

## Server &amp; Enterprise Software

## Where Are We Trading Now: Struggling to move higher

Industry Overview

## What clients are talking about

Our coverage universe was down 1.4% w/w, underperforming Nasdaq's +1.4% again. Last week, client conversations focused on: **1)** macro impact on this week's large cap earnings (WDAY, SNOW, CRM), **2)** the value of a flood of black box preview checks for consumption names such as SNOW and MDB, and **3)** the idiosyncratic catalysts needed to drive SMID names higher (e.g. FROG and ZI) and call investor interest back for former darlings such as FIVN.

## Design saw the largest multiple expansion w/w

On an EV/NTM Sales basis, the Design software group saw the largest multiple expansion w/w (+1.1%) led by ADBE, and the largest expansion relative to the 5-year median (+5.9%). On an EV/NTM FCF basis, the Vertical software group saw the largest multiple expansion w/w (+2.6%) with the Design software group seeing the largest expansion relative to the 5-year median (+8.4%).

**Exhibit 1: Design software saw the largest EV/NTM Sales expansion w/w, led by ADBE**

Software multiple expansion/contraction by category

Category	EV/NTM Sales				EV/NTM FCF			
	Multiple		% Change		Multiple		% Change	
	Current	5-yr median	1 wk	5-yr median	Current	5-yr median	1 wk	5-yr median
Collaboration	5.5x	7.2x	-3.1%	-23.5%	25.8x	20.2x	-3.5%	NA
Communication	2.2x	7.7x	-1.3%	-71.1%	20.1x	27.5x	-9.8%	-27.1%
CRM	5.0x	8.6x	-3.7%	-41.5%	37.4x	42.3x	-4.0%	-11.8%
Design	10.4x	9.8x	1.1%	5.9%	38.7x	35.7x	1.4%	8.4%
ERP & Back Office	5.3x	7.7x	0.8%	-31.3%	37.0x	42.1x	-3.8%	-12.1%
HCM	6.6x	9.8x	-1.0%	-32.1%	40.1x	45.0x	-17.5%	-10.9%
Infrastructure	8.2x	10.6x	-1.1%	-22.7%	41.8x	39.8x	-0.5%	5.1%
Security	8.1x	8.9x	-2.9%	-9.3%	33.1x	32.4x	-3.6%	2.1%
Vertical	6.1x	7.9x	-1.4%	-22.2%	41.1x	39.9x	2.6%	3.0%

**Source:** BofA Global Research estimates for companies under coverage, Bloomberg consensus for companies not under coverage. Stocks included may not be under BofA software coverage. See appendix.

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## Within the report:

- Historical software valuation trends (Exhibit 2 – Exhibit 6)
- Software stock performance overview (Exhibit 7)
- Software coverage comp sheet (Exhibit 8 – Exhibit 12)
- Software valuation by category (Exhibit 14 – Exhibit 15)
- See the Appendix for a mapping of software companies by category, as well as the stock performance of individual companies

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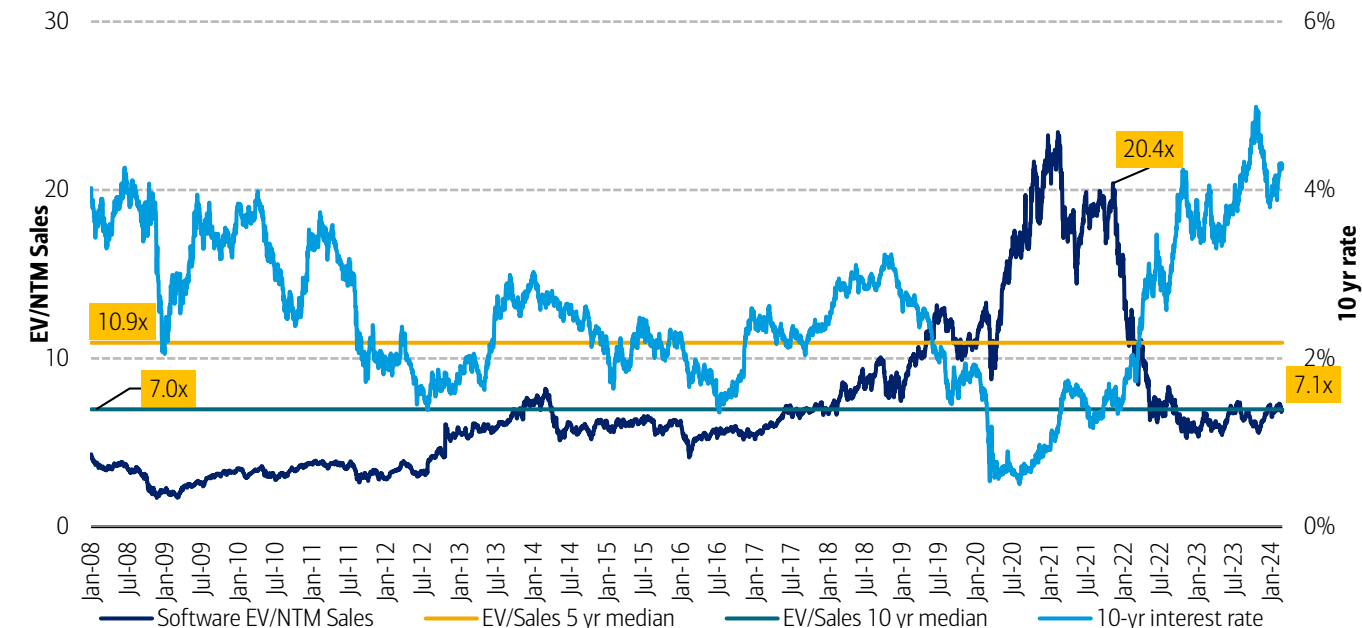
ADBE: Adobe  
CRM: Salesforce.com  
FIVN: Five9  
FROG: JFrog  
MDB: MongoDB  
SNOW: Snowflake  
WDAY: Workday  
ZI: ZoomInfo

## Historical Software Valuation Trend

On an EV/NTM Sales basis, our coverage group is trading at 7.1x, -65% vs the '21 peak of 20.4x. Our coverage group's current multiple is -36% from the 5-year median of 11.0x and roughly on par with the 10-year median of 7.0x.

### Exhibit 2: EV/NTM Sales multiples remain below the 5-yr median though now is on par with the 10-yr median

EV/NTM Sales versus 10-year interest rate - 2008 to date

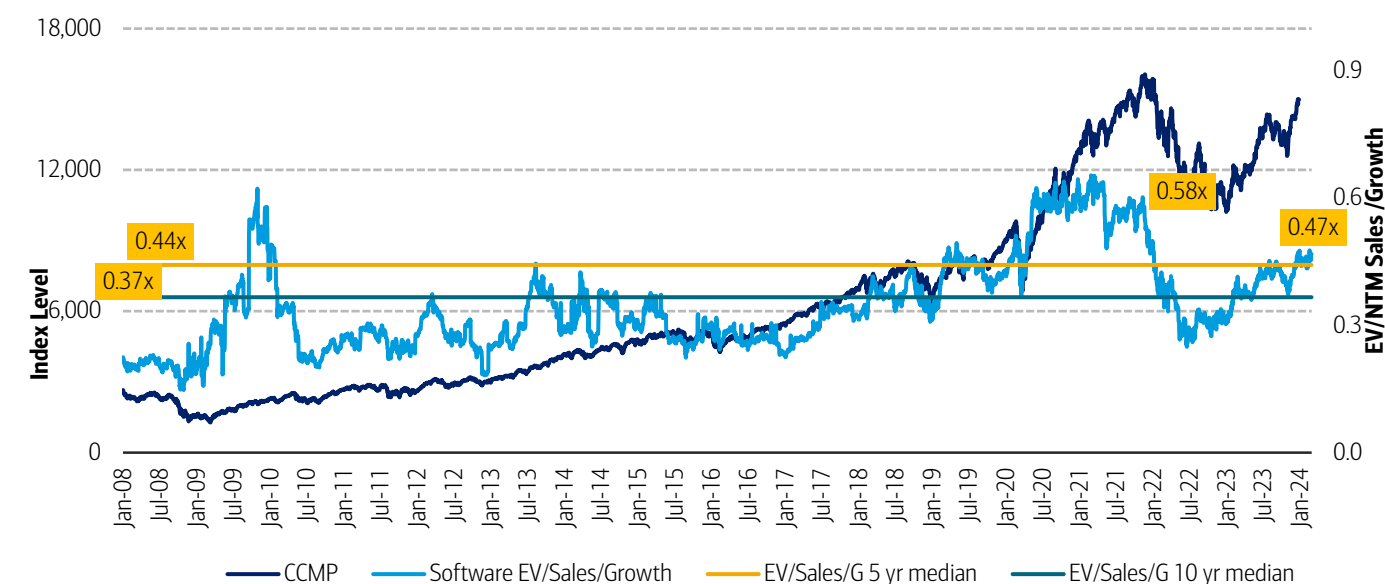


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On an EV/NTM Sales/Growth basis, our software coverage group is trading at 0.47x, -21% from the '21 peak of 0.58x. Our coverage group's current multiple is +7.1% above the 5-year median of 0.44x and +29% from the 10-year median of 0.37x.

