 %
Interest expense	(1.7)	(3.4)	1.7	(50) %
Gains (losses) on assets related to executive deferred compensation plan	(68.8)	71.6	(140.4)	(196) %
Foreign currency exchange gains (losses)	4.7	5.3	(0.6)	(11) %
Other, net	10.8	(5.2)	16.0	(308) %
Total	\$ (46.5)	\$ 70.7	\$ (117.2)	(166) %

The decrease in other income (expense) for fiscal 2022 as compared to fiscal 2021 was primarily due to the decrease in the fair value of our executive deferred compensation plan assets.

Segment Operating Results

We do not allocate certain operating expenses managed at a consolidated level to our reportable segments. These unallocated expenses consist primarily of stock-based compensation expense, amortization of intangible assets, changes in the fair value of deferred compensation plan, restructuring, litigation and acquisition-related costs. See Note 17 of the *Notes to Consolidated Financial Statements* for more information.

Semiconductor & System Design Segment

	Year Ended October 31,		\$ Change	% Change	
	2022	2021	2021 to 2022		
	(dollars in millions)				
Adjusted operating income	\$ 1,628.1	\$ 1,243.1	\$ 385.0	31	%
Adjusted operating margin	35 %	33 %	2 %	6	%

The increase in adjusted operating income for fiscal 2022 compared to fiscal 2021 was primarily due to an increase in revenue from arrangements booked in prior periods.

Software Integrity Segment

	Year Ended October 31,		\$ Change	% Change
	2022	2021	2021 to 2022	
	(dollars in millions)			
Adjusted operating income	\$ 47.0	\$ 38.3	\$ 8.7	23 %
Adjusted operating margin	10 %	10 %	— %	— %

The increase in adjusted operating income for fiscal 2022 compared to fiscal 2021 was primarily due to an increase in revenue from arrangements booked in prior periods.

Income Taxes

Our effective tax rate for fiscal 2022 is 12.3%, which included a tax benefit of \$61.5 million of U.S. federal research tax credit, a foreign derived intangible income (FDII) deduction of \$38.9 million, and excess tax benefits from stock-based compensation of \$88.8 million.

Our effective tax rate for fiscal 2021 was 6.1%, which included a tax benefit of \$45.5 million of U.S. federal research tax credit, a FDII deduction of \$31.2 million, and excess tax benefits from stock-based compensation of \$94.0 million.

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

In 2017, the Hungarian Tax Authority (the HTA) assessed withholding taxes of approximately \$25.0 million and interest and penalties of \$11.0 million, against our Hungary subsidiary (Synopsis Hungary). Synopsis Hungary contested the assessment with the Hungarian Administrative Court (Administrative Court). In 2019, as required under Hungarian law, Synopsis Hungary paid the assessment and recorded a tax expense due to an unrecognized tax benefit of \$17.4 million, which is net of estimated U.S. foreign tax credits. The Administrative Court found against Synopsis Hungary, and we appealed to the Hungarian Supreme Court. During 2021, the Hungarian Supreme Court heard our appeal and remanded the case to the Administrative Court for further proceedings. The Administrative Court once again ruled against Synopsis Hungary, and we filed another appeal with the Hungarian Supreme Court. The Hungarian Supreme Court heard our appeal on January 27, 2022, vacated the lower court's decision and remanded the case back to the Administrative Court for further proceedings. Hearings with the Administrative Court were held on June 30, 2022 and September 22, 2022. In response to a request by the Administrative Court we filed an additional brief on November 23, 2022. We expect a hearing to be scheduled in early 2023.

See Note 15 of the *Notes to Consolidated Financial Statements* for further discussion of the provision for income taxes, the impacts related to the Tax Act, and the Hungarian audit.

Liquidity and Capital Resources

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

As of October 31, 2022, we held \$1.6 billion in cash, cash equivalents and short-term investments. We also held \$2.3 million in restricted cash primarily associated with deposits for office leases. Our cash equivalents consisted primarily of taxable money market mutual funds, time deposits and highly liquid investments with maturities of three months or less. Our short-term investments include U.S. government and municipal obligations, investment-grade available-for-sale debt and asset backed securities. We believe that the overall credit quality of our portfolio is strong, with our global excess cash, and our cash equivalents, invested in banks and securities with a weighted-average credit rating exceeding AA.

As of October 31, 2022, approximately \$755.1 million of our cash and cash equivalents were domiciled in various foreign jurisdictions. We have provided for foreign withholding taxes on the undistributed earnings of certain of our foreign subsidiaries to the extent such earnings are no longer considered to be indefinitely reinvested in the operations of those subsidiaries.

We believe that our existing cash, cash equivalents and short-term investments and sources of liquidity will be sufficient to satisfy our cash requirements and capital return program over at least the next 12 months. We are currently not aware of any trends or demands, commitments, events or uncertainties that will result in, or that are reasonably likely to result in, our liquidity increasing or decreasing in any material way that will impact our capital needs during or beyond the next 12 months. Our future cash requirements will depend on many factors, including our rate of revenue growth, the expansion of our sales and marketing activities, and the timing and extent of our spending to support our research and development efforts. We also may invest in or acquire businesses, applications or technologies, or may further expand our board-authorized stock repurchase program, which may require the use of significant cash resources and/or additional financing.

Cash Flows

	Year Ended October 31,		\$ Change	
	2022	2021	2021 to 2022	
	(dollars in millions)			
Cash provided by operating activities	\$ 1,738.9	\$ 1,492.6	\$ 246.3	
Cash used in investing activities	\$ (572.6)	\$ (549.0)	\$ (23.6)	
Cash used in financing activities	\$ (1,116.3)	\$ (748.7)	\$ (367.6)	

Cash Provided by Operating Activities

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

The increase in cash provided by operating activities was primarily attributable to higher net income and higher accounts receivable collection, partially offset by timing of customer billings and higher disbursements for operations, including vendor and tax payments.

Cash Used in Investing Activities

The increase in cash used in investing activities was primarily due to higher cash paid for acquisitions of \$126.4 million and higher purchases of property and equipment of \$42.8 million, partially offset by higher proceeds from the sales and maturities of short-term investments of \$80.8 million and lower purchases of short-term investments of \$64.5 million.

Cash Used in Financing Activities

The increase in cash used in financing activities was primarily due to higher stock repurchases of \$311.9 million, higher debt repayments of \$48.8 million and higher taxes paid for net share settlements of \$35.1 million, partially offset by higher proceeds from issuance of common stock of \$27.2 million.

Credit and Term Loan Facilities

On January 22, 2021, we entered into a Fourth Extension and Amendment Agreement (the Fourth Amendment), which amended and restated our previous credit agreement, dated as of November 28, 2016 (as amended and restated, the Credit Agreement). Our outstanding borrowings under the previous credit agreement, which as of January 22, 2021 consisted of term loans in the aggregate principal amount of \$97.5 million, were carried over under the Credit Agreement and fully paid on November 26, 2021.

The Fourth Amendment extended the termination date of the existing \$650.0 million senior unsecured revolving credit facility (the Revolver) from November 28, 2021 to January 22, 2024, which could be further extended at our option. The Credit Agreement also provides an uncommitted incremental loan facility of up to \$150.0 million in the aggregate principal amount. The Credit Agreement contains financial covenants requiring us to maintain a maximum consolidated leverage ratio and a minimum consolidated interest coverage ratio, as well as other non-financial covenants. As of October 31, 2022, we were in compliance with all financial covenants.

There was no outstanding balance under the Revolver as of October 31, 2022 and October 31, 2021. We expect our borrowings, if any, under the Revolver will fluctuate from quarter to quarter.

Borrowings bear interest at a floating rate based on a margin over our choice of market observable base rates as defined in the Credit Agreement. As of October 31, 2022, the Revolver bore interest at LIBOR +1%. In addition, commitment fees are payable on the Revolver at rates between 0.125% and 0.200% per year based on our leverage ratio on the daily amount of the revolving commitment.

In July 2018, we entered into a 12-year 220.0 million Renminbi (approximately \$33.0 million) credit agreement with a lender in China to support our facilities expansion. Borrowings bear interest at a floating rate based on the 5-year Loan Prime Rate plus 0.74%. As of October 31, 2022, we had a \$20.8 million outstanding balance under the agreement.

Stock Repurchase Program

Our Board of Directors (the Board) previously approved a stock repurchase program (the Program) with authorization to purchase up to \$1.0 billion of our common stock in December 2021. The Board approved a replenishment of the Program up to \$1.5 billion in September 2022.

During the fiscal year 2022, we repurchased 3.6 million shares of common stock at an average price of \$314.51 per share for an aggregate purchase price of \$1.1 billion. As of October 31, 2022, \$1.4 billion remained available for future stock repurchases. The pace of our repurchase activity will depend on factors such as our working capital needs, our cash requirements for acquisitions, our debt repayment obligations, our stock price, and economic and market conditions.

The IR Act was enacted in the United States on August 16, 2022. The IR Act imposes a 1% excise tax on the fair market value of stock repurchases made by covered corporations after December 31, 2022. The total taxable value of shares repurchased is reduced by the fair market value of any newly issued shares during the taxable year. We are assessing the potential impact of the stock repurchase excise tax. Based on our preliminary assessment, we do not expect a material impact on our overall capital allocation strategy or our consolidated financial statements. Risks related to the IR Act are described in Part I, Item 1A, *Risk Factors*.

Contractual and Other Obligations

Our material cash requirements include the following contractual and other obligations.

Leases

We have operating lease arrangements for office space, data center, equipment and other corporate assets. As of October 31, 2022, we had lease payment obligations, net of immaterial sublease income, of \$569.3 million, with \$54.5 million payable within 12 months.

Purchase Obligations

Purchase obligations represent an estimate of all open purchase orders and contractual obligations in the ordinary course of business for which we have not received the goods or services. As of October 31, 2022, we had \$661.1 million of purchase obligations, with \$367.4 million payable within 12 months. Although open purchase orders are considered enforceable and legally binding, the terms generally allow us the option to cancel, reschedule, and adjust our requirements based on our business needs prior to the delivery of goods or performance of services.

Term Loan

Refer to "Credit and Term Loan Facilities" under Item 7, *Management's Discussion and Analysis of Financial Condition and Results of Operations* included in this Annual Report on Form 10-K for more information.

Long Term Accrued Income Taxes

As of October 31, 2022, we had \$18.8 million of long-term accrued income taxes which represent uncertain tax benefits. Currently, a reasonably reliable estimate of timing of payments related to uncertain tax benefits in individual years beyond fiscal 2022 cannot be made due to uncertainties in timing of the commencement and settlement of potential tax audits.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

We are exposed to financial market risks, primarily due to changes in interest rates, foreign currency exchange rates, and non-marketable equity security price. None of market risk sensitive instruments are held for speculative trading purposes.

Interest Rate Risk. Our exposure to market risk for changes in interest rates relates to our cash, cash equivalents, short-term investments, and outstanding debt. As of October 31, 2022, all of our cash, cash equivalents, and debt were at short-term variable or fixed interest rates. As of October 31, 2022, we had an investment portfolio of fixed income securities of \$147.9 million. These securities, as with all fixed income instruments, are subject to interest rate risk and will decline in value if market interest rates increase. While par value generally approximates fair value on variable instruments, rising interest rates over time would increase both our interest income and our interest expense. The primary objective of our investment activities is to preserve the principal while at the same time maximizing yields without significantly increasing the risk. To achieve this objective, we maintain our portfolio of investments in a mix of tax-exempt and taxable instruments that meet high credit quality standards, as specified in our investment policy. Our policy also limits the amount of credit exposure to any one issue, issuer and type of instrument.

Our cash equivalents and debt by fiscal year of expected maturity and average interest rates as of October 31, 2022 were as follows:

	Maturing in Year Ending October 31,					Total	Fair Value
	2023	2024	2025	2026	2027 and thereafter		
	(in thousands)						
Cash & Cash equivalents	\$ 1,227,136					\$ 1,227,136	\$ 1,227,136
Approx. average interest rate	0.70 %						
Short-term investments	\$ 82,264	\$ 39,410	\$ 17,705	\$ 2,265	\$ 6,269	\$ 147,913	\$ 147,913
Approx. average coupon rate	2.01 %	2.01 %	3.11 %	0.98 %	1.45 %		
Short-term debt (variable rate):							
Credit Facility in China					\$ 20,824	\$ 20,824	\$ 20,824
Average interest rate					LPR + 0.74% of such rate		

Foreign Currency Risk. We operate internationally and are exposed to potentially adverse movements in currency exchange rates. The functional currency of the majority of our active foreign subsidiaries is the foreign subsidiary's local currency. A weakening U.S. dollar relative to other currencies increases expenses of our foreign subsidiaries when they are translated into U.S. dollars in our consolidated statements of income. Likewise, a strengthening of the U.S. dollar relative to other currencies, including the renminbi or Yen, reduces revenue of our foreign subsidiaries upon translation and consolidation. If the U.S. dollar continues to strengthen, this could adversely affect our financial condition and operating results. In addition, increased international sales in the future may result in greater foreign currency denominated sales, increasing our foreign currency risk. Our operating expenses incurred outside the United States and denominated in foreign currencies are increasing and are subject to fluctuations due to changes in foreign currency exchange rates. If we are not able to successfully hedge against the risks associated with foreign currency fluctuations, our financial condition and operating results could be adversely affected. We enter into hedges in the form of foreign currency forward contracts to reduce our exposure to foreign currency rate changes on non-functional currency denominated forecasted transactions and balance sheet positions including:

(1) certain assets and liabilities, (2) shipments forecasted to occur within approximately one month, (3) future billings and revenue on previously shipped orders, and (4) certain future intercompany invoices denominated in foreign currencies. The foreign currency contracts are carried at fair value and denominated in various currencies as listed in the tables below. The duration of forward contracts usually ranges from one month to 27 months. See Note 2 and Note 7 of the *Notes to Consolidated Financial Statements* for a description of our accounting for foreign currency contracts.

The success of our hedging activities depends upon the accuracy of our estimates of various balances and transactions denominated in non-functional currencies. Exchange rates are subject to significant and rapid fluctuations due to a number of factors, including interest rate changes and political and economic uncertainty. Therefore, we cannot predict the prospective impact of exchange rate fluctuations. To the extent our estimates are correct, gains and losses on our foreign currency contracts will be offset by corresponding losses and gains on the underlying transactions. For example, if the Euro were to depreciate by 10% compared to the U.S. dollar prior to the settlement of the Euro forward contracts listed in the table below providing information as of October 31, 2022, the fair value of the contracts would decrease by approximately \$19.5 million, and we would be required to pay approximately \$19.5 million to the counterparty upon contract maturity. At the same time, the U.S. dollar value of our Euro-based expenses would decline, resulting in positive cash flow of approximately \$19.5 million that would offset the loss and negative cash flow on the maturing forward contracts.

If estimates of our balances and transactions prove inaccurate, we will not be completely hedged, and we will record gains or losses, depending upon the nature and extent of such inaccuracy. Although we engage in foreign currency hedging activity, we may be unable to hedge all of our foreign currency risk, which could have a negative impact on our results of operations.

We enter into foreign exchange forward contracts with financial institutions and have not experienced nonperformance by counterparties. Further, we anticipate performance by all counterparties to such agreements.

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Information about the gross notional values of our foreign currency contracts as of October 31, 2022 was as follows:

	Gross Notional Amount in U.S. Dollars (in thousands)	Average Contract Rate
Forward Contract Values:		
Indian rupee	\$ 368,282	82.500
Japanese yen	264,649	146.852
Euro	195,285	1.086
Taiwanese dollar	130,412	29.967
Canadian dollar	102,201	1.321
Chinese renminbi	90,436	7.214
Korean won	83,935	1,289.396
Hungarian forint	51,056	423.933
British pound sterling	41,817	1.234
Israel shekel	38,386	3.419
Singapore dollar	10,498	1.396
Swiss franc	9,183	0.958
	<u>\$ 1,386,140</u>	

Equity Price Risk. Our non-marketable equity securities investments totaled \$31.9 million and \$17.6 million as of October 31, 2022 and 2021, respectively. Our strategic investments include privately-held companies that are considered to be in the start-up or development stages and have a higher inherent risk. Specifically, the technologies or products these companies have under development are typically in the early stages and may never materialize, which could result in a loss of a substantial part of our initial investment in these companies. These investments could be impaired if the carrying value exceeds the fair value and is not expected to recover. The evaluation of these investments is based on information provided by these companies, which is not subject to the same disclosure regulations as U.S. publicly traded companies and as such, the basis for these evaluations is subject to the timing and accuracy of the data provided.

