CIBC CAPITAL MARKETS

EQUITY RESEARCH

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April 1, 2022 **Industry Update**

Software Valuation Monthly – March 2022

Catching A Breather

Sector:
Information Technology

Our Conclusion

March 2022 showed the first positive monthly returns for the tech sector in 2022, with our coverage up 2% in the month and the S&P software Index up 4%. Tech stock share prices largely held in despite a Fed rate hike and the continued uncertainty posed by the Russia-Ukraine conflict.

Both our coverage and overall software markets underperformed the S&P 500 and the TSX as investors remain more interested in value, particularly commodities as inflation worsens. Within our coverage universe, March stock price returns improved sequentially, with an average return of 2% versus a -1% return in February. Returns varied across our coverage with roughly half delivering positive returns; notable outperformers included SFTC (+20%) and KXS (+14%), while the underperformers included DND (-12%), LWRK(-11%) and QFOR (-7%). Performance was not dictated by sub-sector, with strength and weakness spread across business models and market capitalizations.

Key Points

Mature software stocks we track continue to outperform SaaS names, outpacing them by 130 bps in March versus 280 bps of outperformance in February. As investors adjust their portfolios in the face of inflation and economic uncertainty, more stable tech companies are likely to remain in favor in 2022. While January and February saw the unprofitable SaaS names underperform EBITDA-positive SaaS names, March saw a slight reversal. The unprofitable SaaS names saw a 4% return in the month while EBITDA-positive SaaS names were down by 1%.

Our coverage universe (ex. QFOR, CTS and SFTC) is trading at 4.8x EV/sales, which is down 0.4x from February. Average valuations are sitting at a 0.9x discount to two-year historical averages, and all of our names are trading at a discount to their respective two-year historical averages.

Looking at software names on a Rule-of-40 basis, valuations for the highest Rule-of-40 scores contracted more relative to the middle-scoring names, as the valuation gap between the top tier and Tier 3 SaaS names narrowed by 0.6x M/M while the valuation gap between Tier 1 and Tier 4 mature software names also contracted by 0.3x.

All figures in Canadian dollars unless otherwise stated.

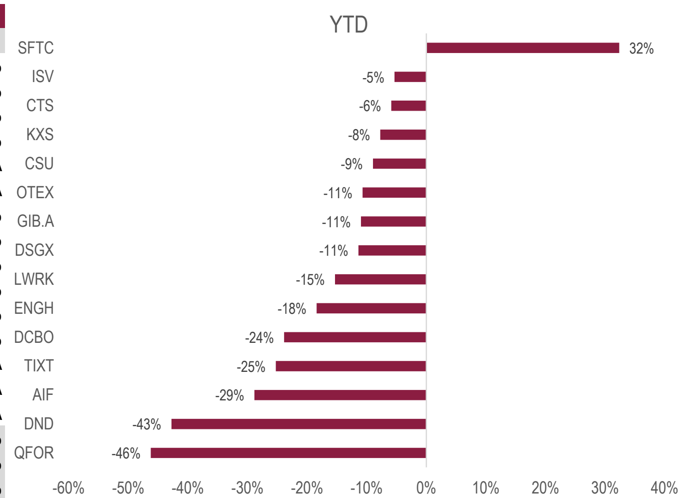
For required regulatory disclosures please refer to "Important Disclosures" beginning on page 20.

Coverage Universe Returns

March returns within our coverage were roughly evenly split between positive returns and negative returns, with an average return of 2%. The broader S&P software index saw an average 4% return amid a broad-market holding pattern, as investors continue to rebalance portfolios and sector selection given the ongoing economic uncertainty, in addition to rising inflation and rates outlook. There was no clear pattern on the type of stocks that were weaker in the month; select SaaS stocks and mature software stocks have delivered relatively notable under/outperformance this month. Our coverage continue to underperform the S&P Software index as well as the TSX (4%) as investors focused on commodity and value stocks.

Exhibit 1: CIBC Software/Services Coverage – Share Price Return History, As Of March 31, 2022

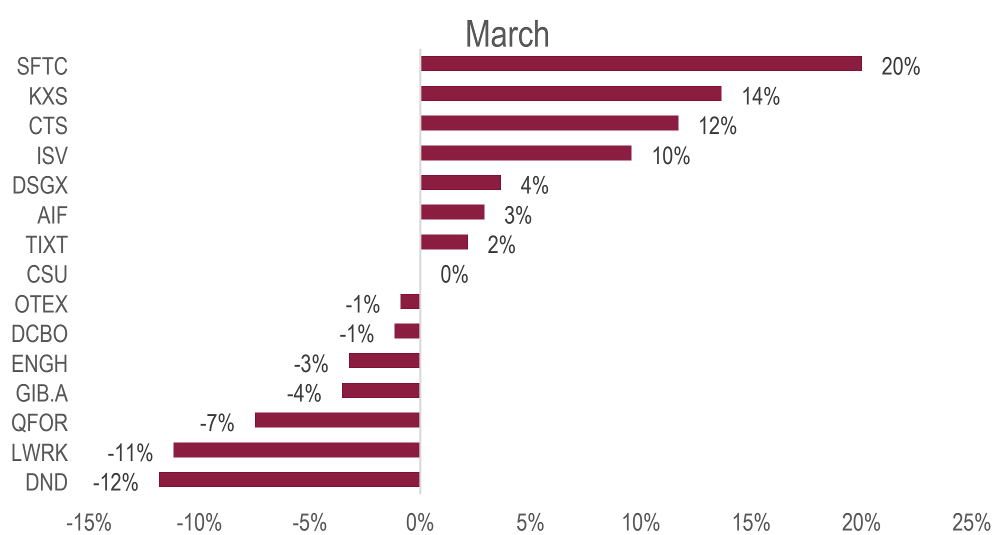
	Rating	1 Month	3 Month	6 Months	YTD	1 Year	3 Year
	Coverage Universe Comparison						
AIF	NT	3%	-29%	-18%	-29%	-16%	94%
GIB.A	OP	-4%	-11%	-8%	-11%	-5%	8%
CSU	OP	0%	-9%	2%	-9%	22%	103%
CTS	NT	12%	-6%	0%	-6%	94%	1104%
DCBO	OP	-1%	-24%	-31%	-24%	20%	NA
DND	NT	-12%	-43%	-39%	-43%	-35%	NA
DSGX	OP	4%	-11%	-9%	-11%	20%	101%
ENGH	OP	-3%	-18%	-29%	-18%	-32%	16%
ISV	NT	10%	-5%	-8%	-5%	1%	53%
KXS	OP	14%	-8%	-10%	-8%	12%	110%
LWRK	NT	-11%	-15%	-33%	-15%	-35%	-21%
OTEX	OP	-1%	-11%	-14%	-11%	-11%	10%
SFTC	OP	20%	32%	NA	NA	NA	NA
QFOR	OP	-7%	NA	NA	NA	NA	NA
TIXT	OP	2%	-25%	-29%	NA	-12%	NA
Average		2%	-13%	-17%	-16%	2%	158%
S&P Software		4%	-11%	-1%	-11%	22%	123%
TSX		4%	3%	9%	3%	17%	36%



Source: FactSet and CIBC World Markets Inc.

There was no consistent pattern for share price performance this month among large-cap versus smaller-cap companies under our coverage. Organic growers including Softchoice, Kinaxis, and Information Services Corp in addition to acquisitive companies such as Converge outperformed this month. Dye & Durham and LifeWorks were the worst performers, down 12% and 11%, respectively. Recently IPO'ed Q4 Inc. continue to experience share price decline in March, and is now -46% YTD.

Exhibit 2: CIBC Software/Services Coverage – Stock Price Returns, March 2022



Source: FactSet and CIBC World Markets Inc.

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The average EV/Sales multiple across our coverage was 4.8x in March, down from 5.2x at the end of February. The valuation average excludes Q4, Softchoice, and Converge given the timing of Q4's IPO and the nature of the reseller business, making EV/Sales a less illustrative metric. Average valuations are now below the two-year average of 5.7x and a 0.1x discount to the five-year average. All of our coverage now trades at a discount to its two-year averages, while Kinaxis trades at a discount in excess of 3x to the two-year average.

Exhibit 3: CIBC Software/Services Coverage – Historical Valuation, March 31, 2022

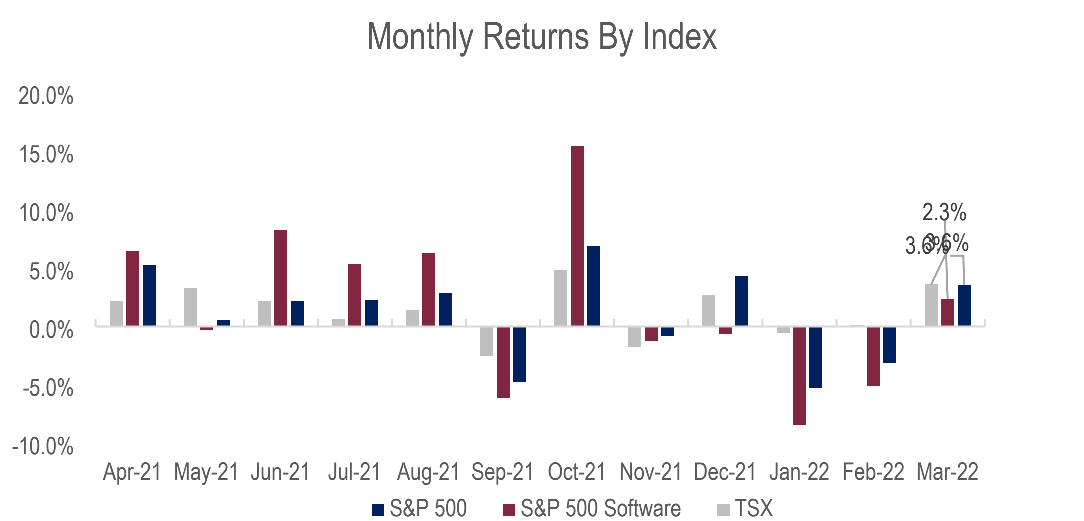
Company	EV/Sales (FY2)	2-Year Average	Δ	5-Year Average	Δ
Altus	3.02x	3.65x	-0.63x	2.89x	0.13x
Constellation	5.13x	5.58x	-0.45x	4.94x	0.18x
Docebo	7.02x	NA	NA	NA	NA
Descartes	11.57x	12.31x	-0.74x	9.83x	1.75x
Dye & Durham	4.56x	NA	NA	NA	NA
Enghouse	3.96x	5.47x	-1.51x	4.80x	-0.84x
CGI Inc.	2.12x	2.28x	-0.17x	2.20x	-0.08x
Information Services	2.44x	2.72x	-0.28x	2.62x	-0.18x
Kinaxis	8.76x	12.20x	-3.44x	9.71x	-0.96x
LifeWorks	1.82x	2.51x	-0.69x	2.45x	-0.64x
Open Text	3.99x	4.41x	-0.42x	4.19x	-0.20x
TELUS International	2.62x	NA	NA	NA	NA
Average	**4.75x**	**5.68x**	**-0.93x**	**4.85x**	**-0.10x**
Median	**3.97x**	**4.41x**	**-0.44x**	**4.19x**	**-0.21x**

Source: FactSet and CIBC World Markets Inc.

* Excludes QFOR, SFTC, CTS

U.S.-listed software stocks were up 2.3% in the month, underperforming the TSX by 130 bps and the S&P 500 by 120 bps. March's underperformance is the third month of relative underperformance versus the TSX, following a 510-bps spread in February 2022.