### Exhibit 3: Software EV/Sales/Growth multiples have expanded above the 5-yr and 10-yr medians, but remain depressed relative to the Nasdaq's

EV/NTM Sales/Growth versus Nasdaq (CCMP) - 2008 to date



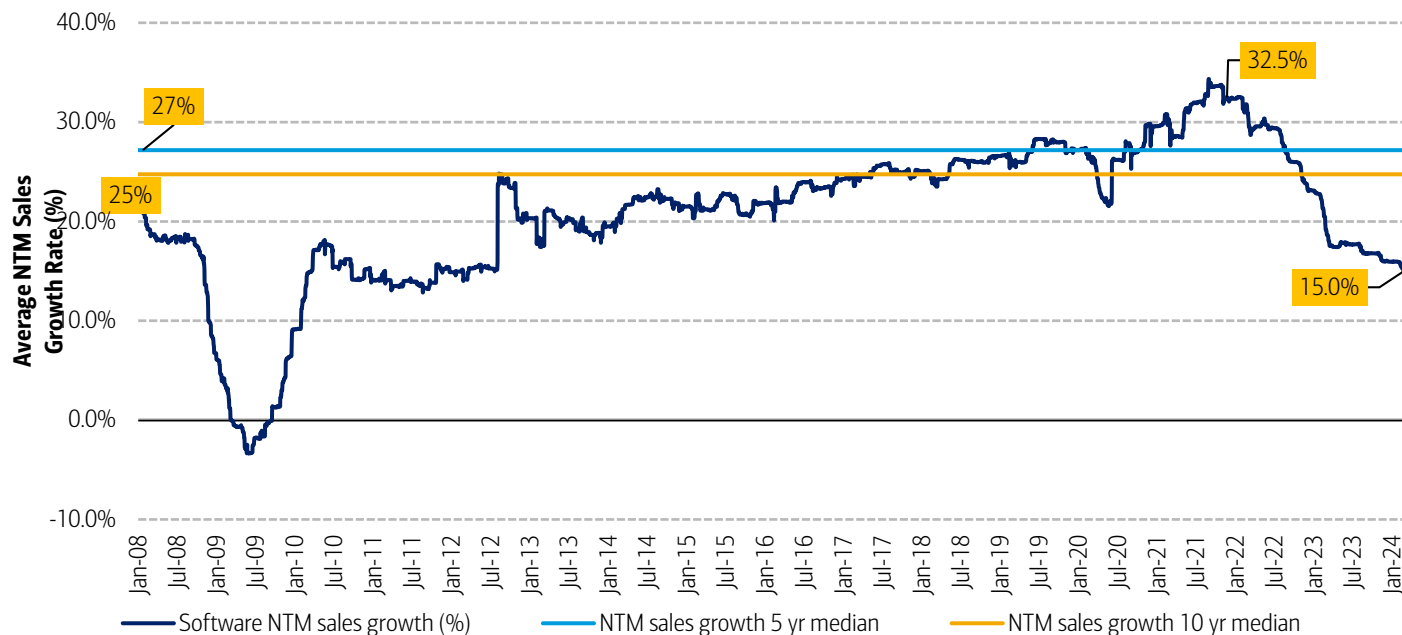
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NTM Sales Growth for our software coverage group is currently 15%, -17.5% from the '21 peak of 32.5%. Our software coverage group's current NTM Sales Growth is -12.2% from 5-year median of 27.2% and -9.7% from 10-year median of 24.7%.

#### Exhibit 4: Growth rates remain muted relative to historical medians on macro-driven budget tightening

NTM growth – 2008 to date



Source: BofA Global Research estimates, Bloomberg

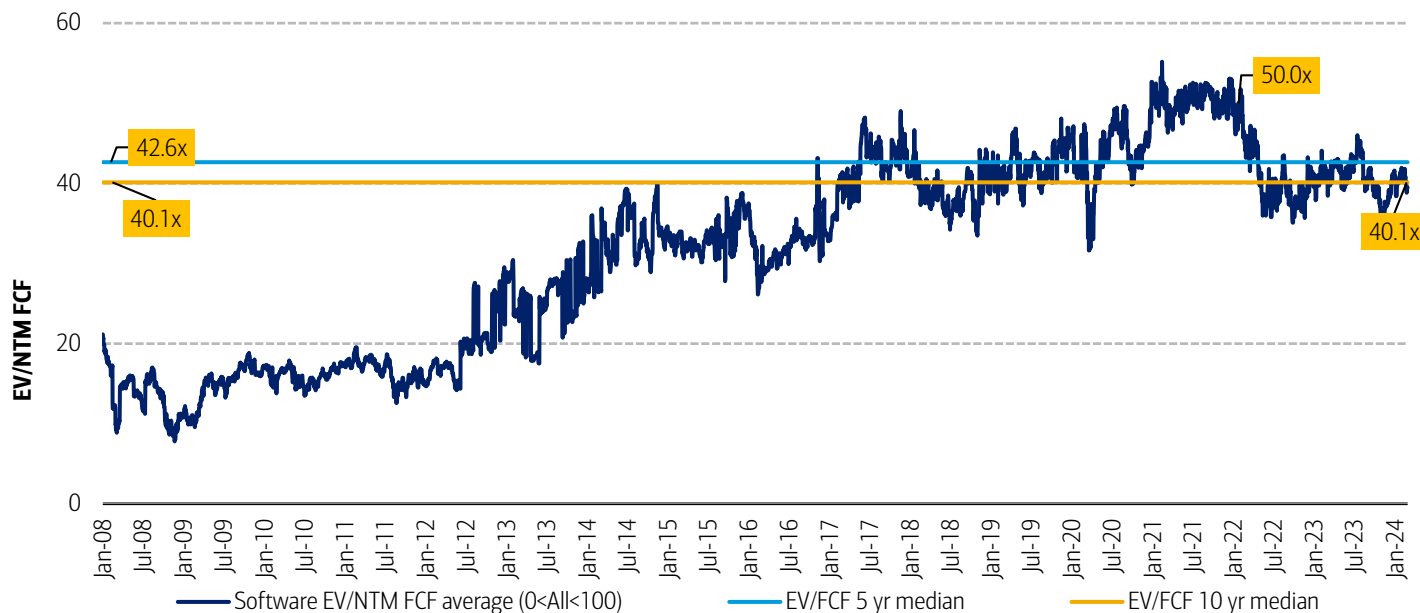
\*Constituents: BofA Software coverage

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On an EV/NTM FCF basis, our coverage group is trading at 40.1x, -20% from the '21 peak of 50.0x. Our coverage group's current multiple is -6% from the 5-year median of 42.6x and on par with the 10-year median of 40.1x.