Item 8. Financial Statements and Supplementary Data**Report of Independent Registered Public Accounting Firm**

To the Stockholders and Board of Directors

Synopsys, Inc.:

Opinions on the Consolidated Financial Statements and Internal Control Over Financial Reporting

We have audited the accompanying consolidated balance sheets of Synopsys, Inc. and subsidiaries (the Company) as of October 29, 2022 and October 30, 2021, the related consolidated statements of income, comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended October 29, 2022, and the related notes (collectively, the consolidated financial statements). We also have audited the Company's internal control over financial reporting as of October 29, 2022, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of October 29, 2022 and October 30, 2021, and the results of its operations and its cash flows for each of the years in the three-year period ended October 29, 2022, in conformity with U.S. generally accepted accounting principles. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of October 29, 2022 based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

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 the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's consolidated financial statements and an opinion on the Company's internal control over financial reporting 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, and whether effective internal control over financial reporting was maintained in all material respects.

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 audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

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

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includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

Critical Audit Matter

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: (1) relates to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of a critical audit matter 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.

Evaluation of the Company's analysis of terms and conditions in software and intellectual property license contracts with customers

As discussed in Notes 2 and 3 to the consolidated financial statements, the Company generates revenue from the sale of products that include software and intellectual property (IP) licenses, hardware products, maintenance and services. The Company's contracts with customers often include promises to transfer multiple products and services to a customer. Arrangements with customers can involve hundreds of products and various license rights, and customers negotiate with the Company over many aspects of these arrangements. The Company's customers often request a broader portfolio of solutions, support and services and seek more favorable terms such as expanded license usage, future purchase rights and other unique rights at an overall lower total cost. The Company recognized total revenue of \$5,081.5 million for the year ended October 29, 2022, which included revenue related to software and IP licenses.

We identified the evaluation of the Company's analysis of terms and conditions in significant software and IP license contracts with customers and their effect on revenue recognition as a critical audit matter. Complex auditor judgment was required to assess the Company's judgments made in applying revenue recognition requirements to certain terms and conditions.

The following are the primary procedures we performed to address this critical audit matter. We evaluated the design and tested the operating effectiveness of certain internal controls related to the Company's revenue recognition process, including the Company's analysis of terms and conditions in software and IP license contracts with customers and their effect on revenue recognition. We tested certain software and IP license customer contracts by inspecting the underlying customer agreements and evaluating the Company's assessment of the contractual terms and conditions in accordance with revenue recognition requirements. For a selection of software and IP license contracts with customers entered during the year, we inquired of personnel outside of the accounting function to corroborate our understanding of certain terms and conditions.

/s/ KPMG LLP

We have served as the Company's auditor since 1992.

Santa Clara, California
December 12, 2022

SYNOPSYS, INC.
CONSOLIDATED BALANCE SHEETS
(In thousands, except par value amounts)

	October 31,	
	2022	2021
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 1,417,608	\$ 1,432,840
Short-term investments	147,913	147,949
Total cash, cash equivalents and short-term investments	1,565,521	1,580,789
Accounts receivable, net	796,091	568,501
Inventories	211,927	229,023
Prepaid and other current assets	439,130	430,028
Total current assets	3,012,669	2,808,341
Property and equipment, net	483,300	472,398
Operating lease right-of-use assets, net	559,090	493,251
Goodwill	3,842,234	3,575,785
Intangible assets, net	386,446	279,132
Deferred income taxes	670,653	612,655
Other long-term assets	463,695	510,698
Total assets	<u>\$ 9,418,087</u>	<u>\$ 8,752,260</u>
LIABILITIES, REDEEMABLE NON-CONTROLLING INTEREST AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable and accrued liabilities	\$ 809,403	\$ 741,191
Operating lease liabilities	54,274	79,678
Deferred revenue	1,910,822	1,517,623
Short-term debt	—	74,992
Total current liabilities	2,774,499	2,413,484
Long-term operating lease liabilities	581,273	487,003
Long-term deferred revenue	154,472	136,303
Long-term debt	20,824	25,094
Other long-term liabilities	327,829	391,433
Total liabilities	3,858,897	3,453,317
Redeemable non-controlling interest	38,664	—
Stockholders' equity:		
Preferred stock, \$0.01 par value: 2,000 shares authorized; none outstanding	—	—
Common stock, \$0.01 par value: 400,000 shares authorized; 152,375 and 153,062 shares outstanding, respectively	1,524	1,531
Capital in excess of par value	1,487,126	1,576,363
Retained earnings	5,534,307	4,549,713
Treasury stock, at cost: 4,886 and 4,198 shares, respectively	(1,272,955)	(782,866)
Accumulated other comprehensive income (loss)	(234,277)	(49,604)
Total Synopsys stockholders' equity	5,515,725	5,295,137
Non-controlling interest	4,801	3,806
Total stockholders' equity	5,520,526	5,298,943
Total liabilities, redeemable non-controlling interest and stockholders' equity	<u>\$ 9,418,087</u>	<u>\$ 8,752,260</u>

See the accompanying *Notes to Consolidated Financial Statements*.

SYNOPSYS, INC.
CONSOLIDATED STATEMENTS OF INCOME
(In thousands, except per share amounts)

	Year Ended October 31,		
	2022	2021	2020
Revenue:			
Time-based products	\$ 2,993,786	\$ 2,633,763	\$ 2,365,199
Upfront products	1,226,728	861,063	735,572
Total products revenue	4,220,514	3,494,826	3,100,771
Maintenance and service	861,028	709,367	584,510
Total revenue	5,081,542	4,204,193	3,685,281
Cost of revenue:			
Products	653,783	542,114	487,307
Maintenance and service	342,978	271,202	254,931
Amortization of intangible assets	66,936	48,461	52,452
Total cost of revenue	1,063,697	861,777	794,690
Gross margin	4,017,845	3,342,416	2,890,591
Operating expenses:			
Research and development	1,680,379	1,504,823	1,279,022
Sales and marketing	779,777	712,491	632,010
General and administrative	353,840	322,988	284,530
Amortization of intangible assets	29,754	33,919	38,829
Restructuring charges	12,057	33,405	36,059
Total operating expenses	2,855,807	2,607,626	2,270,450
Operating income	1,162,038	734,790	620,141
Other income (expense), net	(46,524)	70,724	18,018
Income before income taxes	1,115,514	805,514	638,159
Provision (benefit) for income taxes	137,078	49,155	(25,288)
Net income	978,436	756,359	663,447
Net income (loss) attributed to non-controlling interest and redeemable non-controlling interest	(6,158)	(1,157)	(900)
Net income attributed to Synopsys	\$ 984,594	\$ 757,516	\$ 664,347
Net income per share attributed to Synopsys:			
Basic	\$ 6.44	\$ 4.96	\$ 4.40
Diluted	\$ 6.29	\$ 4.81	\$ 4.27
Shares used in computing per share amounts:			
Basic	153,002	152,698	151,135
Diluted	156,485	157,340	155,706

See the accompanying *Notes to Consolidated Financial Statements*.

SYNOPSYS, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(In thousands)

	Year Ended October 31,		
	2022	2021	2020
Net income	\$ 978,436	\$ 756,359	\$ 663,447
Other comprehensive income (loss):			
Change in foreign currency translation adjustment	(108,145)	9,415	30,466
Change in unrealized gains (losses) on available-for-sale securities, net of tax of \$0 for periods presented	(2,353)	(246)	—
Cash flow hedges:			
Deferred gains (losses), net of tax of \$28,416, \$(1,736), and \$(3,192) for fiscal years 2022, 2021 and 2020, respectively	(79,069)	9,860	7,834
Reclassification adjustment on deferred (gains) losses included in net income, net of tax of \$(1,342), \$4,593, and \$176 for fiscal years 2022, 2021 and 2020, respectively	4,894	(14,559)	73
Other comprehensive income (loss), net of tax effects	(184,673)	4,470	38,373
Comprehensive income	793,763	760,829	701,820
Less: Net income (loss) attributed to non-controlling interest and redeemable non-controlling interest	(6,158)	(1,157)	(900)
Comprehensive income attributed to Synopsys	<u>\$ 799,921</u>	<u>\$ 761,986</u>	<u>\$ 702,720</u>

See the accompanying *Notes to Consolidated Financial Statements*.

SYNOPSYS, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(In thousands)

	Common Stock		Capital in Excess of Par Value	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Income (Loss)	Total Synopsys Stockholders' Equity	Non-controlling Interest	Stockholders' Equity
	Shares	Amount							
Balance at October 31, 2019	150,331	\$ 1,503	\$1,635,455	\$3,164,144	\$ (625,642)	\$ (92,447)	\$ 4,083,013	\$ 5,863	\$ 4,088,876
Net income				664,347			664,347	(900)	663,447
Other comprehensive income (loss), net of tax effects						38,373	38,373		38,373
Purchases of treasury stock	(1,585)	(14)	14		(242,078)		(242,078)		(242,078)
Common stock issued, net of shares withheld for employee taxes	3,872	39	(230,887)	(33,094)	379,107		115,165		115,165
Stock-based compensation			248,584				248,584		248,584
Balance at October 31, 2020	152,618	\$ 1,528	\$1,653,166	\$3,795,397	\$ (488,613)	\$ (54,074)	\$ 4,907,404	\$ 4,963	\$ 4,912,367
Net income				757,516			757,516	(1,157)	756,359
Retained earnings adjustment due to adoption of ASC 326				(3,200)			(3,200)		(3,200)
Other comprehensive income (loss), net of tax effects						4,470	4,470		4,470
Purchases of treasury stock	(2,780)	(28)	28		(753,081)		(753,081)		(753,081)
Equity forward contract, net			(35,000)				(35,000)		(35,000)
Common stock issued, net of shares withheld for employee taxes	3,224	31	(387,103)		458,828		71,756		71,756
Stock-based compensation			345,272				345,272		345,272
Balance at October 31, 2021	153,062	\$ 1,531	\$1,576,363	\$4,549,713	\$ (782,866)	\$ (49,604)	\$ 5,295,137	\$ 3,806	\$ 5,298,943
Net income				984,594			984,594	(1,306)	983,288
Other comprehensive income (loss), net of tax effects						(184,673)	(184,673)		(184,673)
Purchases of treasury stock	(3,609)	(36)	36		(1,135,000)		(1,135,000)		(1,135,000)
Equity forward contract, net			35,000				35,000		35,000
Common stock issued, net of shares withheld for employee taxes	2,922	29	(581,001)		644,911		63,939		63,939
Stock-based compensation			456,728				456,728	2,301	459,029
Balance at October 31, 2022	152,375	\$ 1,524	\$1,487,126	\$5,534,307	\$ (1,272,955)	\$ (234,277)	\$ 5,515,725	\$ 4,801	\$ 5,520,526

See the accompanying *Notes to Consolidated Financial Statements*.

SYNOPSIS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Year Ended October 31,		
	2022	2021	2020
Cash flows from operating activities:			
Net income	\$ 978,436	\$ 756,359	\$ 663,447
Adjustments to reconcile net income to net cash provided by operating activities:			
Amortization and depreciation	228,405	203,676	209,986
Reduction of operating lease right-of-use assets	89,541	86,645	82,895
Amortization of capitalized costs to obtain revenue contracts	73,026	64,698	61,185
Stock-based compensation	459,029	345,272	248,584
Allowance for credit losses	(3,477)	18,515	20,875
Deferred income taxes	(36,913)	(128,583)	(111,526)
Other non-cash	10,188	15,859	4,325
Net changes in operating assets and liabilities, net of acquired assets and liabilities:			
Accounts receivable	(251,390)	201,706	(236,806)
Inventories	1,320	(48,046)	(55,024)
Prepaid and other current assets	(89,983)	(102,174)	(11,298)
Other long-term assets	(15,283)	(153,037)	(83,367)
Accounts payable and accrued liabilities	(34,066)	125,133	113,773
Operating lease liabilities	(85,828)	(82,581)	(78,578)
Income taxes	1,644	28,855	14,120
Deferred revenue	414,251	160,325	148,722
Net cash provided by operating activities	1,738,900	1,492,622	991,313
Cash flows from investing activities:			
Proceeds from sales and maturities of short-term investments	93,696	12,850	—
Purchases of short-term investments	(97,245)	(161,732)	—
Proceeds from sales of long-term investments	582	—	2,151
Purchases of long-term investments	(7,000)	(7,591)	(2,762)
Purchases of property and equipment	(136,589)	(93,764)	(154,717)
Acquisitions, net of cash acquired	(422,374)	(296,017)	(201,045)
Capitalization of software development costs	(2,493)	(1,976)	(4,045)
Other	(1,200)	(800)	—
Net cash used in investing activities	(572,623)	(549,030)	(360,418)
Cash flows from financing activities:			
Proceeds from credit facilities	—	—	276,489
Repayment of debt	(76,838)	(28,061)	(288,879)
Issuances of common stock	237,956	210,719	197,403
Payments for taxes related to net share settlement of equity awards	(174,005)	(138,950)	(82,225)
Purchase of equity forward contract	—	(35,000)	—
Purchases of treasury stock	(1,100,000)	(753,081)	(242,078)
Other	(3,413)	(4,375)	(1,316)
Net cash used in financing activities	(1,116,300)	(748,748)	(140,606)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(65,296)	2,369	17,154
Net change in cash, cash equivalents and restricted cash	(15,319)	197,213	507,443
Cash, cash equivalents and restricted cash, beginning of year	1,435,183	1,237,970	730,527
Cash, cash equivalents and restricted cash, end of year	\$ 1,419,864	\$ 1,435,183	\$ 1,237,970
Supplemental disclosure of cash flow information:			
Cash paid for income taxes during the year:	\$ 167,768	\$ 149,762	\$ 70,711
Interest payments during the year:	\$ 1,258	\$ 3,365	\$ 5,136
Non-cash activities:			
Purchase of property and equipment included in accounts payable	\$ 17,857	\$ 8,654	\$ 6,900
Conversion of notes receivable to non-marketable equity securities	\$ 14,280	\$ —	\$ —

See the accompanying *Notes to Consolidated Financial Statements*.

SYNOPSYS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1. Description of Business

Synopsys, Inc. (Synopsys, we, our or us) provides products and services used across the entire Silicon to Software spectrum, from engineers creating advanced semiconductors to software developers seeking to ensure the security and quality of their code.

We are a global leader in electronic design automation (EDA) software that engineers use to design and test integrated circuits (ICs), also known as chips. We also offer semiconductor intellectual property (IP) products, which are pre-designed circuits that engineers use as components of larger chip designs rather than designing those circuits themselves. We provide software and hardware used to validate the electronic systems that incorporate chips and the software that runs on them. We also provide technical services and support to help our customers develop advanced chips and electronic systems. These products and services are part of our Semiconductor & System Design segment.

We are also a leading provider of software tools and services that improve the security, quality and compliance of software in a wide variety of industries, including electronics, financial services, automotive, medicine, energy and industrials. These tools and services are part of our Software Integrity segment.

Note 2. Summary of Significant Accounting Policies

Basis of Presentation and Principles of Consolidation. Our fiscal year generally ends on the Saturday nearest to October 31 and consists of 52 weeks, with the exception that approximately every five years, we have a 53-week year. When a 53-week year occurs, we include the additional week in the first quarter to realign fiscal quarters with calendar quarters. Fiscal 2022, 2021 and 2020 were 52-week years ending on October 29, 2022, October 30, 2021 and October 31, 2020, respectively. For presentation purposes, the consolidated financial statements and accompanying notes refer to the closest calendar month end. Fiscal 2023 will be a 52-week year.

The consolidated financial statements include our accounts and the accounts of our wholly and majority-owned subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

Use of Estimates. To prepare financial statements in conformity with U.S. generally accepted accounting principles, management must make estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. Actual results could differ from these estimates and could have a material impact on our operating results and financial position.

Comparability. Effective beginning of fiscal 2022, we adopted an Accounting Standards Update (ASU) to simplify the accounting for income taxes in Accounting Standards Codification (ASC) 740, Income Taxes, on a prospective basis. Effective beginning the second quarter of fiscal 2022, we early adopted an ASU, on a prospective basis, to apply revenue guidance to recognize and measure contract assets and contract liabilities from contracts with customers acquired in a business combination on the acquisition date, instead of measuring them at fair value. The adoption of these updates did not have a material impact on our consolidated financial statements.

Effective beginning of fiscal 2021, we adopted ASC 326, Measurement of Credit Losses on Financial Instruments. Prior periods were not retrospectively recast and accordingly, the consolidated statements of income for the year ended October 31, 2020 were prepared using accounting standards that were different than those in effect for the years ended October 31, 2022 and 2021.

Certain reclassifications have been made to the prior year's consolidated financial statements to conform to the current year presentation. The reclassifications did not have a material impact on the prior year's consolidated balance sheets, statements of income, statements of comprehensive income and statements of cash flows.