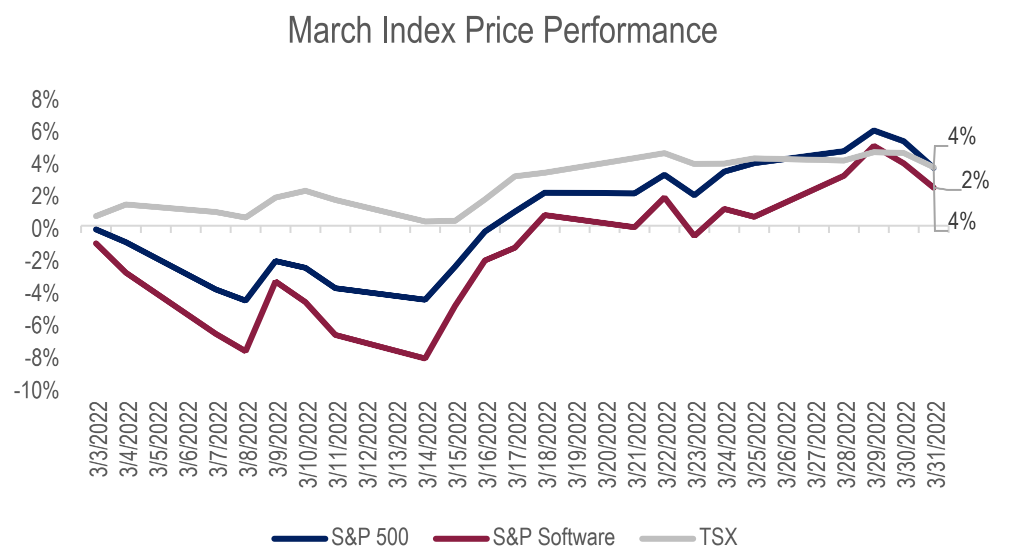
Exhibit 4: S&P 500, S&P 500 Software & TSX – Index Returns, April 2021 – March 2022



Source: FactSet and CIBC World Markets Inc.

Markets continues to digest the geopolitical uncertainty and the associated implications. During March, the market continues to remain volatile, but has recovered during the latter half of the month. S&P 500 and TSX both finished the month in the green with a 4% return, while the S&P software sector finished the month with a 2% return. However, volatility is likely here to stay.

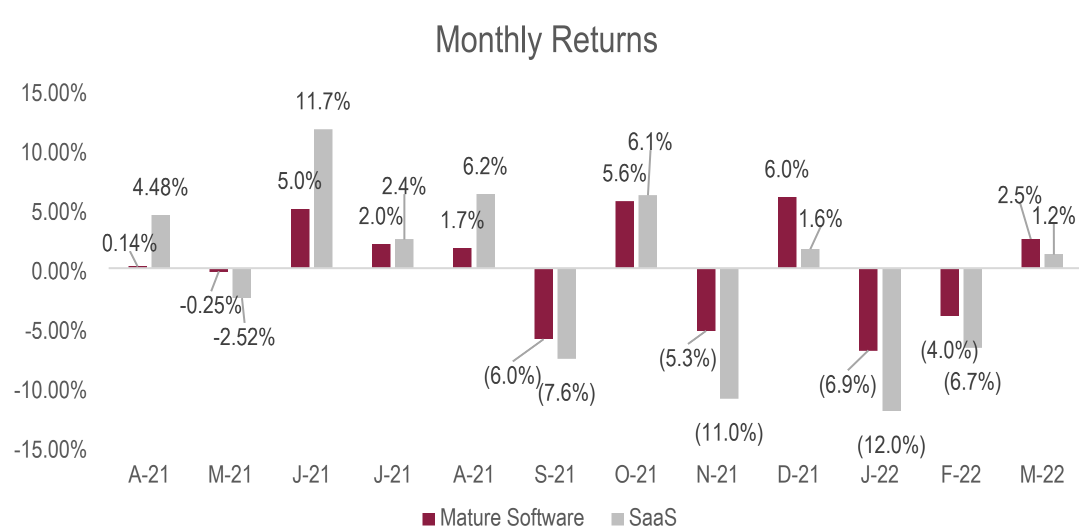
Exhibit 5: S&P 500, S&P Software, TSX Indices – Price Returns, March 2022



Source: FactSet and CIBC World Markets Inc.

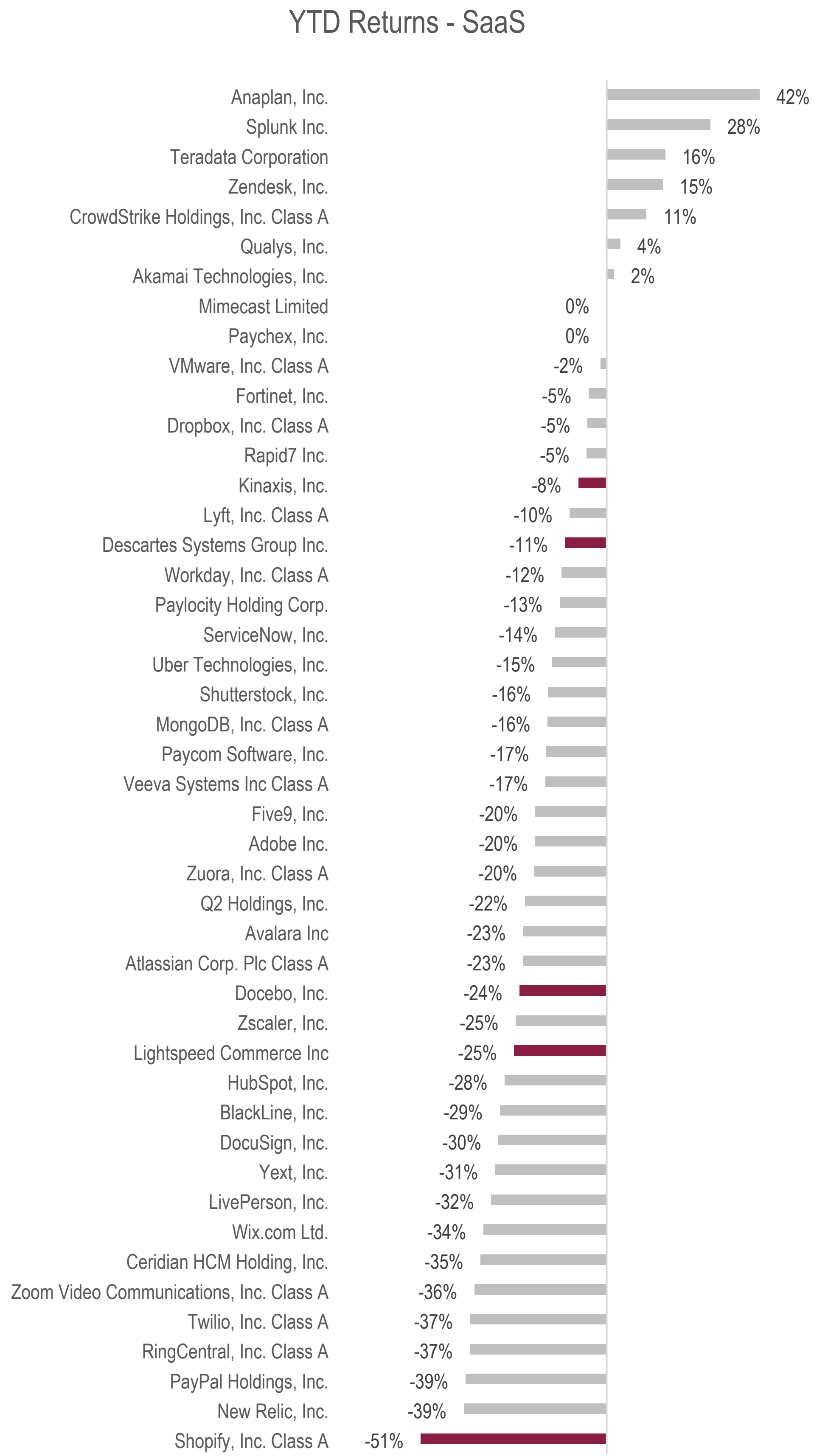
In March, tracked mature software names held in better than the group of SaaS stocks, outperforming them by 130 basis points and finishing up 2.5%. The mature names have outperformed the SaaS names since November as investors adopted a more defensive posture.

Exhibit 6: SaaS And Mature Software – Returns By Month, April 2021 – March 2022



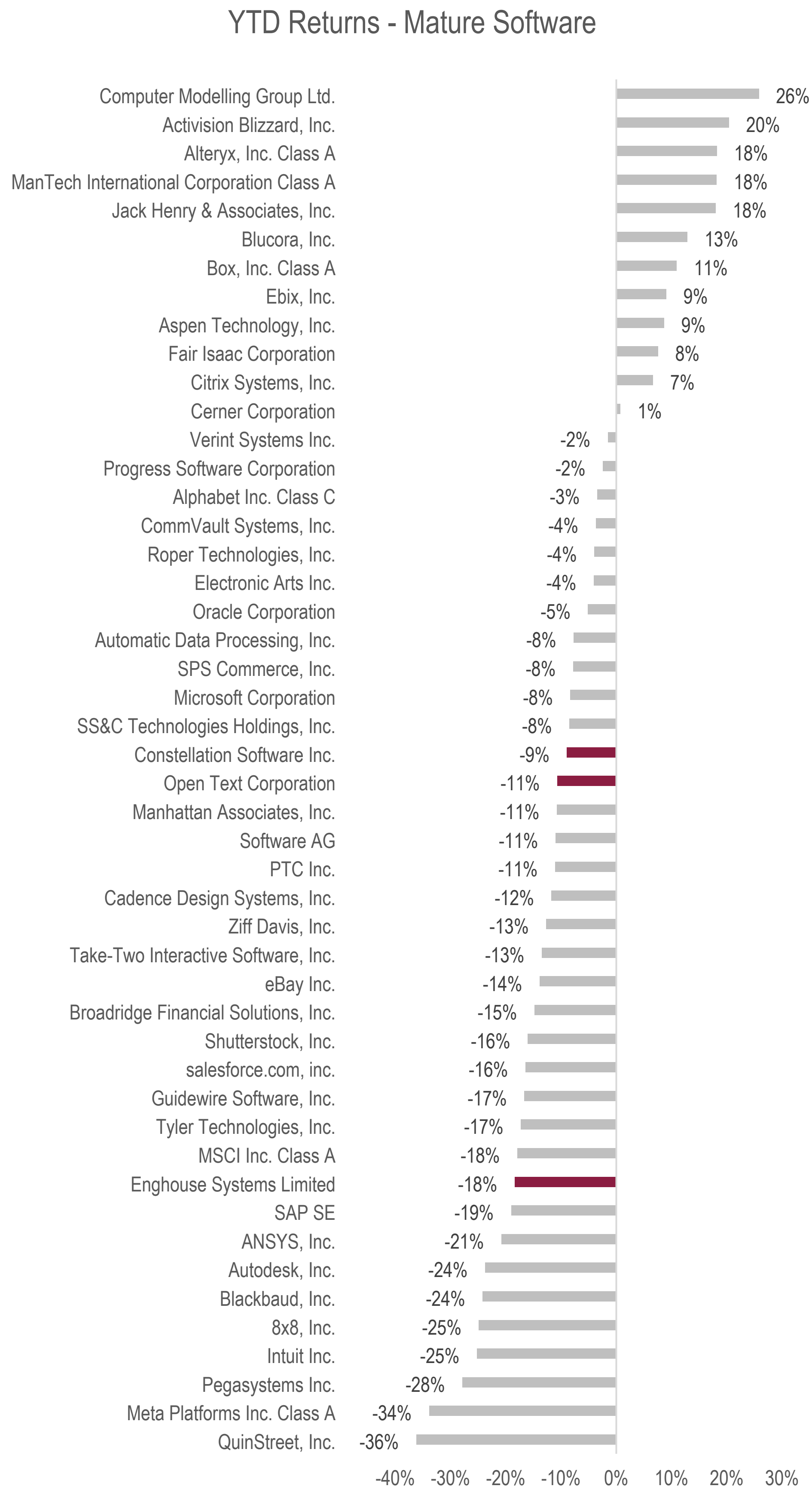
Source: FactSet and CIBC World Markets Inc.