#### Exhibit 5: EV/NTM FCF is now on par with 10-yr median following steady expansion since November 2023

EV/NTM FCF – 2008 to date



Source: BofA Global Research estimates, Bloomberg

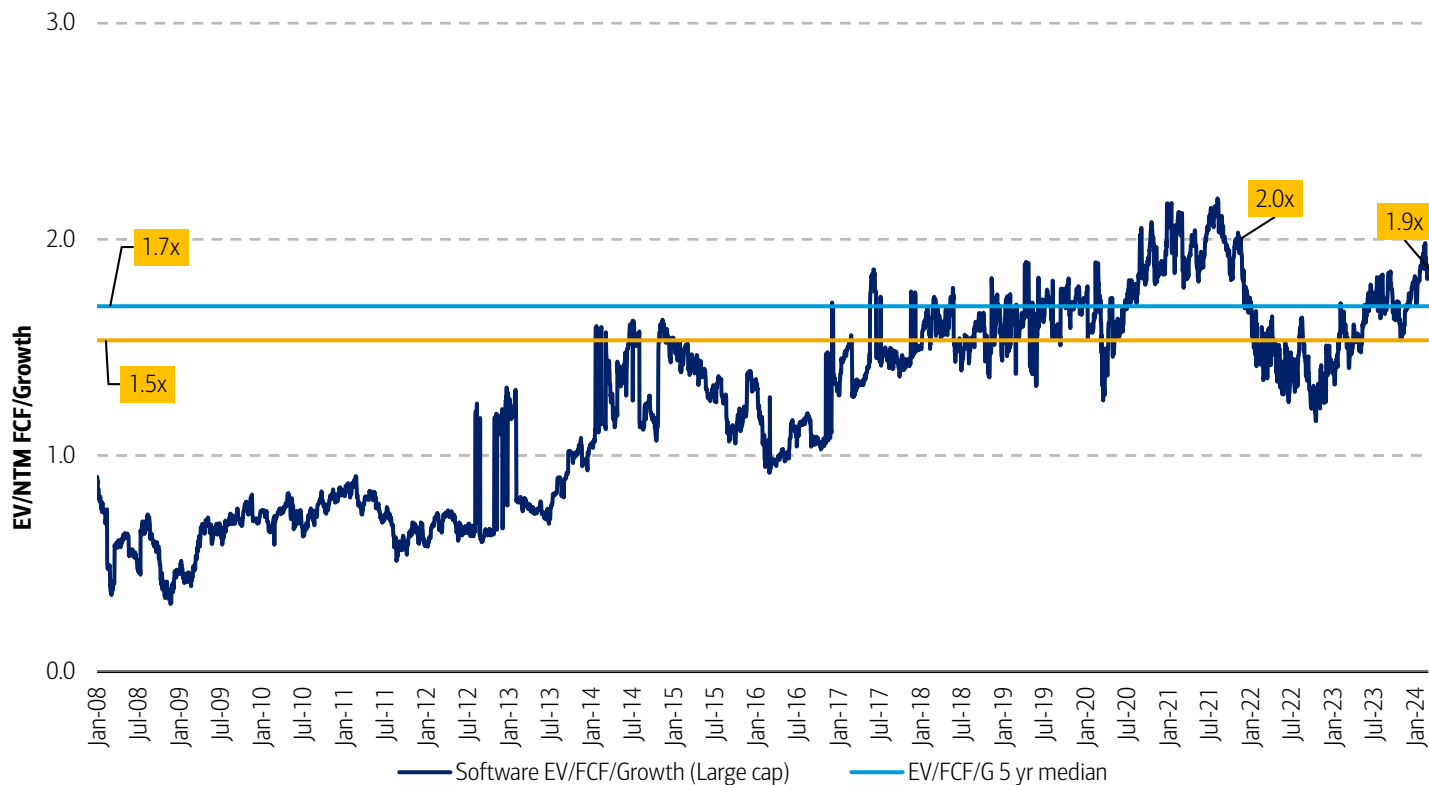
\*Constituents: BofA Software coverage

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On an EV/NTM FCF/Growth basis, the large cap software group is trading at 1.9x, -5% below the '21 peak at 2.0x. The current multiple is +11.7% the 5-year median of 1.7x and +23.1% from the 10-year median of 1.5x.

**Exhibit 6: EV/NTM FCF/Growth multiples have expanded since November 2023 and are now above the 5 and 10-year medians**

EV/NTM FCF/Growth – 2008 to date



Source: BofA Global Research estimates, Bloomberg

\*Constituents: BofA Software coverage

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# Software Stock Performance Overview

As of Feb 26, our software coverage universe was -1.4% from prior week (Nasdaq +1.4%) and -0.2% YTD (Nasdaq +6.5%) which compares to +39.8% in 2023 (Nasdaq +43.4%). The Infrastructure software group outperformed the broader software group on a YTD basis (+9.4%), led by Confluent (covered by Brad Sills).

## Exhibit 7: Large-cap software outperformed our coverage group in 2023 though lagging Nasdaq and S&P 500 YTD

Software stock performance by size and subcategory

BofA Software Coverage	1 Week	YTD	2023 Return	Buy-rated YTD	Buy-rated 2023 Return
Large-Cap Average	0.6%	6.4%	62.7%	7.8%	81.1%
Mid-Cap Average	-2.1%	-1.4%	38.0%	-0.3%	53.7%
Small-Cap Average	-2.3%	-3.4%	26.6%	-0.9%	30.3%
Total Group Average	-1.4%	-0.2%	39.8%	1.7%	51.6%

Software by Category	1 Week	YTD	2023 Return
Collaboration	-2.9%	-3.3%	25.5%
Communication	-1.1%	-13.8%	-3.0%
CRM	-3.4%	-1.1%	39.5%
Design	-0.1%	-4.8%	39.1%
ERP & Back office	-0.9%	-6.2%	22.2%
HCM	-1.2%	2.8%	1.4%
Infrastructure	-1.6%	9.1%	53.7%
Security	-2.5%	4.1%	54.0%
Vertical	-2.2%	-3.4%	34.0%
Nasdaq	1.4%	6.5%	43.4%
S&P 500	1.5%	6.5%	24.2%

**Source:** BofA Global Research estimates for companies under coverage, Bloomberg consensus for companies not under coverage. Note that averages are not market-cap weighted. Stocks included in "Software by category" may not be under BofA software coverage.

As of 2/26/2024

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# BofA Software Comp Sheet

**Exhibit 8: Our large-cap software group is trading at 9.7x CY25e sales and 33.3x CY25e FCF**

BofA Software Coverage Comp Sheet – Large Cap

							2023	2024	2025				2023	2024	2025
		Mkt Cap		EV/2023	EV/2024	EV/2025	EV/Rev/	EV/Rev/	EV/Rev/	EV/2023	EV/2024	EV/2025	EV/FCF/	EV/FCF/	EV/FCF/
Company	Price	(\$mn)	Sales	Sales	Sales	Growth	Growth	Growth	FCF	FCF	FCF	Growth	Growth	Growth	
ADBE	ADOBE INC	\$569.68	261,483	13.3x	12.0x	10.8x	1.3x	1.2x	0.9x	37.1x	28.1x	25.4x	...	0.9x	2.4x
ADSK	AUTODESK INC	\$258.57	55,851	10.4x	9.4x	8.3x	1.1x	0.9x	0.7x	45.5x	35.7x	26.6x	...	1.3x	0.8x
BSY	BENTLEY SYSTEMS INC-CLASS B	\$52.65	17,522	15.5x	14.0x	12.7x	1.3x	1.3x	1.2x	54.0x	53.7x	39.9x	1.4x	...	1.2x
CRM	SALESFORCE INC	\$300.04	294,339	8.5x	7.6x	6.7x	0.8x	0.6x	0.5x	34.4x	27.3x	21.7x	0.9x	1.0x	0.8x
DDOG	DATADOG INC - CLASS A	\$130.21	45,952	20.8x	17.3x	13.8x	0.8x	0.8x	0.6x	70.0x	60.5x	46.4x	1.1x	3.8x	1.5x
DT	DYNATRACE INC	\$50.69	15,169	10.6x	9.0x	7.5x	0.4x	0.5x	0.4x	42.6x	38.3x	30.2x	3.3x	3.4x	1.1x
HUBS	HUBSPOT INC	\$609.53	30,688	13.9x	11.8x	9.7x	0.5x	0.7x	0.4x	94.8x	70.8x	53.0x	5.9x	2.1x	1.6x
INTU	INTUIT INC	\$659.63	187,334	12.7x	11.4x	10.3x	1.2x	1.0x	0.9x	40.9x	37.5x	29.8x	2.4x	4.2x	1.2x
MDB	MONGODB INC	\$456.34	37,648	22.3x	18.2x	14.5x	0.8x	0.8x	0.6x	...	...	...	...	...	...
MSFT	MICROSOFT CORP	\$409.48	3,057,997	13.6x	11.9x	10.5x	1.2x	0.8x	0.8x	47.0x	51.4x	35.3x	4.6x	...	0.8x
NICE	NICE LTD - SPON ADR	\$238.73	15,959	6.4x	5.6x	5.0x	0.7x	0.4x	0.4x	28.8x	25.9x	22.2x	1.5x	2.3x	1.3x
NOW	SERVICENOW INC	\$788.61	163,242	17.9x	14.7x	12.1x	0.8x	0.7x	0.5x	59.4x	47.5x	37.5x	2.3x	1.9x	1.4x
ORCL	ORACLE CORP	\$111.93	315,307	7.7x	7.2x	6.6x	0.6x	1.0x	0.8x	39.1x	37.9x	31.3x	1.9x	12.0x	1.5x
SHOP	SHOPIFY INC - CLASS A	\$77.68	88,788	12.0x	9.7x	7.7x	0.5x	0.4x	0.3x	93.8x	77.9x	42.5x	...	3.8x	0.5x
SNOW	SNOWFLAKE INC-CLASS A	\$228.80	83,062	28.6x	21.9x	16.7x	0.8x	0.7x	0.5x	...	76.1x	56.7x	...	2.0x	1.7x
VEEV	VEEVA SYSTEMS INC-CLASS A	\$224.32	36,734	14.0x	11.9x	10.3x	1.5x	0.7x	0.7x	39.0x	33.1x	27.3x	4.0x	1.9x	1.3x
WDAY	WORKDAY INC-CLASS A	\$309.09	82,334	10.8x	9.3x	7.9x	0.6x	0.6x	0.5x	45.6x	37.9x	32.7x	1.4x	1.9x	2.1x
ZM	ZOOM VIDEO COMMUNICATIONS-A	\$63.95	19,850	3.0x	2.9x	2.8x	1.1x	1.0x	0.6x	9.9x	8.8x	8.3x	0.7x	0.6x	1.5x
Average				13.4x	11.4x	9.7x	0.9x	0.8x	0.6x	48.9x	44.0x	33.3x	2.4x	2.9x	1.3x
Median				13.0x	11.6x	10.0x	0.8x	0.8x	0.6x	44.0x	37.9x	31.3x	1.9x	2.0x	1.3x

