



## 2021 Vertical Software Outlook:

*Glad That's Over! Charging Ahead into the Year of the Ox*

### Vertical Software

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*With the backdrop of a more robust recovery beginning in the 2H, we are entering 2021 broadly positive on our vertical software coverage. That said, we continue to favor durability and highlight ideas with multiple growth catalysts, in addition to any recovery tailwinds. As a result, we are raising our price targets on multiple companies to reflect our continued conviction; upgrading CDNS to Overweight based on our increased confidence in the company's multi-year tailwinds, continued margin expansion prospects, and emerging growth opportunities; and highlighting CHGG and ADSK as our key ideas for 2021.*

Ticker	Current Price	Price Target	Ratings Change	Price Target Change	2021 Estimates Change
ADSK	\$295.88	\$345	—	▲ (From \$310)	—
CDNS	\$134.70	\$155	▲ OW (from SW)	▲ (From NA)	▲
SNPS	\$253.66	\$290	—	▲ (From \$265)	—

## Ratings Change

**CDNS:** Upgrading to OW (Please refer to our separate note, [Core Idea for Durability, Tailwinds, and Further Margin Expansion; Upgrading to OW](#))

## High Conviction Ideas

**ADSK: Market Dominance and Growth Opportunities Still Under-Rewarded.** We believe ADSK could be one of the better FCF growth stories over the next two years. Trading at a 5-turn discount to broader industrial software avg. of 38x 2022 EV/FCF, ADSK's market dominance, fundamentals, and growth remain underappreciated and warrant a premium valuation, in our view.

**CHGG: Study Pack Momentum Headlines Post-Pandemic Drivers (see separate note [here](#)).** We enter 2021 with increased confidence in Chegg's post-pandemic growth drivers. With momentum around Study Pack and international, and supported by recently implemented piracy enforcement measures, we believe Chegg has ample catalysts for the MT and LT.

## Under-the-Radar Reopening Idea

**AZPN: An under-the-radar reopening idea trading at a discount to broader Industrial software.** Recent underperformance through December suggests investors may be overlooking reopening tailwinds. A 2H recovery could present a better and more stable demand environment for end market customers, potentially improving close rates/sales cycles and a better back drop for estimate upside.

## One of Our Favorites

### Construction Industry Ripe for Digitization; Digital Picks and Shovels Positioned for the Long Term

Burdened by paper-based processes, labor-driven inefficiencies, and cost overruns and delays, the digitization of construction continues to be one of our favorite 2-5 year thematic ideas. **+ADSK, BSY, TRMB**

## One of the Most Durable

### Innovation + Silicon Arms Race Presents One of the Most Durable Multi-year Tailwinds in EDA and Simulation

Rising chip design complexity + expanding use cases + incremental buyers (deep pocketed hyperscalers, startups, China, and auto/industrial) = ample multi-year demand drivers for EDA and simulation tools. **+CDNS, SNPS, ANSS**

## One of the More Selective Approaches

### The Post-Pandemic Classroom: Online, Digital, and More Likely Than Before

With the pandemic as a catalyst, we could see the broad acceleration of overall EdTech adoption. Positive on overall industry opportunities, we take a more selective approach and favor **CHGG > TWOU**.

## Key Catalysts to Watch:

- **Pace of vaccine rollout** – Faster or slower rollout in 1Q could lead to robust recovery beginning in 2Q or delayed recovery in 4Q. **(+/- software)**
- **Putting America back to work** – Widely hoped-for infrastructure spending bill could be passed to jumpstart jobs recovery. **+BSY, ADSK, TRMB**
- **Dems somehow pass Corporate Tax increases** – A potential negative, especially for tax-paying Industrial Software group companies.

### 11/24 - ADSK

“And I expect by the second half of the year, that we'll see some pretty good recovery in economic activity that clearly will benefit us. So think of next year as being a little more back-end loaded.” – Former CFO Scott Herren

### 2H 2021

Based on company commentary, we believe expectations are set for a more robust recovery beginning in the 2H of 2021. This more broadly benefits Industrial Software (ADSK, ANSS, AZPN, BSY, DSY-FR, PTC, TRMB).

Calendar: Nov/Dec 2020

Jan 2021

2022

### 12/2 - SNPS

“...it's very difficult to predict what 2021 will look like in general. There is high hope that, as you head in 2H21, not only the Far East will do better from an economic point of view, but also Europe and the U.S. with the coming about of vaccines.” – CFO Trac Pham

### 12/15 - PTC

“...Now it might be more helpful in the Q4 than it is in the Q3 because I think few of us will actually have the vaccine kind of, let's say, in the third quarter.” – CEO Jim Heppelmann

# Vertical Software Coverage Summary

5

Company Name	Company Ticker	KBCM Rating	Stock Price	Market Cap (M)	Stock Performance		Revenue Growth			EV/Sales			EV/FCF			P/E		
					2019	2020	2019	2020E	2021E	2019	2020E	2021E	2019	2020E	2021E	2019	2020E	2021E
<b>EdTech</b>																		
Chegg Inc	CHGG	OW	\$87.62	\$12,195.0	33.4%	138.3%	28.0%	53.1%	24.2%	30.4x	19.8x	16.0x	NM	NM	77.8x	96.3x	66.4x	51.5x
Pluralsight Inc	PS	SW	\$20.63	\$2,973.4	(26.9%)	21.8%	36.6%	22.5%	14.5%	9.7x	7.9x	6.9x	NM	NM	NM	NM	NM	NM
2U Inc	TWOU	SW	\$38.49	\$2,639.6	(51.7%)	66.8%	39.6%	34.2%	19.8%	4.2x	3.1x	2.6x	NM	NM	NM	NM	NM	NM
<b>EdTech Average</b>					<b>(15.1%)</b>	<b>75.6%</b>	<b>34.7%</b>	<b>36.6%</b>	<b>19.5%</b>	<b>14.7x</b>	<b>10.3x</b>	<b>8.5x</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>96.3x</b>	<b>66.4x</b>	<b>51.5x</b>
<b>Industrial Software</b>																		
Autodesk Inc	ADSK	OW	\$295.88	\$65,774.1	42.6%	66.4%	27.4%	14.8%	14.0%	20.1x	17.5x	15.4x	48.3x	48.5x	40.4x	NM	75.3x	59.2x
ANSYS Inc	ANSS	SW	\$355.53	\$31,009.3	80.1%	41.3%	17.3%	6.8%	15.5%	20.0x	18.7x	16.2x	67.2x	70.0x	56.7x	54.1x	57.0x	48.6x
Aspen Technology Inc	AZPN	OW	\$130.73	\$8,928.9	47.2%	7.7%	17.6%	0.3%	22.8%	15.1x	15.1x	12.3x	38.2x	37.2x	33.3x	32.0x	34.0x	25.7x
Bentley Systems Inc	BSY	SW	\$39.97	\$12,169.3	NA	21.0%	6.3%	7.9%	9.0%	17.1x	15.8x	14.5x	76.0x	59.2x	55.8x	86.9x	64.5x	65.5x
Cadence Design Systems Inc	CDNS	OW	\$134.70	\$37,717.3	59.5%	96.7%	9.3%	13.6%	6.7%	15.9x	14.0x	13.1x	56.7x	47.6x	43.3x	61.2x	49.7x	45.8x
Dassault Systemes SE	DSY-FR	SW	€168.50	€44,349.2	41.3%	13.4%	16.3%	10.1%	10.2%	11.4x	10.4x	9.4x	42.7x	47.2x	41.0x	46.0x	45.1x	39.2x
PTC Inc	PTC	SW	\$117.37	\$13,744.0	(9.7%)	59.7%	4.8%	16.1%	8.6%	11.5x	9.9x	9.1x	65.4x	67.6x	42.4x	67.1x	45.7x	43.2x
Synopsys Inc	SNPS	OW	\$253.66	\$39,779.0	65.2%	86.2%	7.7%	9.7%	9.3%	11.5x	10.5x	9.6x	64.2x	46.2x	33.6x	55.6x	45.7x	40.3x
Trimble Inc	TRMB	SW	\$65.78	\$16,629.2	26.7%	60.2%	4.4%	(5.1%)	5.5%	5.5x	5.8x	5.5x	35.1x	35.2x	32.1x	33.1x	30.7x	29.0x
<b>Industrial Software Average</b>					<b>44.1%</b>	<b>50.3%</b>	<b>12.3%</b>	<b>8.2%</b>	<b>11.3%</b>	<b>14.2x</b>	<b>13.1x</b>	<b>11.7x</b>	<b>54.9x</b>	<b>51.0x</b>	<b>42.1x</b>	<b>54.5x</b>	<b>49.7x</b>	<b>44.0x</b>
<b>Real Estate SaaS</b>																		
Appfolio Inc	APPF	SW	\$176.60	\$6,297.6	85.7%	63.7%	34.7%	22.1%	12.9%	23.9x	19.6x	17.3x	NM	NM	NM	NM	37.9x	NM
RealPage Inc	RP	SW	\$86.81	\$8,745.2	11.5%	62.3%	13.5%	16.9%	10.5%	9.4x	8.1x	7.3x	35.1x	41.8x	40.1x	49.3x	45.7x	43.0x
<b>Real Estate SaaS Average</b>					<b>48.6%</b>	<b>63.0%</b>	<b>24.1%</b>	<b>19.5%</b>	<b>11.7%</b>	<b>16.7x</b>	<b>13.8x</b>	<b>12.3x</b>	<b>35.1x</b>	<b>41.8x</b>	<b>40.1x</b>	<b>49.3x</b>	<b>41.8x</b>	<b>43.0x</b>
<b>S/Mid Cap</b>																		
Materialise NV	MTLS	SW	\$53.82	\$2,862.7	(8.6%)	196.1%	6.5%	(14.6%)	8.3%	11.8x	13.8x	12.8x	NM	NM	NM	NM	NM	NM
Pros Holdings Inc	PRO	SW	\$48.81	\$2,115.9	90.8%	(15.3%)	27.1%	0.2%	6.2%	8.0x	8.0x	7.5x	NM	NM	NM	NM	NM	NM
SPS Commerce Inc	SPSC	SW	\$110.07	\$4,003.2	34.5%	95.9%	12.4%	11.1%	9.7%	13.4x	12.1x	11.0x	NM	NM	NM	86.0x	74.4x	70.6x
<b>S/Mid Cap Average</b>					<b>38.9%</b>	<b>92.2%</b>	<b>15.3%</b>	<b>(1.1%)</b>	<b>8.1%</b>	<b>11.1x</b>	<b>11.3x</b>	<b>10.4x</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>86.0x</b>	<b>74.4x</b>	<b>70.6x</b>
<b>Overall Average</b>							<b>18.2%</b>	<b>12.9%</b>	<b>12.2%</b>	<b>14.1x</b>	<b>12.4x</b>	<b>11.0x</b>	<b>52.9x</b>	<b>50.0x</b>	<b>45.1x</b>	<b>60.7x</b>	<b>51.7x</b>	<b>46.8x</b>
<b>Overall Median</b>							<b>16.3%</b>	<b>11.1%</b>	<b>10.2%</b>	<b>11.8x</b>	<b>12.1x</b>	<b>11.0x</b>	<b>52.5x</b>	<b>47.4x</b>	<b>41.0x</b>	<b>55.6x</b>	<b>45.7x</b>	<b>44.5x</b>
					<b>SP 500</b>	30.0%	13.4%											
					<b>Nasdaq</b>	35.2%	41.8%											

## +20% FCF growers:

ADSK , SNPS > ANSS, PTC

- Giving credit to robust FCF growth.
- ADSK remains one of the better and more straightforward multi-year FCF growth stories, in our view.
- SNPS well balanced FCF growth with topline strength + consistent OM expansion.
- Lapping of one-time adjustments is contributing to 2021 FCF acceleration for ANSS and PTC.

## Accelerating Revenue Profiles:

ANSS, BSY, TRMB, MTLs, PRO

- “Relatively” easier 2020 growth comps + 2021 recovery = larger set of software companies (44 of 127 software companies) seeing accelerating growth profiles entering 2021.
- Less of a differentiating screen vs. past years in our view.