Exhibit 7: SaaS Stocks – Return Performance, Year To Date As Of March 31, 2022



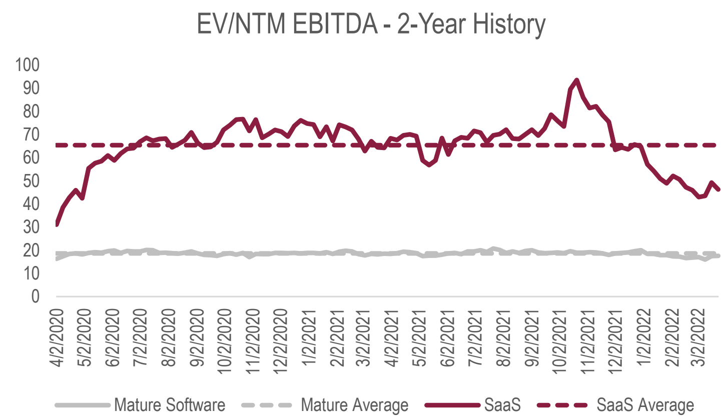
Source: FactSet and CIBC World Markets Inc.

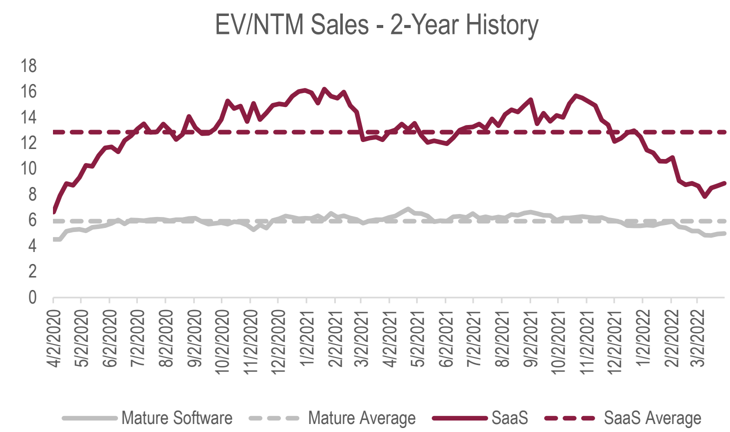
Exhibit 8: Mature Software Stocks – Return Performance, Year To Date As Of March 31, 2022



Source: FactSet and CIBC World Markets Inc.

Exhibit 9: Mature Software Vs. SaaS – Two-year Valuation History, 2020 - 2022



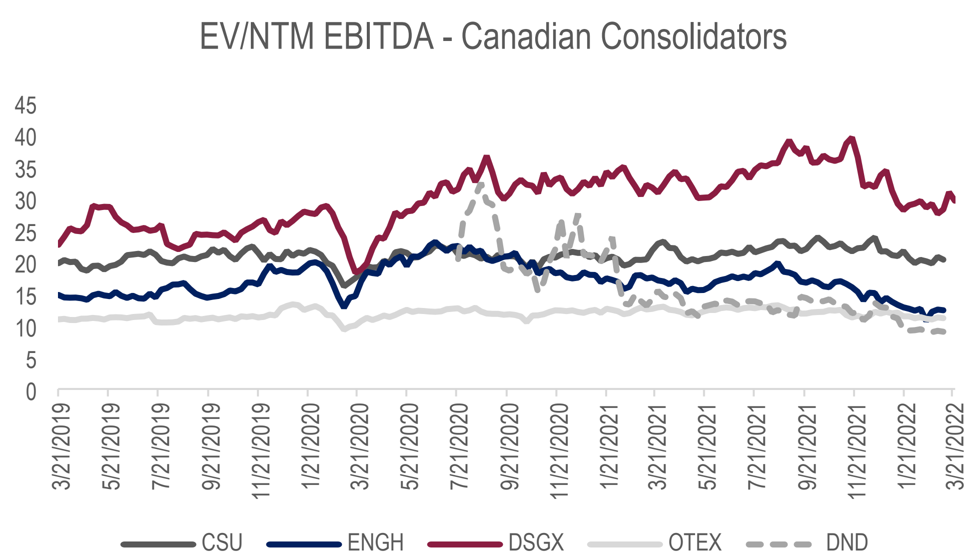


Source: FactSet and CIBC World Markets Inc.

The line charts in Exhibit 9 highlight the impact that the November sell-off and subsequent poor performance from December through February has had on SaaS and mature software stock valuations. The median EV/Sales multiple for SaaS stocks has slipped one turn below the two-year average, while the median EV/EBITDA multiple for mature software names slipped by 0.3x this month, and is now on average trading at a 1.8x discount to the two-year average.

The valuations of Canadian consolidators were largely unchanged in the month and MoM valuation changes moving in disparate manner. Dye & Durham's valuation was down 4% month over month as share price drift lower. Descartes was the only name to have a valuation ticking slightly higher over the month.

Exhibit 10: Canadian Consolidators – EV/NTM EBITDA, 3/21/2019 - 3/31/2022

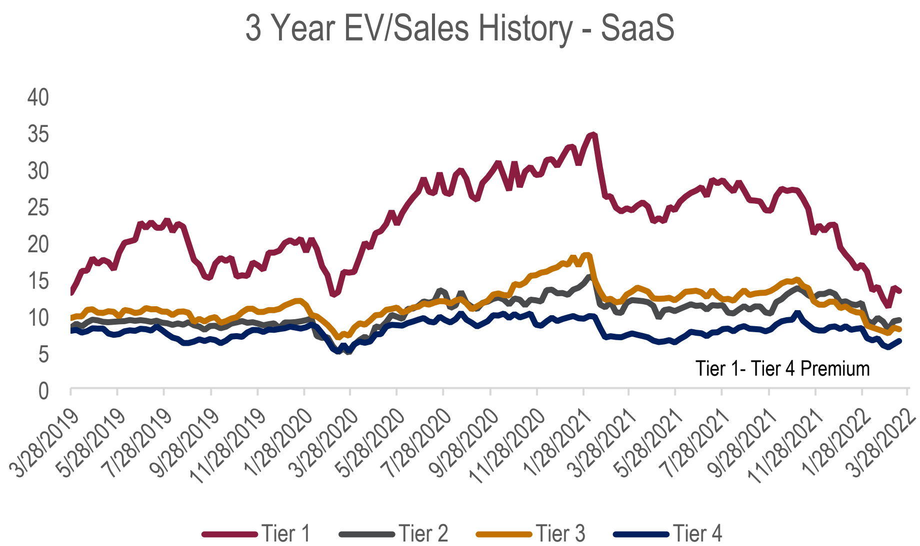


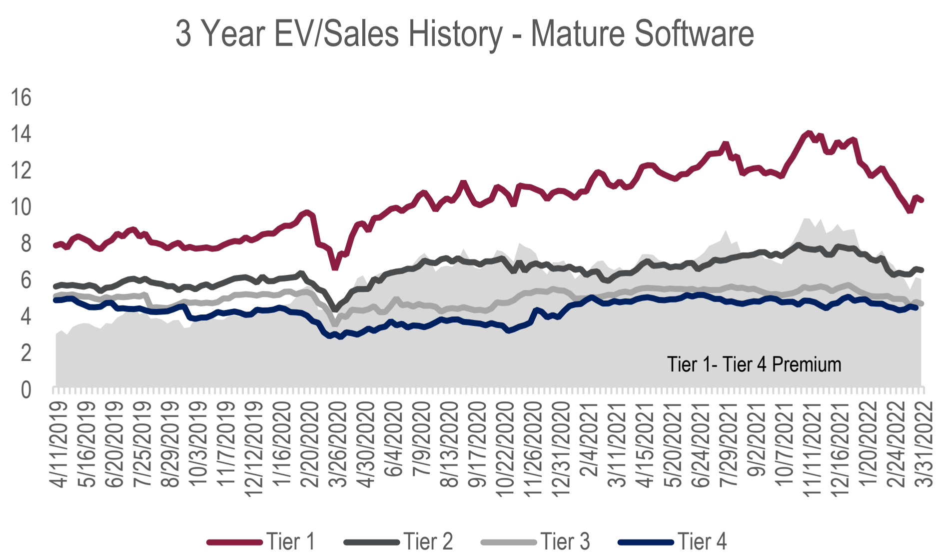
Source: FactSet and CIBC World Markets Inc.

Rule-of-40 Valuation Premiums

To better understand the link between Rule-of-40 scores and valuation multiples, we have grouped the SaaS and mature software populations into tiers based on their Rule-of-40 scores, and examined the change in multiples over a three-year period (see the tables in Exhibits 13 and 14 for tier groupings). While SaaS valuations declined across all tiers, the Tier 1 and Tier 4 SaaS names were more heavily impacted in the month. Tier 1 median EV/Sales valuation contracted by 0.6x while the Tier 4 Rule-of-40 SaaS names saw valuations contract by 0.4x on average. Amongst the Mature software names Tier 1 and Tier 3 mature software names saw devaluation while Tier 2 saw slight rerate higher, although muted. Tier 1 and Tier 3 Mature names contracted by 0.3x.

Exhibit 11: Mature Software Vs. SaaS – EV/S Valuation History, 2019 - 2022

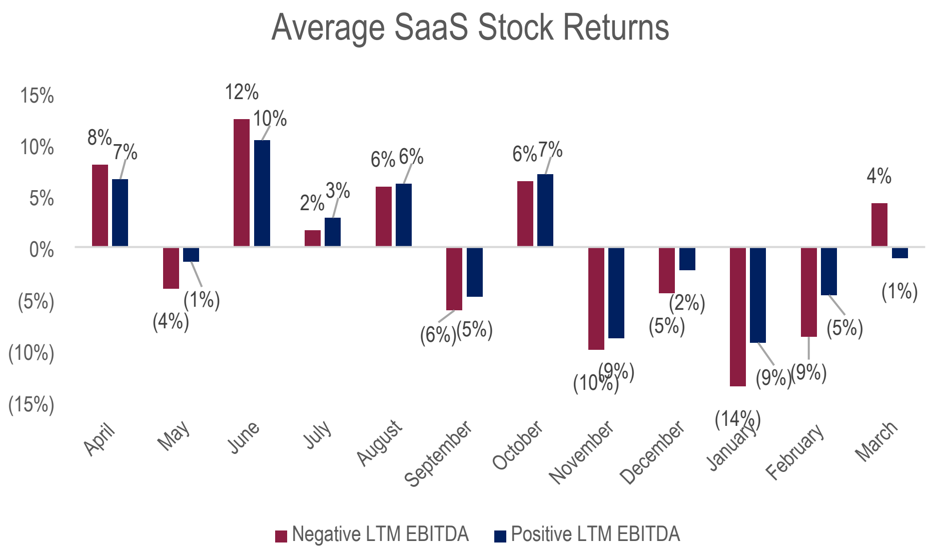




Source: FactSet and CIBC World Markets Inc.

Of the 50 SaaS names we track, the 21 that reported negative LTM EBITDA outperformed the positive EBITDA group by 535 bps in the month. In March 2022, the group of negative EBITDA companies has shown more volatile price performance as the unprofitable group partially closed its gap of YTD underperformance against the positive EBITDA group. YTD 2022, the theme from last year where the positive EBITDA group outperformed the negative EBITDA continues. However, both groups delivered double-digit negative returns on average so far in 2022. On average, the average return for the positive EBITDA group stood at -12.83% while the negative EBITDA group generated -17.27% return.