Source: BofA Global Research estimates

As of 2/26/2024

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**Exhibit 9: On a Rule of 40 (FCF) basis, ADBE, ADSK, CRM, and VEEV presented the largest improvement on Rule of 40, while DT, ORCL, and DDOG saw the largest deterioration**

Large cap rule of 40 – EBITDA and FCF\*

	2023	2024	2025		2023	2024	2025	
	Rule of 40 (EBITDA)	Rule of 40 (EBITDA)	Rule of 40 (EBITDA)	Change (2023 vs 2025)	Rule of 40 (FCF)	Rule of 40 (FCF)	Rule of 40 (FCF)	Change (2023 vs 2025)
<b>Large cap</b>								
ADBE	61%	60%	61%	0.5%	46%	53%	54%	8.2%
ADSK	47%	49%	52%	4.4%	32%	37%	44%	12.1%
BSY	47%	47%	47%	(0.1%)	41%	37%	42%	1.2%
CRM	53%	54%	56%	3.5%	36%	40%	44%	8.7%
DDOG	55%	47%	52%	(2.9%)	57%	49%	55%	(2.0%)
DT	53%	46%	47%	(6.0%)	49%	42%	44%	(5.6%)
HUBS	41%	34%	40%	(1.1%)	40%	34%	40%	0.1%
INTU	51%	50%	53%	2.4%	41%	42%	46%	4.3%
MDB	45%	37%	44%	(0.5%)	36%	32%	39%	2.5%
MSFT	63%	67%	65%	2.2%	40%	38%	42%	2.1%
NICE	46%	52%	48%	2.6%	31%	37%	35%	3.2%
NOW	52%	51%	52%	0.6%	54%	53%	54%	0.2%
ORCL	66%	61%	63%	(3.9%)	32%	26%	30%	(2.1%)
SHOP	38%	40%	44%	5.5%	39%	37%	44%	4.6%
SNOW	46%	45%	49%	3.0%	62%	59%	61%	(1.4%)
VEEV	46%	55%	55%	9.3%	45%	53%	54%	8.5%
WDAY	44%	44%	45%	0.3%	41%	41%	41%	0.9%
ZM	44%	42%	43%	(0.5%)	33%	36%	38%	5.2%
<b>Average</b>	<b>50%</b>	<b>49%</b>	<b>51%</b>	<b>1.1%</b>	<b>42%</b>	<b>41%</b>	<b>45%</b>	<b>2.8%</b>
<b>Median</b>	<b>47%</b>	<b>48%</b>	<b>50%</b>	<b>0.5%</b>	<b>40%</b>	<b>39%</b>	<b>44%</b>	<b>2.3%</b>

Source: BofA Global Research estimates

Rule of 40 is defined as revenue growth + EBITDA (FCF) margin

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**Exhibit 10: Our mid-cap software group is trading at 5.8x C25e Sales, or 0.5x on a growth adjusted basis**

BofA Software Coverage Comp Sheet – Mid Cap

							2023	2024	2025				2023	2024	2025
Company		Price	Mkt Cap (\$mn)	EV/2023 Sales	EV/2024 Sales	EV/2025 Sales	EV/Rev/ Growth	EV/Rev/ Growth	EV/Rev/ Growth	EV/2023 FCF	EV/2024 FCF	EV/2025 FCF	EV/FCF/ Growth	EV/FCF/ Growth	EV/FCF/ Growth
BILL	BILL HOLDINGS INC	\$64.29	6,809	5.2x	4.8x	3.9x	0.1x	0.5x	0.2x	28.2x	34.6x	23.5x	0.1x	...	0.5x
CFLT	CONFLUENT INC-CLASS A	\$33.57	10,940	13.1x	10.7x	8.5x	0.4x	0.5x	0.3x	...	...	...	...	...	...
DBX	DROPBOX INC-CLASS A	\$23.64	8,128	3.5x	3.5x	3.4x	0.5x	2.6x	2.6x	11.6x	9.6x	8.8x	...	0.5x	1.1x
DOCU	DOCUSIGN INC	\$52.46	10,913	3.7x	3.5x	3.2x	0.4x	0.6x	0.5x	14.0x	13.2x	12.1x	0.2x	2.1x	1.4x
ESTC	ELASTIC NV	\$131.24	13,451	10.4x	9.0x	7.7x	0.6x	0.6x	0.5x	...	69.7x	52.8x	...	0.7x	1.6x
FIVN	FIVE9 INC	\$63.95	4,519	5.0x	4.3x	3.7x	0.3x	0.3x	0.2x	52.0x	46.7x	25.5x	0.3x	4.1x	0.3x
FRSH	FRESHWORKS INC-CL A	\$20.30	6,555	9.0x	7.6x	6.4x	0.5x	0.4x	0.3x	63.6x	46.2x	34.9x	...	1.2x	1.1x
GLBE	GLOBAL-E ONLINE LTD	\$32.90	5,888	9.8x	7.5x	5.8x	0.2x	0.2x	0.2x	52.4x	40.2x	29.6x	2.0x	1.3x	0.8x
GTLB	GITLAB INC-CL A	\$70.64	11,649	18.6x	15.0x	11.6x	0.5x	0.6x	0.4x	...	...	...	...	...	...
GWRE	GUIDEWIRE SOFTWARE INC	\$120.81	9,869	10.3x	9.3x	8.2x	1.6x	0.8x	0.6x	...	59.0x	45.3x	...	0.5x	1.5x
INFA	INFORMATICA	\$32.55	9,922	6.8x	6.4x	6.0x	1.1x	1.0x	1.0x	40.6x	27.0x	24.8x	1.2x	0.5x	2.8x
MNDY	MONDAY.COM LTD	\$211.50	13,719	17.4x	13.2x	10.2x	0.4x	0.4x	0.3x	61.0x	52.9x	42.7x	...	3.4x	1.8x
PATH	UIPATH INC - CLASS A	\$23.97	13,592	9.2x	7.5x	6.1x	0.4x	0.3x	0.3x	46.2x	41.2x	30.1x	...	3.5x	0.8x
PAYC	PAYCOM SOFTWARE INC	\$182.59	10,449	6.0x	5.5x	4.9x	0.3x	0.5x	0.4x	35.0x	35.2x	27.4x	1.4x	...	1.0x
PCTY	PAYLOCITY HOLDING CORP	\$170.90	9,717	7.3x	6.4x	5.6x	0.3x	0.5x	0.4x	35.5x	33.1x	27.5x	0.5x	4.5x	1.4x
SMAR	SMARTSHEET INC-CLASS A	\$42.14	4,055	3.7x	3.1x	2.6x	0.1x	0.2x	0.1x	24.7x	19.4x	12.9x	...	0.7x	0.3x
TWLO	TWILIO INC - A	\$59.00	11,045	1.9x	1.8x	1.7x	0.2x	0.4x	0.2x	21.7x	18.0x	15.1x	...	0.9x	0.8x
U	UNITY SOFTWARE INC	\$32.73	10,731	5.7x	5.0x	4.0x	0.1x	0.4x	0.2x	40.7x	19.1x	11.8x	...	0.2x	0.2x
ZI	ZOOMINFO TECHNOLOGIES INC	\$16.98	6,972	6.2x	6.0x	5.8x	0.5x	2.5x	1.2x	18.8x	19.3x	18.3x	3.6x	...	3.4x
Average				8.0x	6.8x	5.8x	0.5x	0.7x	0.5x	36.4x	34.4x	26.1x	1.2x	1.7x	1.2x
Median				6.8x	6.4x	5.8x	0.4x	0.5x	0.3x	35.5x	34.6x	25.5x	0.9x	1.1x	1.1x

Source: BofA Global Research estimates

As of 2/26/2024

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**Exhibit 11: On a Rule of 40 (FCF) basis, GWRE, CFLT, ESTC and INFA presented the largest improvement on Rule of 40, while BILL, MNDY, PCTY, and PAYC saw the largest deterioration**

Mid cap rule of 40 – EBITDA and FCF\*

	2023	2024	2025	Change	2023	2024	2025	Change
	Rule of 40 (EBITDA)	Rule of 40 (EBITDA)	Rule of 40 (EBITDA)	(2023 vs 2025)	Rule of 40 (FCF)	Rule of 40 (FCF)	Rule of 40 (FCF)	(2023 vs 2025)
Mid cap								
BILL	53%	24%	38%	(14.9%)	57%	23%	37%	(20.1%)
CFLT	27%	23%	32%	4.8%	17%	22%	28%	11.7%
DBX	47%	41%	42%	(5.4%)	38%	38%	40%	2.1%
DOCU	38%	32%	34%	(3.8%)	36%	33%	34%	(1.5%)
ESTC	30%	28%	31%	1.6%	25%	28%	31%	6.8%
FIVN	35%	34%	38%	3.0%	27%	25%	32%	5.9%
FRSH	29%	29%	31%	2.0%	34%	35%	37%	3.0%
GLBE	56%	48%	48%	(7.8%)	58%	50%	49%	(8.6%)
GTLB	34%	28%	34%	0.0%	34%	26%	31%	(3.1%)
GWRE	15%	25%	30%	15.0%	14%	27%	31%	16.7%
INFA	36%	39%	40%	3.8%	23%	30%	30%	7.6%
MNDY	50%	42%	40%	(10.7%)	69%	56%	53%	(15.7%)
PATH	39%	40%	41%	2.1%	41%	41%	43%	1.7%
PAYC	66%	49%	52%	(13.7%)	40%	26%	30%	(10.3%)
PCTY	64%	48%	48%	(15.5%)	50%	33%	34%	(15.4%)
SMAR	35%	30%	34%	(1.4%)	40%	34%	39%	(0.9%)
TWLO	24%	20%	25%	1.3%	17%	14%	20%	3.2%
U	71%	44%	58%	(13.5%)	67%	40%	58%	(9.6%)
ZI	54%	43%	46%	(8.6%)	46%	34%	36%	(9.1%)
Average	42%	35%	39%	(3.2%)	39%	32%	37%	(1.9%)
Median	38%	34%	38%	(1.4%)	38%	33%	34%	(0.9%)