## Multi-Year Margin Expansion Stories:

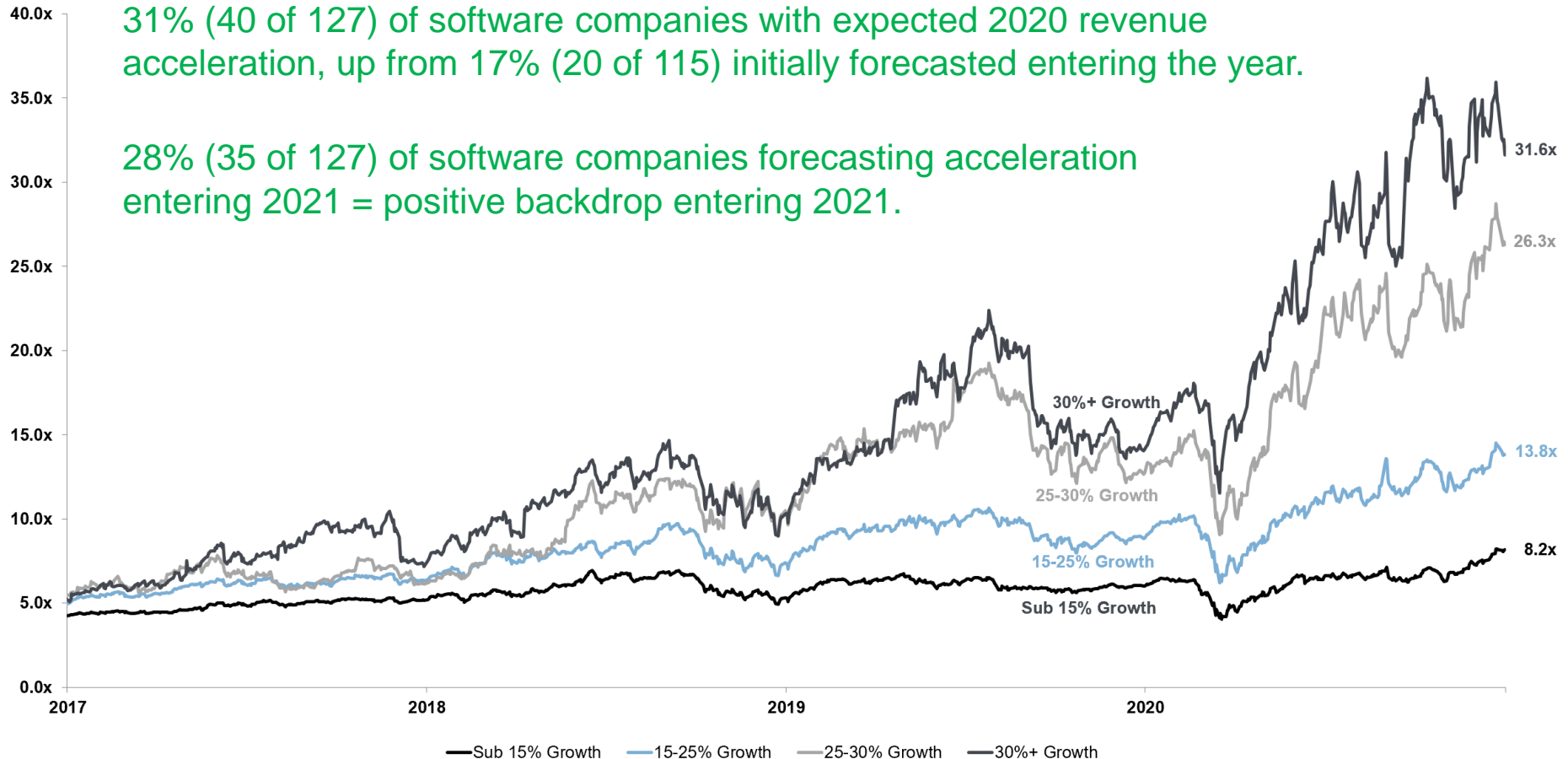
ADSK, CDNS, CHG, SNPS, SPSC

- Giving more credit to companies with OMs at scale, with balanced multi-year margin expansion.
- COVID-19 savings in 2020 led to across-the-board margin expansion.
- Margin expansion expected to be more muted in 2021 as a result.

Company	Revenue Growth			FCF Growth			Operating Margin			EV/Sales	EV/FCF
Ticker	2019	2020E	2021E	2019	2020E	2021E	2019	2020E	2021E	2021E	2021E
<b>EdTech</b>											
CHGG	28.0%	53.1%	24.2%	62.0%	40.8%	60.2%	24.9%	27.2%	28.7%	15.0x	73.1x
PS	36.6%	22.5%	14.5%	58.9%	(23.1%)	NM	(16.0%)	(6.3%)	(7.9%)	6.9x	NM
TWOU	39.6%	34.2%	19.8%	62.3%	(52.2%)	(6.6%)	(11.6%)	(6.2%)	(4.8%)	2.7x	NM
<b>Industrial Software</b>											
ADSK	27.4%	14.8%	14.0%	339.2%	(0.4%)	20.0%	24.5%	29.0%	32.3%	15.8x	41.6x
ANSS	17.3%	6.8%	15.5%	(2.1%)	(4.0%)	23.4%	45.3%	41.5%	42.4%	17.0x	59.5x
AZPN	15.9%	(1.4%)	24.6%	11.7%	2.7%	11.3%	52.9%	48.6%	54.0%	12.4x	33.6x
BSY	6.3%	7.9%	9.0%	3.9%	28.5%	6.0%	23.7%	31.8%	29.0%	15.5x	59.6x
CDNS	9.3%	13.6%	6.7%	20.6%	19.1%	9.9%	32.1%	34.5%	35.0%	13.4x	44.4x
DSY-FR	16.3%	10.1%	10.2%	31.6%	(9.5%)	15.1%	32.0%	30.0%	31.8%	9.4x	41.0x
PTC	4.8%	16.1%	8.6%	3.1%	(3.2%)	59.6%	22.4%	29.0%	28.0%	9.3x	43.0x
SNPS	7.7%	9.7%	9.3%	85.3%	38.9%	37.5%	25.0%	28.0%	29.5%	9.9x	34.8x
TRMB	4.4%	(5.1%)	5.5%	23.1%	(0.2%)	9.7%	20.6%	22.2%	22.3%	5.6x	32.7x
<b>Real Estate SaaS</b>											
APPF	34.7%	22.1%	12.9%	NM	NM	NM	5.4%	9.2%	13.0%	17.7x	NM
RP	13.5%	16.9%	10.5%	36.9%	(16.1%)	4.3%	25.0%	24.3%	25.0%	7.3x	40.2x
<b>S/Mid Cap</b>											
MTLS	6.5%	(14.6%)	8.3%	NM	NM	NM	3.6%	(0.5%)	5.5%	13.7x	NM
PRO	27.1%	0.2%	6.2%	NM	NM	NM	(7.9%)	(15.3%)	(8.1%)	7.7x	NM
SPSC	12.4%	11.1%	9.7%	34.8%	17.3%	7.0%	20.9%	23.5%	24.0%	10.7x	95.2x

31% (40 of 127) of software companies with expected 2020 revenue acceleration, up from 17% (20 of 115) initially forecasted entering the year.

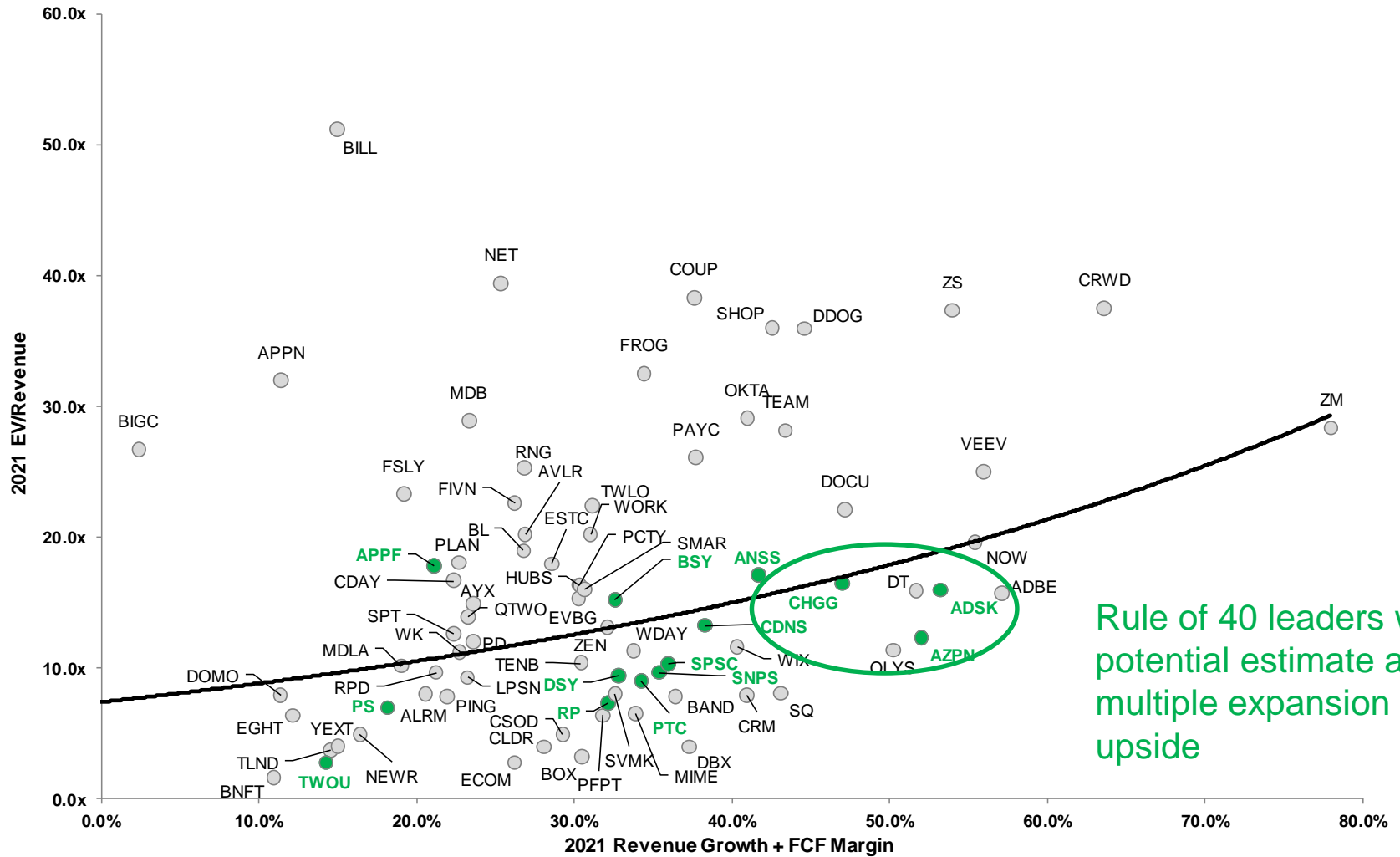
28% (35 of 127) of software companies forecasting acceleration entering 2021 = positive backdrop entering 2021.



N=127 includes the following tickers: ADBE, ADSK, ALRM, ANSS, API, APPF, APPN, ASAN, AVLR, AYX, AZPN, BAND, BIGC, BILL, BL, BLKB, BNFT, BOX, BSY, CDAY, CDNS, CHGG, CHKP, CLDR, COUP, CRM, CRWD, CSLT, CSOD, CTXS, CVLT, CYBR, DBX, DDOG, DOCU, DOMO, DT, ECOM, EGHT, ESTC, EVBG, FEYE, FFIV, FIVN, FROG, FSLY, FTNT, GDDY, GWRE, HUBS, INTU, LPSN, MANH, MDB, MDLA, MIME, MODN, MSFT, MTLN, NCNO, NET, NEWR, NICE, NLOK, NOW, NTN, NUAN, OKTA, ORCL, OTEX, PANW, PAYC, PCTY, PD, PEGA, PFPT, PING, PLAN, PRGS, PRO, PS, PTC, QLYS, QWON, RING, RP, RPD, SAIL, SAP, SCWX, SHOP, SMAR, SNOW, SNPS, SPLK, SPSC, SPT, SQ, SUMO, SVMK, SWI, TDC, TEAM, TENB, TLND, TRMB, TUFN, TWLO, TWOU, TYL, U, VEEV, VG, VMW, VRNS, VRNT, VRSN, WDAY, WIX, WK, WORK, YEXT, ZEN, ZI, ZM, ZS, ZUO

# Software Valuation - Rule of 40

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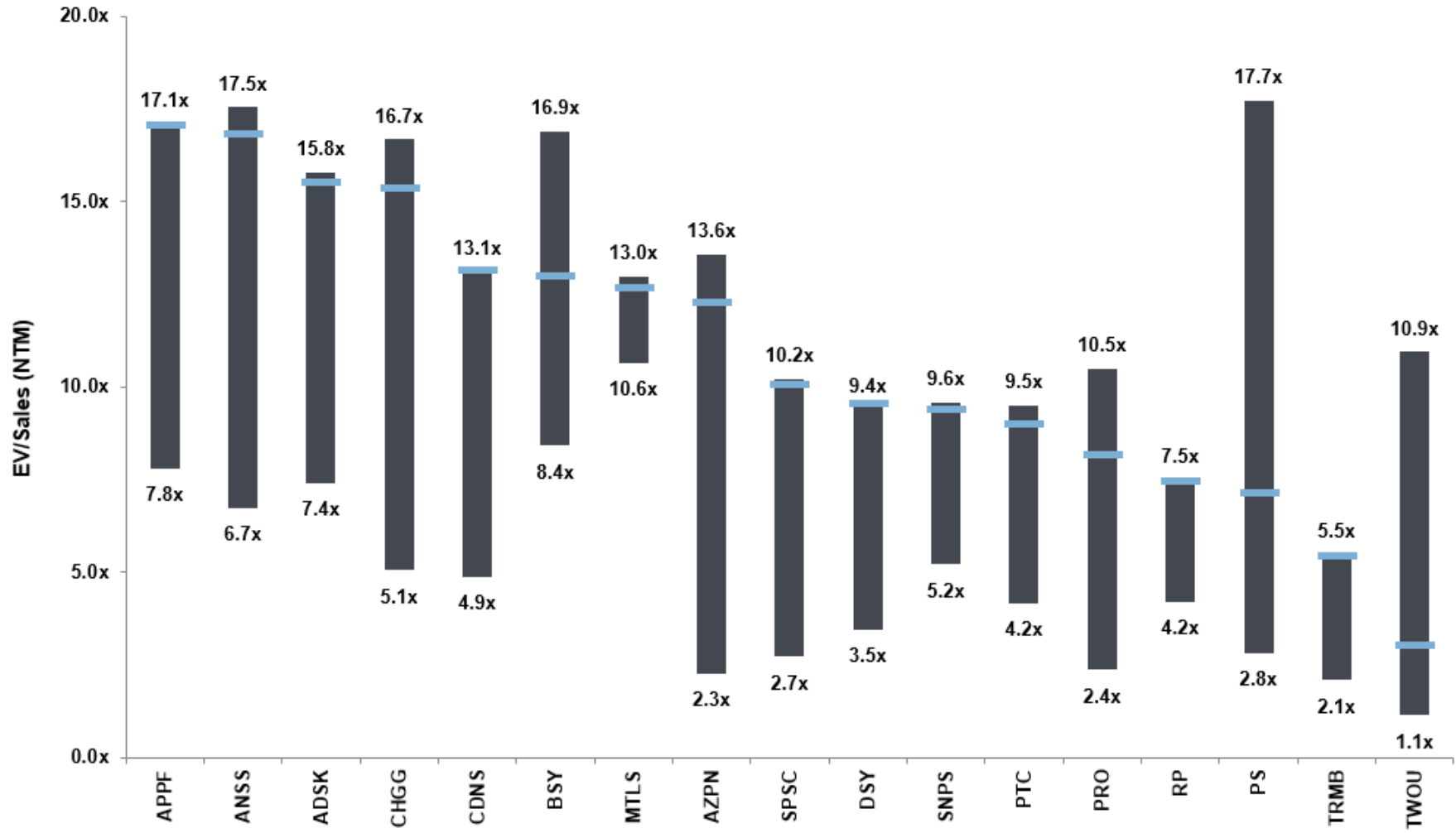
Rule of 40 leaders with potential estimate and multiple expansion upside