Exhibit 12: SaaS Returns – Grouped By EBITDA Positivity, April 2021 – March 2022



Source: FactSet and CIBC World Markets Inc.

Exhibit 13: SaaS Stocks – Comp Table, 2021A – 2023E

	LTM Revenue Growth	LTM FCF Margin	NTM Revenue Growth	NTM FCF Margin	LTM Rule Of 40	NTM Rule Of 40	Enterprise Value ($MM)	EV/S C21A	EV/S C22E	EV/S C23E
Tier 1 SaaS (Rule of 40 > 60)										
Lightspeed POS, Inc.*	**159%**	**-22%**	**40%**	**-12%**	**137%**	**28%**	**3,623**	**16.3x**	**5.3x**	**4.0x**
Nuvei*	**70%**	**36%**	**33%**	**29%**	**106%**	**63%**	**10,523**	**14.5x**	**10.9x**	**8.4x**
CrowdStrike Holdings, Inc.	66%	31%	48%	29%	97%	78%	51,181	58.5x	24.5x	18.0x
Zoom Video Communications	55%	36%	11%	32%	91%	43%	29,743	11.2x	6.6x	5.8x
Zscaler, Inc.	60%	26%	43%	23%	86%	65%	33,409	49.6x	27.7x	20.8x
DocuSign, Inc.	45%	23%	17%	19%	68%	37%	21,382	14.7x	8.7x	7.4x
Veeva Systems Inc	26%	44%	17%	36%	70%	53%	30,347	20.7x	14.2x	12.1x
Atlassian Corp. Plc	35%	35%	21%	25%	70%	46%	74,822	35.8x	24.7x	19.6x
Magnet Forensics*	37%	31%	31%	32%	68%	63%	799	11.4x	9.0x	7.0x
Shopify, Inc.	57%	**10%**	**31%**	5%	**67%**	36%	**78,543**	**17.0x**	**13.0x**	**9.8x**
Tier 1 SaaS (Rule of 40 > 60) Average								**25.0x**	**14.5x**	**11.3x**

	LTM Revenue Growth	LTM FCF Margin	NTM Revenue Growth	NTM FCF Margin	LTM Rule Of 40	NTM Rule Of 40	Enterprise Value ($MM)	EV/S C21A	EV/S C22E	EV/S C22E
Tier 2 SaaS (Rule of 40 b/w 41-60)										
HubSpot, Inc.	47%	18%	33%	14%	66%	46%	22,108	17.0x	12.8x	10.0x
Descartes Systems	**22%**	**40%**	**12%**	**37%**	**62%**	**50%**	**6,007**	**14.1x**	**12.7x**	**11.9x**
ServiceNow, Inc.	30%	31%	26%	31%	61%	57%	110,284	18.7x	14.9x	11.9x
Docebo, Inc.*	55%	**-4%**	**42%**	-4%	**51%**	38%	**1,489**	**14.3x**	**10.2x**	**7.4x**
Twilio, Inc.	61%	-3%	36%	-2%	58%	34%	25,844	9.1x	6.7x	5.2x
Qualys, Inc.	14%	43%	17%	34%	56%	51%	5,201	12.6x	10.8x	9.2x
Mimecast Limited	19%	28%	15%	23%	48%	38%	5,115	10.2x	7.7x	6.6x
Dropbox, Inc.	13%	34%	8%	33%	47%	41%	9,276	4.3x	4.0x	3.7x
Workday, Inc.	20%	27%	20%	19%	47%	40%	58,557	13.6x	9.6x	8.0x
Avalara Inc	40%	6%	23%	0%	45%	23%	8,172	11.7x	9.5x	7.8x
Tier 2 SaaS (Rule of 40 b/w 41-60) Average								**12.6x**	**9.9x**	**8.2x**

	LTM Revenue Growth	LTM FCF Margin	NTM Revenue Growth	NTM FCF Margin	LTM Rule Of 40	NTM Rule Of 40	Enterprise Value ($MM)	EV/S C21A	EV/S C22E	EV/S C22E
Tier 3 SaaS (Rule of 40 b/w 25-40)										
Zendesk, Inc.	30%	12%	26%	10%	42%	37%	14,846	11.1x	8.8x	7.0x
Paylocity Holding Corp.	25%	16%	25%	15%	41%	40%	11,334	17.8x	12.2x	10.1x
RingCentral, Inc.	35%	6%	26%	7%	41%	33%	12,251	7.7x	6.1x	4.9x
VMware, Inc.	9%	31%	7%	28%	40%	35%	58,061	4.9x	4.2x	3.9x
MongoDB, Inc.	48%	1%	35%	0%	49%	35%	29,383	49.8x	25.4x	19.3x
BlackLine, Inc.	21%	18%	23%	2%	39%	25%	4,276	10.0x	8.2x	6.8x
Rapid7 Inc.	30%	8%	28%	7%	39%	35%	7,150	13.4x	10.4x	8.5x
Five9, Inc.	40%	-2%	24%	5%	38%	29%	7,990	13.1x	10.6x	8.5x
Akamai Technologies, Inc.	8%	25%	8%	24%	33%	33%	20,925	6.0x	5.6x	5.2x
Wix.com Ltd.	28%	5%	15%	2%	33%	16%	5,657	4.5x	3.9x	3.3x
Tier 3 SaaS (Rule of 40 b/w 25-40) Average								**13.8x**	**9.5x**	**7.8x**

	LTM Revenue Growth	LTM FCF Margin	NTM Revenue Growth	NTM FCF Margin	LTM Rule Of 40	NTM Rule Of 40	Enterprise Value ($MM)	EV/S C21A	EV/S C22E	EV/S C22E
Tier 4 SaaS (Rule of 40 <28										
Ceridian HCM Holding, Inc.	30%	-1%	18%	3%	29%	20%	11,203	10.9x	9.3x	7.9x
Anaplan, Inc.	32%	-5%	26%	0%	27%	26%	9,522	21.3x	13.0x	10.4x
Teradata Corporation	4%	23%	1%	21%	27%	22%	5,137	2.7x	2.7x	2.5x
Q2 Holdings Inc.	24%	2%	16%	2%	26%	18%	3,701	7.4x	6.4x	5.4x
Splunk Inc.	20%	4%	23%	12%	24%	35%	25,574	11.5x	7.9x	6.5x
Zuora, Inc.	14%	7%	16%	0%	20%	16%	1,761	5.8x	4.4x	3.8x
LivePerson, Inc.	28%	-8%	18%	-12%	20%	6%	1,836	3.9x	3.3x	2.8x
Kinaxis, Inc.*	**4%**	**7%**	**36%**	**1%**	**11%**	**37%**	**3,422**	**13.6x**	**10.5x**	**9.2x**
New Relic, Inc.	15%	-4%	17%	4%	11%	22%	4,205	6.3x	4.7x	4.0x
Yext, Inc.	10%	4%	4%	-1%	14%	3%	775	2.2x	1.9x	1.8x
Tier 4 SaaS (Rule of 40 <28 Average								**8.6x**	**6.4x**	**5.4x**
SaaS Average								**15.0x**	**10.1x**	**8.2x**

* Share Price Converted to USD

Source: FactSet and CIBC World Markets Inc.

Exhibit 14: Mature Software Stocks – Comp Table, 2021A - 2023E

	LTM Revenue	LTM FCF Margin	NTM Revenue Growth	NTM FCF Margin	LTM Rule Of 40	NTM Rule Of 40	Enterprise Value ($MM)	EV/S C21A	EV/S C22E	EV/S C23E	EV/EBITDA C21A	EV/EBITDA C22E	EV/EBITDA C23E
Tier 1 Mature Software (Rule of 40 > 45)													
Intuit Inc.	48%	27%	16%	30%	75%	46%	141,811	14.7x	10.8x	9.3x	48.0x	27.6x	23.1x
Facebook, Inc. Class A	37%	33%	12%	20%	70%	33%	571,558	4.8x	4.3x	3.7x	10.4x	9.5x	8.3x
Alphabet Inc. Class C	41%	26%	18%	25%	67%	42%	1,735,191	6.7x	5.7x	4.9x	19.1x	14.1x	12.2x
Tyler Technologies, Inc.	43%	22%	16%	21%	64%	37%	19,459	12.2x	10.5x	9.6x	>50	40.3x	36.5x
Progress Software	22%	32%	11%	34%	55%	NA	2,558	4.8x	4.2x	4.0x	13.5x	9.6x	9.2x
Microsoft Corporation	21%	33%	15%	32%	53%	47%	2,266,343	13.5x	10.6x	9.4x	28.0x	21.2x	18.4x
Cadence Design Systems, I	11%	35%	13%	34%	46%	47%	45,173	15.1x	13.4x	12.2x	49.1x	31.9x	28.2x
Aspen Technology, Inc.	-2%	43%	14%	38%	42%	52%	11,132	15.7x	14.5x	13.0x	29.1x	28.1x	25.5x
ANSYS, Inc.	13%	28%	10%	27%	41%	37%	27,857	14.6x	13.3x	12.2x	43.0x	29.4x	26.2x
Tier 1 Mature Software (Rule of 40 > 45) Average								**11.4x**	**9.7x**	**8.7x**	**30.0x**	**23.5x**	**20.8x**

	LTM Revenue	LTM FCF Margin	NTM Revenue Growth	NTM FCF Margin	LTM Rule Of 40	NTM Rule Of 40	Enterprise Value ($MM)	EV/S C21A	EV/S C22E	EV/S C23E	EV/EBITDA C21A	EV/EBITDA C22E	EV/EBITDA C23E
Tier 2 Mature Software (Rule of 40 b/w 31-50)													
Autodesk, Inc.	16%	34%	15%	42%	50%	57%	47,876	12.6x	9.5x	8.3x	>50	24.5x	20.5x
salesforce.com, inc.	25%	23%	21%	21%	48%	42%	214,026	10.1x	6.8x	5.7x	49.1x	22.3x	19.0x
SPS Commerce, Inc.	23%	23%	15%	23%	47%	39%	4,487	11.6x	10.1x	8.8x	>50	35.5x	29.5x
Constellation Software Inc	20%	24%	20%	24%	45%	44%	37,433	7.3x	6.3x	5.4x	24.8x	21.4x	18.6x
Manhattan Associates, Inc.	13%	27%	7%	25%	40%	32%	8,526	12.8x	12.0x	10.7x	>50	49.0x	42.0x
PTC Inc.	20%	20%	8%	22%	40%	30%	13,948	7.7x	7.0x	6.3x	26.8x	17.9x	15.8x
eBay Inc.	19%	20%	-5%	23%	39%	18%	35,751	3.4x	3.4x	3.3x	10.2x	9.7x	9.2x
Ziff Davis Inc.	20%	25%	-9%	22%	45%	12%	4,822	3.4x	3.2x	2.9x	10.2x	8.8x	7.9x
SS&C Technologies Holding	8%	27%	5%	27%	35%	32%	22,281	4.4x	4.2x	4.0x	11.5x	10.2x	9.7x
Oracle Corporation	5%	16%	5%	26%	21%	31%	275,761	6.8x	6.3x	6.0x	14.7x	12.4x	11.7x
Tier 2 Mature Software (Rule of 40 b/w 31-50) Average								**8.0x**	**6.9x**	**6.1x**	**21.0x**	**21.2x**	**18.4x**