Source: BofA Global Research estimates

Rule of 40 is defined as revenue growth + EBITDA (FCF) margin

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**Exhibit 12: Our small-cap coverage group is trading at 4.1x C25e Sales, or 0.4x on a growth adjusted basis**

BofA Software Coverage Comp Sheet – Small Cap

							2023	2024	2025				2023	2024	2025
		Mkt Cap		EV/2023	EV/2024	EV/2025	EV/Rev/	EV/Rev/	EV/Rev/	EV/2023	EV/2024	EV/2025	EV/FCF/	EV/FCF/	EV/FCF/
Company	Price	(\$mn)	Sales	Sales	Sales	Growth	Growth	Growth	FCF	FCF	FCF	Growth	Growth	Growth	
AI	C3.AI INC-A	\$27.33	3,243	8.6x	7.4x	6.5x	0.8x	0.4x	0.5x	...	...	51.2x	...	...	...
ALRM	ALARM.COM HOLDINGS INC	\$72.90	3,989	4.3x	4.1x	3.8x	1.0x	0.9x	0.5x	34.5x	69.2x	26.5x	0.1x	...	0.2x
AMPL	AMPLITUDE INC-CLASS A	\$12.22	1,784	5.3x	5.0x	4.7x	0.3x	0.9x	0.8x	60.3x	72.0x	52.6x	...	...	1.4x
ASAN	ASANA INC - CL A	\$18.99	4,212	6.1x	5.4x	4.4x	0.3x	0.4x	0.2x	...	...	46.6x	...	...	0.3x
AVDX	AVIDXCHANGE	\$12.21	2,442	5.7x	5.0x	4.3x	0.3x	0.4x	0.3x	...	...	44.0x	...	...	0.2x
AYX	ALTERYX INC - CLASS A	\$48.02	3,691	4.5x	4.0x	3.6x	0.4x	0.4x	0.3x	...	80.2x	39.7x	...	0.7x	0.4x
BIGC	BIGCOMMERCE HOLDINGS	\$7.94	604	2.2x	2.1x	1.9x	0.2x	0.3x	0.3x	...	...	45.8x	...	...	0.3x
BL	BLACKLINE INC	\$57.11	4,258	7.1x	6.6x	6.0x	0.6x	0.7x	0.7x	34.9x	30.7x	26.8x	0.2x	2.2x	1.9x
BLKB	BLACKBAUD INC	\$68.58	3,646	4.0x	3.7x	3.5x	0.9x	0.5x	0.5x	32.8x	16.8x	15.0x	16.3x	0.2x	1.3x
EGHT	8X8 INC	\$2.75	337	1.0x	1.0x	0.9x	...	...	0.2x	6.6x	4.4x	3.5x	0.0x	0.1x	0.1x
ENFN	ENFUSION	\$9.66	1,235	7.1x	6.1x	5.2x	0.5x	0.4x	0.3x	63.6x	58.7x	39.6x	0.3x	7.0x	0.8x
EVBG	EVERBRIDGE INC	\$28.35	1,247	3.4x	3.2x	3.1x	0.9x	0.6x	0.5x	56.6x	36.1x	25.4x	0.0x	0.6x	0.6x
FROG	JFROG LTD	\$44.57	4,911	12.5x	10.3x	8.4x	0.5x	0.5x	0.4x	60.8x	59.3x	45.8x	0.2x	22.9x	1.5x
HCP	HASHICORP INC-CL A	\$24.73	4,811	6.2x	5.4x	4.5x	0.3x	0.4x	0.2x	...	43.0x	28.1x	...	...	0.5x
INTA	INTAPP INC	\$41.78	3,324	8.1x	6.9x	6.0x	0.3x	0.4x	0.4x	88.4x	56.7x	41.4x	1.0x	1.0x	1.1x
JAMF	JAMF HOLDING CORP	\$19.82	2,695	5.1x	4.5x	4.0x	0.3x	0.3x	0.3x	65.8x	43.2x	27.6x	...	0.8x	0.5x
LAW	CS DISCO INC	\$7.04	457	2.2x	2.1x	1.9x	1.0x	0.3x	0.2x	...	...	...	...	...	...
LSPD	LIGHTSPEED COMMERCE INC	\$13.78	2,115	1.6x	1.3x	1.1x	0.1x	0.1x	0.1x	...	35.7x	38.3x	...	...	...
MLNK	MERIDIANLINK INC	\$18.99	1,540	6.1x	5.8x	5.4x	1.1x	1.0x	0.8x	26.6x	20.6x	18.1x	...	0.7x	1.3x
NCNO	NCINO INC	\$30.38	3,432	7.1x	6.2x	5.4x	0.4x	0.4x	0.4x	46.6x	41.8x	41.9x	...	3.6x	...
PD	PAGERDUTY INC	\$23.48	2,260	5.0x	4.5x	4.0x	0.3x	0.4x	0.3x	30.5x	22.8x	18.3x	0.1x	0.7x	0.7x
PWSC	POWERSCHOOL HOLDINGS	\$23.32	4,741	7.6x	6.6x	6.1x	0.7x	0.5x	0.7x	30.2x	25.1x	21.7x	1.5x	1.2x	1.4x
RNG	RINGCENTRAL INC-CLASS A	\$31.48	2,960	2.0x	1.8x	1.7x	0.2x	0.2x	0.2x	13.4x	11.8x	8.3x	0.1x	0.9x	0.2x
VERX	VERTEX INC - CLASS A	\$25.06	3,810	6.8x	6.0x	5.4x	0.5x	0.5x	0.4x	86.4x	56.3x	39.8x	0.6x	1.0x	1.0x
WEAV	WEAVE COMMUNICATIONS	\$12.58	813	4.5x	3.9x	3.3x	0.2x	0.2x	0.2x	89.5x	40.8x	22.2x	...	0.3x	0.3x
ZETA	ZETA GLOBAL HOLDINGS	\$10.31	2,230	3.2x	2.7x	2.4x	0.1x	0.2x	0.2x	27.9x	19.4x	15.9x	0.6x	0.4x	0.7x
Average				5.3x	4.7x	4.1x	0.5x	0.5x	0.4x	47.5x	40.2x	31.4x	1.6x	2.6x	0.8x
Median				5.2x	4.8x	4.2x	0.4x	0.4x	0.3x	40.8x	40.8x	28.1x	0.2x	0.8x	0.7x

Source: BofA Global Research estimates

As of 2/26/2024

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**Exhibit 13: On a Rule of 40 (FCF) basis, ASAN, EGHT, LAW, and HCP presented the largest improvement on Rule of 40, while AMPL, FROG, INTA, and ZETA saw the largest deterioration**