Cash and Cash Equivalents and Short-term Investments. We classify investments with original maturities of three months or less when acquired as cash equivalents. Our investments in debt securities with maturities of longer than three months from the consolidated balance sheets date are classified as short-term investments as we may convert these investments into cash at any time to fund general operations. Our debt securities generally have an effective maturity term of less than three years and are classified as available-for-sale securities carried at fair value, with unrealized gains and losses included in the consolidated balance sheets as a component of accumulated other comprehensive income (loss). For available-for-sale debt securities in an unrealized loss

SYNOPSYS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—Continued

position, we evaluate whether a current expected credit loss exists based on available information relevant to the credit rating of the security, current economic conditions and reasonable and supportable forecasts. The allowance for credit loss is recorded in other income (expense), net, on the consolidated statements of income, not to exceed the amount of the unrealized loss. Any excess unrealized loss other than the credit loss is recognized in accumulated other comprehensive income or loss in the stockholders' equity section of the consolidated balance sheets. The cost of securities sold is based on the specific identification method and realized gains and losses are included in other income (expense), net. See Note 7. *Financial Assets and Liabilities*. There were no credit losses on available-for-sale debt securities recognized in the years ended October 31, 2022 and 2021.

Accounts Receivable, Net. The balances consist of billed accounts receivable and current portion of unbilled accounts receivable. Trade accounts receivable are recorded at the invoiced amount and do not bear interest.

Allowance for Credit Losses. We maintain an allowance for credit losses for expected uncollectible accounts receivable and contract assets, which is recorded as an offset to accounts receivable or contract assets and provisions for credit losses are recorded in general and administrative expense in the consolidated statements of income. The allowance for current expected credit losses is based on a review of customer accounts and considers historical credit loss information that is adjusted for current conditions and reasonable and supportable forecasts. The allowance for credit losses is reviewed on a quarterly basis to assess the adequacy of the allowance. The following table presented the changes in the allowance for credit losses:

Fiscal Year	Balance at Beginning of Period	Provisions	Write- offs/Adjustments	Balance at End of Period
	(in thousands)			
2022	\$ 31,605	\$ 12,424	\$ (2,793)	\$ 41,236
2021	\$ 29,489	\$ 18,515	\$ (16,399)	\$ 31,605
2020	\$ 9,971	\$ 20,875	\$ (1,357)	\$ 29,489

Inventories. Inventories are computed at standard costs which approximate actual costs, on a first-in, first-out basis and valued at the lower of cost or net realizable value. Inventories primarily include components and finished goods for complex emulation and prototyping hardware systems. The valuation process includes a review of the forecasts based upon future demand and market conditions. Inventory provisions are recorded when the costs are determined to be in excess of anticipated demand or considered obsolete. Inventory provisions are impacted by market and economic conditions, technology changes, new product introductions and changes in strategic direction, and require estimates that may include uncertain elements.

Fair Values of Financial Instruments. Our cash equivalents, short-term investments and foreign currency contracts are carried at fair value. The fair value of our accounts receivable and accounts payable approximates the carrying amount due to their short duration. Non-marketable equity securities are accounted for using either the measurement alternative or equity method of accounting, net of impairments. We perform periodic impairment analysis on these non-marketable equity securities. The carrying amount of the short-term and long-term debt approximates the estimated fair value. See Note 8. *Fair Value Measurements*.

Foreign Currency Contracts. We operate internationally and are exposed to potentially adverse movements in currency exchange rates. We enter into hedges in the form of foreign currency forward contracts to reduce our exposure to foreign currency rate changes on non-functional currency denominated forecasted transactions and balance sheet positions. The assets or liabilities associated with the forward contracts are recorded at fair value in other current assets or accrued liabilities in the consolidated balance sheets.

The accounting for gains and losses resulting from changes in fair value depends on the use of the foreign currency forward contract and whether it is designated and qualifies for hedge accounting. See Note 7. *Financial Assets and Liabilities*.

Concentration of Credit Risk. Financial instruments that potentially subject us to significant concentrations of credit risk consist principally of cash equivalents, short-term investments, foreign currency contracts, and trade accounts receivable. We maintain cash equivalents primarily in highly rated taxable and tax-exempt money market funds located in the U.S. and in various overseas locations.

SYNOPSYS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—Continued

We sell our products worldwide primarily to customers in the global electronics market. We perform on-going credit evaluations of our customers' financial condition and do not require collateral. We establish reserves for potential credit losses and such losses have been within management's expectations and have not been material in any year presented.

Income Taxes. We account for income taxes using the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date.

We account for uncertainty in income taxes using a two-step approach to recognizing and measuring uncertain tax positions. The first step is to evaluate the tax position for recognition by determining whether it is more likely than not that the position will be sustained on audit, including resolution of related appeals or litigation processes, if any. The second step is to measure the tax benefit as the largest amount which is more than 50% likely of being realized upon ultimate settlement. An uncertain tax position is considered effectively settled on completion of an examination by a taxing authority if certain other conditions are satisfied.

Property and Equipment. Property and equipment is recorded at cost less accumulated depreciation. Assets, excluding land, are depreciated using the straight-line method over their estimated useful lives. Depreciation expenses were \$107.7 million, \$119.1 million and \$119.1 million in fiscal 2022, 2021 and 2020, respectively. Repair and maintenance costs are expensed as incurred and such costs were \$72.9 million, \$62.6 million and \$62.1 million in fiscal 2022, 2021 and 2020, respectively.

The useful lives of depreciable assets are as follows:

	Useful Life in Years
Computer and other equipment	3 - 8
Buildings	30
Furniture and fixtures	5
Leasehold improvements	Shorter of the lease term or the estimated useful life

Investments in Equity Securities. We hold equity securities in privately held companies for the promotion of business and strategic objectives. These investments are initially recorded at cost and included in other long-term assets in the consolidated balance sheets and are subject to a periodic impairment review. We account for these investments using the measurement alternative when the fair value of the investment is not readily determinable and we do not have the ability to exercise significant influence or using the equity method of accounting when it is determined that we have the ability to exercise significant influence. For investments accounted for using the equity method of accounting, we record our proportionate share of the investee's income or loss to other income (expense), net, in our consolidated statements of income.

Leases. We determine if an arrangement is a lease at inception of the contract, which is the date on which the terms of the contract are agreed to, and the agreement creates enforceable rights and obligations. A contract is or contains a lease when we have the right to control the use of an identified asset for a period of time. The commencement date of the lease is the date that the lessor makes an underlying asset available for use by the lessee. On the commencement date, leases are evaluated for classification and assets and liabilities are recognized based on the present value of lease payments over the lease term.

The lease term used to calculate the lease liability includes options to extend or terminate the lease when it is reasonably certain that the option will be exercised. The right of use (ROU) asset is initially measured as the amount of lease liability, adjusted for any initial lease costs, prepaid lease payments and any lease incentives. Variable lease payments, consisting primarily of reimbursement of costs incurred by lessors for common area maintenance, real estate taxes and insurance, are not included in the lease liability and are recognized as they are incurred.

SYNOPSYS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—Continued

As most of our leases do not provide an implicit rate, we use the incremental borrowing rate at lease commencement to measure ROU assets and lease liabilities. We use a benchmark senior unsecured yield curve for debt instruments over the similar term, and consider specific credit quality, market conditions, tenor of lease arrangements, and quality of collateral to determine the incremental borrowing rate.

Operating lease expense is generally recognized on a straight-line basis over the lease term. We have elected the practical expedient to account for the lease and non-lease components as a single lease component for the majority of our asset classes. For leases with an initial term of one year or less, we have elected not to record the ROU asset or liability.

Business Combinations. We allocate the purchase price of acquired companies to the tangible and intangible assets acquired and liabilities assumed based on their acquisition-date fair values with the exception of contract assets and contract liabilities (deferred revenue) which are recognized and measured on the acquisition date in accordance with our "Revenue Recognition" policy. The excess of the fair value of purchase consideration over the fair value of these identifiable assets and liabilities is recorded as goodwill. Acquisition-related expenses are recognized separately from the business combination and are expensed as incurred. We include the results of operations of the businesses that are acquired from the acquisition date.

Goodwill. Goodwill represents the excess of the aggregate purchase price over the fair value of the net tangible and identifiable intangible assets acquired by us. The carrying amount of goodwill at each reporting unit is tested for impairment annually in the fourth fiscal quarter, or more frequently if facts and circumstances warrant a review.

Because the fair values of our reporting units have historically exceeded and are expected to continue to significantly exceed the carrying value of our net assets, we perform a qualitative goodwill impairment assessment. A quantitative goodwill impairment assessment is performed if it is determined that it is more likely than not that the fair value of one of our reporting units is lower than the carrying value. When a quantitative goodwill impairment assessment is performed, we use an income approach based on discounted cash flow analysis, a market approach based on market multiples, or a combination of both. If the fair value of a reporting unit is less than its carrying value, a goodwill impairment charge is recorded for the difference. There was no goodwill impairment in fiscal 2022, 2021 and 2020.

Intangible Assets. Intangible assets consist of acquired technology, certain contract rights, customer relationships, trademarks and trade names, and capitalized software. These intangible assets are acquired through business combinations, direct purchases, or internally developed capitalized software. Intangible assets are amortized on a straight-line basis over their estimated useful lives which range from one to ten years.

We review the carrying values of long-lived assets including intangible assets whenever events or changes in circumstances indicate that the carrying value may not be fully recoverable. Recoverability of long-lived assets is measured by comparing the carrying value of such asset group to the future undiscounted cash flows that asset group is expected to generate. If the undiscounted future cash flow is less than the carrying amount of the asset group, we recognize an impairment loss based on the excess of the carrying amount over the fair value of the asset group. There were no impairment charges for long-lived assets in fiscal 2022, 2021 and 2020.

Redeemable Non-controlling Interest. Non-controlling interest that is not solely redeemable within our control is reported as temporary equity in our consolidated balance sheets. The carrying value of the redeemable non-controlling interest equals the redemption value at the end of each reporting period, after giving effect to the change from the net income (loss) attributable to the redeemable non-controlling interest. We remeasure the redemption value of the non-controlling interest on a quarterly basis and changes in the estimated redemption value are recognized through retained earnings and may also impact the net income or loss attributable to common stockholders of Synopsys if the redemption value falls below a stated threshold. See Note 4. ***Business Combinations*** for more information regarding the redeemable non-controlling interests.

Revenue Recognition. We recognize revenue for the transfer of services or products to customers in an amount that reflects the consideration to which we expect to be entitled in exchange for those services or products. The principle is achieved through the following five-step approach:

- Identification of the contract, or contracts, with the customer
- Identification of the performance obligation in the contract

SYNOPSYS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—Continued

- Determination of the transaction price
- Allocation of the transaction price to the performance obligations in the contract
- Recognition of revenue when, or as, we satisfy a performance obligation

Nature of Products and Services

We generate revenue from the licensing of our EDA software, IP Blocks, and Software Integrity products, as well as sale of hardware products, and maintenance and services. The various types are set forth below.

Electronic Design Automation

Software license revenue consists of fees associated with the licensing of our software primarily through Technology Subscription License (TSL) contracts. TSLs are time-based licenses for a finite term and generally provide the customer with limited rights to receive, or to exchange certain quantities of licensed software for, unspecified future technology. The majority of our arrangements are TSLs due to the nature of our business and customer requirements. In addition to the licenses, the arrangements also include: post-contract customer support, which includes providing frequent updates and upgrades to maintain the utility of the software due to rapid changes in technology; other intertwined services such as multiple copies of the tools; assisting our customers in applying our technology in the customers' development environment; and rights to remix licenses for other licenses. Payments are generally received in equal or near equal installments over the term of the arrangement. We have concluded that our software licenses in TSL contracts are not distinct from our obligation to provide unspecified software updates to the licensed software throughout the license term. Such updates represent inputs to a single, combined performance obligation, commencing upon the later of the arrangement effective date or transfer of control to 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 pattern of transfer to the customer over the duration of the subscription term.

IP & System Integration

We generally license IP under nonexclusive license agreements that provide usage rights for specific applications. Additionally, for certain IP license agreements, royalties are collected as customers sell their own products that incorporate our IP. These arrangements generally have two distinct performance obligations that consist of transferring the licensed IP and the post contract support service. Support services consist of a stand-ready obligation to provide technical support and software updates over the support term. Revenue allocated to the IP license is recognized at a point in time upon the later of the delivery date or the beginning of the license period, and revenue allocated to support services is recognized ratably over the support term. Royalties are recognized as revenue is earned, generally when the customer sells its products that incorporate our IP.

Software Integrity Products

Software Integrity product arrangements provide customers the right to software licenses, software updates and technical support. Under the term of these arrangements, the customer expects to receive integral updates to the software licenses that protect the customer's software from potential security vulnerabilities. The licenses and software updates together serve to fulfill our commitment to the customer, as they represent inputs to a single, combined performance obligation that commences upon the later of the arrangement effective date or transfer of the software license. Software updates are part of the contract with the customer, and 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

We generally have two performance obligations in arrangements involving the sale of hardware products. The first performance obligation is to transfer the hardware product, which includes embedded software integral to the functionality of the hardware product. The second performance obligation is to provide maintenance on the hardware and our embedded software, including 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

SYNOPSYS, INC.
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portion of the transaction price allocated to the hardware product is recognized as revenue at a point in time when control of the hardware is transferred to the customer. We have concluded that control generally transfers upon shipment because the customer has the ability to direct the use of the asset and an obligation to pay for the hardware. The portion of the transaction price allocated to maintenance is recognized as revenue that is ratable over the maintenance term.

Professional Services

Our arrangements often include service elements (other than maintenance and support services). These services include training, design assistance, and consulting. These services are generally performed on a time and materials basis, and are recognized over time, as the customer simultaneously receives and consumes the benefit provided. Certain arrangements also include the customization or modification of licensed IP. Revenue from these contracts is recognized over time as the services are performed, when the development is specific to the customer's needs and we have enforceable rights to payment for performance completed. Inputs such as costs incurred and hours expended are used in order to measure progress of performance. We have a history of accurately estimating project status and the costs necessary to complete projects. A number of internal and external factors can affect these estimates, including labor rates, utilization and efficiency variances, specification and testing requirement changes, and changes in customer delivery priorities. Payments for services are generally due upon milestones in the contract or upon consumption of the hourly resources.

Flexible Spending Accounts

Our customers frequently enter into non-cancelable Flexible Spending Account arrangements (FSA) 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 our products or services. These arrangements do not meet the definition of a revenue contract until the customer executes a separate order (pull-down request) to identify the required products and services that they are purchasing. The combination of the FSA arrangement and the subsequent order creates enforceable rights and obligations, thus meeting the definition of a revenue contract. Each separate order under the agreement is treated as an individual contract and accounted for based on the respective performance obligations included within the pull-down requests.

Significant Judgments

Our contracts with customers often include promises to transfer multiple products and services to a customer. Determining whether services and products are considered distinct performance obligations that should be accounted for separately versus together requires significant judgment. We have concluded that (1) our EDA software licenses in TSL contracts are not distinct from our obligation to provide unspecified software updates to the licensed software throughout the license term, because those promises represent inputs to a single, combined performance obligation, and (2) 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. In reaching this conclusion, we considered the nature of the obligation to customers which is to provide an ongoing right to use the most up to date and relevant software. As EDA customers operate in a rapidly changing and competitive environment, satisfying the obligation requires providing critical updates to the existing software products, including ongoing iterative interaction with customers to make the software relevant to customers' ability to meet the time to go to market with advanced products.

Similarly, we also concluded that in our Software Integrity business, the licenses and maintenance updates serve together to fulfill our commitment to the customer as both work together to provide the functionality to the customer and represent a combined performance obligation because the updates are essential to the software's central utility, which is to identify security vulnerabilities and other threats.

Our contracts with customers can involve hundreds of products and various license rights. Customers often negotiate a broad portfolio of solutions, and favorable terms along with future purchase options to manage their overall costs. Determining whether the purchase options are considered distinct performance obligations that should be accounted for separately as material rights versus combined together may require significant judgment.

Judgment is also required to determine the standalone selling price (SSP) for each distinct performance obligation. For non-software performance obligations (IP, Hardware, and services), SSP is established based on observable

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prices of products and services sold separately. SSP for license (and related updates and support) in a contract with multiple performance obligations is determined by applying a residual approach whereby all other non-software performance obligations within a contract are first allocated a portion of the transaction price based upon their respective SSP, using observable prices, with any residual amount of the transaction price allocated to the license because we do not sell the license separately, and the pricing is highly variable.