N=81 includes the following tickers: ADBE, ADSK, ALRM, ANSS, APPF, APPN, AVL, AYX, AZPN, BAND, BIGC, BILL, BL, BLKB, BNFT, BOX, BSY, CDAY, CDNS, CHGG, CLDR, COUP, CRM, CRWD, CSOD, DBX, DDOG, DOCU, DOMO, DSY, DT, ECOM, EGHT, ESTC, EVBG, FIVN, FSLY, HUBS, LPSN, MDB, MDLA, MIME, NET, NEWR, NOW, OKTA, PAYC, PCTY, PD, PFPT, PING, PLAN, PRO, PS, PTC, QLYS, QTSO, RNG, RP, RPD, SHOP, SMAR, SNPS, SPSC, SPT, SQ, SVMK, TEAM, TENB, TLND, TWLO, TWOU, VEEV, WDAY, WIX, WK, WORK, YEXT, ZEN, ZM, ZS



# Peak-Trough EV/NTM Sales

*Historical NTM EV/sales multiples for the past three years.*



## 2020 Announced Acquisitions

Date	Company	Acquired by	Purchase Price (\$M)	Out-Year Rev. Multiple
Dec-20	RealPage	Thoma Bravo	\$10,200	8x
Dec-20	Data Masons	SPS Commerce	\$100	5x
Dec-20	Arena Holdings	PTC	\$715	14.3x
Dec-20	Pluralsight	Vista Equity	\$3,500	7.9x
Dec-20	Slack	Salesforce	\$27,700	24.6x
Nov-20	ShopKeep	Lightspeed	\$440	8.8x
Nov-20	Llamasoft	Coupa	\$1,500	15x
Nov-20	Spacemaker	Autodesk	\$240	-
Nov-20	Workfront	Adobe	\$1,500	-
Nov-20	Homesnap	Costar Group	\$250	6.3x
Oct-20	Forcepoint	Francisco Partner	\$1,000	-
Oct-20	Segment	Twilio	\$3,200	15x
Oct-20	AGI	ANSYS	\$700	8.8x
Sep-20	MobileIron	Ivanti	\$930	4.3x
Aug-20	Epicor	CDR	\$4,700	5.9x
Aug-20	Elli Mae	ICE	\$11,000	-
Aug-20	Livongo	Teladoc	\$18,500	30x
Apr-20	Blue Jeans	Verizon	\$400	4.0x
Mar-20	Checkmarx	Hellman & Friedr	\$1,150	11.5x
Feb-20	Vlocity	Salesforce	\$1,330	8.4x
Feb-20	Credit Karma	Intuit	\$7,100	7x
Feb-20	Saba Software	Cornerstone OD	\$1,395	5.4x
Feb-20	RSA Security	Symphony TG	\$2,075	2.6x
Feb-20	ForeScout	Advent	\$1,900	5.6x
Feb-20	Infor	Koch	\$13,000	4.1x
Feb-20	Rentpath	Costar Group	\$588	2.6x
Jan-20	Plaid	Visa	\$5,300	-
Jan-20	Veeam Software	Insight Ventures	\$5,000	5.0x
Jan-20	Armis	Insight Ventures	\$1,100	11.0x
<b>2020 Total Value/ Average Multiple</b>			<b>\$128B</b>	<b>7.4x</b>

Late 2020 PE take-outs could be a prelude to upcoming activity in the New Year.

## Fresh Fundraising Leaves Tech Private Equity Flush with Cash

\$60B



+

\$19B

Fundraised in Sept 2020



## Potential Targets in 2021, in Our View:

appfolio  
(Strategic)

PROS  
(Financial)

- High growth revenue profile + loyal customer base + payments business = attractive strategic asset.
- Recent divestiture of MyCase legal business = pure-play real estate software provider.
- At 14x 2022 EV/sales, valuation a better potential fit for a strategic buyer.
- Unique AI technology + recurring SaaS model + loyal/ long time customer base = attractive asset.
- Underperforming Travel segment + current valuation in 7-8x EV/sales range = vulnerable candidate to PE takeout.

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## Company-Specific Details

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# Chegg (CHGG): Overweight; Price Target \$100

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Analyst: Jason Celino  
Sector: Vertical Software  
Market Cap: \$11.3B

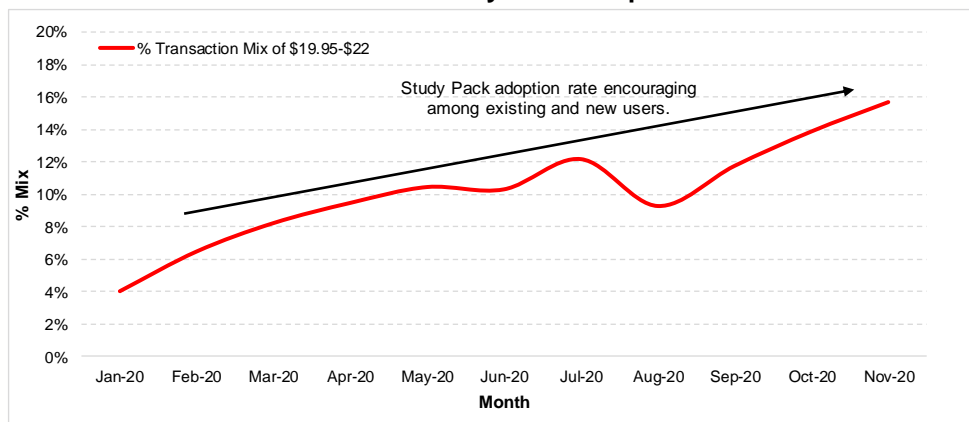


Current Share Price: \$87.62  
Upside to Price Target (\$100): 19.8%  
Current Valuation (2022 Revenue): 13.3x

## Our Call for 2021

- **Much more than a pandemic idea and a core franchise name to own.** Given the strong Study Pack traction among new and existing users, increasing adoption from +15 international countries, and recent launch of device management to crackdown on account sharing, we see Chegg having multiple growth drivers supporting subscriber and revenue growth in 2021 and beyond. Incrementally, we could see more meaningful growth contribution and margin expansion opportunities as Study Pack likely drives ARPS uplift from ~\$36 today towards \$50-\$60 longer term.
- **Study Pack headlines opportunities beyond pandemic tailwinds.** Supported by our proprietary Key First Look data of credit/debit card transactions, we believe Study Pack adoption has reached a run-rate of 10% of overall Chegg Services revenues and could approach a run-rate of 15-20% by the end of 2021. (See separate note [Key First Look Update: Study Pack Momentum Headlines Post-Pandemic Drivers](#))

KFL Data: Study Pack Adoption



CHGG: KBCM vs. Consensus

	2019A	2020E	2021E	2022E
Revenue (\$M)	\$410.9	\$629.0	\$781.4	\$938.8
Y/Y Growth	28.0%	53.1%	24.2%	20.2%
Consensus (\$M)	-	\$628.6	\$779.8	\$935.7
Adj. EBITDA (\$M)	\$125.0	\$202.7	\$260.2	\$329.1
EBITDA margin	30.4%	32.2%	33.3%	35.0%
Consensus (\$M)	-	\$201.9	\$261.6	\$333.2

# Autodesk (ADSK): Overweight; Price Target \$345

13

Analyst: Jason Celino  
Sector: Vertical Software  
Market Cap: \$65.8B

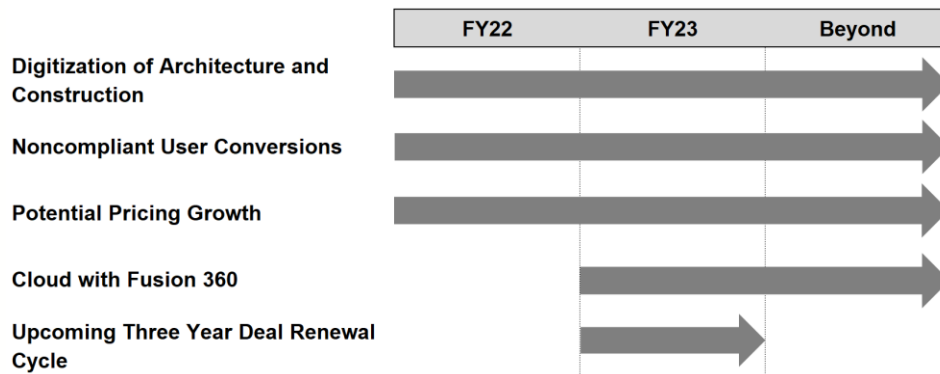


Current Share Price: \$295.88  
Upside to Price Target (\$345): 16.6%  
Current Valuation (FY22 EV/FCF): 28.5x

## Our Call for 2021

- **Core franchise idea to own.** Supported by ample top-line growth drivers (digitization of architecture and construction, noncompliant user conversions, cloud with Fusion 360, and potential pricing growth), combined with programmatic expense management and continued management execution, we believe Autodesk is a key idea to own for 2021.
- **FY22 (2021) bridge year to FY23 LT targets.** In FY21 (2020), Autodesk delivered on its construction roadmap with the launch of a unified platform and made strides in noncompliant user conversion by signing multiple +\$1M license compliance deals. As we look ahead, we view FY22 (2021) as a bridge year to the Company's FY23 financial targets, including revenue CAGR of 16-18%, ~40% OM, and \$2.4B in FCF, and would focus on the ramp towards those goals. Over the next two-year period, we believe Autodesk could be one of the better and more straightforward FCF growth stories.
- **Market dominance and growth opportunities still under-rewarded; raising price target on continued conviction.** Despite the Company's higher growth profile and expanding margins, ADSK still trades at a 5-turn discount to the broader industrial software average of 38x 2022 EV/FCF. We believe ADSK's market dominance in architecture, fundamentals, and LT growth opportunities remain underappreciated and warrant a premium valuation. As a result, we are raising our price target to \$345 based on 33x our FY22 EV/FCF.

### Growth Drivers for the NT/MT/LT



### ADSK: KBCM vs. Consensus

	F2020A	F2021E	F2022E	F2023E
Revenue (\$M)	\$3,274.3	\$3,759.5	\$4,286.2	\$5,252.3
% growth y/y	27.4%	14.8%	14.0%	22.5%
Consensus (\$M)	-	\$3,761.0	\$4,298.0	\$5,078.0
FCF/share	\$6.13	\$6.11	\$7.32	\$10.40
% growth y/y	337.3%	-0.3%	19.9%	42.0%
Consensus	-	\$6.05	\$7.38	\$9.92

# Cadence Design (CDNS): Overweight; Price Target \$155

14

Analyst: Jason Celino  
Sector: Vertical Software  
Market Cap: \$37.7B



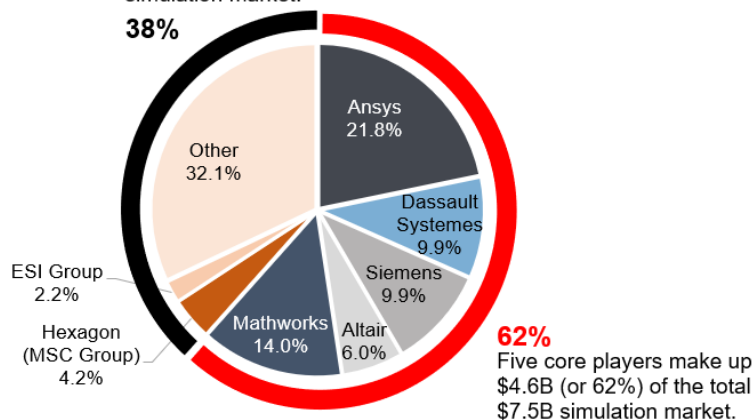
Current Share Price: \$134.70  
Upside to Price Target (\$155): 15.1%  
Current Valuation (2022 EPS): 41.3x

## Our Call for 2021

- **Core multi-year idea; upgrading to Overweight.** Despite notable outperformance in 2020, unabating LT EDA growth tailwinds, further OM expansion potential, and our analysis of incremental simulation growth prospects, we enter 2021 with increased confidence that CDNS is a core multi-year idea. We are raising our 2021 estimates slightly and rolling out our 2022 model, and establishing a price target to \$155 based on 46x our 2022 EPS. (See *separate upgrade note* [Core Idea for Durability, Tailwinds, and Further Margin Expansion; Upgrading to OW](#))
- **Early chapters in the simulation story.** Per our analysis, we believe Cadence is generating simulation revenues from Clarity, Celsius, AWR, and Integrand, of \$25-\$30M, or ~1% of total revenues. Over the next five years, we could see simulation revenue expand to 10% of total, and contribute at least 50-100 bps to top-line growth each year. We see the most immediate and addressable opportunities in capturing share from tier 2 and tier 3 simulation competitors.

### \$7.5B TAM for Stimulation

Smaller players and companies with in-house production make up the long tail of the \$7.5B simulation market.