Small cap rule of 40 – EBITDA and FCF\*

	2023 Rule of 40 (EBITDA)	2024 Rule of 40 (EBITDA)	2025 Rule of 40 (EBITDA)	Change (2023 vs 2025)	2023 Rule of 40 (FCF)	2024 Rule of 40 (FCF)	2025 Rule of 40 (FCF)	Change (2023 vs 2025)
<b>Small cap</b>								
<b>AI</b>	(26.4%)	2%	17%	43.4%	(17.4%)	10%	27%	44.3%
<b>ALRM</b>	21%	21%	27%	6.2%	17%	11%	23%	5.7%
<b>AMPL</b>	23%	19%	19%	(4.0%)	25%	13%	15%	(9.8%)
<b>ASAN</b>	11%	9%	25%	13.5%	14%	18%	32%	17.3%
<b>AVDX</b>	28%	28%	36%	7.4%	22%	18%	26%	3.8%
<b>AYX</b>	22%	24%	27%	4.5%	14%	16%	20%	5.8%
<b>BIGC</b>	10%	8%	10%	0.1%	2%	9%	11%	9.6%
<b>BL</b>	32%	31%	31%	(1.1%)	33%	30%	31%	(2.2%)
<b>BLKB</b>	36%	40%	41%	4.9%	17%	30%	30%	13.5%
<b>EGHT</b>	29%	30%	38%	8.4%	14%	22%	31%	17.3%
<b>ENFN</b>	32%	35%	37%	5.0%	26%	27%	30%	3.5%
<b>EVBG</b>	22%	26%	28%	5.6%	10%	14%	18%	8.5%
<b>FROG</b>	37%	37%	37%	0.1%	46%	40%	40%	(5.5%)
<b>HCP</b>	8%	12%	25%	17.1%	19%	27%	36%	16.9%
<b>INTA</b>	33%	25%	17%	(15.8%)	36%	29%	30%	(5.6%)
<b>JAMF</b>	29%	28%	30%	1.0%	24%	23%	27%	3.0%
<b>LAW</b>	(16.6%)	(5.3%)	(0.5%)	16.1%	(19.9%)	(7.5%)	(2.6%)	17.3%
<b>LSPD</b>	24%	23%	23%	(0.8%)	10%	24%	24%	13.6%
<b>MLNK</b>	40%	43%	47%	6.1%	29%	34%	37%	8.2%
<b>NCNO</b>	30%	31%	33%	2.9%	32%	29%	28%	(4.1%)
<b>PD</b>	35%	31%	36%	1.0%	32%	30%	35%	2.6%
<b>PWSC</b>	44%	47%	43%	(0.3%)	36%	40%	37%	1.3%
<b>RNG</b>	40%	39%	40%	(0.0%)	25%	24%	28%	2.6%
<b>VERX</b>	32%	33%	37%	5.0%	22%	23%	26%	3.5%
<b>WEAV</b>	17%	16%	21%	4.4%	25%	26%	31%	5.9%
<b>ZETA</b>	40%	34%	33%	(6.9%)	34%	30%	29%	(5.3%)
<b>Average</b>	<b>24%</b>	<b>26%</b>	<b>29%</b>	<b>4.8%</b>	<b>20%</b>	<b>23%</b>	<b>27%</b>	<b>6.6%</b>
<b>Median</b>	<b>29%</b>	<b>28%</b>	<b>30%</b>	<b>4.5%</b>	<b>23%</b>	<b>24%</b>	<b>28%</b>	<b>4.8%</b>

Source: BofA Global Research estimates

Rule of 40 is defined as revenue growth + EBITDA (FCF) margin

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# Software Valuation by Category

We categorized the enterprise software space across 9 categories: Collaboration, Communication, CRM, Design, ERP & Back Office, HCM, Infrastructure, Security and Vertical software.

## Exhibit 14: Design software is currently trading at a significant premium to the broader software group (9.8x C25 Sales, or 0.9x growth adjusted)

Software comp sheet by category

Categories	Mkt Cap (\$mn)	EV/2023 Sales	EV/2024 Sales	EV/2025 Sales	2023 EV/Rev/ Growth	2024 EV/Rev/ Growth	2025 EV/Rev/ Growth	EV/2023 FCF	EV/2024 FCF	EV/2025 FCF	2023 EV/FCF/ Growth	2024 EV/FCF/ Growth	2025 EV/FCF/ Growth
<b>Collaboration</b>	\$33,869												
<b>Average</b>		6.9x	5.7x	4.8x	0.4x	0.9x	0.8x	27.5x	23.6x	24.4x	0.5x	0.6x	0.8x
<b>Median</b>		3.7x	3.5x	3.4x	0.4x	0.4x	0.3x	18.7x	16.0x	12.9x	0.0x	2.1x	0.7x
<b>Communication</b>	\$57,928												
<b>Average</b>		2.7x	2.4x	2.5x	0.3x	0.4x	0.3x	27.7x	21.3x	19.6x	0.8x	0.5x	0.6x
<b>Median</b>		2.0x	1.8x	2.3x	0.2x	0.2x	0.2x	18.2x	15.9x	15.1x	0.7x	0.8x	0.4x
<b>CRM</b>	\$490,529												
<b>Average</b>		6.3x	5.4x	4.5x	0.4x	-2.1x	0.4x	49.8x	35.9x	35.4x	0.7x	0.8x	0.8x
<b>Median</b>		5.4x	4.6x	4.1x	0.3x	0.4x	0.3x	43.3x	28.5x	30.5x	0.9x	1.1x	0.8x
<b>Design</b>	\$560,434												
<b>Average</b>		12.2x	11.0x	9.8x	1.2x	1.1x	0.9x	45.7x	37.5x	30.8x	1.0x	0.8x	1.1x
<b>Median</b>		11.4x	10.3x	9.2x	1.3x	1.1x	0.9x	41.9x	35.7x	31.8x	1.4x	2.0x	1.4x
<b>ERP &amp; Back Office</b>	\$559,886												
<b>Average</b>		6.7x	6.0x	5.4x	0.8x	0.5x	0.3x	43.3x	37.6x	30.6x	0.5x	1.2x	0.8x
<b>Median</b>		6.8x	6.0x	5.4x	0.5x	0.5x	0.4x	40.9x	37.5x	29.9x	0.3x	2.1x	0.5x
<b>HCM</b>	\$255,955												
<b>Average</b>		7.4x	6.6x	5.9x	0.6x	0.7x	0.6x	33.9x	43.3x	31.6x	1.1x	1.9x	1.0x
<b>Median</b>		6.7x	5.9x	5.4x	0.5x	0.5x	0.4x	35.0x	34.1x	27.4x	1.4x	2.0x	1.1x
<b>Infrastructure</b>	\$3,945,508												
<b>Average</b>		9.9x	8.4x	7.0x	0.6x	0.7x	0.5x	46.5x	44.5x	34.1x	0.7x	0.7x	1.0x
<b>Median</b>		7.2x	6.8x	6.0x	0.5x	0.6x	0.4x	46.6x	43.1x	33.3x	0.9x	0.8x	0.8x
<b>Security</b>	\$262,055												
<b>Average</b>		9.7x	8.2x	7.0x	0.3x	0.8x	0.6x	39.1x	36.3x	31.9x	0.8x	1.1x	0.9x
<b>Median</b>		7.0x	6.4x	6.0x	0.5x	0.6x	0.5x	31.9x	28.5x	24.4x	0.8x	0.8x	1.3x
<b>Vertical</b>	\$187,902												
<b>Average</b>		7.2x	6.3x	5.5x	0.4x	0.4x	0.5x	38.2x	37.8x	29.1x	0.8x	0.8x	0.9x
<b>Median</b>		6.4x	5.6x	5.0x	0.5x	0.5x	0.5x	33.6x	32.2x	28.1x	1.0x	0.7x	1.2x

**Source:** BofA Global Research estimates for companies under coverage, Bloomberg consensus for companies not under coverage  
As of 2/26/24. Stocks included may not be under BofA software coverage. See appendix.

On an EV/NTM Sales basis, the Design software group saw the largest multiple expansion w/w (+1.1%) led by Adobe (covered by Brad Sills) and relative to the 5-year median (+5.9%), led by Cadence Design Systems (covered by Vivek Arya).

On an EV/NTM FCF basis, the Vertical software group saw the largest multiple expansion w/w (+2.6%) led by Toast (covered by Jason Kupferberg) with the Design software group seeing the largest expansion relative to the 5-year median (+8.4%), led by led by Cadence Design Systems (covered by Vivek Arya).

#### Exhibit 15: Design software saw the largest EV/NTM Sales multiple expansion, led by Adobe

Software multiple expansion/contraction by category

Category	EV/NTM Sales				EV/NTM Sales/growth				EV/NTM FCF			
	Multiple		% Change		Multiple		% Change		Multiple		% Change	
	Current	5-yr median	1 wk	5-yr median	Current	5-yr median	1 wk	5-yr median	Current	5-yr median	1 wk	5-yr median
<b>Collaboration</b>	5.5x	7.2x	-3.1%	-23.5%	0.7x	0.4x	3.1%	100.9%	25.8x	20.2x	-3.5%	NA
<b>Communication</b>	2.2x	7.7x	-1.3%	-71.1%	0.4x	0.4x	9.5%	-2.4%	20.1x	27.5x	-9.8%	-27.1%
<b>CRM</b>	5.0x	8.6x	-3.7%	-41.5%	0.4x	0.3x	-0.3%	28.7%	37.4x	42.3x	-4.0%	-11.8%
<b>Design</b>	10.4x	9.8x	1.1%	5.9%	0.9x	0.8x	5.7%	15.9%	38.7x	35.7x	1.4%	8.4%
<b>ERP &amp; Back Office</b>	5.3x	7.7x	0.8%	-31.3%	0.5x	0.5x	4.9%	7.5%	37.0x	42.1x	-3.8%	-12.1%
<b>HCM</b>	6.6x	9.8x	-1.0%	-32.1%	0.6x	0.6x	-0.8%	0.4%	40.1x	45.0x	-17.5%	-10.9%
<b>Infrastructure</b>	8.2x	10.6x	-1.1%	-22.7%	0.6x	0.5x	-0.2%	13.6%	41.8x	39.8x	-0.5%	5.1%
<b>Security</b>	8.1x	8.9x	-2.9%	-9.3%	0.8x	0.5x	2.8%	59.7%	33.1x	32.4x	-3.6%	2.1%
<b>Vertical</b>	6.1x	7.9x	-1.4%	-22.2%	0.5x	0.6x	-2.7%	-13.8%	41.1x	39.9x	2.6%	3.0%

**Source:** BofA Global Research estimates for companies under coverage, Bloomberg consensus for companies not under coverage  
As of 2/26/24. Stocks included may not be under BofA software coverage. See appendix.

