Synopsys, Inc. (SNPS)

Baird Facts

Please refer to Appendix - Important Disclosures and Analyst Certification.

<table>
<thead>
<tr>
<th>Price ($) (5/20/20):</th>
<th>165.47</th>
<th>Rating:</th>
<th>Outperform</th>
</tr>
</thead>
<tbody>
<tr>
<td>52WK H-L ($) :</td>
<td>167 - 105</td>
<td>Suitability:</td>
<td>Higher Risk</td>
</tr>
<tr>
<td>Market Cap (mil):</td>
<td>25,570</td>
<td>Price Target ($) :</td>
<td>182</td>
</tr>
<tr>
<td>Shares Out (mil):</td>
<td>154.5</td>
<td>L-Term Rev. Gr Rate Est:</td>
<td>8%</td>
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<tr>
<td>Float (mil):</td>
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<td>L-Term EPS Gr Rate Est:</td>
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<tr>
<td>Avg. Daily Vol (mil):</td>
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<td>Debt/Cap:</td>
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<td>Dividend ($) :</td>
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<tr>
<td>Yield (%):</td>
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<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>FY Oct</th>
<th>2019A</th>
<th>2020E</th>
<th>2021E</th>
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<tr>
<td>Q1</td>
<td>1.08A</td>
<td>1.01A</td>
<td>1.42E</td>
</tr>
<tr>
<td>Q2</td>
<td>1.16A</td>
<td>0.99E</td>
<td>1.48E</td>
</tr>
<tr>
<td>Q3</td>
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<td>1.37E</td>
<td>1.50E</td>
</tr>
<tr>
<td>Q4</td>
<td>1.15A</td>
<td>1.81E</td>
<td>1.63E</td>
</tr>
<tr>
<td>Total</td>
<td>4.56A</td>
<td>5.18E</td>
<td>6.04E</td>
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<tr>
<td>FY P/E</td>
<td>36.3x</td>
<td>31.9x</td>
<td>27.4x</td>
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<tr>
<td>P/E (Cal)</td>
<td>36.8x</td>
<td>30.1x</td>
<td>27.6x</td>
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</table>

Headquartered | IPO/Founded
--- | ---
Mountain View, CA | 1992/1986

Management
- Chief Executive Officer: Dr. Aart de Gues
- Chief Executive Officer: Dr. Chi-Foon Chan
- Chief Financial Officer: Trac Pham
- Investor Relations: Lisa Ewbank

Company Description
Synopsys, Inc., headquartered in Mountain View, California, provides software and intellectual property (IP) products for the design and testing of integrated circuits (i.e., chips). As a key technology partner to the semiconductor industry, Synopsys helps to enable innovation in chip design while accelerating time to market and ensuring product reliability. As innovation drives greater complexity in chips and broader systems, the potential risk from security vulnerabilities also rises; seeing this as a potential opportunity, Synopsys entered the software security market in 2014 with Software Integrity Solutions growing to 10% of total revenues during Fiscal 2019 (+65% CAGR).

Revenue Profile

Additional Detail (Product or End Mkt)

<table>
<thead>
<tr>
<th>Geographic</th>
<th>Revenues</th>
<th>Software Integrity 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>APAC</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Americas</td>
<td>51%</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>EMEA</td>
<td>10%</td>
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</tr>
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</table>

Source: Baird estimates, Factset, Company reports
Synopsys, Inc.
May 20, 2020

Competition
In the semiconductor design and verification space, the company competes most frequently with Cadence Design and Mentor Graphics (now a part of Siemens AG). Other companies with EDA or electronics design capability include Altium, Ansys, CEVA, Keysight Technologies and Zuken Ltd.