Contract Balances

The timing of revenue recognition may differ from the timing of invoicing customers, and these timing differences result in receivables (billed or unbilled), contract assets, or contract liabilities (deferred revenue) on our consolidated balance sheet. We record a contract asset when revenue is recognized prior to the right to invoice, or deferred revenue when revenue is recognized subsequent to invoicing. For time-based software agreements, customers are generally invoiced in equal, quarterly amounts, although some customers prefer to be invoiced in single or annual amounts. We record an unbilled receivable when revenue is recognized and we have an unconditional right to invoice and receive payment.

Warranties and Indemnities

Warranties. We generally warrant our products to be free from defects in media and to substantially conform to material specifications for a period of 90 days for our software products and for up to six months for our hardware products.

Indemnities. In addition to such warranties, in certain cases, we provide our customers with limited indemnification with respect to claims that their use of our software products infringes on patents, copyrights, trademarks or trade secrets. For example, in connection with a litigation campaign launched by Bell Semiconductor LLC (Bell Semic), a patent monetization entity, some customers have requested defense and indemnification against claims of patent infringement asserted by Bell Semic in various district court litigations and at the U.S. International Trade Commission. Bell Semic alleges that the customers' use of one or more features of certain of our products infringes one or more of six patents held by Bell Semic. We have offered to defend some of our customers consistent with the terms of our End User License Agreement. We are unable to estimate the potential impact of these commitments on the future results of operations.

Net Income Per Share. We compute basic net income per share by dividing net income available to common stockholders by the weighted average number of common shares outstanding during the period. Diluted net income per share reflects the dilution from potential common shares outstanding such as stock options and unvested restricted stock units and awards during the period using the treasury stock method. See Note 14. *Net Income Per Share.*

Foreign Currency Translation. The functional currency of the majority of our active foreign subsidiaries is the foreign subsidiary's local currency. Assets and liabilities that are not denominated in the functional currency are remeasured into the functional currency with any related gains or losses recorded in earnings. We translate assets and liabilities of our non-U.S. dollar functional currency foreign operations into the U.S. dollar reporting currency at exchange rates in effect at the balance sheet date. We translate income and expense items of such foreign operations into the U.S. dollar reporting currency at average exchange rates for the period. Accumulated translation adjustments are reported in stockholders' equity, as a component of accumulated other comprehensive income (loss).

Recently Adopted Accounting Pronouncements

In December 2019, the Financial Accounting Standards Board (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. We adopted the standard as of the beginning of fiscal 2022 on a prospective basis and the adoption did not have a material impact on our consolidated financial statements.

Beginning in fiscal 2021, we adopted ASC 326, which was issued by the FASB in June 2016 as ASU 2016-13 Financial Instruments – Credit Losses: Measurement of Credit Losses on Financial Instruments. The ASU replaced previous incurred loss impairment guidance and established a single expected credit losses allowance framework for financial assets carried at amortized cost. It also eliminated the concept of other-than-temporary impairment and requires credit losses related to certain available-for-sale debt securities to be recorded through an allowance for

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credit losses. We adopted ASC 326 using the modified retrospective method, which requires a cumulative-effect adjustment to the opening balance of retained earnings to be recognized on the date of adoption and, accordingly, recorded a net decrease of \$3.2 million to retained earnings as of beginning of fiscal 2021. Please see the “Allowance for Credit Losses” accounting policy above.

In October 2021, the FASB issued ASU 2021-08, Business Combinations (Topic 805): Accounting for Contract Assets and Contract Liabilities from Contracts with Customers. The new guidance requires contract assets and contract liabilities acquired in a business combination to be recognized and measured by the acquirer on the acquisition date in accordance with ASC 606, Revenue from Contracts with Customers, as if the acquirer had originated the contracts. We early adopted the standard in the second quarter of fiscal 2022 on a prospective basis, and the adoption did not have a material impact on our consolidated financial statements.

Recent Accounting Pronouncements Not Yet Adopted

In June 2022, the FASB issued ASU 2022-03, Fair Value Measurement (Topic 820): Fair Value Measurement of Equity Securities Subject to Contractual Sale Restrictions (ASU 2022-03), which applies to all equity securities measured at fair value that are subject to contractual sale restrictions. This change prohibits entities from taking into account contractual restrictions on the sale of equity securities when estimating fair value and introduces required disclosures for such transactions. The standard will become effective for us beginning on November 1, 2024 and will be applied prospectively. Early adoption is permitted. Any future impact from the adoption of this guidance will depend on the facts and circumstances of future transactions.

Note 3. Revenue

Disaggregated Revenue

The following table showed the percentage of revenue by product groups:

	2022	2021	2020
EDA	50.8 %	55.5 %	57.4 %
IP & System Integration	39.3 %	34.8 %	32.6 %
Software Integrity Products & Services	9.2 %	9.4 %	9.7 %
Other	0.7 %	0.3 %	0.3 %
Total	100.0 %	100.0 %	100.0 %

Contract Balances

The contract assets indicated below are presented as prepaid and other current assets in the consolidated balance sheets. The contract assets are transferred to receivables when the rights to invoice and receive payment become unconditional. Unbilled receivables are presented as accounts receivable, net, in the consolidated balance sheets.

Contract balances were as follows:

	As of October 31,	
	2022	2021
	(in thousands)	
Contract assets, net	\$ 260,498	\$ 284,574
Unbilled receivables	\$ 46,254	\$ 35,589
Deferred revenue	\$ 2,065,294	\$ 1,653,926

During fiscal 2022, we recognized \$1.2 billion of revenue that was included in the deferred revenue balance as of October 31, 2021. During fiscal 2021, we recognized \$1.2 billion of revenue that was included in the deferred revenue balance as of October 31, 2020.

Contracted but unsatisfied or partially unsatisfied performance obligations were approximately \$7.1 billion as of October 31, 2022, which includes \$1.1 billion in non-cancellable Flexible Spending Account (FSA) commitments from customers where actual product selection and quantities of specific products or services are to be determined by customers at a later date. We have elected to exclude future sales-based royalty payments from the remaining

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performance obligations. Approximately 44% of the contracted but unsatisfied or partially unsatisfied performance obligations as of October 31, 2022, excluding non-cancellable FSA, are expected to be recognized over the next 12 months with the remainder recognized thereafter.

During fiscal 2022 and fiscal 2021, we recognized \$137.3 million and \$116.7 million, respectively, from performance obligations satisfied from sales-based royalties earned during the periods.

Costs of Obtaining a Contract with Customer

The incremental costs of obtaining a contract with a customer, which consist primarily of direct sales commission earned upon execution of the contract, were capitalized in compliance with authoritative guidance, and amortized over the estimated period of which the benefit is expected to be received. As direct sales commission paid for renewals are commensurate with the amounts paid for initial contracts, the deferred incremental costs will be recognized over the contract term.

Capitalized commission costs, net of accumulated amortization, as of October 31, 2022 and 2021 were \$96.5 million and \$92.2 million, respectively. The balances are included in other long-term assets in our consolidated balance sheets. Amortization of these assets were \$73.0 million, \$64.7 million and \$61.2 million, respectively, during fiscal 2022, fiscal 2021 and fiscal 2020, and are included in sales and marketing expense in our consolidated statements of income.

Note 4. Business Combinations

Fiscal 2022

NTT Security AppSec Solutions Inc.

On June 22, 2022, we completed the acquisition of all outstanding shares of NTT Security AppSec Solutions Inc. (which has operated under the name WhiteHat Security, or WhiteHat), a provider of dynamic application security testing solutions, from NTT Security Corporation for an aggregate purchase price of \$330.1 million in cash. With this acquisition, we have broadened our product offering in the application security testing market.

The aggregate purchase consideration was preliminarily allocated as follows:

	(in thousands)
Total purchase consideration	\$ 330,112
Less: cash acquired	22,849
Total purchase consideration, net of cash acquired	\$ 307,263
Allocations	
Goodwill	\$ 249,852
Intangible assets	97,500
Deferred revenue	(40,367)
Other tangible assets, net	278
	\$ 307,263

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The goodwill was primarily attributed to the expected post-acquisition synergies from the integration of WhiteHat. The \$249.9 million of goodwill was assigned to the Software Integrity reporting unit and the amount recognized was not deductible for tax purposes. The acquired identifiable intangible assets of \$97.5 million were valued using the income approach. The intangible assets are being amortized over their respective useful lives ranging from 5 to 10 years.

During the fourth quarter of fiscal 2022, we recorded measurement period adjustments to reflect the facts and circumstances in existence as of the acquisition date. These adjustments primarily related to the valuation of individually immaterial net tangible assets of \$2.1 million with corresponding increase to goodwill.

OpenLight Photonics, Inc.

During the three months ended April 30, 2022, we acquired 75% equity interest in OpenLight Photonics, Inc. (OpenLight) for cash consideration of \$90.0 million. The remaining 25% equity interest in OpenLight is held by Juniper Networks, Inc. (the Minority Investor) from their contribution of IP and certain tangible assets.

The agreement with the Minority Investor contains redemption features whereby the interest held by the Minority Investor is redeemable either (i) at the option of the Minority Investor on or after the third anniversary of the acquisition or sooner in certain circumstances or (ii) at our option beginning on the third anniversary of the acquisition. This option is exercisable at the greater of fair value at the time of redemption or \$30.0 million and was valued at \$10.1 million, resulting in a total consideration of \$100.1 million.

The preliminary purchase price was allocated as follows: \$94.0 million to identifiable intangible assets and \$46.7 million to goodwill, which were attributable to the Semiconductor & System Design reporting unit. The goodwill was mainly attributable to the assembled workforce and planned growth in new markets. There was no tax-deductible goodwill related to the acquisition.

During the fourth quarter of fiscal 2022, we recorded a measurement period adjustment to reflect the facts and circumstances in existence as of the acquisition date. This adjustment relates to the valuation of deferred tax assets of \$1.6 million with corresponding increase to goodwill.

From the date of acquisition through October 31, 2022, OpenLight incurred a net loss of \$19.4 million, of which \$4.9 million was attributable to redeemable non-controlling interest. As of October 31, 2022, the carrying value of the redeemable non-controlling interest was \$38.7 million in the consolidated balance sheets.

Other Fiscal 2022 Acquisitions

During fiscal 2022, we completed two other acquisitions for aggregate purchase consideration of \$31.8 million, net of cash acquired. The preliminary purchase price was allocated as follows: \$12.7 million to identifiable intangible assets and \$22.2 million to goodwill, which were attributable to the Semiconductor & System Design reporting unit. There was no tax-deductible goodwill related to the acquisitions.

We have included the financial results of the fiscal 2022 acquisitions in our consolidated financial statements from their respective acquisition date. We do not consider these acquisitions to be material, individually or in the aggregate, to our consolidated financial statements.

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Fiscal 2021

During fiscal 2021, we completed several acquisitions for an aggregate consideration of \$298.9 million, net of cash acquired. We do not consider these acquisitions to be material, individually or in the aggregate, to our consolidated financial statements. Total purchase consideration was primarily allocated to identifiable intangible assets of \$109.3 million and goodwill of \$205.8 million, of which \$160.1 million is attributable to the Semiconductor & System Design reporting segment and \$45.7 million is attributable to the Software Integrity reporting segment.

Approximately \$34.0 million of the goodwill related to the fiscal 2021 acquisitions was deductible for tax purposes.

Preliminary Fair Value Estimates

For all acquisitions completed in fiscal 2022, the purchase price was allocated to tangible and identifiable intangible assets acquired and liabilities assumed based on their preliminary estimated fair values, which were determined using generally accepted valuation techniques based on estimates and assumptions made by management at the time of acquisition. These estimates and assumptions are subject to change as additional information becomes available during the respective measurement period, which is not expected to exceed 12 months from applicable acquisition date. The primary areas of those preliminary estimates relate to certain tangible assets and liabilities, identifiable intangible assets, and income taxes.

Acquisition-Related Transaction Costs

Acquisition-related transaction costs were \$14.1 million and \$15.4 million during fiscal 2022 and 2021, respectively. These costs consist of professional fees and administrative costs and were expensed as incurred in our consolidated statements of income.

Note 5. Goodwill and Intangible Assets**Goodwill**

Goodwill represents the excess of the purchase price over the fair value of the net tangible and identifiable intangible assets acquired in business combinations. We have two reportable segments, and reporting units are determined to be the same as reportable segments. In fiscal 2022, we changed our annual assessment date from the last day of the fourth fiscal quarter to the first day of the fourth fiscal quarter to align the impairment assessment date more closely with our long-term planning and forecasting process. We performed the required annual goodwill impairment test and concluded that goodwill was not impaired. As a result of our qualitative assessment, we determined that it was not necessary to perform the quantitative assessment at measurement date.

Goodwill activity by reportable segment for the year ended October 31, 2022 consisted of the following:

	Semiconductor & System Design	Software Integrity	Total
		(in thousands)	
Balance at October 31, 2021	\$ 3,104,474	\$ 471,311	\$ 3,575,785
Additions	68,923	249,852	318,775
Adjustments	1,285	—	1,285
Effect of foreign currency translation	(53,611)	—	(53,611)
Balance at October 31, 2022	<u>\$ 3,121,071</u>	<u>\$ 721,163</u>	<u>\$ 3,842,234</u>

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Goodwill activity by reportable segment for the year ended October 31, 2021 consisted of the following:

	Semiconductor & System Design	Software Integrity (in thousands)	Total
Balance at October 31, 2020	\$ 2,939,512	\$ 425,602	\$ 3,365,114
Additions	158,760	45,709	204,469
Effect of foreign currency translation	6,202	—	6,202
Balance at October 31, 2021	\$ 3,104,474	\$ 471,311	\$ 3,575,785

Intangible Assets

Intangible assets as of October 31, 2022 consisted of the following:

	Gross Carrying Amount	Accumulated Amortization (in thousands)	Net Amount
Core/developed technology	\$ 1,083,703	\$ 813,226	\$ 270,477
Customer relationships	426,242	333,984	92,258
Contract rights intangible	190,666	188,262	2,404
Trademarks and trade names	52,795	34,054	18,741
Capitalized software development costs	48,591	46,025	2,566
Total	\$ 1,801,997	\$ 1,415,551	\$ 386,446

Intangible assets as of October 31, 2021 consisted of the following:

	Gross Carrying Amount	Accumulated Amortization (in thousands)	Net Amount
Core/developed technology	\$ 911,903	\$ 748,759	\$ 163,144
Customer relationships	404,571	308,355	96,216
Contract rights intangible	193,317	188,231	5,086
Trademarks and trade names	43,095	31,155	11,940
Capitalized software development costs	46,098	43,352	2,746
Total	\$ 1,598,984	\$ 1,319,852	\$ 279,132

Amortization expense related to intangible assets consisted of the following:

	Year Ended October 31,		
	2022	2021	2020
	(in thousands)		
Core/developed technology	\$ 64,469	\$ 46,049	\$ 47,890
Customer relationships	26,640	31,478	35,075
Contract rights intangible	2,682	2,413	5,181
Trademarks and trade names	2,899	2,440	3,135
Capitalized software development costs ⁽¹⁾	2,672	4,067	3,723
Total	\$ 99,362	\$ 86,447	\$ 95,004

⁽¹⁾ Amortization of capitalized software development costs is included in cost of products revenue in the consolidated statements of income.

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The following table presented the estimated future amortization of intangible assets as of October 31, 2022:

Fiscal Year	(in thousands)
2023	\$ 99,311
2024	88,021
2025	71,113
2026	58,688
2027	38,487
2028 and thereafter	30,826
Total	\$ 386,446

Note 6. Balance Sheet Components

	As of	
	October 31, 2022	October 31, 2021
	(in thousands)	
Accounts receivable, net:		
Accounts receivable	\$ 779,390	\$ 563,592
Unbilled accounts receivable	46,254	35,589
Total accounts receivable	825,644	599,181
Less: allowance for credit losses	(29,553)	(30,680)
Total	\$ 796,091	\$ 568,501
Property and equipment, net:		
Computer and other equipment	\$ 870,388	\$ 812,161
Buildings	135,722	134,931
Furniture and fixtures	80,885	73,624
Land	21,598	19,965
Leasehold improvements	241,062	236,064
	1,349,655	1,276,745
Less: accumulated depreciation ⁽¹⁾	(866,355)	(804,347)
Total	\$ 483,300	\$ 472,398
Other long-term assets:		
Deferred compensation plan assets	\$ 279,096	\$ 343,820
Capitalized commission, net	96,509	92,249
Other long-term assets	88,090	74,629
Total	\$ 463,695	\$ 510,698
Accounts payable and accrued liabilities:		
Payroll and related benefits	\$ 559,886	\$ 581,687
Other accrued liabilities	211,937	132,091
Accounts payable	37,580	27,413
Total	\$ 809,403	\$ 741,191
Other long-term liabilities:		
Deferred compensation plan liabilities	\$ 279,096	\$ 343,820
Other long-term liabilities	48,733	47,613
Total	\$ 327,829	\$ 391,433

⁽¹⁾ Accumulated depreciation includes write-offs due to retirement of fully depreciated fixed assets.