### CDNS: KBCM vs. Consensus

	2019A	2020E	2021E	2022E
Revenue (\$M)	\$2,336.3	\$2,653.7	\$2,831.4	\$3,050.1
% growth y/y	9.3%	13.6%	6.7%	7.7%
Consensus (\$M)	-	\$2,655.0	\$2,831.0	\$3,046.0
EPS	\$2.20	\$2.71	\$2.94	\$3.26
% growth y/y	18.0%	23.1%	8.6%	10.7%
Consensus	-	\$2.70	\$2.87	\$3.14

# Synopsys (SNPS): Overweight; Price Target \$290

15

Analyst: Jason Celino  
Sector: Vertical Software  
Market Cap: \$39.8B

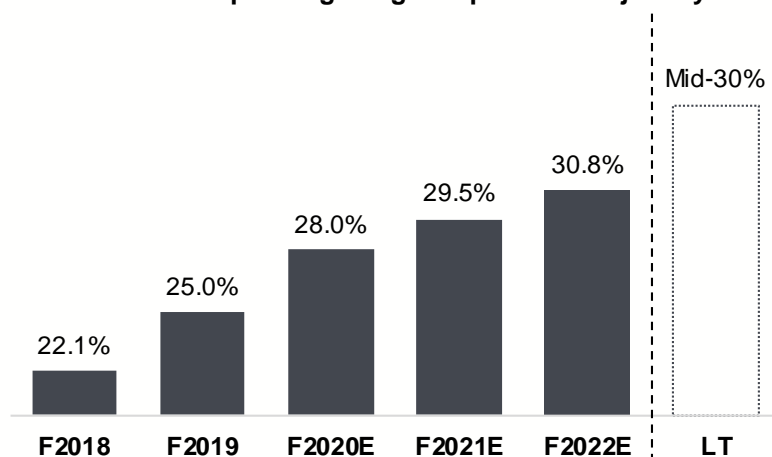


Current Share Price: \$253.66  
Upside to Price Target (\$290): 14.3%  
Current Valuation (2022 EPS): 36x

## Our Call for 2021

- **EDA demand drivers some of the most durable, no signs of abating in 2021.** Increasing silicon content in autos, autonomous driving, IoT, AI/ML designs, and increasing chip design complexity could continue to benefit Synopsys. We see more than enough opportunity to go around for both CDNS and SNPS.
- **Multi-year margin expansion story continues; updated pathway to mid-30% levels LT.** Synopsys expanded its corporate operating margin by almost 300 bps in FY20 to 28%. We are modeling another ~150 bps for FY21, with momentum carrying forward to ~31% in FY22, and believe Synopsys could drive to the mid-30% OMs LT.
- **Raising price target to \$290 on continued confidence in EDA strength and margin expansion opportunities.** We believe SNPS could continue to grind higher through the year as margins continue to expand. Given our confidence in EDA tailwinds and margin expansion opportunities, we are raising our price target to \$290 based on 40x our FY22 EPS plus \$7.00 in net cash, or 35.5x our FY22 EV/FCF.

SNPS: Operating Margin Expansion Trajectory



SNPS: KBCM vs. Consensus

	F2019A	F2020A	F2021E	F2022E
Revenue (\$M)	\$3,360.7	\$3,685.3	\$4,028.3	\$4,333.3
% growth y/y	7.7%	9.7%	9.3%	7.6%
Consensus (\$M)			\$4,029.0	\$4,360.0
EPS	\$4.56	\$5.55	\$6.29	\$7.05
% growth y/y	16.7%	21.7%	13.3%	12.1%
Consensus			\$6.30	\$7.12

# AspenTech (AZPN): Overweight; Price Target \$156

16

**Analyst: Jason Celino**  
**Sector: Vertical Software**  
**Market Cap: \$8.9B**



**Current Share Price: \$130.73**  
**Upside to Price Target (\$156): 19.3%**  
**Current Valuation (FY22 FCF/Share): 30x**

## Under-the-Radar Reopening Name

- **Under-the-radar reopening idea.** Despite an oil downturn and pandemic, we believe AspenTech has managed well in 2020. As economies reopen, we see AspenTech benefitting similarly to the rest of industrial software as capital projects and spending return. With shares trading at a 7-turn discount to the broader industrial software average of 37x, we see the potential for estimate upside and multiple expansion.
- **APM pipelines looking robust for FY21.** AspenTech noted APM again had a record number of active pilots during F1Q and reiterated confidence in its pipelines. The Company expects APM to be more back-half weighted in FY21 and to contribute ~2% to annual spend growth.
- **Partial cloud lifted on filing delays.** AspenTech has filed its previously delayed 10K (June ending) and 10Q (September ending) in December. As expected, full F1Q results were largely consistent with the preliminary F1Q commentary given on November 5. In our December 28 note (see [here](#)), we adjusted our prior period model to reflect the immaterial adjustments, and updated our quarterly FY21 estimates.

### APM Could Conservatively Add 2-3% of Annual Spend Growth in FY21-FY22

	F2017	F2018	F2019	F2020E	F2021E	F2022E
Annual Spend (\$M)	\$460	\$489	\$541	\$593	\$639	\$691
% growth Y/Y	4.2%	6.4%	10.6%	9.6%	7.7%	8.2%
Annual Spend from APM (\$M)	\$0.5	\$3.7	\$10.3	\$9.2	\$11.9	\$12.8
% Annual Spend growth from APM	-	0.8%	2.1%	1.7%	2.0%	2.0%
Revenue at end of year from APM (\$M)	\$0.5	\$4.2	\$14.4	\$23.6	\$35.5	\$48.3

### AZPN: KBCM vs. Consensus

	F2020A	F2021E	F2022E
Revenue (\$M)	\$598.7	\$735.4	\$698.8
% growth y/y	0.1%	22.8%	-5.0%
Consensus (\$M)	-	\$725.7	\$738.5
FCF/share	\$3.55	\$3.99	\$4.45
% growth y/y	5.4%	12.2%	11.7%
Consensus	-	\$4.01	\$4.58
Annual Spend (\$M)	\$593.0	\$638.6	\$691.2
% growth y/y	9.6%	7.7%	8.2%
Consensus (\$M)	-	\$639.7	\$700.8

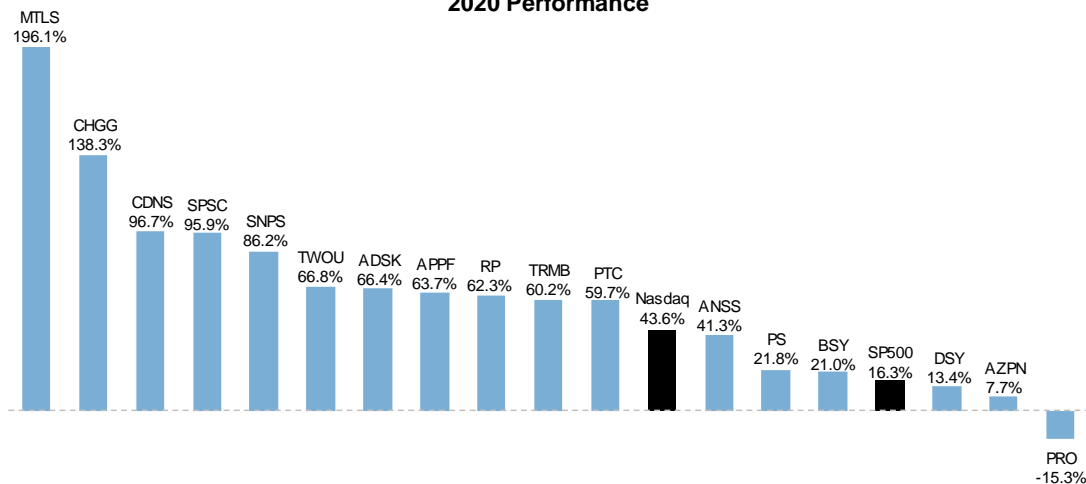


# 2020 Year in Review

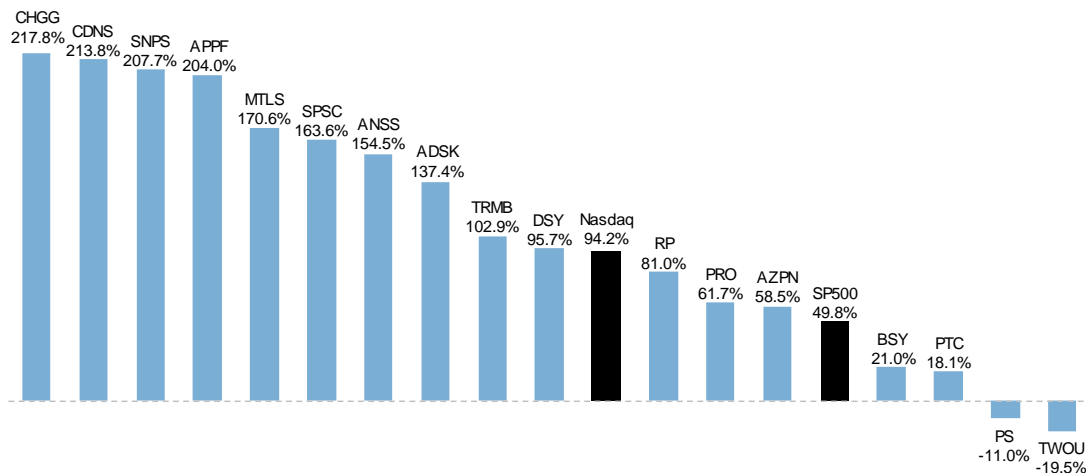
Despite a challenging macro, majority of our coverage demonstrated resilience with 14 stocks outperforming the S&P 500.

- **MTLS** – Recent SPAC activity and resurgence in 3D printing interest.
- **CHGG** – Remote learning accelerates growth and expands scope of several multi-yr growth drivers.
- **CDNS, SNPS** – EDA tailwinds + margin expansion + execution = consistent outperformance.
- **ADSK, PTC** – Subscription models hold up well, previous completed model transitions prove justified.
- **TWOU** – Stock rallies in final weeks of December from heightened M&A activity.
- **RP** – Outperformance from Thoma Bravo acquisition offer in Dec.
- **ANSS, DSY** – Perpetual license declines weigh on growth and performance.
- **AZPN** – Oil downturn was an overhang on performance for much of 2020.
- **PS** – Training budget and priority weighs on 1H20 performance; stock recovers slightly after Vista Equity acquisition offer in Dec.
- **PRO** – Travel disruptions dragged airlines business.

## 2020 Performance

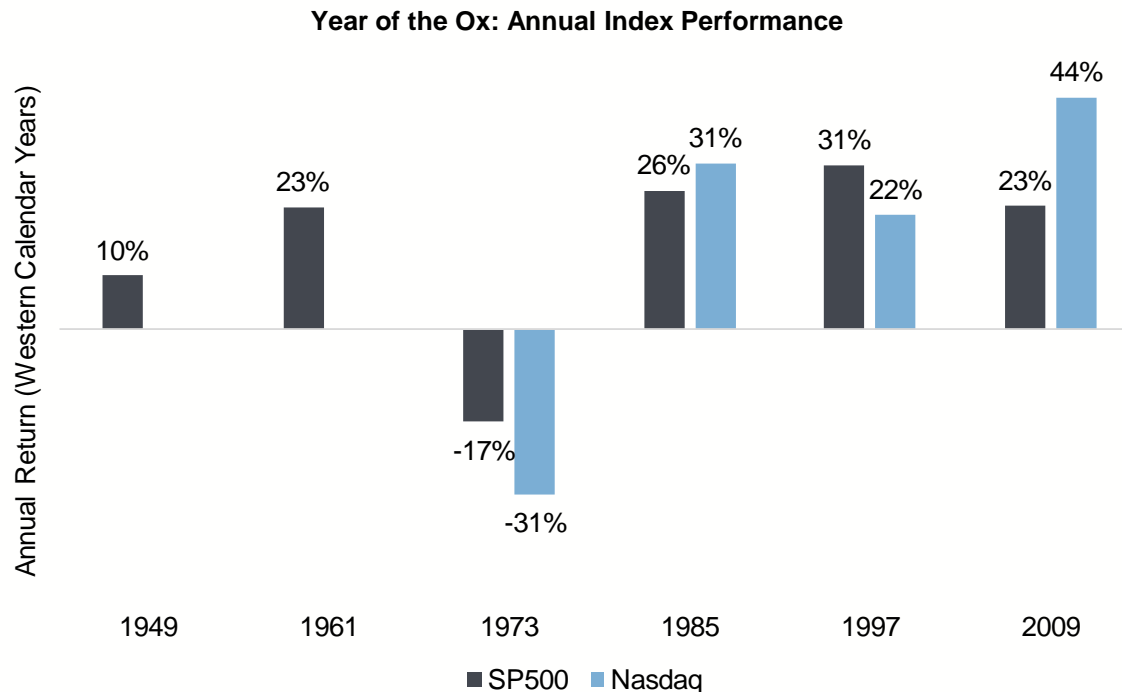


## Two Year Performance



# 2021: Year of the Ox

- 2021 will be the **Year of the Ox** using the Chinese lunar calendar.
  - Chinese New Year will be February 12, 2021.
- **Embracing the symbolism of the Ox.**
  - Ironically, the previous Ox year was 2009, which was also the year that markets subsequently rebounded from the Great Recession.
  - Ox also symbolizes Bull, in which we are hopeful looking ahead into 2021.
  - Average return for the Nasdaq composite has been 16% across the last four Ox years, with three positive years and one negative year.



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# Valuation and Risks

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**ADSK:** Autodesk has a strong franchise and has good opportunities in construction. We have increasing confidence that Autodesk is expanding its use cases from its move to subscription, and believe it could see accelerating FCF. Our price target of \$345 is based on 33x our FY22 EV/FCF. ADSK is trading at 28.5x FY22 EV/FCF, which compares to the industrial software average of 37.2x. Market and macroeconomic conditions could impede the stock from achieving our price target, as could risks such as pricing pressure, increased competition, or the slower adoption of new offerings. COVID-19 may also present unanticipated risks.

**CDNS:** Our price target of \$155 is based on 46x our 2022 EPS estimate of \$3.26 plus net cash of \$4.67, or 44x our 2022 EV/FCF estimates. CDNS is currently trading at 41.3x our 2022 EPS; this compares to vertical leaders such as ANSS, which is trading at 46x, and the broader industrial software average of 39.7x. An unexpected general economic slowdown or a recession in the economy could hurt Cadence's business. Also, an unexpected loss of share of its customers could pose a risk to our fair-value estimate. However, share shifts are generally difficult in the industry due to the time and effort it takes to switch EDA vendors. COVID-19 may also present unanticipated risks. These risks could impede CDNS from achieving our price target.