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# Appendix

## Exhibit 16: Software by category analysis includes the stocks below

Software companies by category

Collaboration		Communication		CRM		Design		ERP and back office		HCM		Infrastructure		Security		Vertical	
ASAN	Asana Inc	EGAN	eGain	BIGC	Bigcommerce	ADBE	Adobe	AVDX	AvidXchange	ADP	Automatic Data	AI	C3.ai	ALRM	Alarm	APPF	Appfolio
BOX	Box Inc	EGHT	8x8	CRM	Salesforce.com	ADSK	Autodesk	BILL	BILL	CDAY	Ceridian HCM	AMPL	Amplitude	CHKP	Check Point	BLKB	Blackbaud
DBX	Dropbox	FIVN	Five9	CRTO	Criteo	ANSS	Ansys, Inc.	BL	BlackLine, Inc.	PAYC	Paycom	APPN	Appian	CLVT	Clarivate PLC	CCCS	CCC Intelligent Sol
MNDY	Monday.com	KLTR	Kaltura	CVO	Coveo	AZPN	AspenTech	DOCU	DocuSign	PAYX	Paychex	AYX	Alteryx, Inc	CRWD	CrowdStrike	COUR	Cousera
SMAR	Smartsheet	LPSN	LivePerson	CXM	Sprinklr	BSY	Bentley Systems	EXFY	Expensify	PCTY	Paylocity	BASE	Couchbase	CYBR	CyberArk	CPLF	Copperleaf
		LVOX	LiveVox	FRSH	Freshworks	CDNS	Cadence	INTU	Intuit	PYCR	Paycor HCM Inc	BBAI	Bigbear.AI	FTNT	Fortinet	CWAN	Clearware Analytics
		MCHX	Marchex	GLBE	Global-e Online	DSY	Dassault Systems	LAW	Disco	WDAY	Workday	CFLT	Confluent	GEN	Gen Digital.	DH	Definitive Hlthcare.
		NICE	NICE Ltd.	HUBS	HubSpot	NEM	Newmont	MANH	Manhattan Associates			DDOG	Datadog	OKTA	Okta Inc	DOX	Amdocs
		RNG	RingCentral	LSPD	Lightspeed	PTC	PTC	QTWO	Q2			DOMO	Domo	PANW	Palo Alto Networks	EBIX	Ebix
		TWLO	Twilio	ONTF	ON24	U	Unity	SAP	SAP			DT	Dynatrace	QLYS	Qualys	ENFN	Enfusion, Inc.
		VRNT	Verint	SEMR	SEMrush			UPLD	Upland Software			ESTC	Elastic	RPD	Rapid7	ETWO	EZopen
		ZM	Zoom	SHOP	Shopify, Inc.			VERX	Vertex			EVBG	Everbridge	S	SentinelOne	EVCN	EverCommerce
				SPT	Sprout Social			WK	Workiva Inc			FROG	JFrog	SCWX	SecureWorks	GWRE	Guidewire
				WIX	Wix			ZUO	Zuora			GTLB	GitLab	TENB	Tenable	INST	Instructure
				YEXT	Yext							HCP	HashiCorp	ZS	Zscaler	INTA	Intapp
				ZETA	Zeta Global							INFA	Informatica			IOT	Samsara Inc
				ZI	ZoomInfo							JAMF	Jamf			KARO	Karooooo
												MDB	MongoDB			MLNK	MeridianLink
												MSFT	Microsoft			MODN	Model N
												NOW	ServiceNow			NCNO	nCino
												ORCL	Oracle			PAR	Par Technology
												OTEX	Open Text			PCOR	Procore
												PATH	UiPath			PRO	PROS
												PD	PagerDuty			PWSC	PowerSchool
												PEGA	Pegasystems			SPSC	SPS Commerce
												PLTR	Palantir			TEMN	Temenos
												SNOW	Snowflake			TOST	Toast
												SWI	Solarwinds			TYL	Tyler Technologies
												TEAM	Atlassian			VEEV	Veeva Systems
																WEAV	Weave

Source: BofA Global Research

Stocks included may not be under BofA software coverage

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**Exhibit 17: YTD large-cap software stock performance slightly lagged Nasdaq and S&P 500**

Large-cap software stock performance

	1 Week	YTD	2023 Return
Nasdaq	1.4%	6.5%	43.4%
S&P 500	1.5%	6.5%	24.2%
ADBE	3.0%	-5.6%	77.3%
ADSK	-0.5%	5.6%	30.3%
BSY	-1.4%	0.4%	41.2%
CRM	4.1%	14.7%	98.5%
DDOG	0.5%	7.4%	65.1%
HUBS	-0.6%	5.0%	100.8%
INTU	0.7%	5.7%	60.6%
MDB	-2.5%	10.9%	107.7%
MSFT	1.2%	8.7%	56.8%
NOW	2.9%	11.5%	82.0%
ORCL	0.2%	5.7%	29.0%
SHOP	-4.3%	-0.1%	124.4%
SNOW	0.6%	16.4%	38.6%
VEEV	2.0%	16.3%	19.3%
WDAY	1.9%	11.8%	65.0%
ZM	2.6%	-11.4%	6.2%
<b>Large-Cap Average</b>	<b>0.6%</b>	<b>6.4%</b>	<b>62.7%</b>

Source: BofA Global Research, Bloomberg

BofA GLOBAL RESEARCH

**Exhibit 18: YTD mid-cap software stock performance lagged Nasdaq and S&P 500**

Mid-cap software stock performance

	1 Week	YTD	2023 Return
Nasdaq	1.4%	6.5%	43.4%
S&P 500	1.5%	6.5%	24.2%
BILL	0.7%	-21.7%	-25.1%
CFLT	-1.3%	43.2%	5.2%
DBX	-5.0%	-19.1%	31.7%
DOCU	5.1%	-11.3%	7.3%
DT	-1.4%	-7.9%	42.8%
ESTC	0.0%	15.6%	118.8%
FRSH	-0.8%	-12.6%	59.7%
GLBE	-18.0%	-15.3%	92.0%
GTLB	-2.9%	13.2%	38.6%
GWRE	1.4%	10.8%	74.3%
INFA	-5.1%	14.0%	74.3%
NICE	9.3%	23.0%	3.7%
PATH	-3.8%	-3.4%	95.4%
PAYC	-5.4%	-12.7%	-33.4%
PCTY	-3.7%	3.7%	-15.1%
TWLO	-1.0%	-23.6%	55.0%
U	-3.4%	-19.9%	43.0%
<b>Mid-Cap Average</b>	<b>-2.1%</b>	<b>-1.4%</b>	<b>39.3%</b>

Source: BofA Global Research, Bloomberg

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**Exhibit 19: YTD small-cap software stock performance lagged Nasdaq and S&P 500**

Small-cap software stock performance

	1 Week	YTD	2023 Return
Nasdaq	1.4%	6.5%	43.4%
S&P 500	1.5%	6.5%	24.2%
AI	-3.1%	-3.0%	156.6%
ALRM	5.2%	13.6%	30.6%
AMPL	-14.5%	-5.3%	5.3%
AVDX	-1.2%	-2.2%	24.6%
AYX	0.3%	1.8%	-6.9%
BIGC	-9.3%	-19.4%	11.3%
BL	-1.7%	-9.3%	-7.2%
BLKB	0.3%	-20.0%	47.3%
CVO	-1.7%	11.9%	5.7%
EGHT	5.2%	-27.4%	-12.5%
ENFN	3.6%	-3.0%	0.3%
EVBG	0.4%	16.5%	-17.8%
FIVN	-12.8%	-19.5%	16.0%
FROG	-0.6%	28.8%	62.3%
HCP	5.9%	6.0%	-13.5%
INTA	-4.4%	7.7%	52.4%
JAMF	-4.2%	10.3%	-15.2%
LAW	-12.4%	-7.7%	20.1%
LSPD	-5.3%	-35.3%	46.8%
MLNK	-0.7%	-23.0%	80.4%
NCNO	-0.5%	-11.4%	27.2%
PWSC	-7.1%	-3.0%	2.1%
RNG	0.5%	-9.3%	-4.1%
VERX	-0.9%	-7.0%	85.7%
WEAV	1.4%	10.3%	150.4%
ZETA	-0.9%	16.0%	8.0%
ZI	-2.8%	-8.1%	-38.6%
<b>Small-Cap Average</b>	<b>-2.3%</b>	<b>-3.4%</b>	<b>26.6%</b>

Source: BofA Global Research, Bloomberg

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**Exhibit 20: Criteo within CRM software led the stock performance YTD**