Note 7. Financial Assets and Liabilities

Cash Equivalents and Short-term investments

As of October 31, 2022, the balances of our cash equivalents and short-term investments were as follows:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses Less Than 12 Continuous Months	Gross Unrealized Losses 12 Continuous Months or Longer	Estimated Fair Value ⁽¹⁾
	(in thousands)				
Cash equivalents:					
Money market funds	\$ 77,683	\$ —	\$ —	\$ —	\$ 77,683
Total:	<u>\$ 77,683</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 77,683</u>
Short-term investments:					
U.S. government agency & T-bills	\$ 25,816	\$ —	\$ (174)	\$ (39)	\$ 25,603
Municipal bonds	2,970	—	(12)	(80)	2,878
Corporate debt securities	95,899	7	(747)	(1,135)	94,024
Asset-backed securities	25,826	—	(149)	(269)	25,408
Total:	<u>\$ 150,511</u>	<u>\$ 7</u>	<u>\$ (1,082)</u>	<u>\$ (1,523)</u>	<u>\$ 147,913</u>

⁽¹⁾ See Note 8. Fair Value Measurements for further discussion on fair values.

Our short-term investment portfolio includes both corporate and government securities that have a maximum maturity of three years. The longer the duration of these securities, the more susceptible they are to changes in market interest rates and bond yields. As yields increase, those securities with a lower yield-at-cost show a mark-to-market unrealized loss. Most of our unrealized losses are due to changes in market interest rates, and bond yields. We believe that we have the ability to realize the full value of all of these investments upon maturity. As of October 31, 2022, our investments that were in a continuous loss position of 12 months or more, as well as the unrealized losses on those investments, were immaterial.

The contractual maturities of our available-for-sale debt securities as of October 31, 2022 were as follows:

	Amortized Cost	Fair Value
	(in thousands)	
Less than 1 year	\$ 83,234	\$ 82,264
1-5 years	61,593	60,156
5-10 years	3,230	3,165
>10 years	2,454	2,328
Total	<u>\$ 150,511</u>	<u>\$ 147,913</u>

As of October 31, 2021, the balances of our cash equivalents and short-term investments were as follows:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses Less Than 12 Continuous Months	Gross Unrealized Losses 12 Continuous Months or Longer	Estimated Fair Value ⁽¹⁾
(in thousands)					
Cash equivalents:					
Money market funds	\$ 172,934	\$ —	\$ —	\$ —	\$ 172,934
Total:	<u>\$ 172,934</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 172,934</u>
Short-term investments:					
U.S. government agency & T-bills	\$ 6,447	\$ —	\$ (5)	\$ —	\$ 6,442
Municipal bonds	4,588	—	(12)	—	4,576
Corporate debt securities	103,615	7	(170)	—	103,452
Asset-backed securities	33,545	6	(72)	—	33,479
Total:	<u>\$ 148,195</u>	<u>\$ 13</u>	<u>\$ (259)</u>	<u>\$ —</u>	<u>\$ 147,949</u>

⁽¹⁾ See Note 8. Fair Value Measurements for further discussion on fair values.

Restricted cash

We include amounts generally described as restricted cash in cash and cash equivalents when reconciling beginning-of-period and end-of-period total amounts shown on the consolidated statements of cash flows. Restricted cash is primarily associated with office leases.

The following table provided a reconciliation of cash, cash equivalents and restricted cash included in the consolidated balance sheets:

	October 31,	
	2022	2021
(in thousands)		
Cash and cash equivalents	\$ 1,417,608	\$ 1,432,840
Restricted cash included in prepaid and other current assets	1,566	1,560
Restricted cash included in other long-term assets	690	783
Total cash, cash equivalents and restricted cash	<u>\$ 1,419,864</u>	<u>\$ 1,435,183</u>

Non-marketable equity securities

Our portfolio of non-marketable equity securities consists of strategic investments in privately held companies. There were no material impairments of non-marketable equity securities in fiscal 2022, fiscal 2021, or fiscal 2020.

Derivatives

We recognize derivative instruments as either assets or liabilities in the consolidated balance sheets at fair value and provide qualitative and quantitative disclosures about such derivatives. We operate internationally and are exposed to potentially adverse movements in foreign currency exchange rates. We enter into hedges in the form of foreign currency forward contracts to reduce our exposure to foreign currency rate changes on non-functional currency denominated forecasted transactions and balance sheet positions including: (1) certain assets and liabilities, (2) shipments forecasted to occur within approximately one month, (3) future billings and revenue on previously shipped orders, and (4) certain future intercompany invoices denominated in foreign currencies.

The duration of forward contracts, the majority of which are short-term, ranges from approximately 1 month to 27 months at inception. We do not use foreign currency forward contracts for speculative or trading purposes. We enter into foreign exchange forward contracts with high credit quality financial institutions that are rated "A" or above and

to date have not experienced nonperformance by counterparties. In addition, we mitigate credit risk in derivative transactions by permitting net settlement of transactions with the same counterparty and anticipate continued performance by all counterparties to such agreements.

The assets or liabilities associated with the forward contracts are recorded at fair value in other current assets or accrued liabilities in the consolidated balance sheets. The accounting for gains and losses resulting from changes in fair value depends on the use of the foreign currency forward contract and whether it is designated and qualifies for hedge accounting. The cash flow impact upon settlement of the derivative contracts is included in "net cash provided by operating activities" in the consolidated statements of cash flows.

Cash Flow Hedging Activities

Certain foreign exchange forward contracts are designated and qualify as cash flow hedges. These contracts have durations of approximately 27 months or less. Certain forward contracts are rolled over periodically to capture the full length of exposure to our foreign currency risk, which can be up to three years. To receive hedge accounting treatment, all hedging relationships are formally documented at the inception of the hedge, and the hedges must be highly effective in offsetting changes to future cash flows on the hedged transactions. The related gains or losses resulting from changes in fair value of these hedges is initially reported, net of tax, as a component of other comprehensive income (loss) (OCI), in stockholders' equity and reclassified into revenue or operating expenses, as appropriate, at the time the hedged transactions affect earnings. We expect a majority of the hedge balance in OCI to be reclassified to the statements of income within the next 12 months.

We did not record any gains or losses related to discontinuation of cash flow hedges for fiscal years 2022, 2021 and 2020.

Non-designated Hedging Activities

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

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

The effects of the non-designated derivative instruments on our consolidated statements of income for fiscal years 2022, 2021, and 2020 were summarized as follows:

	October 31,		
	2022	2021	2020
	(in thousands)		
Gains (losses) recorded in other income (expense), net	\$ (15,851)	\$ (855)	\$ 1,957

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

	October 31,	
	2022	2021
	(in thousands)	
Total gross notional amounts	\$ 1,386,140	\$ 1,176,152
Net fair value	\$ (50,080)	\$ 13,404

Our exposure to the market gains or losses will vary over time as a function of currency exchange rates. The amounts ultimately realized upon settlement of these financial instruments, together with the gains and losses on the underlying exposures, will depend on actual market conditions during the remaining life of the instruments.

The following table represented the consolidated balance sheets location and amount of derivative instrument fair values segregated between designated and non-designated hedge instruments:

	Fair values of derivative instruments designated as hedging instruments	Fair values of derivative instruments not designated as hedging instruments
	(in thousands)	
Balance at October 31, 2022		
Other current assets	\$ 2,315	\$ 223
Accrued liabilities	\$ 52,171	\$ 447
Balance at October 31, 2021		
Other current assets	\$ 15,455	\$ 17
Accrued liabilities	\$ 2,027	\$ 42

The following table represented the location of the amount of gains and losses on derivative instrument fair values for designated hedge instruments, net of tax in the consolidated statements of income:

	Location of gains (losses) recognized in OCI on derivatives	Amount of gains (losses) recognized in OCI on derivatives (effective portion)	Location of gains (losses) reclassified from OCI	Amount of gains (losses) reclassified from OCI (effective portion)
(in thousands)				
Fiscal year ended October 31, 2022				
Foreign exchange contracts	Revenue	\$ (19,755)	Revenue	\$ 10,975
Foreign exchange contracts	Operating expenses	(59,314)	Operating expenses	(15,869)
Total		<u>\$ (79,069)</u>		<u>\$ (4,894)</u>
Fiscal year ended October 31, 2021				
Foreign exchange contracts	Revenue	\$ 1,148	Revenue	\$ 4,181
Foreign exchange contracts	Operating expenses	8,712	Operating expenses	10,378
Total		<u>\$ 9,860</u>		<u>\$ 14,559</u>
Fiscal year ended October 31, 2020				
Foreign exchange contracts	Revenue	\$ 3,034	Revenue	\$ 530
Foreign exchange contracts	Operating expenses	4,800	Operating expenses	(603)
Total		<u>\$ 7,834</u>		<u>\$ (73)</u>

Other Commitments — Credit and Term Loan

On January 22, 2021, we entered into a Fourth Extension and Amendment Agreement (the Fourth Amendment), which amended and restated our previous credit agreement, dated as of November 28, 2016 (as amended and restated, the Credit Agreement). Our outstanding borrowings under the previous credit agreement, which as of January 22, 2021 consisted of term loans in the aggregate principal amount of \$97.5 million, were carried over under the Credit Agreement and fully paid on November 26, 2021.

The Fourth Amendment extended the termination date of the existing \$650.0 million senior unsecured revolving credit facility (the Revolver) from November 28, 2021 to January 22, 2024, which could be further extended at our option. The Credit Agreement also provides an uncommitted incremental loan facility of up to \$150.0 million in the aggregate principal amount. The Credit Agreement contains financial covenants requiring us to maintain a maximum consolidated leverage ratio and a minimum consolidated interest coverage ratio, as well as other non-financial covenants. As of October 31, 2022, we were in compliance with all financial covenants.

There was no outstanding balance under the Revolver as of October 31, 2022 and October 31, 2021. We expect our borrowings, if any, under the Revolver will fluctuate from quarter to quarter.

Borrowings bear interest at a floating rate based on a margin over our choice of market observable base rates as defined in the Credit Agreement. As of October 31, 2022, the Revolver bore interest at LIBOR +1%. In addition, commitment fees are payable on the Revolver at rates between 0.125% and 0.200% per year based on our leverage ratio on the daily amount of the revolving commitment.

In July 2018, we entered into a 12-year 220.0 million Renminbi (approximately \$33.0 million) credit agreement with a lender in China to support our facilities expansion. Borrowings bear interest at a floating rate based on the 5-year Loan Prime Rate plus 0.74%. As of October 31, 2022, we had a \$20.8 million outstanding balance under the agreement.

The carrying amount of the short-term and long-term debt approximates the estimated fair value.

Note 8. Fair Value Measurements

ASC 820-10, *Fair Value Measurements and Disclosures*, defines fair value, establishes guidelines and enhances disclosure requirements for fair value measurements. The accounting guidance requires an entity to maximize the

use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The accounting guidance also establishes a fair value hierarchy based on the independence of the source and objective evidence of the inputs used. There are three fair value hierarchies based upon the level of inputs that are significant to fair value measurement:

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

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

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

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

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

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

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

Our borrowings under our Credit and Term Loan facilities are classified within Level 2 because these borrowings are not actively traded and have a variable interest rate structure based upon market rates currently available to us for debt with similar terms and maturities. See Note 7. *Financial Assets and Liabilities* for more information on these borrowings.

Assets/Liabilities Measured at Fair Value on a Recurring Basis

Assets and liabilities measured at fair value on a recurring basis were summarized below as of October 31, 2022:

Description	Total	Fair Value Measurement Using			
		Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	
		(in thousands)			
Assets					
Cash equivalents:					
Money market funds	\$ 77,683	\$ 77,683	\$ —	\$ —	
Short-term investments:					
U.S. government agency & T-bills	25,603	—	25,603		—
Municipal bonds	2,878	—	2,878		—
Corporate debt securities	94,024	—	94,024		—
Asset-backed securities	25,408	—	25,408		—
Prepaid and other current assets:					
Foreign currency derivative contracts	2,538	—	2,538		—
Other long-term assets:					
Deferred compensation plan assets	279,096	279,096	—		—
Total assets	<u>\$ 507,230</u>	<u>\$ 356,779</u>	<u>\$ 150,451</u>	<u>\$ —</u>	
Liabilities					
Accounts payable and accrued liabilities:					
Foreign currency derivative contracts	\$ 52,618	\$ —	\$ 52,618	\$ —	
Other long-term liabilities:					
Deferred compensation plan liabilities	279,096	279,096	—		—
Total liabilities	<u>\$ 331,714</u>	<u>\$ 279,096</u>	<u>\$ 52,618</u>	<u>\$ —</u>	

Assets and liabilities measured at fair value on a recurring basis were summarized below as of October 31, 2021:

Description	Total	Fair Value Measurement Using			
		Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	
Assets					
Cash equivalents:					
Money market funds	\$ 172,934	\$ 172,934	\$ —	\$ —	
Short-term investments:					
U.S. government agency & T-bills	6,442	—	6,442		
Municipal bonds	4,576	—	4,576		
Corporate debt securities	103,452	—	103,452		
Asset-backed securities	33,479	—	33,479		
Prepaid and other current assets:					
Foreign currency derivative contracts	15,472	—	15,472		
Other long-term assets:					
Deferred compensation plan assets	343,820	343,820	—		
Total assets	\$ 680,175	\$ 516,754	\$ 163,421	\$ —	
Liabilities					
Accounts payable and accrued liabilities:					
Foreign currency derivative contracts	\$ 2,068	\$ —	\$ 2,068	\$ —	
Other long-term liabilities:					
Deferred compensation plan liabilities	343,820	343,820	—		
Total liabilities	\$ 345,888	\$ 343,820	\$ 2,068	\$ —	

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

Non-Marketable Equity Securities

Non-marketable equity securities are classified within Level 3 as they are valued using a combination of observable transaction price and unobservable inputs or data in an inactive market due to the absence of market price and inherent lack of liquidity.

Note 9. Leases

We have operating lease arrangements for office space, data center, equipment and other corporate assets. These leases have various expiration dates through December 31, 2040, some of which include options to extend the leases for up to 10 years. Because we are not reasonably certain to exercise these renewal options, the options are not considered in determining the lease term and associated potential option payments are excluded from lease payments.

The components of our lease expense during the period presented were as follows:

	Year Ended October 31,	
	2022	2021
	(in thousands)	
Operating lease expense ⁽¹⁾	\$ 91,972	\$ 93,848
Variable lease expense ⁽²⁾	11,649	8,231
Total lease expense	\$ 103,621	\$ 102,079

(1) Operating lease expense includes immaterial amounts of short-term leases, net of sublease income.

(2) Variable lease expense includes payments to lessors that are not fixed or determinable at lease commencement date. These payments primarily consist of maintenance, property taxes, insurance and variable indexed based payments.

Supplemental cash flow information during the period presented was as follows:

	Year Ended October 31,	
	2022	2021
	(in thousands)	
Cash paid for amounts included in the measurement of operating lease liabilities	\$ 83,858	\$ 86,360
ROU assets obtained in exchange for operating lease liabilities	\$ 168,095	\$ 112,637

Lease term and discount rate information related to our operating leases as of the end of the period presented were as follows:

	October 31, 2022	October 31, 2021
Weighted-average remaining lease term (in years)	9.16	8.00
Weighted-average discount rate	2.19 %	2.01 %

The following table represented the maturities of our future lease payments due under operating leases as of October 31, 2022:

Fiscal year	Lease Payments (in thousands)
2023	\$ 64,198
2024	92,741
2025	82,272
2026	72,620
2027	71,301
2028 and thereafter	329,782
Total future minimum lease payments	712,914
Less: Imputed interest	77,367
Total lease liabilities	\$ 635,547

In addition, certain facilities owned by us were leased to third parties under non-cancellable operating lease agreements. These leases have annual escalating payments and have expiration dates through March 31, 2031 in accordance with the terms and conditions of the existing agreement. The lease receipts from owned facilities, including sublease income from other facilities leased by us, due to us as of October 31, 2022, were as follows:

Fiscal year	Lease Receipts (in thousands)
2023	\$ 16,240
2024	24,591
2025	24,479
2026	25,333
2027	26,452
2028 and thereafter	83,737
Total	\$ 200,832

Note 10. Contingencies

Legal Proceedings

We are subject to routine legal proceedings, as well as demands, claims and threatened litigation that arise in the normal course of our business. The ultimate outcome of any litigation is often uncertain and unfavorable outcomes could have a negative impact on our results of operations and financial condition. We regularly review the status of each significant matter and assess its potential financial exposure. If the potential loss from any claim or legal proceeding is considered probable and the amount is estimable, we accrue a liability for the estimated loss. Legal proceedings are inherently uncertain and as circumstances change, it is possible that the amount of any accrued liability may increase, decrease, or be eliminated.