**SNPS:** Our price target of \$290 is based on 40x our FY22 EPS estimate, plus net cash of \$7.00. SNPS is trading at 36x our FY22 EPS estimate, which compares to CDNS trading at 41.3x CY21 EPS estimate and the broader industrial software average of 39.7x. Market and macroeconomic risks could impede the shares from achieving our price target, as could company-specific risks including aggressive pricing from competitors, risky mergers or acquisitions, or slowing growth of the semiconductor industry. COVID-19 may also present unanticipated risks.

**AZPN.** With ample growth opportunity for AspenTech, license revenue could grow by double digits, in our view, when oil prices stabilize, and FCF/share could grow 15-20%. Our price target of \$156 is based on 35x our FY22 FCF/share estimate. AspenTech is currently trading at 30x FY22E FCF/share, compared to the industrial software average of 37x. Market and macroeconomic conditions could interfere with the realization of our price target, as could risks such as pricing pressure, changes in commodity prices, and challenges in end markets.

**CHGG.** Multiple catalysts in Study Pack, international, and shared account conversions give us confidence that Chegg could see growth reacceleration in 2020 and sustain high growth in 2021 and 2022. Our price target of \$100 is based on 15x our 2022 EV/sales estimate (44x 2022E EV/EBITDA). CHGG is currently trading at 16x 2021E EV/sales vs. the high-growth (25-30% growth) SaaS average of 26x. Market and macroeconomic conditions could interfere with the realization of our price target, as could risks such as shortened school periods or other factors that could negatively affect Chegg Services subscription length, integration delays or issues of its acquisitions, execution issues around international expansion, transition issues from Ingram to FedEx, increased competition, or slowing revenue and subscriber growth.

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## Appendix: Models/Valuation Framework

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# ADSK: Income Statement

24

Autodesk Inc.												
FY ends Jan. 31												
Figures in thousands, except per-share data												
	2020	Apr-20 1Q21	Jul-20 2Q21	Oct-20 3Q21	Jan-21 4Q21E	2021E	Apr-21 1Q22E	Jul-21 2Q22E	Oct-21 3Q22E	Jan-22 4Q22E	2022E	2023E
<b>Revenue:</b>												
Maintenance	\$386,600	\$62,100	\$51,200	\$39,800	\$37,688	\$190,788	\$32,120	\$19,505	\$16,860	\$12,675	\$81,160	\$11,260
Subscription	\$2,751,900	\$803,000	\$841,200	\$884,400	\$934,400	\$3,463,000	\$946,400	\$1,006,400	\$1,056,400	\$1,126,400	\$4,135,600	\$5,150,600
Total Maintenance and subscription	\$3,138,500	\$865,100	\$892,400	\$924,200	\$972,088	\$3,653,788	\$978,520	\$1,025,905	\$1,073,260	\$1,139,075	\$4,216,760	\$5,161,860
License and other	\$135,800	\$20,600	\$20,700	\$28,200	\$36,200	\$105,700	\$15,600	\$16,600	\$17,600	\$19,600	\$69,400	\$90,400
<b>Total Revenue</b>	<b>\$3,274,300</b>	<b>\$885,700</b>	<b>\$913,100</b>	<b>\$952,400</b>	<b>\$1,008,288</b>	<b>\$3,759,488</b>	<b>\$994,120</b>	<b>\$1,042,505</b>	<b>\$1,090,860</b>	<b>\$1,158,675</b>	<b>\$4,286,160</b>	<b>\$5,252,260</b>
% Growth y/y	27.4%	20.4%	14.6%	13.0%	12.1%	14.8%	12.2%	14.2%	14.5%	14.9%	14.0%	22.5%
% Growth q/q		-1.5%	3.1%	4.3%	5.9%		-1.4%	4.9%	4.6%	6.2%		
<b>Calculated Billings</b>	<b>4,190,000</b>	<b>\$883,700</b>	<b>\$786,900</b>	<b>\$1,006,300</b>	<b>\$1,427,788</b>	<b>4,104,688</b>	<b>\$968,120</b>	<b>\$1,065,505</b>	<b>\$1,245,860</b>	<b>\$1,736,675</b>	<b>5,016,160</b>	<b>6,048,260</b>
% Growth	54.8%	10.8%	-11.9%	-0.7%	-3.9%	-2.0%	9.6%	35.4%	23.8%	21.6%	22.2%	20.6%
<b>Cost of Revenue:</b>												
Cost of maintenance and subscription revenue	\$209,600	\$53,600	\$54,200	\$56,000	\$64,157.78	\$227,958	\$64,093	\$66,684	\$69,225	\$72,900.80	\$272,903	\$326,299
GM of maintenance and subscription revenue	93.3%	93.8%	93.9%	93.9%	93.4%	93.8%	93.5%	93.5%	93.6%	93.6%	93.5%	93.7%
Cost of license and other revenue	\$60,700	\$15,600	\$13,400	\$13,800	\$13,756	\$56,556	\$5,928	\$6,308	\$6,688	\$7,448	\$26,372	\$34,352
GM of license and other revenue		24.3%	35.3%	51.1%	62.0%		62.0%	62.0%	62.0%	62.0%		
Amortization of developed technology		\$0	\$0	\$0	\$0		\$0	\$0	\$0	\$0		
<b>Total Cost of Revenue</b>	<b>\$270,300</b>	<b>\$69,200</b>	<b>\$67,600</b>	<b>\$69,800</b>	<b>\$77,914</b>	<b>\$284,514</b>	<b>\$70,021</b>	<b>\$72,992</b>	<b>\$75,913</b>	<b>\$80,349</b>	<b>\$299,275</b>	<b>\$360,651</b>
<b>Gross Profit</b>	<b>\$3,004,000</b>	<b>\$816,500</b>	<b>\$845,500</b>	<b>\$882,600</b>	<b>\$930,374</b>	<b>\$3,474,974</b>	<b>\$924,099</b>	<b>\$969,513</b>	<b>\$1,014,947</b>	<b>\$1,078,326</b>	<b>\$3,986,885</b>	<b>\$4,891,609</b>
% Gross Margin	91.7%	92.2%	92.6%	92.7%	92.3%	92.4%	93.0%	93.0%	93.0%	93.1%	93.0%	93.1%
<b>Operating expenses:</b>												
S&M	\$1,160,300	\$298,900	\$305,900	\$312,400	\$332,000	\$1,249,200	\$328,900	\$335,900	\$342,400	\$356,000	\$1,363,200	\$1,468,200
% of revenue	35.4%	33.7%	33.5%	32.8%	32.9%	33.2%	33.1%	32.2%	31.4%	30.7%	31.8%	28.0%
R&D	\$727,000	\$184,400	\$196,900	\$197,300	\$218,500	\$797,100	\$199,400	\$211,900	\$227,300	\$248,500	\$887,100	\$991,100
% of revenue	22.2%	20.8%	21.6%	20.7%	21.7%	21.2%	20.1%	20.3%	20.8%	21.4%	20.7%	18.9%
G&A	\$314,100	\$85,400	\$80,300	\$85,800	\$87,400	\$338,900	\$89,400	\$84,300	\$89,800	\$88,400	\$351,900	\$372,900
% of revenue	9.6%	9.6%	8.8%	9.0%	8.7%	9.0%	9.0%	8.1%	8.2%	7.6%	8.2%	7.1%
<b>Total operating expenses</b>	<b>\$2,201,400</b>	<b>\$568,700</b>	<b>\$583,100</b>	<b>\$595,500</b>	<b>\$637,900</b>	<b>\$2,385,200</b>	<b>\$617,700</b>	<b>\$632,100</b>	<b>\$659,500</b>	<b>\$692,900</b>	<b>\$2,602,200</b>	<b>\$2,832,200</b>
% of revenue	67.2%					63.4%					60.7%	53.9%
<b>Operating income</b>	<b>\$802,600</b>	<b>\$247,800</b>	<b>\$262,400</b>	<b>\$287,100</b>	<b>\$292,474</b>	<b>\$1,089,774</b>	<b>\$306,399</b>	<b>\$337,413</b>	<b>\$355,447</b>	<b>\$385,426</b>	<b>\$1,384,685</b>	<b>\$2,059,409</b>
% Operating margin	24.5%	28.0%	28.7%	30.1%	29.0%	29.0%	30.8%	32.4%	32.6%	33.3%	32.3%	39.2%
Interest & Other	(\$45,000)	(\$23,500)	(\$2,800)	(\$11,600)	(\$12,000)	(\$49,900)	(\$7,500)	(\$7,500)	(\$7,500)	(\$7,500)	(\$30,000)	\$0
Income Before Taxes	\$757,600	\$224,300	\$259,600	\$275,500	\$280,474	\$1,039,874	\$298,899	\$329,913	\$347,947	\$377,926	\$1,354,685	\$2,059,409
Tax rate		16.0%	16.0%	16.0%	16.0%		18.0%	18.0%	18.0%	18.0%		
Income Taxes	\$136,400	\$35,900	\$41,600	\$44,000	\$44,876	\$166,376	\$53,802	\$59,384	\$62,630	\$68,027	\$243,843	\$370,694
<b>Pro Forma Net Income</b>	<b>\$621,200</b>	<b>\$188,400</b>	<b>\$218,000</b>	<b>\$231,500</b>	<b>\$235,598</b>	<b>\$873,498</b>	<b>\$245,097</b>	<b>\$270,529</b>	<b>\$285,316</b>	<b>\$309,899</b>	<b>\$1,110,842</b>	<b>\$1,688,716</b>
<b>EPS</b>	<b>\$2.80</b>	<b>\$0.85</b>	<b>\$0.98</b>	<b>\$1.04</b>	<b>\$1.06</b>	<b>\$3.93</b>	<b>\$1.10</b>	<b>\$1.22</b>	<b>\$1.28</b>	<b>\$1.39</b>	<b>\$5.00</b>	<b>\$7.60</b>



# ADSK: Statement of Cash Flow

25

Autodesk Inc.												
Figures in thousands												
	2020	Apr-20 1Q21	Jul-20 2Q21	Oct-20 3Q21	Jan-21 4Q21E	2021E	Apr-21 1Q22E	Jul-21 2Q22E	Oct-21 3Q22E	Jan-22 4Q22E	2022E	2023E
<b>Operating activities</b>												
Net income	\$214,500	\$66,500	\$98,200	\$132,200	\$130,598	\$427,498	\$170,477	\$195,089	\$209,056	\$232,819	\$807,442	\$1,370,556
Operating Activities												
Depreciation and amortization	\$127,300	\$30,000	\$30,000	\$32,200	\$35,000	\$127,200	\$37,000	\$37,000	\$37,000	\$37,000	\$148,000	\$148,000
Stock-based compensation expense	\$362,400	\$98,200	\$95,900	\$97,400	\$110,000	\$401,500	\$76,000	\$77,000	\$78,000	\$79,000	\$310,000	\$328,000
Changes in operating assets and liabilities and other	\$722,300	\$99,900	(\$136,200)	\$86,700	\$396,500	\$446,900	(\$203,000)	\$36,000	\$148,000	\$475,000	\$456,000	\$554,500
Accounts receivable	(\$178,500)	\$295,500	(\$132,800)	(\$49,900)	(\$110,000)	\$2,800	(\$55,000)	(\$37,000)	(\$42,000)	(\$116,000)	(\$250,000)	(\$307,000)
Deferred income taxes	\$10,300	\$3,500	\$11,000	(\$1,500)	\$5,000	\$18,000	(\$7,000)	\$10,000	\$5,000	\$8,000	\$16,000	\$14,500
Prepaid expenses and other	\$58,500	(\$47,500)	(\$4,500)	(\$9,600)	\$3,000	(\$58,600)	(\$25,000)	\$30,000	\$10,000	\$10,000	\$25,000	\$21,000
Accounts payable and accrued liabilities	(\$90,800)	(\$154,600)	\$111,800	\$85,100	\$75,000	\$117,300	(\$80,000)	\$20,000	\$20,000	(\$10,000)	(\$50,000)	\$25,000
Deferred revenue	\$916,700	(\$1,100)	(\$128,900)	\$51,700	\$419,500	\$341,200	(\$26,000)	\$23,000	\$155,000	\$578,000	\$730,000	\$796,000
Accrued income taxes	\$6,100	\$4,100	\$7,200	\$10,900	\$4,000	\$26,200	(\$10,000)	(\$10,000)	\$0	\$5,000	(\$15,000)	\$5,000
<b>Net cash provided by operating activities</b>	<b>\$1,415,100</b>	<b>\$327,300</b>	<b>\$91,200</b>	<b>\$361,100</b>	<b>\$672,098</b>	<b>\$1,451,698</b>	<b>\$80,477</b>	<b>\$345,089</b>	<b>\$472,056</b>	<b>\$823,819</b>	<b>\$1,721,442</b>	<b>\$2,401,056</b>
<b>Investing activities</b>												
Net (purchases) sales and maturities of available-for-sale marketable securities	\$7,500	(\$11,000)	(\$6,000)	(\$4,000)		(\$21,000)					\$0	\$0
Business combinations, net of cash acquired	\$0	\$0	\$0	\$0		\$0					\$0	\$0
Capital expenditures	(\$53,200)	(\$19,900)	(\$26,800)	(\$20,900)	(\$28,000)	(\$95,600)	(\$22,000)	(\$22,000)	(\$22,000)	(\$28,000)	(\$94,000)	(\$90,000)
Other investing activities	(\$11,600)	(\$47,100)	(\$1,000)	(\$40,000)		(\$88,100)					\$0	\$0
<b>Net cash provided by (used in) investing activities</b>	<b>(\$57,300)</b>	<b>(\$78,000)</b>	<b>(\$33,800)</b>	<b>(\$64,900)</b>	<b>(\$28,000)</b>	<b>(\$204,700)</b>	<b>(\$22,000)</b>	<b>(\$22,000)</b>	<b>(\$22,000)</b>	<b>(\$28,000)</b>	<b>(\$94,000)</b>	<b>(\$90,000)</b>
<b>Free Cash Flow</b>	<b>\$1,361,900</b>	<b>\$307,400</b>	<b>\$64,400</b>	<b>\$340,200</b>	<b>\$644,098</b>	<b>\$1,356,098</b>	<b>\$58,477</b>	<b>\$323,089</b>	<b>\$450,056</b>	<b>\$795,819</b>	<b>\$1,627,442</b>	<b>\$2,311,056</b>
<b>Financing activities</b>												
Proceeds from issuance of common stock, net of issuance costs	\$93,700	\$56,800	\$1,700	\$54,400		\$112,900					\$0	\$0
Repurchases of common stock	(\$442,500)	(\$202,000)	(7,000)	(190,400)		(\$399,400)					\$0	\$0
Draw s on Line of Credit	\$0	(\$452,500)	\$2,500	(\$2,500)		(\$452,500)					\$0	\$0
Other	(\$118,000)	(\$32,500)	(\$9,600)	(\$62,900)		(\$105,000)					\$0	\$0
<b>Net cash provided by (used in) financing activities</b>	<b>(\$466,800)</b>	<b>(\$630,200)</b>	<b>(\$12,400)</b>	<b>(\$201,400)</b>	<b>\$0</b>	<b>(\$844,000)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Effect of exchange rate changes on cash and cash equivalents	(\$2,300)	(\$4,100)	\$5,100	\$2,400		\$3,400					\$0	\$0
<b>Net increase (decrease) in cash and cash equivalents</b>	<b>\$888,700</b>	<b>(\$385,000)</b>	<b>\$50,100</b>	<b>\$97,200</b>	<b>\$644,098</b>	<b>\$406,398</b>	<b>\$58,477</b>	<b>\$323,089</b>	<b>\$450,056</b>	<b>\$795,819</b>	<b>\$1,627,442</b>	<b>\$2,311,056</b>
Cash and cash equivalents at beginning of period	\$886,100	\$1,774,800	\$1,389,800	\$1,439,900	\$1,537,100	\$1,774,800	\$2,181,198	\$2,239,675	\$2,562,764	\$3,012,820	\$2,181,198	\$3,808,640
Cash and cash equivalents at end of period	\$1,774,800	\$1,389,800	\$1,439,900	\$1,537,100	\$2,181,198	\$2,181,198	\$2,239,675	\$2,562,764	\$3,012,820	\$3,808,640	\$3,808,640	\$6,119,695
Shares outstanding	222,200	221,300	222,200	222,300	222,400	222,050	222,200	222,100	222,200	222,300	222,200	222,250
<b>Quarterly</b>												
Net cash from operations per share	\$6.37	\$1.48	\$0.41	\$1.62	\$3.02	\$6.54	\$0.36	\$1.55	\$2.12	\$3.71	\$7.75	\$10.80
<b>Free cash flow per share</b>	<b>\$6.13</b>	<b>\$1.39</b>	<b>\$0.29</b>	<b>\$1.53</b>	<b>\$2.90</b>	<b>\$6.11</b>	<b>\$0.26</b>	<b>\$1.45</b>	<b>\$2.03</b>	<b>\$3.58</b>	<b>\$7.32</b>	<b>\$10.40</b>
Net income per share	\$0.96	\$0.30	\$0.44	\$0.59	\$0.59	\$1.92	\$0.77	\$0.88	\$0.94	\$1.05	\$3.63	\$6.17
Ending cash & equiv. per share	\$7.99	\$6.28	\$6.48	\$6.91	\$9.81	\$9.82	\$10.08	\$11.54	\$13.56	\$17.13	\$17.14	\$27.54