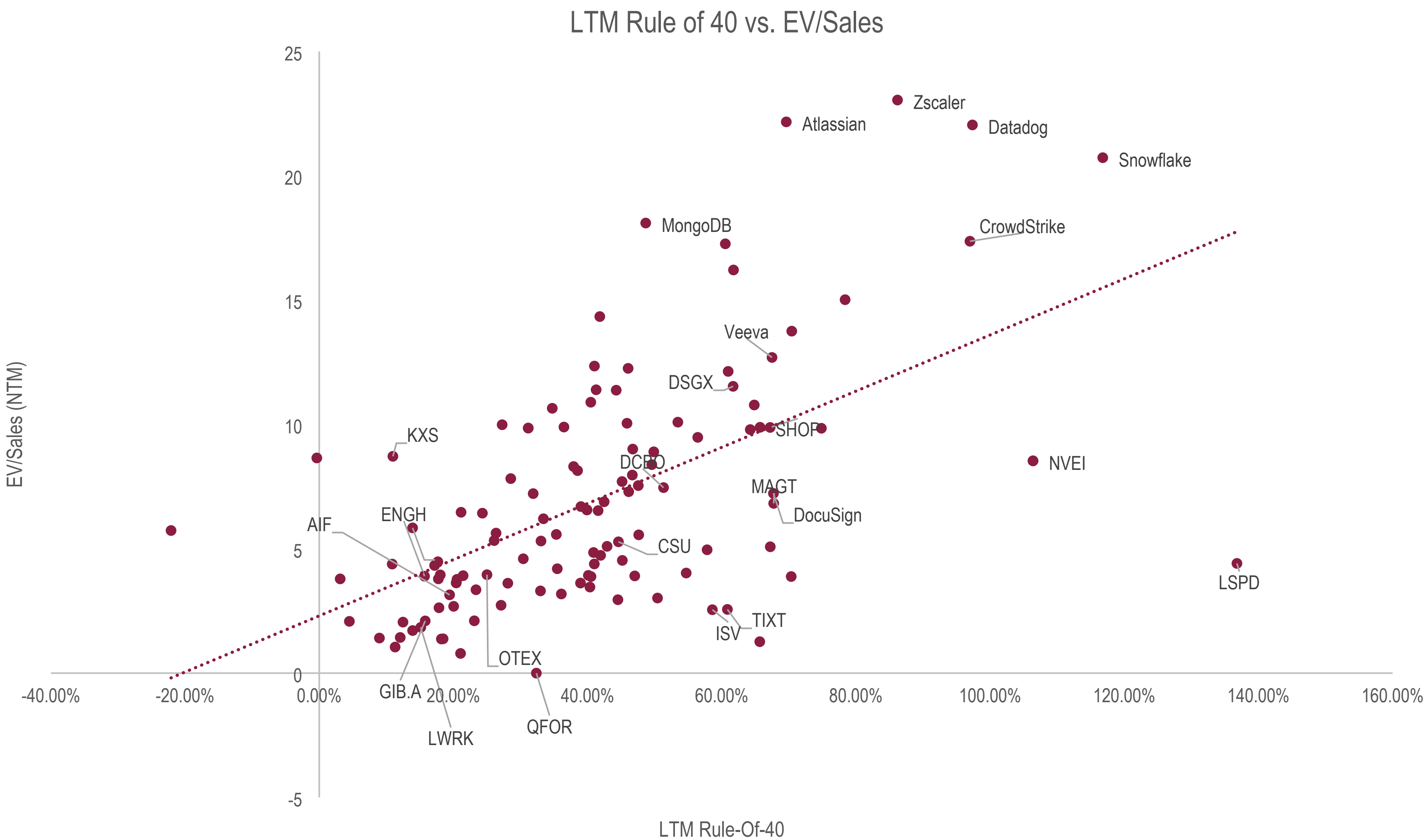
	LTM Revenue	LTM FCF Margin	NTM Revenue Growth	NTM FCF Margin	LTM Rule Of 40	NTM Rule Of 40	Enterprise Value ($MM)	EV/S C21A	EV/S C22E	EV/S C23E	EV/EBITDA C21A	EV/EBITDA C22E	EV/EBITDA C23E
Tier 3 Mature Software (Rule of 40 b/w 20-30)													
Jack Henry & Associates, In	9%	23%	7%	17%	32%	24%	14,256	8.1x	7.1x	6.7x	20.5x	22.2x	20.3x
Cerner Corporation	5%	26%	5%	16%	30%	21%	28,581	5.0x	4.7x	4.5x	16.7x	13.9x	12.9x
CommVault Systems, Inc.	8%	20%	7%	23%	28%	30%	2,741	3.8x	3.4x	3.2x	45.9x	14.9x	13.2x
ADP Inc.	8%	19%	7%	22%	26%	29%	97,262	6.5x	5.8x	5.4x	25.4x	22.2x	20.2x
Open Text Corporation	**4%**	**21%**	**6%**	**28%**	**25%**	**35%**	**14,486**	**4.2x**	**3.9x**	**3.8x**	**11.3x**	**10.9x**	**10.2x**
Blackbaud, Inc.	2%	22%	16%	14%	23%	30%	4,075	4.4x	3.8x	3.5x	37.9x	15.6x	14.1x
Pegasystems Inc.	19%	2%	21%	7%	21%	28%	6,906	5.7x	4.7x	3.9x	NEG	>50	35.0x
QuinStreet, Inc.	13%	8%	9%	5%	21%	14%	530	0.9x	0.8x	0.7x	18.1x	10.5x	7.9x
Blucora, Inc.	17%	1%	10%	11%	18%	20%	1,398	1.6x	1.4x	1.3x	13.1x	8.7x	7.7x
Enghouse Systems Limite	**-10%**	**26%**	**3%**	**31%**	**16%**	**34%**	**2,025**	**4.4x**	**4.2x**	**4.0x**	**12.5x**	**12.2x**	**11.7x**
Tier 3 Mature Software (Rule of 40 b/w 20-30) Average								**4.5x**	**4.0x**	**3.7x**	**22.4x**	**14.6x**	**15.3x**

	LTM Revenue	LTM FCF Margin	NTM Revenue Growth	NTM FCF Margin	LTM Rule Of 40	NTM Rule Of 40	Enterprise Value ($MM)	EV/S C21A	EV/S C22E	EV/S C23E	EV/EBITDA C21A	EV/EBITDA C22E	EV/EBITDA C23E
Tier 4 Mature Software (Rule of 40 <20)													
Altus Group Limited	**11%**	**8%**	**17%**	**13%**	**19%**	**30%**	**2,513**	**4.0x**	**3.5x**	**3.4x**	**23.7x**	**19.9x**	**19.3x**
SAP SE	2%	16%	6%	16%	18%	22%	133,364	4.8x	4.5x	4.2x	18.6x	15.0x	13.5x
Citrix Systems, Inc.	-1%	18%	3%	19%	18%	22%	15,727	4.9x	4.7x	4.5x	22.4x	14.9x	14.1x
Verint Systems Inc.	5%	12%	8%	22%	18%	30%	3,501	4.2x	3.7x	3.4x	24.3x	13.6x	12.2x
Alteryx, Inc. Class A	8%	6%	34%	-2%	14%	32%	5,041	9.4x	7.0x	5.9x	NEG	NEG	>50
Software AG	0%	13%	10%	12%	12%	22%	2,045	2.5x	2.3x	2.1x	13.2x	10.1x	8.4x
ManTech International	1%	8%	3%	5%	9%	8%	3,861	1.5x	1.5x	1.4x	12.8x	14.9x	14.4x
Guidewire Software, Inc.	0%	-1%	8%	7%	0%	15%	7,556	10.2x	9.2x	8.2x	NEG	NEG	>50
BlackBerry Limited	**-28%**	**6%**	**24%**	**-11%**	**-22%**	**12%**	**4,021**	**4.3x**	**4.6x**	**4.3x**	**>50**	**NEG**	**NEG**
								5.1x	**4.6x**	**4.1x**	**19.2x**	**14.7x**	**13.6x**
Mature Software Average								**7.2x**	**6.2x**	**5.6x**	**23.5x**	**18.9x**	**17.3x**

Source: FactSet and CIBC World Markets Inc.

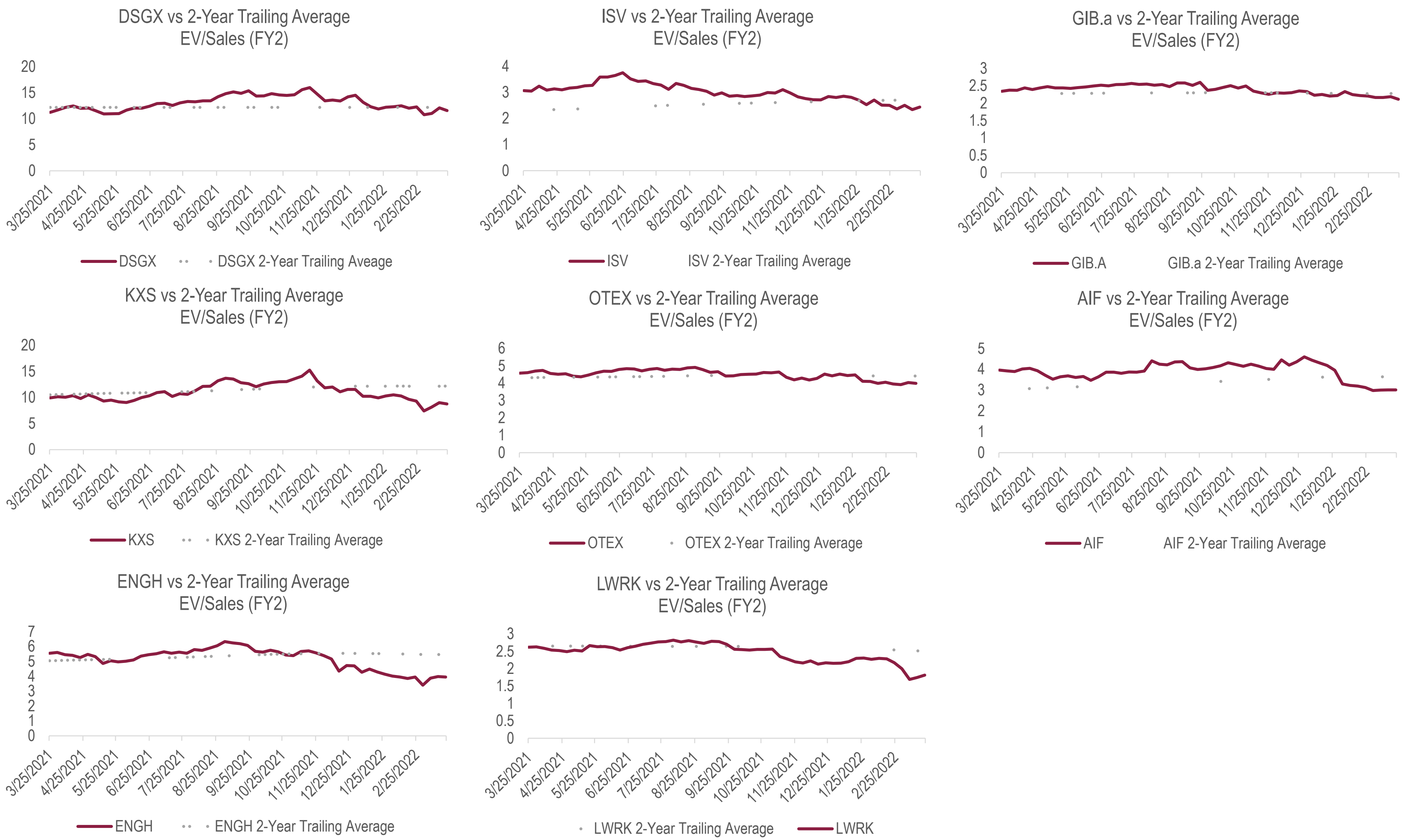
CIBC

Exhibit 15: Software Stocks – Rule Of 40 Vs. EV/Sales, Last 12 Months



Source: FactSet and CIBC World Markets Inc.