We have determined that, except as set forth below, no disclosure of estimated loss is required for a claim against us because: (1) there is not a reasonable possibility that a loss exceeding amounts already recognized (if any) may be incurred with respect to such claim; (2) a reasonably possible loss or range of loss cannot be estimated; or (3) such estimate is immaterial.

Mentor Patent Litigation

Prior to the legal settlement as further described below, we were engaged in complex patent litigation with Mentor Graphics Corporation (Mentor) involving several actions in different forums. We succeeded to the litigation when we acquired Emulation & Verification Engineering S.A. on October 4, 2012.

Legal Settlement

In March 2017, Siemens PLM Software (Siemens) acquired Mentor. On June 29, 2018, we, Siemens and Mentor settled all outstanding patent litigation between us and Mentor for a \$65.0 million payment made from us to Mentor. As a result of the settlement, the litigation with Mentor was dismissed and the injunction entered in connection with that litigation was vacated. The settlement included mutual seven-year patent cross-licenses between us and Siemens, and between us and Mentor. We and Mentor also amended an existing interoperability agreement to collaborate on a wide range of EDA products for the benefit of our mutual customers. The amendment includes a one-time termination charge between \$0.0 and \$25.0 million, payable to Mentor under certain conditions.

Tax Matters

We undergo examination from time to time by U.S. and foreign authorities for non-income based taxes, such as sales, use and value-added taxes, and are currently under examination by tax authorities in certain jurisdictions. If the potential loss from such examinations is considered probable and the amount or the range of loss could be estimated, we would accrue a liability for the estimated expense. In addition to the foregoing, we are, from time to time, party to various other claims and legal proceedings in the ordinary course of our business, including with tax and other governmental authorities. For a description of certain of these other matters, refer to *Note 15. Income Taxes*.

Note 11. Accumulated Other Comprehensive Income (Loss)

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

	Year Ended October 31,	
	2022	2021
	(in thousands)	
Cumulative currency translation adjustments	\$ (156,192)	\$ (48,047)
Unrealized gains (losses) on derivative instruments, net of taxes	(75,486)	(1,311)
Unrealized gains (losses) on available-for-sale securities, net of taxes	(2,599)	(246)
Total	<u>\$ (234,277)</u>	<u>\$ (49,604)</u>

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

	Year Ended October 31,		
	2022	2021	2020
	(in thousands)		
Reclassifications:			
Gains (losses) on cash flow hedges, net of taxes			
Revenues	\$ 10,975	\$ 4,181	\$ 530
Operating expenses	(15,869)	10,378	(603)
Total	<u>\$ (4,894)</u>	<u>\$ 14,559</u>	<u>\$ (73)</u>

Amounts reclassified in fiscal 2022, 2021, and 2020 primarily consisted of gains (losses) from our cash flow hedging activities. See *Note 7. Financial Assets and Liabilities*.

Note 12. Stock Repurchase Program

Our Board of Directors (the Board) previously approved a stock repurchase program (the Program) with authorization to purchase up to \$1.0 billion of our common stock in December 2021. The Board approved a replenishment of the Program with authorization to purchase up to \$1.5 billion in September 2022. As of October 31, 2022, \$1.4 billion remained available for future repurchases under the program.

In August 2022, we entered into an accelerated stock repurchase agreement (the August 2022 ASR) to repurchase an aggregate of \$240.0 million of our common stock. Pursuant to the August 2022 ASR, we made a prepayment of \$240.0 million to receive initial deliveries of shares valued at \$192.0 million. The remaining balance of \$48.0 million was settled in October 2022. Total shares purchased under the August 2022 ASR were approximately 0.8 million shares, at an average purchase price of \$307.60 per share.

Stock repurchase activities as well as the reissuance of treasury stock for employee stock-based compensation purposes were as follows:

	Year Ended October 31,		
	2022	2021 ⁽¹⁾	2020
	(in thousands, except per share price)		
Shares repurchased	3,609	2,780	1,585
Average purchase price per share	\$ 314.51	\$ 270.84	\$ 152.76
Aggregate purchase price	\$ 1,135,000	\$ 753,081	\$ 242,078
Reissuance of treasury stock	2,922	3,224	3,872

⁽¹⁾ Excluded 107,701 shares and \$35.0 million equity forward contract that was settled in November 2021.

Note 13. Employee Benefit Plans

Employee Stock Purchase Plan

Under our Employee Stock Purchase Plan (ESPP), participating employees are granted the right to purchase shares of common stock at a price per share that is 85% of the lesser of the fair market value of the shares at (1) the beginning of an offering period (generally, a rolling two year period) or (2) the purchase date (generally occurring at the end of each semi-annual purchase period), subject to the terms of ESPP, including a limit on the number of shares that may be purchased in a purchase period.

On April 9, 2020 and April 12, 2022, our stockholders approved amendments to the ESPP to increase the number of shares of common stock authorized for issuance under the plan by 5.0 million and 2.0 million shares, respectively. During fiscal 2022, 2021 and 2020, we issued 0.7 million, 1.0 million, and 1.0 million shares, respectively, under the ESPP at average per share prices of \$195.48, \$134.26 and \$103.41, respectively. As of October 31, 2022, 14.1 million shares of common stock were reserved for future issuance under the ESPP.

Equity Compensation Plans

2006 Employee Equity Incentive Plan. On April 25, 2006, our stockholders approved the 2006 Employee Equity Incentive Plan (2006 Employee Plan), which provides for the grant of incentive stock options, non-statutory stock options, restricted stock awards, restricted stock unit awards, stock appreciation rights and other forms of equity compensation, including performance stock awards and performance cash awards, as determined by the plan administrator. The terms and conditions of each type of award are set forth in the 2006 Employee Plan and in the award agreements governing particular awards.

Restricted stock units are granted under the 2006 Employee Plan as part of our incentive compensation program. In general, restricted stock units vest over three to four years and are subject to the employee's continuing service with us. Restricted stock units granted with specific performance criteria vest to the extent performance conditions are met. Restricted stock units granted with certain market conditions vest over two years to the extent these market conditions are met. For each restricted stock unit granted under the 2006 Employee Plan, a share reserve ratio of 1.70 is applied for the purpose of determining the remaining number of shares reserved for future grants under the plan. Options granted under this plan generally have a contractual term of seven years and generally vest over four years.

On April 8, 2021 and April 12, 2022, our stockholders amended the 2006 Employee Plan to, among other things, increase the number of shares of common stock reserved for future issuance under the plan by 4.7 million shares and 3.0 million shares, respectively. As of October 31, 2022, an aggregate of 2.1 million stock options and 4.6 million restricted stock units were outstanding, and 13.1 million shares were available for future issuance under the 2006 Employee Plan.

2005 and 2017 Non-Employee Directors Equity Incentive Plans. On April 6, 2017, our stockholders approved the 2017 Non-Employee Directors Equity Incentive Plan (2017 Directors Plan). In connection with stockholder approval of the 2017 Directors Plan, the 2005 Non-Employee Directors Equity Incentive Plan (2005 Directors Plan) was terminated as of April 6, 2017, and no awards could be granted under the 2005 Directors Plan after that date.

Under the 2005 Directors Plan, we granted options, which vest over a period of three to four years to non-employee directors. As of October 31, 2022, 7,500 stock options were outstanding under the 2005 Directors Plan.

The 2017 Directors Plan provides for equity awards to non-employee directors in the form of stock options, restricted stock units, restricted stock or a combination thereof. On April 6, 2017, our stockholders approved an aggregate of 0.45 million shares of common stock reserved under the 2017 Directors Plan.

We grant restricted stock awards and options under the 2017 Directors Plan. Restricted stock awards generally vest on an annual basis and options vest over a period of three years. As of October 31, 2022, 4,985 shares of restricted stock awards were unvested and 12,792 stock options were outstanding, and a total of 373,213 shares of common stock were reserved for future issuance under the 2017 Directors Plan.

Other Assumed Stock Plans through Acquisitions. We have assumed certain outstanding stock awards of acquired companies, including restricted stock units and options. If these assumed equity awards are canceled, forfeited or

expire unexercised, the underlying shares do not become available for future grant. As of October 31, 2022, 0.1 million shares of our common stock remained subject to such outstanding assumed equity awards.

Restricted Stock Units. The following table contained information concerning activities related to restricted stock units granted under the 2006 Employee Plan and assumed from acquisitions:

	Restricted Stock Units Outstanding ⁽¹⁾	Weighted Average Grant Date Fair Value	Weighted Average Remaining Contractual Life (In Years)	Aggregate Fair Value
(in thousands, except per share amounts and years)				
Balance at October 31, 2019	3,857	\$ 97.21	1.56	
Granted ⁽²⁾	2,041	\$ 168.15		
Vested ⁽³⁾	(1,480)	\$ 88.70		\$ 261,563
Forfeited	(288)	\$ 104.67		
Balance at October 31, 2020	4,130	\$ 134.80	1.47	
Granted ⁽²⁾	1,901	\$ 258.58		
Vested ⁽³⁾	(1,565)	\$ 122.01		\$ 421,034
Forfeited	(279)	\$ 167.76		
Balance at October 31, 2021	4,187	\$ 193.58	1.39	
Granted ⁽²⁾	2,402	\$ 323.46		
Vested ⁽³⁾	(1,589)	\$ 170.36		\$ 529,766
Forfeited	(362)	\$ 228.70		
Balance at October 31, 2022	4,638	\$ 265.76	1.32	

⁽¹⁾ No restricted stock units were assumed in connection with acquisitions in the last three fiscal years, but the balance at fiscal year-end included certain restricted stock units that were previously assumed in connection with acquisitions.

⁽²⁾ The number of granted restricted stock units included those granted to senior management with performance-based vesting criteria (in addition to service-based vesting criteria) (performance-based RSUs) reported at the maximum possible number of shares that may ultimately be issuable if all applicable performance-based criteria are achieved at their maximum levels and all applicable service-based criteria are fully satisfied.

⁽³⁾ The number of vested restricted stock units included shares that were withheld on behalf of employees to satisfy the minimum statutory tax withholding requirements.

Stock Options. The following table summarized stock option activity and included stock options granted under all equity plans:

	Options Outstanding			
	Shares Under Stock Option ⁽¹⁾	Weighted-Average Exercise Price per Share	Weighted-Average Remaining Contractual Life (In Years)	Aggregate Intrinsic Value
	(in thousands, except per share amounts and years)			
Balance at October 31, 2019	5,290	\$ 65.57	4.08	\$ 373,112
Granted	700	\$ 143.44		
Exercised	(1,891)	\$ 51.76		
Canceled/forfeited/expired	(106)	\$ 84.14		
Balance at October 31, 2020	3,993	\$ 85.26	4.10	\$ 513,845
Granted	353	\$ 239.46		
Exercised	(1,203)	\$ 66.50		
Canceled/forfeited/expired	(36)	\$ 128.49		
Balance at October 31, 2021	3,107	\$ 109.51	3.81	\$ 694,921
Granted	293	\$ 342.86		
Exercised	(1,126)	\$ 86.24		
Canceled/forfeited/expired	(114)	\$ 164.46		
Balance at October 31, 2022	2,160	\$ 150.37	3.57	\$ 328,120
Vested and expected to vest as of October 31, 2022	2,160	\$ 150.37	3.57	\$ 328,120
Exercisable at October 31, 2022	1,449	\$ 103.44	2.77	\$ 278,915

⁽¹⁾ No stock options were assumed in connection with acquisitions in the last three fiscal years, but the balance at fiscal year-end included certain stock options that were previously assumed in connection with acquisitions.

The aggregate intrinsic value in the preceding table represented the pre-tax intrinsic value based on stock options with an exercise price less than our closing stock price of \$295.84 as of October 31, 2022. The pre-tax intrinsic value of options exercised and their average exercise prices were:

	Year Ended October 31,		
	2022	2021	2020
	(in thousands, except per share price)		
Intrinsic value	\$ 273,524	\$ 254,587	\$ 218,640
Average exercise price per share	\$ 86.24	\$ 66.50	\$ 51.76

Restricted Stock Units and Stock Options. The following table contained additional information concerning activities related to stock options and restricted stock units that were granted under the 2006 Employee Plan and assumed from acquisitions:

	Available for Grant ⁽¹⁾⁽²⁾ (in thousands)
Balance at October 31, 2019	12,208
Options granted ⁽²⁾	(694)
Options canceled/forfeited/expired ⁽²⁾	102
Restricted stock units granted ⁽¹⁾	(3,469)
Restricted stock units forfeited ⁽¹⁾	482
Additional shares reserved	3,500
Balance at October 31, 2020	12,129
Options granted ⁽²⁾	(353)
Options canceled/forfeited/expired ⁽²⁾	36
Restricted stock units granted ⁽¹⁾	(3,232)
Restricted stock units forfeited ⁽¹⁾	471
Additional shares reserved	4,700
Balance at October 31, 2021	13,751
Options granted ⁽²⁾	(286)
Options canceled/forfeited/expired ⁽²⁾	114
Restricted stock units granted ⁽¹⁾⁽³⁾	(4,083)
Restricted stock units forfeited ⁽¹⁾	615
Additional shares reserved	3,000
Balance at October 31, 2022	13,111

⁽¹⁾ Restricted stock units included awards granted under the 2006 Employee Plan and assumed through acquisitions. The number of RSUs reflects the application of the award multiplier of 1.70 as described above.

⁽²⁾ Options granted by us are not subject to the award multiplier ratio described above.

⁽³⁾ The number of granted restricted stock units included those granted to senior management with market-based vesting and performance-based vesting criteria (in addition to service-based vesting criteria) (market-based RSUs) reported at the maximum possible number of shares that may ultimately be issuable if all applicable market-based and performance-based criteria are achieved at their maximum levels and all applicable service-based criteria are fully satisfied.

Restricted Stock Awards. The following table summarized restricted stock award activities during fiscal 2022 under the 2005 Directors Plan and 2017 Directors Plan:

	Restricted Shares (in thousands, except per share amounts)	Weighted-Average Grant Date Fair Value
Unvested at October 31, 2019	11	\$ 116.43
Granted	9	\$ 140.97
Vested	(11)	\$ 116.43
Forfeited	—	\$ —
Unvested at October 31, 2020	9	\$ 140.97
Granted	5	\$ 261.01
Vested	(9)	\$ 140.97
Forfeited	—	\$ —
Unvested at October 31, 2021	5	\$ 261.01
Granted	5	\$ 310.02
Vested	(5)	\$ 261.01
Forfeited	—	\$ —
Unvested at October 31, 2022	5	\$ 310.02

Valuation and Expense of Stock-Based Compensation. We estimate the fair value of stock options and employee stock purchase rights under the ESPP on the grant date. The value of awards expected to vest is recognized as expense over the applicable service periods. We use the straight-line attribution method to recognize stock-based compensation costs over the service period of the award except for performance grants with specific performance criteria. With respect to such performance grants in each reporting period, we estimate the probability of achievement of applicable performance goals and recognize related stock-based compensation expense using the graded-vesting method. The amount of stock-based compensation expense recognized in any 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.

We use the Black-Scholes option-pricing model to determine the fair value of stock options and employee stock purchase plan rights. The Black-Scholes option-pricing model incorporates various subjective assumptions including expected volatility, expected term and interest rates. The expected volatility for both stock options and employee stock purchase rights is estimated by a combination of implied volatility for publicly traded options of our common stock with a term of six months or longer and the historical stock price volatility over the estimated expected term of such awards, which is based on historical experience. Restricted stock units are valued based on the closing price of our common stock on the grant date. The fair value for market-based RSUs is estimated on the grant date using a Monte Carlo simulation model with the following assumptions: expected volatilities ranging from 33.01% to 37.8%, based on the historical volatilities of our common stock and peer companies' common stock over the remaining performance period; risk-free interest rate ranging from 1.33% to 3.46%, based on the yield of the zero-coupon U.S. Treasury bill that is commensurate with the remaining performance period; and an expected term of 1.16 to 1.69 years, based on the remaining performance period of the market-based award.