# AZPN: Income Statement

26

Aspen Technology, Inc. (AZPN)		Sep-19	Dec-19	Mar-20	Jun-20	Sep-20	Dec-20	Mar-21	Jun-21	Sep-21	Dec-21	Mar-22	Jun-22				
FY ends June 30 - In thousands, except per-share		2019	1Q20	2Q20	3Q20	4Q20	2020	1Q21	2Q21E	3Q21E	4Q21E	2021E	1Q22E	2Q22E	3Q22E	4Q22E	2022E
License	\$404,581						\$388,180	\$61,859	\$144,300	\$135,000	\$175,000	\$516,159	\$80,000	\$120,000	\$113,000	\$152,000	\$465,000
% Growth	27.1%						-4.1%					33.0%	29.3%	-16.8%	-16.3%	-13.1%	-9.9%
% of Revenue	67.8%						64.8%	53.8%	72.7%	70.9%	75.6%	70.2%	58.2%	67.4%	65.8%	71.9%	66.5%
Maintenance	\$163,567						\$178,139	\$46,858	\$47,858	\$48,858	\$49,858	\$193,432	\$50,000	\$50,500	\$51,000	\$51,500	\$203,000
% Growth	3.0%						8.9%					8.6%	6.7%	5.5%	4.4%	3.3%	4.9%
% of Revenue	27.4%						29.8%	40.8%	24.1%	25.7%	21.5%	26.3%	36.4%	28.4%	29.7%	24.4%	29.1%
Services & Other	\$28,534						\$32,398	\$6,254	\$6,354	\$6,454	\$6,704	\$25,766	\$7,500	\$7,600	\$7,700	\$7,950	\$30,750
% Growth	-5.8%						13.5%					-20.5%	19.9%	19.6%	19.3%	18.6%	19.3%
% of Revenue	4.8%						5.4%	5.4%	3.2%	3.4%	2.9%	3.5%	5.5%	4.3%	4.5%	3.8%	4.4%
Total Revenue	\$596,682	\$140,177	\$126,012	\$130,588	\$201,940	\$598,717	\$114,971	\$198,512	\$190,312	\$231,562	\$735,357	\$137,500	\$178,100	\$171,700	\$211,450	\$698,750	
% Growth	17.6%	23.8%	-8.7%	-11.9%	2.4%	0.3%	-18.0%	57.5%	45.7%	14.7%	22.8%	19.6%	-10.3%	-9.8%	-8.7%	-5.0%	
Cost of license and Maintenance	\$26,268	\$6,637	\$6,593	\$6,659	\$6,600	\$26,489	\$6,900	\$8,839	\$8,457	\$10,343	\$34,540	\$5,980	\$7,843	\$7,544	\$9,361	\$30,728	
License and maintenance GMs	95.4%	94.7%	94.3%	94.6%	96.6%	95.2%	93.7%	95.4%	95.4%	95.4%	95.1%	95.4%	95.4%	95.4%	95.4%	95.4%	
% of License and Maintenance Revenue	4.6%	5.3%	5.7%	5.4%	3.4%	4.8%	6.3%	4.6%	4.6%	4.6%	4.9%	4.6%	4.6%	4.6%	4.6%	4.6%	
Cost of Service & Other	\$31,548	\$8,581	\$8,933	\$9,046	\$8,558	\$35,118	\$8,566	\$8,260	\$8,068	\$8,380	\$33,274	\$7,875	\$7,980	\$8,085	\$8,348	\$32,288	
Service GMs	-9.6%	8.2%	3.4%	-9.8%	-34.0%	-5.7%	-37.0%	-30.0%	-25.0%	-25.0%	-29.1%	-5.0%	-5.0%	-5.0%	-5.0%	-5.0%	
% of Services Revenue	109.6%	91.8%	96.6%	109.8%	134.0%	105.7%	137.0%	130.0%	125.0%	125.0%	129.1%	105.0%	105.0%	105.0%	105.0%	105.0%	
Gross Profit	\$538,866	\$124,959	\$110,486	\$114,883	\$186,782	\$537,110	\$99,505	\$181,413	\$173,787	\$212,839	\$667,543	\$123,645	\$162,277	\$156,071	\$193,742	\$635,735	
% Gross Margin	90.3%	89.1%	87.7%	88.0%	92.5%	89.7%	86.5%	91.4%	91.3%	91.9%	90.8%	89.9%	91.1%	90.9%	91.6%	91.0%	
S&M	\$111,374	\$29,192	\$28,500	\$28,354	\$28,440	\$114,486	\$25,172	\$34,172	\$36,672	\$37,672	\$133,688	\$33,600	\$33,800	\$34,000	\$34,500	\$135,900	
% of Revenue	18.7%	20.8%	22.6%	21.7%	14.1%	19.1%	21.9%	17.2%	19.3%	16.3%	18.2%	24.4%	19.0%	19.8%	16.3%	19.4%	
% of Annual Spend	20.6%	21.3%	20.2%	19.7%	19.2%	20.3%	16.9%	22.4%	23.6%	23.6%	20.9%	20.7%	20.4%	20.2%	20.0%	19.7%	
R&D	\$83,122	\$22,493	\$22,625	\$23,576	\$23,536	\$92,230	\$22,530	\$25,030	\$25,530	\$26,030	\$99,120	\$25,500	\$25,700	\$25,900	\$26,400	\$103,500	
% of Revenue	13.9%	16.0%	18.0%	18.1%	11.7%	15.4%	19.6%	12.6%	13.4%	11.2%	13.5%	18.5%	14.4%	15.1%	12.5%	14.8%	
% of Annual Spend	15.4%	16.4%	16.0%	16.4%	15.9%	15.6%	15.1%	16.4%	16.4%	16.3%	15.5%	15.7%	15.5%	15.4%	15.3%	15.0%	
G&A	\$63,231	\$19,884	\$16,422	\$18,219	\$18,510	\$73,035	\$17,633	\$19,133	\$20,133	\$20,533	\$77,432	\$20,000	\$20,100	\$20,200	\$20,300	\$80,600	
% of Revenue	10.6%	14.2%	13.0%	14.0%	9.2%	12.2%	15.3%	9.6%	10.6%	8.9%	10.5%	14.5%	11.3%	11.8%	9.6%	11.5%	
% of Annual Spend	11.7%	14.5%	11.6%	12.7%	12.5%	12.3%	11.8%	12.6%	12.9%	12.9%	12.1%	12.3%	12.2%	12.0%	11.7%	11.7%	
Total GAAP Operating Expenses	\$257,727	\$71,569	\$67,547	\$70,149	\$70,486	\$279,751	\$65,335	\$78,335	\$82,335	\$84,235	\$310,240	\$79,100	\$79,600	\$80,100	\$81,200	\$320,000	
% of Revenue	43.2%	51.1%	53.6%	53.7%	34.9%	46.7%	56.8%	39.5%	43.3%	36.4%	42.2%	57.5%	44.7%	46.7%	38.4%	45.8%	
% of Annual Spend	47.6%	52.2%	47.9%	48.8%	47.5%	47.2%	43.8%	51.4%	52.9%	52.8%	48.6%	48.8%	48.2%	47.5%	47.0%	46.3%	
GAAP Operating Income	\$281,139	\$53,390	\$42,939	\$44,734	\$116,296	\$257,359	\$34,170	\$103,078	\$91,452	\$128,604	\$357,303	\$44,545	\$82,677	\$75,971	\$112,542	\$315,735	
% GAAP Operating Margin	47.1%	38.1%	34.1%	34.3%	57.6%	43.0%	29.7%	51.9%	48.1%	55.5%	48.6%	32.4%	46.4%	44.2%	53.2%	45.2%	
% of Annual Spend	52.0%	39.0%	30.5%	31.1%	78.4%	43.4%	22.9%	67.6%	58.8%	80.6%	56.0%	27.5%	50.0%	45.1%	65.1%	45.7%	
Non-GAAP Operating Income	\$314,683	\$63,978	\$52,140	\$53,897	\$125,542	\$295,557	\$42,746	\$113,078	\$101,452	\$138,604	\$395,879	\$54,545	\$92,677	\$85,971	\$122,542	\$355,735	
% Operating Margin	52.7%	45.6%	41.4%	41.3%	62.2%	49.4%	37.2%	57.0%	53.3%	59.9%	53.8%	39.7%	52.0%	50.1%	58.0%	50.9%	
% of Annual Spend	58.2%	46.7%	37.0%	37.5%	84.7%	49.8%	28.7%	74.2%	65.2%	86.8%	62.0%	33.7%	56.1%	51.0%	70.9%	51.5%	
Interest, Other Income (Expense), Net	\$20,389	\$6,108	\$4,270	\$4,614	\$7,006	\$21,998	\$5,105	\$5,205	\$5,305	\$5,405	\$21,020	\$6,300	\$6,400	\$6,500	\$6,600	\$25,800	
% of Revenue	3.4%	4.4%	3.4%	3.5%	3.5%	3.7%	4.4%	2.6%	2.8%	2.3%	2.9%	4.6%	3.6%	3.8%	3.1%	3.7%	
EBT	\$301,528	\$59,498	\$47,209	\$49,348	\$123,302	\$279,357	\$39,275	\$108,283	\$96,757	\$134,009	\$378,323	\$50,845	\$89,077	\$82,471	\$119,142	\$341,535	
Tax rate	13.3%					17.8%	16.7%	19.0%	19.0%	19.0%	18.8%	19.0%	19.0%	19.0%	19.0%	19.0%	
Income Taxes	(\$40,166)					(\$49,686)	(\$6,564)	(\$20,574)	(\$18,384)	(\$25,462)	(\$70,983)	(\$9,661)	(\$16,925)	(\$15,669)	(\$22,637)	(\$64,892)	
Net income, non-GAAP	\$287,863	\$60,735	\$46,824	\$49,321	\$107,541	\$259,848	\$41,287	\$97,709	\$88,373	\$118,547	\$345,916	\$49,684	\$80,652	\$75,302	\$105,005	\$310,643	
EPS, Non-GAAP	\$4.08	\$0.88	\$0.68	\$0.72	\$1.58	\$3.85	\$0.60	\$1.43	\$1.30	\$1.75	\$5.09	\$0.74	\$1.20	\$1.12	\$1.56	\$4.61	
Diluted shares outstanding	70,740	69,317	68,844	68,482	68,176	68,705	68,299	68,099	67,899	67,799	68,024	67,499	67,399	67,299	67,199	67,349	
Annual Spend (in Millions)	\$541	\$548	\$564	\$575	\$593	\$593	\$596	\$610	\$622	\$639	\$639	\$648	\$661	\$674	\$691	\$691	
Seq % Change	10.6%	1.3%	2.9%	2.0%	3.1%	9.6%	0.5%	2.3%	2.1%	2.6%	7.7%	1.5%	2.0%	2.0%	2.5%	8.2%	
Y/YR % Change		10.0%	9.9%	9.3%	9.6%		8.8%	8.1%	8.2%	7.7%		8.7%	8.5%	8.3%	8.2%		