Exhibit 16: CIBC Software/Services Coverage – EV/Sales Vs. Two-year Trailing Average, March 2021 – March 2022



Source: FactSet and CIBC World Markets Inc.

Exhibit 17: SaaS Stocks Grouped By Rule-of-40 – Price Returns, Three-year History

	Rule Of 40	EV/NTM Sales	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Zoom	91%	6.7x	-4.5%	-38.5%	-54.5%	-65.2%	-63.5%	NA
Lightspeed	137%	5.9x	16.9%	-28.9%	-69.7%	-57.6%	-51.8%	85.0%
CrowdStrike	97%	23.5x	14.9%	8.7%	-5.2%	7.2%	24.4%	NA
Zscaler	86%	31.3x	-2.6%	-25.7%	-6.8%	20.8%	40.5%	240.2%
Shopify	67%	13.1x	0.4%	-51.7%	-49.8%	-40.3%	-38.9%	227.2%
DocuSign	68%	8.5x	-9.1%	-31.0%	-58.3%	-51.8%	-47.1%	106.6%
Veeva	72%	14.8x	-8.4%	-18.3%	-24.9%	-22.0%	-18.7%	67.5%
Atlassian	70%	27.7x	-4.4%	-23.8%	-24.2%	25.6%	39.4%	161.4%
Twilio	58%	6.4x	-2.9%	-37.9%	-47.3%	-51.3%	-51.6%	27.6%
HubSpot	66%	12.6x	-10.9%	-28.4%	-30.3%	19.8%	4.6%	185.7%
Descartes	62%	12.8x	3.7%	-11.2%	-8.1%	25.3%	20.3%	101.4%
ServiceNow	61%	15.1x	-2.5%	-14.9%	-9.9%	1.2%	11.4%	125.9%
Average	**78%**	**14.9x**	**-1%**	**-25%**	**-32%**	**-16%**	**-11%**	**133%**
Median	**69%**	**13.0x**	**-3%**	**-27%**	**-28%**	**-10%**	**-7%**	**116%**

	Rule Of 40	EV/NTM Sales	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Docebo	51%	10.1x	-1.2%	-26.8%	-30.0%	-21.9%	19.7%	NA
Qualys	56%	11.1x	13.4%	1.3%	28.3%	16.9%	35.9%	72.1%
Avalara	45%	9.4x	-5.2%	-25.4%	-43.3%	-39.7%	-25.4%	78.4%
Mimecast	48%	8.7x	-0.1%	0.3%	24.1%	40.0%	97.9%	68.0%
Dropbox	47%	4.2x	2.6%	-5.6%	-20.5%	4.8%	-12.8%	6.7%
Workday	47%	9.6x	-0.4%	-13.4%	-4.0%	-0.1%	-3.6%	24.2%
Five9	38%	10.3x	2.7%	-20.9%	-31.7%	-36.7%	-29.4%	109.0%
Vmware	40%	4.2x	-1.8%	-2.9%	-24.3%	-18.8%	-24.3%	-36.9%
Wix.com	33%	3.9x	21.9%	-34.1%	-46.1%	-58.2%	-62.6%	-13.5%
Zendesk	42%	8.6x	3.0%	13.3%	3.5%	-16.0%	-9.3%	41.5%
Average	**45%**	**8.0x**	**3%**	**-11%**	**-14%**	**-13%**	**-1%**	**39%**
Median	**46%**	**9.1x**	**1%**	**-9%**	**-22%**	**-17%**	**-11%**	**42%**

	Rule Of 40	EV/NTM Sales	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
MongoDB	49%	23.7x	16.2%	-16.7%	-3.2%	23.5%	65.9%	201.7%
RingCentral	41%	6.0x	-6.9%	-39.7%	-44.7%	-69.1%	-60.7%	8.7%
BlackLine	39%	8.1x	-2.7%	-29.3%	-38.0%	-45.1%	-32.5%	58.1%
Paylocity	41%	13.9x	-0.4%	-13.5%	-26.1%	-0.1%	14.4%	130.7%
Rapid7	39%	10.0x	6.7%	-7.6%	-1.4%	23.4%	49.1%	119.8%
Akamai	33%	5.8x	9.7%	1.9%	12.9%	13.7%	17.2%	66.5%
Anaplan	27%	12.4x	43.0%	40.2%	7.0%	-9.5%	20.8%	65.3%
LivePerson	20%	3.2x	3.8%	-33.3%	-58.1%	-60.8%	-53.7%	-15.9%
Average	**36%**	**10.4x**	**9%**	**-12%**	**-19%**	**-15%**	**3%**	**79%**
Median	**39%**	**9.0x**	**5%**	**-15%**	**-15%**	**-5%**	**16%**	**66%**

	Rule Of 40	EV/NTM Sales	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Teradata	27%	2.9x	-0.3%	14.0%	-12.9%	119.4%	27.9%	12.9%
Q2 Holdings	26%	6.3x	-3.3%	-23.2%	-24.9%	-51.3%	-38.5%	-11.0%
Ceridian	29%	9.2x	-3.5%	-34.7%	-39.5%	-35.8%	-18.9%	33.3%
Zuora	20%	4.2x	-1.5%	-21.3%	-10.0%	7.5%	1.2%	-25.2%
Kinaxis	11%	10.0x	13.6%	-9.6%	-10.2%	-9.3%	11.6%	109.8%
Yext	14%	1.9x	-4.3%	-32.1%	-42.3%	-56.2%	-52.4%	-68.5%
Splunk	24%	7.9x	27.5%	28.0%	8.0%	-12.5%	9.7%	19.3%
New Relic	11%	5.2x	3.0%	-39.6%	-5.4%	2.3%	8.8%	-32.2%
Average	**20%**	**5.9x**	**4%**	**-15%**	**-17%**	**-4%**	**-6%**	**5%**
Median	**22%**	**5.8x**	**-1%**	**-22%**	**-12%**	**-11%**	**5%**	**1%**

Source: FactSet and CIBC World Markets Inc.

Exhibit 18: SaaS Stocks Grouped By LTM Revenue Growth – Price Returns, Three-year History

	Rule Of 40	EV/NTM EBITDA	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Meta Platforms Inc. Class A	70%	10.0x	9.3%	-35.4%	-34.5%	-18.6%	-24.5%	33.4%
Alphabet Inc.	67%	14.5x	4.1%	-4.4%	3.8%	59.4%	35.0%	138.0%
Aspen Technology	42%	29.1x	12.1%	8.8%	32.4%	27.0%	14.6%	58.6%
Intuit Inc.	75%	29.4x	2.6%	-25.3%	-12.1%	26.6%	25.5%	83.9%
Microsoft	53%	23.0x	4.5%	-9.1%	8.6%	38.6%	30.8%	161.4%
Progress Software	55%	9.7x	7.3%	-3.2%	-3.4%	4.2%	6.9%	6.1%
ANSYS	41%	29.7x	-0.2%	-21.7%	-6.8%	-12.7%	-6.5%	73.9%
Tyler Technologies	64%	41.0x	5.3%	-17.3%	-2.2%	1.9%	4.8%	117.7%
Cadence Design	46%	32.0x	9.3%	-12.6%	8.0%	20.5%	20.1%	159.0%
Autodesk	50%	24.6x	0.2%	-23.9%	-25.6%	-29.8%	-22.7%	37.6%
Average	**58%**	**0.6x**	**58%**	**58%**	**58%**	**58%**	**58%**	**58%**
Median	**54%**	**0.5x**	**54%**	**54%**	**54%**	**54%**	**54%**	**54%**

	Rule Of 40	EV/NTM EBITDA	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
eBay	39%	10.7x	5.4%	-14.3%	-18.2%	14.0%	-6.5%	54.2%
Ziff Davis Inc	45%	8.9x	-1.3%	-13.1%	-21.0%	14.0%	-7.1%	28.6%
Salesforce.com	48%	21.6x	1.6%	-16.8%	-21.5%	-4.6%	0.2%	34.1%
SPS Commerce	47%	36.5x	4.2%	-7.5%	-19.9%	20.8%	32.1%	147.4%
Constellation Software	45%	21.2x	0.0%	-9.8%	2.9%	29.3%	21.8%	102.7%
PTC Inc.	40%	18.6x	-2.2%	-11.7%	-10.2%	-9.9%	-21.7%	16.9%
Manhattan Associates	40%	49.9x	4.3%	-11.6%	-9.2%	31.9%	18.2%	151.7%
SS&C Technologies	35%	10.6x	0.9%	-8.8%	7.2%	3.1%	7.4%	17.8%
Open Text	25%	11.4x	-0.9%	-11.2%	-13.5%	-6.7%	-11.1%	10.3%
Average	**40%**	**21.1x**	**1%**	**-12%**	**-11%**	**10%**	**4%**	**63%**
Median	**40%**	**18.6x**	**1%**	**-12%**	**-14%**	**14%**	**0%**	**34%**

	Rule Of 40	EV/NTM EBITDA	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Cerner	30%	14.2x	0.3%	0.5%	31.5%	19.2%	30.2%	63.5%
Jack Henry & Associates	32%	24.6x	10.0%	17.5%	18.6%	21.6%	29.9%	42.0%
CommVault Systems	28%	17.8x	6.3%	-4.2%	-13.7%	19.8%	2.9%	2.5%
QuinStreet	21%	12.7x	5.4%	-36.5%	-34.9%	-45.9%	-42.9%	-13.4%
Blackbaud	23%	14.8x	-1.6%	-25.2%	-16.5%	4.0%	-15.8%	-24.9%
Oracle	21%	13.3x	8.8%	-6.0%	-9.3%	27.9%	17.9%	54.0%
Blucora	18%	8.8x	-0.5%	12.8%	20.5%	22.9%	17.5%	-41.4%
Automatic Data Processing	26%	23.5x	12.5%	-7.3%	14.0%	29.1%	20.7%	42.4%
Pegasystems	21%	55.7x	-5.6%	-29.1%	-36.8%	-39.5%	-29.5%	24.1%
Altus Group	19%	18.0x	2.9%	-28.5%	-18.5%	2.8%	-16.4%	93.7%
Average	**24%**	**20.3x**	**4%**	**-11%**	**-5%**	**6%**	**1%**	**24%**
Median	**22%**	**16.3x**	**4%**	**-7%**	**-12%**	**20%**	**10%**	**33%**

	Rule Of 40	EV/NTM EBITDA	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Enghouse	16%	12.6x	-3.2%	-19.0%	-28.2%	-35.9%	-32.2%	16.4%
Alteryx	14%	NA	13.2%	15.3%	-0.2%	-41.3%	-13.8%	-14.7%
Citrix	18%	14.9x	-1.7%	5.4%	-6.7%	-22.4%	-28.1%	1.2%
SAP SE	18%	14.1x	2.3%	-19.0%	-14.1%	-5.7%	-3.2%	-1.8%
Verint Systems	18%	15.2x	3.4%	-1.3%	15.0%	51.1%	13.7%	69.6%
ManTech International	9%	15.0x	2.3%	17.9%	11.4%	-3.1%	-0.9%	59.6%
Software AG	12%	9.9x	-6.9%	-11.0%	-22.3%	-6.4%	-13.1%	3.5%
Guidewire Software	0%	NA	7.3%	-16.3%	-20.4%	-26.5%	-6.9%	-2.6%
BlackBerry Limited	-22%	NA	7.2%	-23.5%	-24.3%	9.8%	-12.0%	-31.2%
Average	**9%**	**13.6x**	**3%**	**-6%**	**-10%**	**-9%**	**-11%**	**11%**
Median	**14%**	**14.5x**	**2%**	**-11%**	**-14%**	**-6%**	**-12%**	**1%**

Source: FactSet and CIBC World Markets Inc.