The assumptions presented in the following table were used to estimate the fair value of stock options and employee stock purchase rights granted under our stock plans:

	Year Ended October 31,		
	2022	2021	2020
Stock Options			
Expected life (in years)	4.1	4.1	4.1
Risk-free interest rate	1.07%- 4.42%	0.35% - 1.00%	0.26% - 1.71%
Volatility	32.28% -37.04%	29.19% - 32.28%	23.05%- 32.80%
Weighted average estimated fair value	\$98.07	\$61.58	\$33.02
ESPP			
Expected life (in years)	0.5 - 2.0	0.5 - 2.0	0.5 - 2.0
Risk-free interest rate	0.67% - 3.44%	0.00% - 0.19%	0.09% - 1.24%
Volatility	34.51% - 38.69%	28.02% - 39.68%	25.59% - 43.06%
Weighted average estimated fair value	\$102.63	\$89.82	\$47.69

The compensation cost recognized in the consolidated statements of income for our stock compensation arrangements was as follows:

	Year Ended October 31,		
	2022 ⁽¹⁾	2021	2020
	(in thousands)		
Cost of products	\$ 55,134	\$ 38,345	\$ 27,193
Cost of maintenance and service	24,146	13,817	9,327
Research and development expense	241,978	171,013	125,814
Sales and marketing expense	81,617	61,940	43,205
General and administrative expense	56,154	60,157	43,045
Stock-based compensation expense before taxes	459,029	345,272	248,584
Income tax benefit	(74,271)	(53,483)	(39,077)
Stock-based compensation expense after taxes	\$ 384,758	\$ 291,789	\$ 209,507

⁽¹⁾ During fiscal 2022, we recognized stock-based compensation expense relating to restricted stock units, granted to senior executives in February, May and August 2022 with certain market, performance and service conditions (market-based RSUs). Under the award agreements, the vesting of the market-based RSUs is contingent on achieving total stockholder return (TSR) relative to a peer index as well as revenue growth metrics. The performance period during which the achievement goals will be measured is fiscal 2022 and fiscal 2023. The maximum potential awards that may be earned are 187.5% of the target number of the initial awards. The awards will vest in equal increments in December 2023 and December 2024 if the TSR target, revenue growth metrics, and service conditions are achieved.

As of October 31, 2022, we had \$999.7 million of total unrecognized stock-based compensation expense relating to options, RSUs and restricted stock awards, which is expected to be recognized over a weighted average period of 2.2 years. As of October 31, 2022, we had \$77.6 million of total unrecognized stock-based compensation expense relating to the ESPP, which is expected to be recognized over a period of 2.0 years.

Deferred Compensation Plan. We maintain the Synopsys Deferred Compensation Plan (Deferred Plan), which permits eligible employees to defer up to 50% of their annual cash base compensation and up to 100% of their eligible cash variable compensation. Amounts may be withdrawn from the Deferred Plan pursuant to elections made by the employees in accordance with the terms of the plan. Since the inception of the Deferred Plan, we have not made any matching or discretionary contributions to the Deferred Plan. There are no Deferred Plan provisions that provide for any guarantees or minimum return on investments. Undistributed amounts under the Deferred Plan are subject to the claims of our creditors. The securities held by the Deferred Plan are classified as trading securities.

Deferred plan assets and liabilities were as follows:

Selected plan assets and liabilities were as follows:				
	As of October 31, 2022		As of October 31, 2021	
	(in thousands)			
Plan assets recorded in other long-term assets	\$	279,096	\$	343,820
Plan liabilities recorded in other long-term liabilities ⁽¹⁾	\$	279,096	\$	343,820

⁽¹⁾ *Undistributed deferred compensation balances due to participants.*

Income or loss from the change in fair value of the Deferred Plan assets is recorded in other income (expense), net. The increase or decrease in the fair value of the undistributed Deferred Plan obligation is recorded in total cost of revenue and operating expense. The following table summarized the impact of the Deferred Plan:

	Year Ended October 31,		
	2022	2021	2020
	(in thousands)		
Increase (reduction) to cost of revenue and operating expense	\$ (68,778)	\$ 71,603	\$ 21,469
Other income (expense), net	(68,778)	71,603	21,469
Net increase (decrease) to net income	\$ —	\$ —	\$ —

Other Retirement Plans. We sponsor various defined contribution retirement plans for our eligible U.S. and non-U.S. employees. Total contributions to these plans were \$51.2 million, \$49.4 million, and \$41.7 million in fiscal 2022, 2021, and 2020, respectively. For employees in the United States and Canada, we match pre-tax employee contributions up to a maximum of U.S. \$3,000 and Canadian \$4,000, respectively, per participant per year.

Certain of our international subsidiaries sponsor defined benefit retirement plans. The unfunded projected benefit obligation for these defined benefit retirement plans as of October 31, 2022 and 2021 was immaterial and recorded in other long-term liabilities in our consolidated balance sheets.

Note 14. Net Income Per Share

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

	Year Ended October 31,		
	2022	2021	2020
	(in thousands, except per share amounts)		
Numerator:			
Net income attributed to Synopsys	\$ 984,594	\$ 757,516	\$ 664,347
Denominator:			
Weighted average common shares for basic net income per share	153,002	152,698	151,135
Dilutive effect of common share equivalents from equity-based compensation	3,483	4,642	4,571
Weighted average common shares for diluted net income per share	156,485	157,340	155,706
Net income per share attributed to Synopsys:			
Basic	\$ 6.44	\$ 4.96	\$ 4.40
Diluted	\$ 6.29	\$ 4.81	\$ 4.27
Anti-dilutive employee stock-based awards excluded	281	408	97

Note 15. Income Taxes

The domestic and foreign components of our total income (loss) before provision for income taxes were as follows:

	Year Ended October 31,		
	2022	2021	2020
	(in thousands)		
United States	\$ 1,036,279	\$ 640,531	\$ 544,391
Foreign	79,235	164,983	93,768
Total income (loss) before provision for income taxes	<u>\$ 1,115,514</u>	<u>\$ 805,514</u>	<u>\$ 638,159</u>

The components of the provision (benefit) for income taxes were as follows:

	Year Ended October 31,		
	2022	2021	2020
	(in thousands)		
Current:			
Federal	\$ 105,493	\$ 85,950	\$ 29,272
State	23,201	11,898	1,863
Foreign	45,297	79,890	55,103
	<u>173,991</u>	<u>177,738</u>	<u>86,238</u>
Deferred:			
Federal	(42,086)	(108,530)	(84,739)
State	1,519	1,796	(20,233)
Foreign	3,654	(21,849)	(6,554)
	<u>(36,913)</u>	<u>(128,583)</u>	<u>(111,526)</u>
Provision (benefit) for income taxes	<u>\$ 137,078</u>	<u>\$ 49,155</u>	<u>\$ (25,288)</u>

The provision (benefit) for income taxes differed from the taxes computed with the statutory federal income tax rate as follows:

	Year Ended October 31,		
	2022	2021	2020
	(in thousands)		
Statutory federal tax	\$ 234,257	\$ 168,745	\$ 133,979
State tax (benefit), net of federal effect	(2,514)	(2,419)	(29,096)
Federal tax credits	(61,582)	(45,503)	(39,206)
Tax on foreign earnings	25,930	7,988	(3,980)
Foreign-derived intangible income deduction	(38,924)	(31,214)	(24,282)
Tax settlements	—	(7,134)	(13,167)
Stock-based compensation	(52,625)	(62,620)	(50,047)
Changes in valuation allowance	19,794	15,232	(614)
Other	12,742	6,080	1,125
Provision (benefit) for income taxes	<u>\$ 137,078</u>	<u>\$ 49,155</u>	<u>\$ (25,288)</u>

We have provided for foreign withholding taxes on undistributed earnings of certain of our foreign subsidiaries to the extent such earnings are no longer considered to be indefinitely reinvested in the operations of those subsidiaries. Where foreign subsidiaries are considered indefinitely reinvested, and if the tax effect of undistributed earnings and other outside basis differences were recognized, the nature of taxes expected would be primarily withholding taxes, taxes in non-conforming states, and taxes on intermediate holding companies outside of the U.S., net of foreign tax credits where available. As of October 31, 2022, the taxes due, after allowable foreign tax credits, are not expected to be material.

The significant components of deferred tax assets and liabilities were as follows:

	October 31,	
	2022	2021
	(in thousands)	
Net deferred tax assets:		
Deferred tax assets:		
Deferred revenue	41,941	30,113
Deferred compensation	67,782	59,823
Intangible and depreciable assets	119,791	117,211
Capitalized research and development costs	231,733	203,052
Stock-based compensation	60,537	40,922
Tax loss carryovers	59,754	30,305
Foreign tax credit carryovers	27,153	32,498
Research and other tax credit carryovers	316,650	326,164
Operating Lease Liabilities	119,575	94,519
Other	16,887	—
Gross deferred tax assets	1,061,803	934,607
Valuation allowance	(198,213)	(174,117)
Total deferred tax assets	863,590	760,490
Deferred tax liabilities:		
Intangible assets	102,796	61,448
Operating lease Right-of-Use-Assets	96,598	77,877
Accruals and reserves	5,998	6,216
Undistributed earnings of foreign subsidiaries	1,000	7,580
Other	—	628
Total deferred tax liabilities	206,392	153,749
Net deferred tax assets	\$ 657,198	\$ 606,741

It is more likely than not that the results of future operations will be able to generate sufficient taxable income to realize the net deferred tax assets. The valuation allowance provided against our deferred tax assets as of October 31, 2022 is mainly attributable to foreign tax credits available to non-U.S. subsidiaries and the California research credits. The valuation allowance increased by a net of \$24.1 million in fiscal 2022 primarily related to the net increase of valuation allowance on California research credits.

We have the following tax loss and credit carryforwards available to offset future income tax liabilities:

<u>Carryforward</u>	<u>Amount</u> <u>(in thousands)</u>	<u>Expiration</u> <u>Date</u>
Federal net operating loss carryforward	\$ 142,645	2023-2041
Federal research credit carryforward	140,331	2023-2042
Federal foreign tax credit carryforward	16,813	2027-2033
International foreign tax credit carryforward	12,025	Indefinite
International net operating loss carryforward	37,086	2027-Indefinite
California research credit carryforward	226,519	Indefinite
Other state research credit carryforward	20,743	2025-2042
State net operating loss carryforward	198,348	2023-2044

The federal and state net operating loss carryforward is from acquired companies and the annual use of such loss is subject to significant limitations under Internal Revenue Code Section 382 and certain provisions of the Tax Act. Foreign tax credits may only be used to offset tax attributable to foreign source income.

The gross unrecognized tax benefits decreased by approximately \$1.2 million during fiscal 2022 resulting in gross unrecognized tax benefits of \$81.2 million as of October 31, 2022. A reconciliation of the beginning and ending balance of gross unrecognized tax benefits is summarized as follows:

	<u>As of October 31, 2022</u>	<u>As of October 31, 2021</u>
	<u>(in thousands)</u>	
Beginning balance	\$ 82,360	\$ 83,149
Increases in unrecognized tax benefits related to prior year tax positions	435	794
Decreases in unrecognized tax benefits related to prior year tax positions	(9,791)	(7,372)
Increases in unrecognized tax benefits related to current year tax positions	6,794	9,168
Decreases in unrecognized tax benefits related to settlements with taxing authorities	(1,104)	(1,538)
Reductions in unrecognized tax benefits due to lapse of applicable statute of limitations	(2,601)	(1,235)
Increases in unrecognized tax benefits acquired	14,121	—
Changes in unrecognized tax benefits due to foreign currency translation	(9,031)	(606)
Ending balance	<u>\$ 81,183</u>	<u>\$ 82,360</u>

As of October 31, 2022 and 2021, approximately \$81.2 million and \$82.4 million, respectively, of the unrecognized tax benefits would affect our effective tax rate if recognized upon resolution of the uncertain tax positions.

Interest and penalties related to estimated obligations for tax positions taken in our tax returns are recognized as a component of income tax expense (benefit) in the consolidated statements of income and totaled approximately \$0.8 million, \$0.4 million and \$0.2 million for fiscal years 2022, 2021 and 2020, respectively. As of October 31, 2022 and 2021, the combined amount of accrued interest and penalties related to tax positions taken on our tax returns was approximately \$12.7 million and \$13.5 million, respectively.

The timing of the resolution of income tax examinations, and the amounts and timing of various tax payments that are part of the settlement process, are highly uncertain. Variations in such amounts and/or timing could cause large fluctuations in the balance sheet classification of current and non-current assets and liabilities. We believe that in the coming 12 months, it is reasonably possible that either certain audits and ongoing tax litigation will conclude or the statute of limitations on certain state and foreign income and withholding taxes will expire, or both. Given the uncertainty as to ultimate settlement terms, the timing of payment and the impact of such settlements on other uncertain tax positions, the range of the estimated potential decrease in underlying unrecognized tax benefits is between \$0.0 and \$28.0 million.

We and/or our subsidiaries remain subject to tax examination in the following jurisdictions:

Jurisdiction	Year(s) Subject to Examination
United States	Fiscal years after 2020
California	Fiscal years after 2017
Hungary	Fiscal years after 2018
Ireland	Fiscal years after 2017
Japan	Fiscal years after 2016
Korea and Taiwan	Fiscal years after 2020
China	Fiscal years after 2012
India	Fiscal years after 2018

In addition, we have made acquisitions with operations in several of our significant jurisdictions which may have years subject to examination different from the years indicated in the above table.

IRS Examinations

In fiscal 2021, the Examination Division of the IRS completed its pre-filing review for fiscal 2020 and as a result we recognized approximately \$7.1 million in unrecognized tax benefits, primarily due to the allowance of research tax credits.

In fiscal 2020, we reached partial settlement with the Examination Division of the IRS for fiscal 2019 and recognized approximately \$6.3 million in unrecognized tax benefits, primarily due to the allowance of certain foreign tax credits and research tax credits.

State Examinations

In fiscal 2020, we reached final settlement with the California Franchise Tax Board for fiscal 2015, 2016, and 2017. As a result of the settlement, we recognized \$20.2 million in unrecognized tax benefits and increased our valuation allowance by \$20.2 million.

Non-U.S. Examinations

Hungarian Tax Authority

In 2017, the Hungarian Tax Authority (the HTA) assessed withholding taxes of approximately \$25.0 million and interest and penalties of \$11.0 million, against our Hungary subsidiary (Synopsys Hungary). Synopsys Hungary contested the assessment with the Hungarian Administrative Court (Administrative Court). In 2019, as required under Hungarian law, Synopsys Hungary paid the assessment and recorded a tax expense due to an unrecognized tax benefit of \$17.4 million, which is net of estimated U.S. foreign tax credits. The Administrative Court found against Synopsys Hungary, and we appealed to the Hungarian Supreme Court. During 2021, the Hungarian Supreme Court heard our appeal and remanded the case to the Administrative Court for further proceedings. The Administrative Court once again ruled against Synopsys Hungary, and we filed another appeal with the Hungarian Supreme Court. The Hungarian Supreme Court heard our appeal on January 27, 2022, vacated the lower court's decision and remanded the case back to the Administrative Court for further proceedings. Hearings with the Administrative Court were held on June 30, 2022 and September 22, 2022. In response to a request by the Administrative Court, we filed an additional brief on November 23, 2022. We expect a hearing to be scheduled in early 2023.

In fiscal 2020, we reached final settlement with the HTA for fiscal years 2014 through 2018. As a result of the settlement, we recognized tax expense of \$1.4 million, and recognized \$6.9 million in unrecognized tax benefits.

Note 16. Other Income (Expense), Net

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

	Year Ended October 31,		
	2022	2021	2020
	(in thousands)		
Interest income	\$ 8,545	\$ 2,442	\$ 3,561
Interest expense	(1,698)	(3,365)	(5,140)
Gains (losses) on assets related to deferred compensation plan	(68,778)	71,603	21,469
Foreign currency exchange gains (losses)	4,694	5,292	5,544
Other, net	10,713	(5,248)	(7,416)
Total	<u>\$ (46,524)</u>	<u>\$ 70,724</u>	<u>\$ 18,018</u>

Note 17. Segment Disclosure

Segment reporting is based upon the “management approach,” i.e., how management organizes our operating segments for which separate financial information is (1) available and (2) evaluated regularly by the Chief Operating Decision Maker (CODM) in deciding how to allocate resources and in assessing performance. Until the second quarter of fiscal 2022, we had two CODMs, our two Co-Chief Executive Officers. One of our Co-Chief Executive Officers transitioned out of this role effective May 1, 2022. Commencing in the third quarter of fiscal 2022, our CODM is our sole Chief Executive Officer.

We have two reportable segments: (1) Semiconductor & System Design, which includes EDA tools, IP products, system integration solutions and other associated revenue categories, and (2) Software Integrity, which includes a comprehensive solution for building integrity—security, quality and compliance testing—into the customers’ software development lifecycle and supply chain.