# AZPN: Statement of Cash Flow

27

Aspen Technology, Inc. (AZPN) FY ends June 30 - In thousands, except per-share	2019	Sep-19 1Q20	Dec-19 2Q20	Mar-20 3Q20	Jun-20 4Q20	2020	Sep-20 1Q21	Dec-20 2Q21E	Mar-21 3Q21E	Jun-21 4Q21E	2021E	Sep-21 1Q22E	Dec-21 2Q22E	Mar-22 3Q22E	Jun-22 4Q22E	2022E
Net income (loss)	261,362	52,370	39,555	42,082	95,664	229,671	32,711	87,709	78,373	108,547	307,340	41,184	72,152	66,802	96,505	276,643
<b>Reconciling adjustments:</b>																
Depreciation and amortization	8,143	2,036	2,443	2,549	2,522	9,550	2,334	2,334	100	1,000	5,768	1,500	1,500	100	1,000	4,100
Net foreign currency loss (gain)	(1,251)	721	(883)	345	(1,128)	(945)	1,463				1,463					0
Stock-based compensation	27,573	9,275	7,559	7,299	7,415	31,548	6,268	8,000	8,000	8,000	30,268	8,000	8,000	8,000	8,000	32,000
Deferred income taxes	(27,129)	(182)	172	(372)	28,483	28,101	41				41					0
Provision for bad debts	645	982	282	2,127	1,864	5,255	3,120	(50)	(50)	(50)	2,970	(50)	(50)	(50)	(50)	(200)
Other non-cash operating activities	429	1,994	1,472	3,475	2,778	9,719	2,567				2,567					0
<b>Changes in assets and liabilities:</b>																
Accounts receivable	(6,626)	(1,945)	(2,594)	(11,889)	3,553	(12,875)	2,243	(20,000)	(6,000)	(4,000)	(27,757)	(5,000)	(11,000)	(6,000)	(6,500)	(28,500)
Contract assets, net	(57,660)	(25,440)	2,919	30,777	(36,340)	(28,084)	(7,366)	(15,000)	2,000	(11,500)	(31,866)	(30,000)	(5,000)	10,000	(8,000)	(33,000)
Prepaid expenses, other assets, income taxes	(2,411)	(2,092)	324	(433)	(3,087)	(5,288)	(1,616)	0	(5,500)	(13,000)	(20,116)	1,200	0	(500)	(5,000)	(4,300)
A/P, accrued expenses, other liabilities	17,439	(15,018)	(12,313)	(1,783)	(7,324)	(36,438)	(8,168)	5,000	0	(2,000)	(5,168)	5,000	8,000	10,000	3,000	26,000
Deferred revenue	17,799	(1,355)	9,291	5,765	(657)	13,044	2,854	(10,000)	5,000	10,000	7,854	(11,000)	15,000	5,000	20,000	29,000
<b>Cash from operations</b>	<b>\$238,313</b>	<b>\$21,346</b>	<b>\$48,227</b>	<b>\$79,942</b>	<b>\$93,743</b>	<b>\$243,258</b>	<b>\$36,451</b>	<b>\$57,993</b>	<b>\$81,923</b>	<b>\$96,997</b>	<b>\$273,364</b>	<b>\$10,834</b>	<b>\$88,602</b>	<b>\$93,352</b>	<b>\$108,955</b>	<b>\$301,743</b>
<b>Cash flows from investing:</b>																
PPE	(436)	(600)	(368)	(143)	(167)	(1,278)	(177)	(500)	(500)	(500)	(1,677)	(500)	(500)	(500)	(500)	(2,000)
Capitalized computer software development costs	(1,131)	(9)	(61)	0	(71)	(141)	(806)				(806)					0
Purchase price adjustments on previous acquisitions, other	0	0	0	0	0	0	(334)				(334)					0
Acquisition related deposits	(6,098)	(74,219)	0	(631)	66	(74,784)	0				0					0
<b>Cash from investing</b>	<b>(\$7,665)</b>	<b>(\$74,828)</b>	<b>(\$429)</b>	<b>(\$774)</b>	<b>(\$172)</b>	<b>(\$76,203)</b>	<b>(\$1,317)</b>	<b>(\$500)</b>	<b>(\$500)</b>	<b>(\$500)</b>	<b>(\$2,817)</b>	<b>(\$500)</b>	<b>(\$500)</b>	<b>(\$500)</b>	<b>(\$500)</b>	<b>(\$2,000)</b>
<b>Free Cash Flow</b>	<b>\$236,746</b>	<b>\$20,737</b>	<b>\$47,798</b>	<b>\$79,799</b>	<b>\$93,505</b>	<b>\$241,839</b>	<b>\$35,468</b>	<b>\$57,493</b>	<b>\$81,423</b>	<b>\$96,497</b>	<b>\$270,881</b>	<b>\$10,334</b>	<b>\$88,102</b>	<b>\$92,852</b>	<b>\$108,455</b>	<b>\$299,743</b>
Excess Tax Benefits from SBC, Other Adjustments	27	(353)	1,617	(71)	71	1,264	291	10	10	10	321	10	10	10	10	40
<b>Adjusted FCF</b>	<b>\$236,773</b>	<b>\$20,384</b>	<b>\$49,415</b>	<b>\$79,728</b>	<b>\$93,576</b>	<b>\$243,103</b>	<b>\$35,759</b>	<b>\$57,503</b>	<b>\$81,433</b>	<b>\$96,507</b>	<b>\$271,202</b>	<b>\$10,344</b>	<b>\$88,112</b>	<b>\$92,862</b>	<b>\$108,465</b>	<b>\$299,783</b>
<b>Cash from financing:</b>																
Exercise of stock options	10,864	1,018	1,696	0	6,290	9,004	268									
Proceeds from secured borrowings	50,000	100,000	29,163	86,000	4,000	219,163	(4,000)									
Repayment of secured borrowings	0	0	0	0	(8,000)	(8,000)	0									
Payment of tax withholding obligations related to restricted stock	(14,477)	(3,166)	(2,685)	(2,395)	(1,921)	(10,167)	(1,828)									
Stock repurchase, debt issuance costs, other	(300,914)	(50,848)	(53,470)	(51,786)	(4,461)	(160,565)	0									
<b>Net cash used in financing activities</b>	<b>(\$254,527)</b>	<b>\$47,004</b>	<b>(\$25,296)</b>	<b>\$31,819</b>	<b>(\$4,092)</b>	<b>\$49,435</b>	<b>(\$5,560)</b>									
Exchange rate impact	(360)	(729)	631	(740)	218	(620)	228									
<b>Change in cash and cash equivalents</b>	<b>(\$24,239)</b>	<b>(\$7,207)</b>	<b>\$23,133</b>	<b>\$110,247</b>	<b>\$89,697</b>	<b>\$215,870</b>	<b>\$29,802</b>	<b>\$57,493</b>	<b>\$81,423</b>	<b>\$96,497</b>	<b>\$270,547</b>	<b>\$10,334</b>	<b>\$88,102</b>	<b>\$92,852</b>	<b>\$108,455</b>	<b>\$299,743</b>
<b>Cash at beginning of period</b>	<b>\$96,165</b>	<b>\$71,926</b>	<b>\$64,719</b>	<b>\$87,852</b>	<b>\$198,099</b>	<b>\$71,926</b>	<b>\$287,796</b>	<b>\$317,598</b>	<b>\$375,091</b>	<b>\$456,514</b>	<b>\$287,796</b>	<b>\$558,343</b>	<b>\$568,677</b>	<b>\$656,780</b>	<b>\$749,631</b>	<b>\$558,343</b>
<b>Cash at end of period</b>	<b>\$71,926</b>	<b>\$64,719</b>	<b>\$87,852</b>	<b>\$198,099</b>	<b>\$287,796</b>	<b>\$287,796</b>	<b>\$317,598</b>	<b>\$375,091</b>	<b>\$456,514</b>	<b>\$553,011</b>	<b>\$558,343</b>	<b>\$568,677</b>	<b>\$656,780</b>	<b>\$749,631</b>	<b>\$858,086</b>	<b>\$858,086</b>
Shares outstanding	70,740	69,317	68,844	68,482	68,176	68,705	68,299	68,099	67,899	67,799	68,024	67,499	67,399	67,299	67,199	67,349
FFO per share	\$3.37	\$0.31	\$0.70	\$1.17	\$1.38	\$3.54	\$0.53	\$0.85	\$1.21	\$1.43	\$4.02	\$0.16	\$1.31	\$1.39	\$1.62	\$4.48
FCF per share	\$3.37	\$0.30	\$0.72	\$1.16	\$1.37	\$3.55	\$0.52	\$0.84	\$1.20	\$1.42	\$3.99	\$0.15	\$1.31	\$1.38	\$1.61	\$4.45

# CHGG: Income Statement

28

<b>Chegg, Inc.</b> <i>Figures in millions, except per share data</i>	<b>2019</b>	<b>1Q20 MAR</b>	<b>2Q20 JUN</b>	<b>3Q20 SEP</b>	<b>4Q20E DEC</b>	<b>2020E</b>	<b>1Q21E MAR</b>	<b>2Q21E JUN</b>	<b>3Q21E SEP</b>	<b>4Q21E DEC</b>	<b>2021E</b>	<b>2022E</b>
Chegg Services subscribers (in thousands)	3,942.0	2,908.0	3,716.0	3,747.0	3,814.5	6,117.7	3,635.0	4,459.2	4,571.3	4,577.4	7,448.3	8,937.9
% Y/Y grow th	28.9%	34.8%	66.7%	69.2%	50.0%	55.2%	25.0%	20.0%	22.0%	20.0%	21.8%	20.0%
% Q/Q grow th		14.4%	27.8%	0.8%	1.8%		-4.7%	22.7%	2.5%	0.1%		
Required Materials	78.7	31.2	27.0	35.1	26.2	119.5	33.6	28.4	36.9	27.5	126.3	130.1
% Y/Y grow th	17.3%	41.2%	99.2%	41.4%	44.0%	51.9%	7.5%	5.0%	5.0%	5.0%	5.7%	3.0%
% Q/Q grow th		71.7%	-13.5%	30.1%	-25.4%		28.2%	-15.5%	30.1%	-25.4%		
Chegg Services	332.2	100.4	126.0	118.9	164.2	509.5	140.5	161.3	148.0	205.2	655.1	808.8
% Y/Y grow th	30.8%	33.3%	56.9%	71.6%	53.0%	53.3%	40.0%	28.0%	24.5%	25.0%	28.6%	23.5%
% Q/Q grow th		-6.5%	25.6%	-5.6%	38.1%		-14.4%	14.8%	-8.2%	38.7%		
<b>Total revenue</b>	<b>410.9</b>	<b>131.6</b>	<b>153.0</b>	<b>154.0</b>	<b>190.4</b>	<b>629.0</b>	<b>174.1</b>	<b>189.6</b>	<b>184.9</b>	<b>232.7</b>	<b>781.4</b>	<b>938.8</b>
% Y/Y grow th	28.0%	35.1%	63.0%	63.6%	51.7%	53.1%	32.3%	23.9%	20.1%	22.2%	24.2%	20.2%
% Q/Q grow th		4.8%	16.3%	0.7%	23.6%		-8.6%	8.9%	-2.5%	25.9%		
Total cost of revenues	91.8	42.2	43.3	62.1	51.4	199.0	53.1	50.3	70.3	60.5	781.4	24.2%
<b>Gross profit</b>	<b>319.2</b>	<b>89.4</b>	<b>109.7</b>	<b>91.9</b>	<b>139.0</b>	<b>430.0</b>	<b>121.0</b>	<b>139.4</b>	<b>114.6</b>	<b>172.2</b>	<b>547.2</b>	<b>655.6</b>
% Gross margin	77.7%	67.9%	71.7%	59.7%	73.0%	68.4%	69.5%	73.5%	62.0%	74.0%	70.0%	69.8%
Research and development	117.5	32.6	32.8	35.6	36.1	137.0	43.0	40.0	45.0	48.0	176.0	211.0
Sales and marketing	56.2	18.1	13.3	22.2	14.9	68.5	22.0	18.5	22.5	21.5	84.5	92.0
General and administrative	43.2	13.8	15.7	11.0	13.0	53.5	15.0	16.0	15.5	16.0	62.5	69.5
Total operating expenses	216.9	64.4	61.8	68.8	64.0	259.0	80.0	74.5	83.0	85.5	323.0	372.5
<b>Operating income (loss)</b>	<b>102.2</b>	<b>25.0</b>	<b>47.9</b>	<b>23.1</b>	<b>75.0</b>	<b>170.9</b>	<b>41.0</b>	<b>64.9</b>	<b>31.6</b>	<b>86.7</b>	<b>224.2</b>	<b>283.1</b>
% Operating margin	24.9%	19.0%	31.3%	15.0%	39.4%	27.2%	23.5%	34.2%	17.1%	37.3%	28.7%	30.1%
Interest expense, net	(1.6)	(0.5)	(0.5)	2.9	(0.5)	1.4	(0.8)	(0.8)	(0.8)	(0.8)	(3.0)	(3.0)
Other income, net	20.1	5.0	3.2	(0.8)	4.0	11.4	4.0	4.0	4.0	4.0	16.0	16.0
Total interest expense and other income, net	18.4	4.5	2.8	2.1	3.5	12.8	3.3	3.3	3.3	3.3	13.0	13.0
<b>Pretax income (loss)</b>	<b>120.7</b>	<b>29.5</b>	<b>50.6</b>	<b>25.1</b>	<b>78.5</b>	<b>183.7</b>	<b>44.2</b>	<b>68.1</b>	<b>34.9</b>	<b>90.0</b>	<b>237.2</b>	<b>296.1</b>
Tax (benefit)	2.6	0.5	1.3	1.1	0.9	3.8	1.3	1.5	1.5	1.5	5.8	7.5
Tax rate	2.2%	1.8%	2.5%	4.2%	1.1%	2.1%	2.9%	2.2%	4.3%	1.7%	2.4%	2.5%
<b>Net income (loss)</b>	<b>118.0</b>	<b>29.0</b>	<b>49.4</b>	<b>24.1</b>	<b>77.6</b>	<b>180.0</b>	<b>42.9</b>	<b>66.6</b>	<b>33.4</b>	<b>88.5</b>	<b>231.4</b>	<b>288.6</b>
<b>EPS diluted</b>	<b>\$0.91</b>	<b>\$0.22</b>	<b>\$0.37</b>	<b>\$0.17</b>	<b>\$0.55</b>	<b>\$1.32</b>	<b>\$0.32</b>	<b>\$0.49</b>	<b>\$0.24</b>	<b>\$0.64</b>	<b>\$1.70</b>	<b>\$2.08</b>
Average shares	129.59	130.77	133.58	139.18	140.18	135.93	135.00	136.00	137.00	137.50	136.38	138.75
<b>Adjusted EBITDA</b>	<b>125.0</b>	<b>31.8</b>	<b>55.5</b>	<b>31.9</b>	<b>83.5</b>	<b>202.7</b>	<b>50.0</b>	<b>73.9</b>	<b>40.6</b>	<b>95.7</b>	<b>260.2</b>	<b>329.1</b>
% Adjusted EBITDA margin	30.4%	24.2%	36.3%	20.7%	43.9%	32.2%	28.7%	39.0%	22.0%	41.1%	33.3%	35.0%