Collaboration, Communications, CRM, and Design software stock performance

	1 Week	YTD	2023 Return
Nasdaq	1.4%	6.5%	43.4%
S&P 500	1.5%	6.5%	24.2%
ASAN	-0.2%	-0.6%	38.1%
BOX	-2.8%	-1.2%	-17.7%
DBX	-5.0%	-19.1%	31.7%
MNDY	-3.6%	15.7%	53.9%
SMAR	-2.9%	-11.3%	21.5%
<b>Collaboration Average</b>	<b>-2.9%</b>	<b>-3.3%</b>	<b>25.5%</b>
EGAN	2.9%	-26.5%	-7.8%
EGHT	5.2%	-27.4%	-12.5%
FIVN	-12.8%	-19.5%	16.0%
KLTR	-8.8%	-25.6%	13.4%
LPSN	-0.4%	-34.0%	-62.6%
MCHX	-6.7%	-12.2%	-15.0%
NICE	9.3%	23.0%	3.7%
RNG	0.5%	-9.3%	-4.1%
TWLO	-1.0%	-23.6%	55.0%
VRNT	-3.2%	15.1%	-25.5%
ZM	2.6%	-11.4%	6.2%
<b>Communication Average</b>	<b>-1.1%</b>	<b>-13.8%</b>	<b>-3.0%</b>
BIGC	-9.3%	-19.4%	11.3%
CRM	4.1%	14.7%	98.5%
CRTO	2.5%	27.2%	-2.8%
CVO	-1.7%	11.9%	5.7%
CXM	1.1%	6.6%	47.4%
FRSH	-0.8%	-12.6%	59.7%
GLBE	-18.0%	-15.3%	92.0%
HUBS	-0.6%	5.0%	100.8%
LSPD	-5.3%	-35.3%	46.8%
ONTF	-14.5%	-9.9%	-8.7%
SEMR	0.2%	-7.2%	67.8%
SHOP	-4.3%	-0.1%	124.4%
SPT	-7.3%	-2.5%	8.8%
WIX	5.7%	9.3%	60.1%
YEXT	-5.0%	1.6%	-9.8%
ZETA	-0.9%	16.0%	8.0%
ZI	-2.8%	-8.1%	-38.6%
<b>CRM Average</b>	<b>-3.4%</b>	<b>-1.1%</b>	<b>39.5%</b>
ADBE	3.0%	-5.6%	77.3%
ADSK	-0.5%	5.6%	30.3%
ANSS	2.3%	-7.0%	50.2%
AZPN	1.0%	-16.2%	7.2%
BSY	-1.4%	0.4%	41.2%
CDNS	4.6%	11.5%	69.6%
DSY	-0.8%	-2.4%	32.1%
NEM	-10.6%	-27.8%	-12.3%
PTC	2.1%	4.0%	45.8%
PTC	2.1%	4.0%	45.8%
U	-3.4%	-19.9%	43.0%
<b>Design Average</b>	<b>-0.1%</b>	<b>-4.8%</b>	<b>39.1%</b>

Source: BofA Global Research, Bloomberg

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**Exhibit 21: Confluent within Infrastructure led the stock outperformance YTD**

ERP &amp; Back Office, HCM, and Infrastructure software stock performance

	1 Week	YTD	2023 Return
Nasdaq	1.4%	6.5%	43.4%
S&P 500	1.5%	6.5%	24.2%
AVDX	-1.2%	-2.2%	24.6%
BILL	0.7%	-21.7%	-25.1%
BL	-1.7%	-9.3%	-7.2%
DOCU	5.1%	-11.3%	7.3%
EXFY	31.9%	-14.6%	-72.0%
INTU	0.7%	5.7%	60.6%
LAW	-12.4%	-7.7%	20.1%
MANH	2.8%	16.4%	77.4%
QWOO	9.7%	7.4%	61.6%
SAP	6.0%	21.3%	49.8%
UPLD	-43.7%	-36.3%	-40.7%
VERX	-0.9%	-7.0%	85.7%
WK	-9.3%	-16.2%	20.9%
ZUO	-0.1%	-11.0%	47.8%
<b>ERP &amp; Back Office Average</b>	<b>-0.9%</b>	<b>-6.2%</b>	<b>22.2%</b>
ADP	0.5%	9.1%	-2.5%
DAY	-2.8%	6.1%	4.6%
PAYC	-5.4%	-12.7%	-33.4%
PAYX	0.5%	4.1%	3.1%
PCTY	-3.7%	3.7%	-15.1%
PYCR	0.7%	-2.7%	-11.8%
WDAY	1.9%	11.8%	65.0%
<b>HCM Average</b>	<b>-1.2%</b>	<b>2.8%</b>	<b>1.4%</b>
AI	-3.1%	-3.0%	156.6%
AMPL	-14.5%	-5.3%	5.3%
APPN	-11.0%	-12.0%	15.7%
AYX	0.3%	1.8%	-6.9%
BASE	-0.1%	23.9%	69.8%
BBAI	2.3%	5.7%	217.6%
CFLT	-1.3%	43.2%	5.2%
DDOG	0.5%	7.4%	65.1%
DOMO	2.7%	7.7%	-27.7%
DT	-1.4%	-7.9%	42.8%
ESTC	0.0%	15.6%	118.8%
EVBG	0.4%	16.5%	-17.8%
FROG	-0.6%	28.8%	62.3%
GTLB	-2.9%	13.2%	38.6%
HCP	5.9%	6.0%	-13.5%
INFA	-5.1%	14.0%	74.3%
JAMF	-4.2%	10.3%	-15.2%
MDB	-2.5%	10.9%	107.7%
MSFT	1.2%	8.7%	56.8%
NOW	2.9%	11.5%	82.0%
ORCL	0.2%	5.7%	29.0%
OTEX	-3.7%	-8.4%	41.8%
PATH	-3.8%	-3.4%	95.4%
PD	-0.2%	2.9%	-12.8%
PEGA	0.8%	33.8%	42.7%
PLTR	-3.2%	37.9%	167.4%
SNOW	0.6%	16.4%	38.6%
SWI	-4.2%	-3.8%	33.4%
TEAM	-1.6%	-14.1%	84.8%
<b>Infrastructure Average</b>	<b>-1.6%</b>	<b>9.1%</b>	<b>53.7%</b>

Source: BofA Global Research, Bloomberg

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**Exhibit 22: CrowdStrike within Security led the stock performance YTD**

Security and Vertical software stock performance

	1 Week	YTD	2023 Return
Nasdaq	1.4%	6.5%	43.4%
S&P 500	1.5%	6.5%	24.2%
ALRM	5.2%	13.6%	30.6%
CHKP	-0.9%	5.6%	21.1%
CLVT	-0.3%	-3.6%	11.0%
CRWD	-2.2%	26.1%	142.5%
CYBR	0.2%	19.2%	69.0%
FTNT	0.7%	17.9%	19.7%
GEN	1.4%	-5.1%	6.5%
OKTA	-3.2%	-5.0%	32.5%
PANW	-16.0%	4.4%	111.3%
QLYS	1.0%	-15.4%	74.9%
RPD	-6.2%	-1.8%	68.0%
S	-5.0%	2.2%	88.1%
SCWX	-2.2%	-8.9%	15.5%
TENB	-6.5%	3.7%	20.7%
ZS	-4.3%	9.1%	98.0%
<b>Security Average</b>	<b>-2.5%</b>	<b>4.1%</b>	<b>54.0%</b>
APPF	2.0%	37.4%	64.4%
BLKB	0.3%	-20.0%	47.3%
CCCS	1.0%	1.8%	30.9%
COUR	-3.9%	-16.4%	63.7%
CPLF	-2.1%	0.2%	5.2%
CWAN	1.5%	-0.1%	6.8%
DH	-10.2%	-9.8%	-9.6%
DOX	0.3%	4.1%	-3.3%
ENFN	3.6%	-3.0%	0.3%
ETWO	-0.1%	-7.4%	-25.2%
EVCN	-0.2%	-10.2%	48.3%
GWRE	1.4%	10.8%	74.3%
INST	-5.1%	-14.6%	15.2%
INTA	-4.4%	7.7%	52.4%
IOT	-1.3%	1.8%	168.5%
KARO	-0.1%	1.2%	4.3%
MLNK	-0.7%	-23.0%	80.4%
MODN	-3.1%	-7.2%	-33.6%
NCNO	-0.5%	-11.4%	27.2%
PAR	-3.7%	6.5%	67.0%
PCOR	-1.9%	7.6%	46.7%
PRO	-4.0%	-11.7%	59.9%
PWSC	-7.1%	-3.0%	2.1%
SPSC	-4.4%	-4.9%	50.9%
TEMN	-1.7%	-17.1%	54.2%
TOST	-4.9%	16.8%	1.3%
TWOU	-20.7%	-69.6%	-80.4%
TYL	0.1%	5.6%	29.7%
VEEV	2.0%	16.3%	19.3%
WEAV	1.4%	10.3%	150.4%
<b>Vertical Average</b>	<b>-2.2%</b>	<b>-3.4%</b>	<b>34.0%</b>

Source: BofA Global Research, Bloomberg

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster <sup>R1</sup>
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Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

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