Quick Summary
- **Maintain Outperform.** Synopsys is a top idea. The company reports F2Q results next Wednesday and we expect an in-line quarter. The F3Q and FY20 guidance will likely have several moving pieces given potential impacts to near-term hardware/IP deliveries, likely prudence in planning around recouping volume within the October fiscal year, and updating of bookings expectations for Software Integrity. Even with these items, Synopsys has one of the best revenue/margin acceleration opportunities in our coverage into 2H20, underpinning our positive view.
- **Maintain Outperform rating.**
- We are positive on Synopsys as the leader in design software (EDA) for semiconductor development. The technology/semiconductor vertical has proven to be the most resilient through reporting season for our design software names, and we believe this relative strength and strong thematic/secular appeal can continue to aid stock performance.
- **Synopsys reports F2Q (April) results on May 20.**
- We expect in-line results relative to guidance for $820-850 million in revenues (flat YoY growth; consensus = $837 million) and EPS of $0.96-1.01 (consensus = $0.98). Similar to recent quarters, we expect IP growth to be the standout contributor with Software Integrity likely muted given softer bookings during FY19.
- **A few items we are focused on:**
  - **F3Q guidance.** Our revenue estimate is approximately 4% below current consensus. This is a similar magnitude as was the case with Cadence (link), which ultimately did capture their June-quarter guidance reflecting the potential delivery delays in IP/hardware. With Synopsys’ July quarter, delivery impacts could be more manageable; Siemens/Mentor noted last week that they have “clearly visible elements in our portfolio that are going to be materializing on the revenue side” during the upcoming quarter, which we take as a good indication of scheduled demand coming from chip customers.
  - **“Core” EDA growth.** The core catalogue of Fusion/Custom/Verification Continuum is very well positioned to benefit from R&D activity supporting advanced developments during 2021+. We believe F2Q has another difficult comparison against last year’s high demand for emulator/prototyping solutions, which could optically ‘disguise’ the MSD/HSD growth profile for EDA software.
  - **Software Integrity.** Peer commentary so far has been constructive regarding renewal activity for security solutions, albeit while still factoring in bookings deceleration for remainder of 2020. This was already a transitional year for Synopsys and our expectations remain muted (we model 4-5% revenue growth in FY20). At the same time, the company continues to be recognized for its portfolio of offerings and the Polaris platform could drive better growth during FY21.
  - **China (less than 10% of revenue).** We are interested in whether the company can size/quantify potential impacts from the proposed expansion in export restrictions by the US Department of Commerce. Last year, Synopsys incorporated export restrictions the week after they were published and was still able to increase FY19 guidance.

Investment Thesis
**A good time for EDA, a good time for Synopsys.** The primary customers of Synopsys EDA software are semiconductor companies, for which the drive to innovate – more performance in smaller packages using less power – has necessitated consistent investment in R&D efforts. EDA is of central importance to chip development and its multi-step workflows, with EDA industry growth typically in close lockstep to broader semiconductor R&D growth. As the leader in digital design and verification, Synopsys benefits from these development activities.

- **Looking forward, R&D spending appears set to re-accelerate following a lean year in 2019.** In the past, these R&D “upcycles” have proven to be positive for Synopsys stock and EDA revenue performance: in the two prior instances this cycle (2008-12, 2015-17), Synopsys stock realized annualized outperformance of 6% and 20%, respectively, during the period of R&D acceleration. We believe this market environment supports management’s targets for mid- to high-single-digit growth for EDA revenues.

**IP a growth accelerator.** The ongoing push to accelerate time to market and optimize development resources has been a positive secular driver for the intellectual property market, where semiconductor companies are able to utilize pre-designed and pre-verified circuits in the buildout of new chips. Synopsys in the No. 2 overall provider (behind Arm Ltd.) with the leading position in several categories: interface, embedded memory and foundry-specific IP. In years ahead, we expect IP revenues to continue to deliver double-digit growth given favorable secular dynamics and opportunities for Synopsys outperformance:

- **Continued outsourcing of key functions where Synopsys has leadership.** Of the $5.5 billion market opportunity today, approximately 65% is outsourced to third-party IP providers. While certain categories, like wired interfaces and verification, are 70%+ outsourced, there is still opportunity elsewhere to accelerate usage of third-party IP (e.g., analog, security and wireless see <50% outsourced today).
- **Growing complexity in chip design is causing a shift in how companies approach IP, moving from the purchase of individual blocks and toward complete and integrated IP subsystems.** This is particularly true in the case of new market opportunities (e.g., autonomous driving systems that require automotive-grade safety and performance benchmarks) and with new technology startups (where a starting point for investment is often IP in order to best leverage smaller design teams).

**Software Integrity an important long-term contributor.** The process of developing and deploying software has undergone significant change with the advent of cloud computing and need for business applications to have fast and frequent updating. This has driven new business strategies and a more symbiotic relationship between software developers and IT operations (“DevOps”), while also giving way to new considerations around software composition: security and compliance testing/validation. Synopsys Software Integrity
Solutions helps customers benchmark the effectiveness of software security through Professional Services, while delivering cloud-based testing tools to determine open source license compliance and potential security vulnerabilities and defects.

- Since 2014, Synopsys has acquired a portfolio of solutions across application security testing and software composition analysis: Coverity for static application security testing, Defensics and Seeker for dynamic and interactive security testing (e.g., testing code in running state), and Black Duck for analyzing third-party and open-source components.
- In Fiscal 2019, these acquisitions came together to create an enterprise-scale cloud platform – Polaris – that gives customers a single interface to access all tools (while enabling cross-selling for Synopsys once customers land on the platform).