The financial information provided to and used by the CODM to assist in making operational decisions, allocating resources, and assessing performance reflects consolidated financial information as well as revenue, adjusted operating income, and adjusted operating margin information for the Semiconductor & System Design and Software Integrity segments, accompanied by disaggregated information relating to revenue by geographic region.

Information by reportable segment was as follows:

	Year Ended October 31,		
	2022	2021	2020
	(in thousands)		
Total Segments:			
Revenue	\$ 5,081,542	\$ 4,204,193	\$ 3,685,281
Adjusted operating income	1,675,102	1,281,389	1,031,630
Adjusted operating margin	33 %	30 %	28 %
Semiconductor & System Design:			
Revenue	\$ 4,615,714	\$ 3,810,409	\$ 3,327,211
Adjusted operating income	1,628,108	1,243,078	990,837
Adjusted operating margin	35 %	33 %	30 %
Software Integrity:			
Revenue	\$ 465,828	\$ 393,784	\$ 358,070
Adjusted operating income	46,994	38,311	40,793
Adjusted operating margin	10 %	10 %	11 %

Certain operating expenses are not allocated to the segments and are managed at a consolidated level. The unallocated expenses managed at a consolidated level, including amortization of intangible assets, stock-based compensation, changes in the fair value of deferred compensation plan and certain other operating expenses, were

presented in the table below to provide a reconciliation of the total adjusted operating income from segments to our consolidated operating income:

	Year Ended October 31,		
	2022	2021	2020
	(in thousands)		
Total segment adjusted operating income	\$ 1,675,102	\$ 1,281,389	\$ 1,031,630
Reconciling items:			
Amortization of intangible assets	(96,690)	(82,380)	(91,281)
Stock-based compensation expense	(459,029)	(345,272)	(248,584)
Deferred compensation plan	68,778	(71,603)	(21,469)
Other	(26,123)	(47,344)	(50,155)
Total operating income	<u>\$ 1,162,038</u>	<u>\$ 734,790</u>	<u>\$ 620,141</u>

The CODM does not use total assets by segment to evaluate segment performance or allocate resources. As a result, total assets by segment are not required to be disclosed.

In allocating revenue to particular geographic areas, the CODM considers where individual "seats" or licenses to our products are located. Revenue is defined as revenue from external customers. Revenue and property and equipment, net, related to operations in the United States and other geographic areas were:

	Year Ended October 31,		
	2022	2021	2020
	(in thousands)		
Revenue:			
United States	\$ 2,349,766	\$ 1,951,964	\$ 1,774,348
Europe	493,430	440,825	385,287
China	795,405	562,711	420,829
Korea	531,542	427,471	389,008
Other	911,399	821,222	715,809
Consolidated	<u>\$ 5,081,542</u>	<u>\$ 4,204,193</u>	<u>\$ 3,685,281</u>
	As of October 31,		
	2022	2021	
	(in thousands)		
Property and Equipment, net:			
United States	\$ 297,780	\$ 283,602	
Other	185,520	188,796	
Total	<u>\$ 483,300</u>	<u>\$ 472,398</u>	

Geographic revenue data for multi-regional, multi-product transactions reflect internal allocations and are therefore subject to certain assumptions and to our allocation methodology.

One customer, including its subsidiaries, accounted for 11.7%, 10.6%, and 12.4% of our consolidated revenue in fiscal 2022, 2021, and 2020, respectively. No customer was responsible for over 10% of our accounts receivables as of October 31, 2022 and 2021.

Note 18. Restructuring Charges

In the third quarter of fiscal 2021, we initiated a restructuring plan for involuntary and voluntary employee termination and facility closure actions as part of a business reorganization (the 2021 Plan). The 2021 Plan consisted primarily of severance, retirement benefits under the 2021 Voluntary Retirement Program (2021 VRP) and lease abandonment costs, and was substantially completed in the first quarter of fiscal 2022. Total charges under the 2021 Plan were \$45.5 million.

During fiscal 2022, we recorded restructuring charges of \$12.1 million and made payments of \$26.3 million under the 2021 Plan. As of October 31, 2022, the outstanding restructuring related liabilities were immaterial and recorded in accounts payable and accrued liabilities in the consolidated balance sheets.

During fiscal 2021, we recorded restructuring charges of \$33.4 million and made payments of \$19.2 million under the 2021 Plan. As of October 31, 2021, \$14.2 million of payroll and related benefits liabilities remained outstanding and was recorded in accounts payable and accrued liabilities in the consolidated balance sheets. The remaining balance was paid in fiscal 2022.

During fiscal 2020, we recorded restructuring charges of \$36.1 million under the 2019 restructuring plan. These charges consisted primarily of severance and retirement benefits. \$57.4 million was paid in fiscal 2020 which included payments of remaining balances in fiscal 2019. As of October 31, 2020, \$1.3 million remained outstanding and was recorded in accounts payable and accrued liabilities as payroll and related benefits in the consolidated balance sheets. The remaining balance was paid in fiscal 2021.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

Not applicable.

Item 9A. Controls and Procedures

- (a) *Evaluation of Disclosure Controls and Procedures.* As of October 29, 2022, Synopsys carried out an evaluation under the supervision and with the participation of Synopsys' management, including the Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of Synopsys' disclosure controls and procedures (as such term is defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act). There are inherent limitations to the effectiveness of any system of disclosure controls and procedures. Accordingly, even effective disclosure controls and procedures can only provide reasonable, not absolute, assurance of achieving their control objectives. Our Chief Executive Officer and Chief Financial Officer have concluded that, as of October 29, 2022, Synopsys' disclosure controls and procedures were effective to provide reasonable assurance that information required to be disclosed in the reports Synopsys files and submits under the Exchange Act is recorded, processed, summarized and reported as and when required, and that such information is accumulated and communicated to Synopsys' management, including the Chief Executive Officer and Chief Financial Officer, to allow timely decisions regarding its required disclosure.
- (b) *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 Rules 13a-15(f) and 15d-15(f) under the Exchange Act) for Synopsys.
- Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of October 29, 2022. In assessing the effectiveness of our internal control over financial reporting, our management used the framework 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 October 29, 2022, our internal control over financial reporting was effective based on these criteria. Our independent registered public accounting firm, KPMG LLP, has issued an auditors' report on the effectiveness of our internal control over financial reporting, which is included herein.
- (c) *Changes in Internal Control Over Financial Reporting.* There were no changes in Synopsys' internal control over financial reporting during the fiscal quarter ended October 29, 2022 that have materially affected, or are reasonably likely to materially affect, Synopsys' internal control over financial reporting.

Item 9B. Other Information

None.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

For information required by this Item relating to our executive officers, see *Information about our Executive Officers* in Part I, Item 1 of this Annual Report on Form 10-K.

The information required by this Item relating to our directors and nominees is included under the heading “Proposal 1 — Election of Directors,” in our definitive Proxy Statement to be filed within 120 days after October 29, 2022 for the 2023 Annual Meeting of Stockholders (the Proxy Statement) and is incorporated herein by reference. The information required by this Item regarding our Audit Committee is included under the headings “Audit Committee Report” and “Corporate Governance” in our Proxy Statement and is incorporated herein by reference. We will provide disclosure of delinquent Section 16(a) reports, if any, in our Proxy Statement, and such disclosure, if any, is incorporated herein by reference.

The information required by this Item relating to our code of ethics and its applicability to our Principal Executive Officer, Principal Financial Officer and Principal Accounting Officer is included under the subheading “Ethics and Business Conduct” under the heading “Corporate Governance” in our Proxy Statement and is incorporated herein by reference.

Item 11. Executive Compensation

The information required by this Item relating to director and executive compensation is included under the headings “Compensation Discussion and Analysis” (and all subheadings thereunder), “Executive Compensation Tables” (and all subheadings thereunder), “Director Compensation,” “Compensation Committee Interlocks and Insider Participation,” and “Compensation Committee Report” in our Proxy Statement and is incorporated herein by reference.

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

The information required by this Item relating to security ownership of certain beneficial owners and management is included under the heading “Security Ownership of Certain Beneficial Owners and Management” in our Proxy Statement, and the information required by this Item relating to securities authorized for issuance under equity compensation plans is included under the heading “Equity Compensation Plan Information” in our Proxy Statement, and, in each case, is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions and Director Independence

The information required by this Item relating to the review, approval or ratification of transactions with related persons is included under the heading “Transactions with Related Persons” in our Proxy Statement, and the information required by this Item relating to director independence is included under the heading “Director Independence,” and, in each case, is incorporated herein by reference.

Item 14. Principal Accountant Fees and Services

The information required by this Item is included under the subheadings “Fees and Services of Independent Registered Public Accounting Firm” and “Audit Committee Pre-Approval Policies and Procedures” under the proposal titled “Ratification of Selection of Independent Registered Public Accounting Firm” in our Proxy Statement and is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) The following documents are filed as part of this Form 10-K:

(1) Financial Statements

The following documents are included as Part II, Item 8 of this Form 10-K:

	Page
Report of Independent Registered Public Accounting Firm (KPMG LLP, Santa Clara, CA, PCAOB ID: 185)	48
Consolidated Balance Sheets	50
Consolidated Statements of Income	51
Consolidated Statements of Comprehensive Income	52
Consolidated Statements of Stockholders' Equity	53
Consolidated Statements of Cash Flows	54
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(2) Financial Statement Schedules

Schedules not listed above have been omitted because the information required to be set forth therein is not applicable or is shown in the financial statements or notes herein.

(3) Exhibits

See Item 15(b) below.

(b) Exhibits

EXHIBIT INDEX

Exhibit Number	Exhibit Description	Incorporated By Reference				Filed or Furnished Herewith
		Form	File No.	Exhibit	Filing Date	
3.1	Amended and Restated Certificate of Incorporation	10-Q	000-19807	3.1	9/15/2003	
3.2	Amended and Restated Bylaws	10-K	000-19807	3.2	12/15/2020	
4.1	Description of Synopsys' Capital Stock	10-K	000-19807	4.2	12/15/2020	
10.1	Conformed Credit Agreement, as amended and restated pursuant to that certain Fourth Extension and Amendment Agreement, dated January 22, 2021, among Synopsys, Inc. as Borrower, the Lenders parties thereto and JPMorgan Chase Bank, N.A., as administrative agent for the lenders	8-K	000-19807	10.1	1/25/2021	
10.2*	2006 Employee Equity Incentive Plan, as amended	8-K	000-19807	10.3	4/15/2022	
10.3*	Form of Restricted Stock Unit Grant Notice and Award Agreement under 2006 Employee Equity Incentive Plan	8-K	000-19807	10.4	4/15/2022	

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Exhibit Number	Exhibit Description	Incorporated By Reference				Filed or Furnished Herewith
		Form	File No.	Exhibit	Filing Date	
10.4*	Form of Stock Option Grant Notice and Award Agreement under 2006 Employee Equity Incentive Plan	8-K	000-19807	10.5	4/15/2022	
10.5*	Employee Stock Purchase Plan, as amended	8-K	000-19807	10.6	4/15/2022	
10.6*	2017 Non-Employee Directors Equity Incentive Plan	8-K	000-19807	10.8	4/10/2017	
10.7*	Form of Restricted Stock Grant Notice and Award Agreement under 2017 Non-Employee Directors Equity Incentive Plan	10-K	000-19807	10.9	12/14/2017	
10.8*	Form of Stock Options Grant Notice and Option Agreement under 2017 Non-Employee Directors Equity Incentive Plan	10-K	000-19807	10.10	12/14/2017	
10.9*	Deferred Compensation Plan as restated effective August 1, 2002	10-Q	000-19807	10.5	6/10/2004	
10.10*	Synopsisys Amended and Restated Deferred Compensation Plan II	10-Q	000-19807	10.23	3/9/2009	
10.11	Form of Indemnification Agreement for directors and executive officers	8-K	000-19807	99.2	7/14/2011	
10.12*	Director's and Officer's Insurance and Company Reimbursement Policy	S-1	33-45138	10.2	2/24/1992 (effective date)	
10.13*	Amended and Restated Employment Agreement, dated December 15, 2016 between Synopsisys, Inc. and Dr. Aart de Geus	8-K	000-19807	10.16	12/21/2016	
10.14*	Executive Incentive Plan, as amended	8-K	000-19807	10.1	12/6/2021	
10.15*	Amended and Restated Executive Change of Control Severance Benefit Plan	8-K	000-19807	10.19	12/21/2016	
10.16*	Compensation Recovery Policy	10-K	000-19807	10.46	12/22/2008	
10.17*	Executive Severance Benefit and Transition Plan	8-K	000-19807	10.1	2/9/2021	
10.18*	Relocation Assistance Agreement, dated April 30, 2021, by and between Synopsisys, Inc. and Sassine Ghazi	10-Q	000-19807	10.2	5/21/2021	
10.19*	Offer Letter, dated November 23, 2022, by and between Synopsisys, Inc. and Shelagh Glaser	8-K	000-19807	10.1	11/29/2022	
21.1	Subsidiaries of Synopsisys, Inc.					X

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Exhibit Number	Exhibit Description	Incorporated By Reference				Filed or Furnished Herewith
		Form	File No.	Exhibit	Filing Date	
23.1	Consent of KPMG LLP, Independent Registered Public Accounting Firm					X
24.1	Power of Attorney (see signature page to Annual Report on Form 10-K)					X
31.1	Certification of Chief Executive Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Exchange Act					X
31.2	Certification of Chief Financial Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Exchange Act					X
32.1+	Certification of Chief Executive Officer and Chief Financial Officer furnished pursuant to Rule 13a-14(b) or Rule 15d-14(b) of the Exchange Act and Section 1350 of Chapter 63 of Title 18 of the United States Code					X
101	The following financial statements from the Company's Annual Report on Form 10-K for the year ended October 29, 2022, formatted in Inline XBRL: (i) Consolidated Balance Sheets as of October 29, 2022 and October 30, 2021, (ii) Consolidated Statements of Income for the Years Ended October 29, 2022, October 30, 2021 and October 31, 2020, (iii) Consolidated Statements of Comprehensive Income for the Years Ended October 29, 2022, October 30, 2021 and October 31, 2020, (iv) Consolidated Statements of Stockholders' Equity for the Years Ended October 29, 2022, October 30, 2021 and October 31, 2020, (v) Consolidated Statements of Cash Flows for the Years Ended October 29, 2022, October 30, 2021 and October 31, 2020 and (vi) Notes to Consolidated Financial Statements, tagged as blocks of text and including detailed tags					X

* Indicates a management contract, compensatory plan or arrangement.

+ This exhibit is furnished with this Annual Report on Form 10-K and is not deemed filed with the Securities and Exchange Commission and is not incorporated by reference in any filing of Synopsys, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date hereof and irrespective of any general incorporation language contained in such filing.

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.

SYNOPSYS, INC.

Date: December 12, 2022

By: /s/ Shelagh Glaser
Shelagh Glaser
Chief Financial Officer
(Principal Financial Officer)

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Aart J. de Geus and Shelagh Glaser, and each of them, as their true and lawful attorneys-in-fact and agents, with full power of substitution and reconstitution, for them and in their name, place and stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as they might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any of them, or their substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

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

<u>Name</u>	<u>Title</u>	<u>Date</u>
<u>/S/ AART J. DE GEUS</u> Aart J. de Geus	Chief Executive Officer (Principal Executive Officer) and Chairman of the Board of Directors	December 12, 2022
<u>/S/ SHELAGH GLASER</u> Shelagh Glaser	Chief Financial Officer (Principal Financial Officer)	December 12, 2022
<u>/S/ SUDHINDRA KANKANWADI</u> Sudhindra Kankanwadi	Chief Accounting Officer (Principal Accounting Officer)	December 12, 2022
<u>/S/ LUIS BORGEN</u> Luis Borgen	Director	December 12, 2022
<u>/S/ MARC CASPER</u> Marc Casper	Director	December 12, 2022
<u>/S/ JANICE D. CHAFFIN</u> Janice D. Chaffin	Director	December 12, 2022
<u>/S/ BRUCE R. CHIZEN</u> Bruce R. Chizen	Director	December 12, 2022
<u>/S/ MERCEDES JOHNSON</u> Mercedes Johnson	Director	December 12, 2022
<u>/S/ CHRYSOSTOMOS L. NIKIAS</u> Chrysostomos L. Nikias	Director	December 12, 2022
<u>/S/ JEANNINE SARGENT</u> Jeannine Sargent	Director	December 12, 2022
<u>/S/ JOHN G. SCHWARZ</u> John G. Schwarz	Director	December 12, 2022
<u>/S/ ROY VALLEE</u> Roy Vallee	Director	December 12, 2022