# CDNS: Income Statement

29

Cadence Design Systems, Inc.	F2019	MAR	JUN	SEP	DEC	F2020	MAR	JUN	SEP	DEC	F2021	F2022
	A	A	A	A	E	E	E	E	E	E	E	E
<i>Figures in millions, except per-share data</i>	F2019	1Q2020	2Q2020	3Q2020	4Q2020	F2020	1Q2021	2Q2021	3Q2021	4Q2021	F2021	F2022
<b>Total revenue</b>	<b>2,336.3</b>	<b>618.0</b>	<b>638.4</b>	<b>666.6</b>	<b>730.7</b>	<b>2,653.7</b>	<b>699.2</b>	<b>704.2</b>	<b>709.1</b>	<b>718.9</b>	<b>2,831.4</b>	<b>3,050.1</b>
Product and maintenance	2,204.6	581.7	601.4	630.3	693.4	2,506.7	661.5	666.1	670.8	679.5	2,677.8	2,887.9
Services	131.7	36.3	37.1	36.3	37.4	147.0	37.7	38.1	38.3	39.5	153.6	162.2
Growth, Y/Y	9.3%	7.1%	10.0%	15.0%	21.9%	13.6%	13.1%	10.3%	6.4%	-1.6%	6.7%	7.7%
Growth, Q/Q		3.1%	3.3%	4.4%	9.6%		-4.3%	0.7%	0.7%	1.4%		
Cost of goods sold	219.0	62.2	62.1	69.3	77.9	271.4	73.0	70.3	70.7	75.4	289.4	309.9
Gross profit	2,117.3	555.8	576.3	597.3	652.8	2,382.3	626.2	634.0	638.4	643.5	2,542.0	2,740.2
Gross margin	90.6%	89.9%	90.3%	89.6%	89.3%	89.8%	89.6%	90.0%	90.0%	89.5%	89.8%	89.8%
Marketing and sales	442.0	116.5	109.8	113.7	130.7	470.8	125.7	122.7	122.2	123.7	494.4	514.9
Marketing and sales %	18.9%	18.9%	17.2%	17.1%	17.9%	17.7%	18.0%	17.4%	17.2%	17.2%	17.5%	16.9%
Research & development	812.1	211.5	213.9	216.2	233.2	874.9	232.2	231.2	232.2	235.2	931.0	1,000.0
R&D %	34.8%	34.2%	33.5%	32.4%	31.9%	33.0%	33.2%	32.8%	32.8%	32.7%	32.9%	32.8%
Sales, general & administrative	113.8	28.6	28.8	28.3	34.3	120.1	32.3	31.8	31.3	30.3	125.9	125.9
SG&A %	4.9%	4.6%	4.5%	4.3%	4.7%	4.5%	4.6%	4.5%	4.4%	4.2%	4.4%	4.1%
Operating expenses	1,367.9	356.7	352.5	358.3	398.3	1,465.8	390.3	385.8	385.8	389.3	1,551.3	1,640.8
Operating expense as % of revenue	58.5%	57.7%	55.2%	53.8%	54.5%	55.2%	55.8%	54.8%	54.4%	54.2%	54.8%	53.8%
<b>Operating income</b>	<b>749.4</b>	<b>199.1</b>	<b>223.9</b>	<b>239.0</b>	<b>254.5</b>	<b>916.5</b>	<b>235.9</b>	<b>248.1</b>	<b>252.5</b>	<b>254.2</b>	<b>990.8</b>	<b>1,099.4</b>
Operating margin	32.1%	32.2%	35.1%	35.9%	34.8%	34.5%	33.7%	35.2%	35.6%	35.4%	35.0%	36.0%
Total Other Income	-14.1	-1.2	-4.1	-4.4	-4.5	-14.2	-3.5	-3.5	-3.5	-3.5	-14.0	-14.0
Pretax income	735.3	198.0	219.8	234.6	250.0	902.4	232.4	244.6	249.0	250.7	976.8	1,085.4
Taxes	117.6	31.7	35.2	37.5	40.0	144.4	37.2	39.1	39.8	40.1	156.3	173.7
Tax rate	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%
<b>Non-GAAP net income</b>	<b>617.6</b>	<b>166.3</b>	<b>184.6</b>	<b>197.1</b>	<b>210.0</b>	<b>758.0</b>	<b>195.2</b>	<b>205.5</b>	<b>209.2</b>	<b>210.6</b>	<b>820.5</b>	<b>911.7</b>
Pro forma net margin (%)	26.4%	26.9%	28.9%	29.6%	28.7%	28.6%	27.9%	29.2%	29.5%	29.3%	29.0%	29.9%
<b>Non-GAAP EPS</b>	<b>2.20</b>	<b>0.60</b>	<b>0.66</b>	<b>0.70</b>	<b>0.75</b>	<b>2.71</b>	<b>0.70</b>	<b>0.74</b>	<b>0.75</b>	<b>0.76</b>	<b>2.94</b>	<b>3.26</b>
Diluted shares outstanding	280.47	279.27	279.08	280.02	279.82	279.55	279.00	278.75	278.50	278.25	278.63	279.63
FCF	655.0					780.0					857.4	951.1
<b>FCF per share</b>	<b>2.34</b>					<b>2.79</b>					<b>3.08</b>	<b>3.40</b>

# SNPS: Income Statement

30

Synopsys Inc. (SNPS)																
Figures in millions, except per-share data																
	F2019	JAN	APR	JUL	OCT	F2020	JAN	APR	JUL	OCT	F2021	JAN	APR	JUL	OCT	F2022
	A	1Q2020	2Q2020	3Q2020	4Q2020	A	1Q2021	2Q2021	3Q2021	4Q2021	E	1Q2022	2Q2022	3Q2022	4Q2022	E
Total revenue	3,360.7	834.4	861.3	964.1	1,025.4	3,685.3	953.2	993.5	1,019.0	1,062.6	4,028.3	1,039.5	1,068.9	1,091.8	1,133.0	4,333.3
Time-based products	2,198.0	556.4	590.1	612.1	606.6	2,365.2	594.5	624.2	638.5	670.5	2,527.7	660.4	693.4	710.8	746.3	2,810.9
Upfront products	619.8	150.7	129.8	210.9	244.2	735.6	177.0	185.9	195.2	204.9	762.9	184.4	178.9	182.5	186.1	731.9
Maintenance and Service	542.9	127.2	141.5	141.1	174.7	584.5	181.7	183.5	185.3	187.2	737.7	194.7	196.6	198.6	200.6	790.4
Growth, Y/Y	7.7%	1.7%	3.0%	13.0%	20.5%	9.7%	14.2%	15.4%	5.7%	3.6%	9.3%	9.1%	7.6%	7.1%	6.6%	7.6%
Growth, Q/Q		-2.0%	3.2%	11.9%	6.4%		-7.0%	4.2%	2.6%	4.3%		-2.2%	2.8%	2.1%	3.8%	
Cost of goods sold	666.9	170.7	164.2	168.0	200.4	703.4	186.1	198.6	198.7	201.8	785.2	208.5	213.4	212.9	210.8	845.6
Gross profit	2,693.8	663.7	697.1	796.2	825.0	2,981.9	767.1	795.0	820.3	860.8	3,243.1	831.0	855.5	878.9	922.2	3,487.7
Gross margin	80.2%	79.5%	80.9%	82.6%	80.5%	80.9%	80.5%	80.0%	80.5%	81.0%	80.5%	79.9%	80.0%	80.5%	81.4%	80.5%
Research & development	1,043.3	280.9	284.1	276.3	298.4	1,139.7	295.4	305.4	310.4	319.4	1,230.6	324.4	327.4	328.4	330.4	1,310.6
R&D %	31.0%	33.7%	33.0%	28.7%	29.1%	30.9%	31.0%	30.7%	30.5%	30.1%	30.5%	31.2%	30.6%	30.1%	29.2%	30.2%
Sales and Marketing	598.7	141.5	140.2	140.4	162.5	584.5	147.0	149.0	153.0	157.0	606.1	160.0	158.0	156.0	155.0	629.1
Marketing and sales %	17.8%	17.0%	16.3%	14.6%	15.8%	15.9%	15.4%	15.0%	15.0%	14.8%	15.0%	15.4%	14.8%	14.3%	13.7%	14.5%
General and Administrative	213.0	54.4	51.4	56.0	64.3	226.1	52.3	53.3	55.3	57.3	218.3	54.3	53.3	52.3	51.3	211.3
SG&A %	6.3%	6.5%	6.0%	5.8%	6.3%	6.1%	5.5%	5.4%	5.4%	5.4%	5.4%	5.2%	5.0%	4.8%	4.5%	4.9%
Other charges	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other charges%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Operating expenses	1,855.0	476.7	475.7	472.6	525.3	1,950.3	494.8	507.8	518.8	533.8	2,055.0	538.8	538.8	536.8	536.8	2,151.0
Operating expense as % of revenue	55.2%	57.1%	55.2%	49.0%	51.2%	52.9%	51.9%	51.1%	50.9%	50.2%	51.0%	51.8%	50.4%	49.2%	47.4%	49.6%
Operating income	838.8	186.9	221.4	323.6	299.7	1,031.6	272.3	287.2	301.6	327.0	1,188.1	292.3	316.8	342.1	385.5	1,336.7
Operating margin	25.0%	22.4%	25.7%	33.6%	29.2%	28.0%	28.6%	28.9%	29.6%	30.8%	29.5%	28.1%	29.6%	31.3%	34.0%	30.8%
Total Other Income	-2.5	-0.4	2.7	0.1	-5.4	-3.0	-1.0	-3.3	-3.3	-3.3	-10.9	-2.0	-2.0	-2.0	-2.0	-8.0
Pretax income	836.3	186.5	224.1	323.7	294.3	1,028.7	271.3	283.9	298.3	323.7	1,177.2	290.3	314.8	340.1	383.5	1,328.7
Taxes	133.8	29.8	35.9	51.7	47.1	164.5	43.4	45.4	47.7	51.8	188.4	46.4	50.4	54.4	61.4	212.6
Tax rate	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%
Non-GAAP net income	702.5	156.7	188.3	271.9	247.2	864.1	227.9	238.5	250.5	271.9	988.9	243.8	264.4	285.7	322.1	1,116.1
Pro forma net margin (%)	20.9%	18.8%	21.9%	28.2%	24.1%	23.4%	23.9%	24.0%	24.6%	25.6%	24.5%	23.5%	24.7%	26.2%	28.4%	25.8%
Non-GAAP EPS	4.56	1.01	1.22	1.74	1.58	5.55	1.45	1.52	1.59	1.73	6.29	1.54	1.67	1.80	2.03	7.05
Diluted shares outstanding	154.5	154.5	154.5	156.0	156.8	156.8	156.8	157.1	157.3	157.6	157.6	157.8	158.1	158.3	158.6	158.6
FCFF	602.4	-44.8	353.9	359.9	167.7	836.6					1,150.0					1,262.5
FCFF per diluted share	3.89	-0.29	2.29	2.31	1.07	5.38					7.30					7.96

## Disclosure Appendix

### **Important Disclosures**

Important disclosures for the companies mentioned in this report can be found at <https://key2.bluematrix.com/sellside/Disclosures.action>.

Please refer to the analysts' recently published reports for company-specific valuation and risks.

### **Reg A/C Certification**

The research analyst(s) responsible for the preparation of this research report certifies that: (1) all the views expressed in this research report accurately reflect the research analyst's personal views about any and all of the subject securities or issuers; and (2) no part of the research analyst's compensation was, is, or will be directly or indirectly related to the specific recommendations or views expressed by the research analyst(s) in this research report.

### **Rating Disclosures**

Distribution of Ratings/IB Services Firmwide and by Sector									
KeyBanc Capital Markets					Technology				
Rating	Count	Percent	IB Serv/Past 12 Mos.		Rating	Count	Percent	IB Serv/Past 12 Mos.	
			Count	Percent				Count	Percent
Overweight [OW]	311	50.24	65	20.90	Overweight [OW]	106	54.64	18	16.98
Sector Weight [SW]	299	48.30	59	19.73	Sector Weight [SW]	86	44.33	12	13.95
Underweight [UW]	9	1.45	0	0.00	Underweight [UW]	2	1.03	0	0.00

### **Rating System**

**Overweight** - We expect the stock to outperform the analyst's coverage sector over the coming 6-12 months.

**Sector Weight** - We expect the stock to perform in line with the analyst's coverage sector over the coming 6-12 months.

**Underweight** - We expect the stock to underperform the analyst's coverage sector over the coming 6-12 months.

## Disclosure Appendix (cont'd)

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Important disclosures for the companies mentioned in this report can be found at <https://key2.bluematrix.com/sellside/> **Disclosures.action**.

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