Exhibit 19: SaaS Stocks Grouped By LTM Revenue Growth – Price Returns, Three-year History

	LTM Rev Growth	EV/NTM Sales	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Lightspeed	159%	5.9x	16.9%	-28.9%	-69.7%	-57.6%	-51.8%	85.0%
Zoom	55%	6.7x	-4.5%	-38.5%	-54.5%	-65.2%	-63.5%	NA
Shopify	57%	13.1x	0.4%	-51.7%	-49.8%	-40.3%	-38.9%	227.2%
CrowdStrike	66%	23.5x	14.9%	8.7%	-5.2%	7.2%	24.4%	NA
Twilio	61%	6.4x	-2.9%	-37.9%	-47.3%	-51.3%	-51.6%	27.6%
Zscaler	60%	31.3x	-2.6%	-25.7%	-6.8%	20.8%	40.5%	240.2%
Docebo	55%	10.1x	-1.2%	-26.8%	-30.0%	-21.9%	19.7%	NA
DocuSign	45%	8.5x	-9.1%	-31.0%	-58.3%	-51.8%	-47.1%	106.6%
HubSpot	47%	12.6x	-10.9%	-28.4%	-30.3%	19.8%	4.6%	185.7%
MongoDB	48%	23.7x	16.2%	-16.7%	-3.2%	23.5%	65.9%	201.7%
Average	**63%**	**13.7x**	**2%**	**-27%**	**-35%**	**-23%**	**-13%**	**148%**
Median	**57%**	**12.6x**	**0%**	**-28%**	**-35%**	**-24%**	**-26%**	**148%**

	LTM Rev Growth	EV/NTM Sales	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Five9	40%	10.3x	2.7%	-20.9%	-31.7%	-36.7%	-29.4%	109.0%
Avalara	40%	9.4x	-5.2%	-25.4%	-43.3%	-39.7%	-25.4%	78.4%
Wix.com	28%	3.9x	21.9%	-34.1%	-46.1%	-58.2%	-62.6%	-13.5%
RingCentral	35%	6.0x	-6.9%	-39.7%	-44.7%	-69.1%	-60.7%	8.7%
ServiceNow	30%	15.1x	-2.5%	-14.9%	-9.9%	1.2%	11.4%	125.9%
Atlassian	35%	27.7x	-4.4%	-23.8%	-24.2%	25.6%	39.4%	161.4%
LivePerson	28%	3.2x	3.8%	-33.3%	-58.1%	-60.8%	-53.7%	-15.9%
Anaplan	32%	12.4x	43.0%	40.2%	7.0%	-9.5%	20.8%	65.3%
Ceridian	30%	9.2x	-3.5%	-34.7%	-39.5%	-35.8%	-18.9%	33.3%
Veeva	26%	14.8x	-8.4%	-18.3%	-24.9%	-22.0%	-18.7%	67.5%
Average	**32%**	**11.2x**	**4%**	**-20%**	**-32%**	**-30%**	**-20%**	**62%**
Median	**31%**	**9.9x**	**-3%**	**-25%**	**-36%**	**-36%**	**-22%**	**66%**

	LTM Rev Growth	EV/NTM Sales	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Zendesk	30%	8.6x	3.0%	13.3%	3.5%	-16.0%	-9.3%	41.5%
Rapid7	30%	10.0x	6.7%	-7.6%	-1.4%	23.4%	49.1%	119.8%
Q2 Holdings	24%	6.3x	-3.3%	-23.2%	-24.9%	-51.3%	-38.5%	-11.0%
BlackLine	21%	8.1x	-2.7%	-29.3%	-38.0%	-45.1%	-32.5%	58.1%
Mimecast	19%	8.7x	-0.1%	0.3%	24.1%	40.0%	97.9%	68.0%
Descartes	22%	12.8x	3.7%	-11.2%	-8.1%	25.3%	20.3%	101.4%
Paylocity	25%	13.9x	-0.4%	-13.5%	-26.1%	-0.1%	14.4%	130.7%
Workday	20%	9.6x	-0.4%	-13.4%	-4.0%	-0.1%	-3.6%	24.2%
Dropbox	13%	4.2x	2.6%	-5.6%	-20.5%	4.8%	-12.8%	6.7%
Average	**23%**	**9.1x**	**1%**	**-10%**	**-11%**	**-2%**	**9%**	**60%**
Median	**22%**	**8.7x**	**0%**	**-11%**	**-8%**	**0%**	**-4%**	**58%**

	LTM Rev Growth	EV/NTM Sales	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Qualys	14%	11.1x	13.4%	1.3%	28.3%	16.9%	35.9%	72.1%
Zuora	14%	4.2x	-1.5%	-21.3%	-10.0%	7.5%	1.2%	-25.2%
New Relic	15%	5.2x	3.0%	-39.6%	-5.4%	2.3%	8.8%	-32.2%
Splunk	20%	7.9x	27.5%	28.0%	8.0%	-12.5%	9.7%	19.3%
Yext	10%	1.9x	-4.3%	-32.1%	-42.3%	-56.2%	-52.4%	-68.5%
Akamai	8%	5.8x	9.7%	1.9%	12.9%	13.7%	17.2%	66.5%
Vmware	9%	4.2x	-1.8%	-2.9%	-24.3%	-18.8%	-24.3%	-36.9%
Teradata	4%	2.9x	-0.3%	14.0%	-12.9%	119.4%	27.9%	12.9%
Kinaxis	4%	10.0x	13.6%	-9.6%	-10.2%	-9.3%	11.6%	109.8%
Average	**11.0%**	**5.9x**	**7%**	**-7%**	**-6%**	**7%**	**4%**	**13%**
Median	**10.1%**	**5.2x**	**3%**	**-3%**	**-10%**	**2%**	**10%**	**13%**

Source: FactSet and CIBC World Markets Inc.

Exhibit 20: Mature Software Stocks Grouped By LTM Revenue Growth – Price Returns, Three-year History

	LTM Revenue Growth	EV/NTM EBITDA	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Meta Platforms Inc. Class /	37%	10.0x	9.3%	-35.4%	-34.5%	-18.6%	-24.5%	33.4%
Alphabet Inc.	41%	14.5x	4.1%	-4.4%	3.8%	59.4%	35.0%	138.0%
Intuit Inc.	48%	29.4x	2.6%	-25.3%	-12.1%	26.6%	25.5%	83.9%
Aspen Technology	-2%	29.1x	12.1%	8.8%	32.4%	27.0%	14.6%	58.6%
Tyler Technologies	43%	41.0x	5.3%	-17.3%	-2.2%	1.9%	4.8%	117.7%
eBay	19%	10.7x	5.4%	-14.3%	-18.2%	14.0%	-6.5%	54.2%
PTC Inc.	20%	18.6x	-2.2%	-11.7%	-10.2%	-9.9%	-21.7%	16.9%
Salesforce.com	25%	21.6x	1.6%	-16.8%	-21.5%	-4.6%	0.2%	34.1%
Ziff Davis Inc	20%	8.9x	-1.3%	-13.1%	-21.0%	14.0%	-7.1%	28.6%
ANSYS	13%	29.7x	-0.2%	-21.7%	-6.8%	-12.7%	-6.5%	73.9%
SPS Commerce	23%	36.5x	4.2%	-7.5%	-19.9%	20.8%	32.1%	147.4%
Average	**26%**	**22.7x**	**4%**	**-14%**	**-10%**	**11%**	**4%**	**72%**
Median	**23%**	**21.6x**	**4%**	**-14%**	**-12%**	**14%**	**0%**	**59%**

	LTM Revenue Growth	EV/NTM EBITDA	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Pegasystems	19%	55.7x	-5.6%	-29.1%	-36.8%	-39.5%	-29.5%	24.1%
Microsoft	21%	23.0x	4.5%	-9.1%	8.6%	38.6%	30.8%	161.4%
QuinStreet	13%	12.7x	5.4%	-36.5%	-34.9%	-45.9%	-42.9%	-13.4%
Cadence Design	11%	32.0x	9.3%	-12.6%	8.0%	20.5%	20.1%	159.0%
Progress Software	22%	9.7x	7.3%	-3.2%	-3.4%	4.2%	6.9%	6.1%
Constellation Software	**20%**	**21.2x**	**0.0%**	**-9.8%**	**2.9%**	**29.3%**	**21.8%**	**102.7%**
Autodesk	16%	24.6x	0.2%	-23.9%	-25.6%	-29.8%	-22.7%	37.6%
Blucora	17%	8.8x	-0.5%	12.8%	20.5%	22.9%	17.5%	-41.4%
Average	**18%**	**23.5x**	**3%**	**-14%**	**-8%**	**0%**	**0%**	**55%**
Median	**18%**	**22.1x**	**2%**	**-11%**	**0%**	**12%**	**12%**	**31%**

	LTM Revenue Growth	EV/NTM EBITDA	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Manhattan Associates	13%	49.9x	4.3%	-11.6%	-9.2%	31.9%	18.2%	151.7%
CommVault Systems	8%	17.8x	6.3%	-4.2%	-13.7%	19.8%	2.9%	2.5%
Altus Group	11%	18.0x	2.9%	-28.5%	-18.5%	2.8%	-16.4%	93.7%
Open Text	4%	11.4x	-0.9%	-11.2%	-13.5%	-6.7%	-11.1%	10.3%
Alteryx	8%	>100x	13.2%	15.3%	-0.2%	-41.3%	-13.8%	-14.7%
SS&C Technologies	8%	10.6x	0.9%	-8.8%	7.2%	3.1%	7.4%	17.8%
Automatic Data Processing	8%	23.5x	12.5%	-7.3%	14.0%	29.1%	20.7%	42.4%
Jack Henry & Associates	9%	24.6x	10.0%	17.5%	18.6%	21.6%	29.9%	42.0%
Oracle	5%	13.3x	8.8%	-6.0%	-9.3%	27.9%	17.9%	54.0%
Verint Systems	5%	15.2x	3.4%	-1.3%	15.0%	51.1%	13.7%	69.6%
Average	**8%**	**20.5x**	**6%**	**-5%**	**-1%**	**14%**	**7%**	**47%**
Median	**8%**	**17.8x**	**5%**	**-7%**	**-5%**	**21%**	**11%**	**42%**

	LTM Revenue Growth	EV/NTM EBITDA	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Cerner	5%	14.2x	0.3%	0.5%	31.5%	19.2%	30.2%	63.5%
ManTech International	1%	15.0x	2.3%	17.9%	11.4%	-3.1%	-0.9%	59.6%
Blackbaud	2%	14.8x	-1.6%	-25.2%	-16.5%	4.0%	-15.8%	-24.9%
Guidewire Software	0%	NA	7.3%	-16.3%	-20.4%	-26.5%	-6.9%	-2.6%
Citrix	-1%	14.9x	-1.7%	5.4%	-6.7%	-22.4%	-28.1%	1.2%
SAP SE	2%	14.1x	2.3%	-19.0%	-14.1%	-5.7%	-3.2%	-1.8%
Software AG	0%	9.9x	-6.9%	-11.0%	-22.3%	-6.4%	-13.1%	3.5%
Enghouse	-10%	12.6x	-3.2%	-19.0%	-28.2%	-35.9%	-32.2%	16.4%
Average	**0%**	**13.6x**	**0%**	**-8%**	**-8%**	**-10%**	**-9%**	**14%**
Median	**1%**	**14.2x**	**-1%**	**-14%**	**-15%**	**-6%**	**-10%**	**2%**

Source: FactSet and CIBC World Markets Inc.