**Period of heavy investment should give way to improving returns moving forward.** We believe Fiscal 2020 through 2022 should see operating margin expand from ~25% toward ~30% as Synopsys leverages the significant investment in headcount and personnel-related costs (both organic and inorganic) that took place during recent years. The second half of Fiscal 2019 saw early indications of improvement with Synopsys able to grow sales and expand profitability without making commensurate investments in application engineering and other sales/support functions. As shown in the following chart, this is in contrast to Fiscal 2017 and 2018 when nearly 60% of every incremental revenue dollar was spent on personnel-related costs.

**Valuation.** Our $182 price target is based on 30x our NTM free cash flow estimate. With design software peers trading near 34x NTM FCF today, we apply a discount. We believe a modest discount is warranted in light of the historical volatility associated with the semiconductor industry.

**Risks.** Key risks include the following: 1) growth in R&D spending by the semiconductor industry and impacts on EDA/IP spending; 2) competition from large global EDA vendors (Cadence and Mentor Graphics) and solution providers in the software integrity business; 3) impacts from operating a global business, including foreign currency fluctuation, IP protection, and trade policy uncertainty; 4) timing and magnitude of investments to support growth; 5) impacts of acquisitions, both by the company and among customers (where consolidation can influence spending decisions on EDA tools); 6) modeling risk, particularly around the timing of IP and hardware usage by customers and resulting revenue recognition; 7) seasonal characteristics of financial and stock performance; 8) uncertainties created by COVID-19 and the resulting impacts on customer spending decisions.

**Risks & Caveats**

**Growth in semiconductor R&D and impacts on EDA/IP spending.** Spending on EDA tools and IP blocks is heavily influenced by new design projects at semiconductor and electronic system companies. These end markets are cyclical and downturns can influence the timing of new projects or size of R&D budgets. One favorable offset in this equation is the introduction of new technology and/or product architectures which continue to receive incremental spending, even in the midst of lower industry revenues. As one example, we estimate the Top 25 largest semiconductor companies (excl. Memory) will see revenues decline by nearly 10% in 2019, yet R&D spending is poised to increase slightly.

**Competition.** In the semiconductor design and verification space, the company competes most frequently with Cadence Design and Mentor Graphics (now a part of Siemens AG). Other companies with EDA or electronics design capability include Altium, Ansys, CEVA, Keysight Technologies and Zuken Ltd.

In Software Integrity, primary competitors include Checkmarx Ltd., Veracode, Micro Focus, Rapid7, Qualys, WhiteSource, Snyk, and numerous other new entrants.

**Impacts from operating a global business.** Revenue from international operations has approximated 50% of total sales during recent years. A weakening U.S. dollar relative to other currencies can increase expenses of foreign operations when they are translated into U.S. dollars. While the company does engage in FX hedging activity, this is not guaranteed to hedge all foreign currency risk.

Furthermore, the adoption of government trade restrictions – including tariffs, export/import regulations, sanctions, or other trade barriers – can negatively impact the company’s ability to sell to certain customers. With respect to 2019 financial performance, Synopsys’ compliance with U.S. Department of Commerce Export Control regulations resulted in the inability to sell to certain customers in China, a region that has represented less than 10% of total company sales.

**Timing and magnitude of investments to support growth.** The company’s largest operating expense is Research and Development, typically running between 31% and 33% of revenue. The industries in which Synopsys operates are known for rapid technical change and require continuous innovation in order to remain competitive. In particular, the company has noted trends in the areas of design and manufacturing (e.g., advanced process nodes and 3D transistors), joint hardware/software development, re-use of IP, and adoption of cloud computing techniques, all of which require higher levels of investment.

**Impacts from acquisitions.** Among semiconductor companies, there has been a trend toward consolidation through M&A. To the extent this continues, Synopsys (and other EDA vendors) could face elevated pricing pressure or competition in order to retain services to the newly formed and larger entity.

**Modeling risk.** The ability to forecast/model the company’s quarterly results can be difficult given accounting treatment of certain product sales and the timing of investments to support future business. For example, revenue related to hardware and IP depends on the commencement of new projects by customers, with Synopsys recognizing product revenue upon delivery.
Supplemental Information
Our $182 price target is based on 30x our NTM free cash flow estimate.
Appendix – Important Disclosures and Analyst Certification

Robert W. Baird & Co. Incorporated makes a market in the securities of SNPS.

**Appendix – Important Disclosures and Analyst Certification**

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