Exhibit 21: SaaS Stocks Grouped By Market Cap – Price Returns, Three-year History

	Market Cap	EV/NTM Sales	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Shopify	77,065	13.1x	0.4%	-51.7%	-49.8%	-40.3%	-38.9%	227.2%
ServiceNow	111,378	15.1x	-2.5%	-14.9%	-9.9%	1.2%	11.4%	125.9%
Atlassian	41,475	27.7x	-4.4%	-23.8%	-24.2%	25.6%	39.4%	161.4%
Workday	46,934	9.6x	-0.4%	-13.4%	-4.0%	-0.1%	-3.6%	24.2%
Zoom	28,990	6.7x	-4.5%	-38.5%	-54.5%	-65.2%	-63.5%	NA
Zscaler	34,041	31.3x	-2.6%	-25.7%	-6.8%	20.8%	40.5%	240.2%
Twilio	28,298	6.4x	-2.9%	-37.9%	-47.3%	-51.3%	-51.6%	27.6%
Vmware	47,946	4.2x	-1.8%	-2.9%	-24.3%	-18.8%	-24.3%	-36.9%
CrowdStrike	47,700	23.5x	14.9%	8.7%	-5.2%	7.2%	24.4%	NA
Veeva	29,535	14.8x	-8.4%	-18.3%	-24.9%	-22.0%	-18.7%	67.5%
Average	**49,336**	**15.2x**	**-1%**	**-22%**	**-25%**	**-14%**	**-8%**	**105%**
Median	**44,205**	**14.0x**	**-3%**	**-21%**	**-24%**	**-9%**	**-11%**	**97%**

	Market Cap	EV/NTM Sales	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
MongoDB	29,972	23.7x	16.2%	-16.7%	-3.2%	23.5%	65.9%	201.7%
HubSpot	22,593	12.6x	-10.9%	-28.4%	-30.3%	19.8%	4.6%	185.7%
DocuSign	21,303	8.5x	-9.1%	-31.0%	-58.3%	-51.8%	-47.1%	106.6%
Akamai	19,144	5.8x	9.7%	1.9%	12.9%	13.7%	17.2%	66.5%
Splunk	23,882	7.9x	27.5%	28.0%	8.0%	-12.5%	9.7%	19.3%
Ceridian	10,395	9.2x	-3.5%	-34.7%	-39.5%	-35.8%	-18.9%	33.3%
RingCentral	9,900	6.0x	-6.9%	-39.7%	-44.7%	-69.1%	-60.7%	8.7%
Paylocity	11,340	13.9x	-0.4%	-13.5%	-26.1%	-0.1%	14.4%	130.7%
Zendesk	14,660	8.6x	3.0%	13.3%	3.5%	-16.0%	-9.3%	41.5%
Avalara	8,706	9.4x	-5.2%	-25.4%	-43.3%	-39.7%	-25.4%	78.4%
Average	**17,189**	**10.6x**	**2%**	**-15%**	**-22%**	**-17%**	**-5%**	**87%**
Median	**16,902**	**8.9x**	**-2%**	**-21%**	**-28%**	**-14%**	**-2%**	**72%**

	Market Cap	EV/NTM Sales	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Five9	7,634	10.3x	2.7%	-20.9%	-31.7%	-36.7%	-29.4%	109.0%
Wix.com	5,949	3.9x	21.9%	-34.1%	-46.1%	-58.2%	-62.6%	-13.5%
Dropbox	6,700	4.2x	2.6%	-5.6%	-20.5%	4.8%	-12.8%	6.7%
New Relic	4,426	5.2x	3.0%	-39.6%	-5.4%	2.3%	8.8%	-32.2%
Descartes	6,211	12.8x	3.7%	-11.2%	-8.1%	25.3%	20.3%	101.4%
Anaplan	9,771	12.4x	43.0%	40.2%	7.0%	-9.5%	20.8%	65.3%
Rapid7	6,461	10.0x	6.7%	-7.6%	-1.4%	23.4%	49.1%	119.8%
BlackLine	4,341	8.1x	-2.7%	-29.3%	-38.0%	-45.1%	-32.5%	58.1%
Lightspeed	4,531	5.9x	16.9%	-28.9%	-69.7%	-57.6%	-51.8%	85.0%
Average	**6,225**	**8.1x**	**11%**	**-15%**	**-24%**	**-17%**	**-10%**	**55%**
Median	**6,211**	**8.1x**	**4%**	**-21%**	**-20%**	**-9%**	**-13%**	**65%**

	Market Cap	EV/NTM Sales	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Qualys	5,558	11.1x	13.4%	1.3%	28.3%	16.9%	35.9%	72.1%
Mimecast	5,322	8.7x	-0.1%	0.3%	24.1%	40.0%	97.9%	68.0%
Teradata	5,157	2.9x	-0.3%	14.0%	-12.9%	119.4%	27.9%	12.9%
Q2 Holdings	3,510	6.3x	-3.3%	-23.2%	-24.9%	-51.3%	-38.5%	-11.0%
Kinaxis	3,599	10.0x	13.6%	-9.6%	-10.2%	-9.3%	11.6%	109.8%
LivePerson	1,772	3.2x	3.8%	-33.3%	-58.1%	-60.8%	-53.7%	-15.9%
Docebo	1,700	10.1x	-1.2%	-26.8%	-30.0%	-21.9%	19.7%	NA
Zuora	1,783	4.2x	-1.5%	-21.3%	-10.0%	7.5%	1.2%	-25.2%
Yext	904	1.9x	-4.3%	-32.1%	-42.3%	-56.2%	-52.4%	-68.5%
Average	**3,256**	**6.5x**	**2%**	**-15%**	**-15%**	**-2%**	**6%**	**18%**
Median	**3,510**	**6.3x**	**0%**	**-21%**	**-13%**	**-9%**	**12%**	**1%**

Source: FactSet and CIBC World Markets Inc.

Exhibit 22: Mature Software Stocks Grouped By Market Cap – Price Returns, Three-year History

	Market Cap	EV/NTM EBITDA	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Microsoft	2,311,359	23.0x	4.5%	-9.1%	8.6%	38.6%	30.8%	161.4%
Alphabet Inc.	1,718,083	14.5x	4.1%	-4.4%	3.8%	59.4%	35.0%	138.0%
Meta Platforms Inc. Class /	513,447	10.0x	9.3%	-35.4%	-34.5%	-18.6%	-24.5%	33.4%
Salesforce.com	210,197	21.6x	1.6%	-16.8%	-21.5%	-4.6%	0.2%	34.1%
Oracle	220,737	13.3x	8.8%	-6.0%	-9.3%	27.9%	17.9%	54.0%
Intuit Inc.	135,988	29.4x	2.6%	-25.3%	-12.1%	26.6%	25.5%	83.9%
SAP SE	138,220	14.1x	2.3%	-19.0%	-14.1%	-5.7%	-3.2%	-1.8%
Automatic Data Processing	95,577	23.5x	12.5%	-7.3%	14.0%	29.1%	20.7%	42.4%
Autodesk	46,580	24.6x	0.2%	-23.9%	-25.6%	-29.8%	-22.7%	37.6%
Cadence Design	45,782	32.0x	9.3%	-12.6%	8.0%	20.5%	20.1%	159.0%
Average	**543,597**	**20.6x**	**6%**	**-16%**	**-8%**	**14%**	**10%**	**74%**
Median	**174,209**	**22.3x**	**4%**	**-15%**	**-11%**	**24%**	**19%**	**48%**

	Market Cap	EV/NTM EBITDA	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
eBay	33,642	10.7x	5.4%	-14.3%	-18.2%	14.0%	-6.5%	54.2%
Constellation Software	36,257	21.2x	0.0%	-9.8%	2.9%	29.3%	21.8%	102.7%
ANSYS	27,644	29.7x	-0.2%	-21.7%	-6.8%	-12.7%	-6.5%	73.9%
Cerner	27,492	14.2x	0.3%	0.5%	31.5%	19.2%	30.2%	63.5%
Tyler Technologies	18,432	41.0x	5.3%	-17.3%	-2.2%	1.9%	4.8%	117.7%
SS&C Technologies	19,235	10.6x	0.9%	-8.8%	7.2%	3.1%	7.4%	17.8%
PTC Inc.	12,598	18.6x	-2.2%	-11.7%	-10.2%	-9.9%	-21.7%	16.9%
Open Text	11,509	11.4x	-0.9%	-11.2%	-13.5%	-6.7%	-11.1%	10.3%
Jack Henry & Associates	14,350	24.6x	10.0%	17.5%	18.6%	21.6%	29.9%	42.0%
Citrix	12,705	14.9x	-1.7%	5.4%	-6.7%	-22.4%	-28.1%	1.2%
Average	**75,189**	**21.4x**	**3%**	**-10%**	**0%**	**10%**	**8%**	**65%**
Median	**27,492**	**20.9x**	**3%**	**-12%**	**-5%**	**14%**	**9%**	**59%**

	Market Cap	EV/NTM EBITDA	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
Aspen Technology	11,024	29.1x	12.1%	8.8%	32.4%	27.0%	14.6%	58.6%
Manhattan Associates	8,760	49.9x	4.3%	-11.6%	-9.2%	31.9%	18.2%	151.7%
Guidewire Software	7,905	NA	7.3%	-16.3%	-20.4%	-26.5%	-6.9%	-2.6%
Pegasystems	6,584	55.7x	-5.6%	-29.1%	-36.8%	-39.5%	-29.5%	24.1%
Ziff Davis Inc	4,575	8.9x	-1.3%	-13.1%	-21.0%	14.0%	-7.1%	28.6%
SPS Commerce	4,724	36.5x	4.2%	-7.5%	-19.9%	20.8%	32.1%	147.4%
Blackbaud	3,111	14.8x	-1.6%	-25.2%	-16.5%	4.0%	-15.8%	-24.9%
Alteryx	4,283	NA	13.2%	15.3%	-0.2%	-41.3%	-13.8%	-14.7%
Verint Systems	3,397	15.2x	3.4%	-1.3%	15.0%	51.1%	13.7%	69.6%
Average	**6,040**	**30.0x**	**4%**	**-9%**	**-9%**	**5%**	**1%**	**49%**
Median	**4,724**	**29.1x**	**4%**	**-12%**	**-17%**	**14%**	**-7%**	**29%**

	Market Cap	EV/NTM EBITDA	1 Month	3 Month	6 Month	YTD	1 Year	3 Year
CommVault Systems	2,957	17.8x	6.3%	-4.2%	-13.7%	19.8%	2.9%	2.5%
Software AG	2,571	9.9x	-6.9%	-11.0%	-22.3%	-6.4%	-13.1%	3.5%
Altus Group	1,784	18.0x	2.9%	-28.5%	-18.5%	2.8%	-16.4%	93.7%
Enghouse	1,758	12.6x	-3.2%	-19.0%	-28.2%	-35.9%	-32.2%	16.4%
Progress Software	2,080	9.7x	7.3%	-3.2%	-3.4%	4.2%	6.9%	6.1%
ManTech International	2,382	15.0x	2.3%	17.9%	11.4%	-3.1%	-0.9%	59.6%
QuinStreet	633	12.7x	5.4%	-36.5%	-34.9%	-45.9%	-42.9%	-13.4%
Blucora	940	8.8x	-0.5%	12.8%	20.5%	22.9%	17.5%	-41.4%
Average	**1,888**	**13.1x**	**2%**	**-9%**	**-11%**	**-5%**	**-10%**	**16%**
Median	**1,932**	**12.6x**	**3%**	**-8%**	**-16%**	**0%**	**-7%**	**5%**

Source: FactSet and CIBC World Markets Inc.

Important Disclosures

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