

Five9

4Q23 Wrap: Soft start to '24 show-me story

Reiterate Rating: UNDERPERFORM | PO: 61.00 USD | Price: 71.05 USD

Macro headwinds persist, guidance consistent

Management highlighted a robust sales pipeline, strong deal closure rate and conservatism in guidance. However, focus is on what management described as a “soggy” macro environment leading to weakness in the consumer vertical (FIVN's 3rd largest), a smaller than hoped for 4Q revenue beat and back-end loaded 2024 revenue guidance. We expect the latter to drive the stock in the near term as investors remain focused on revenue acceleration visibility and potential for macro sensitivity to negatively affect forecasts.

Revenue in line, EPS ahead of the Street

FIVN reported total revenue of 239.1mn (+14.7% YoY) vs our estimate and consensus of \$240.6mn and \$238.0mn respectively. Non-GAAP EPS of \$0.61 was well ahead of our at-consensus estimate of \$0.49. FIVN dollar-based retention rate (DBRR) was stable Q/Q at 110%. FIVN introduced full-year 2024 revenue and non-GAAP EPS guidance of \$1,055mn and \$2.16 at the mid (versus Street at \$1,055mn and \$2.17), respectively, which is in line with previous management commentary regarding its preliminary conservative growth outlook for 2024 of 16%. Management expects 2024 DBRR to remain flat with 2023.

Lowering revenue estimates for 2024/2025

We update our estimates to reflect results/guidance. We are lowering our 2024E revenue growth rate to 16.1% (from 16.3%), based primarily on increased caution on the magnitude of FIVN's expected 2H24 growth reacceleration. We also lower our 2024 non-GAAP EPS estimate, though this is primarily due to lighter projected revenue. We hold our 2025E revenue growth estimate constant at 18.1% but lower our absolute estimate by 0.3%.

Reiterate Underperform and \$61 PO

We reiterate our Underperform rating and \$61 PO, implying an EV/Sales multiple of 3.6x our C25 revenue estimate (we roll forward our target multiple, was previously 4.3x CY24 rev). This 3.6x multiple is a discount to the 20% to 30% growth comp group of 7.5x, which we believe is justified based on slower growth and increasing competitive intensity.

Estimates (Dec) (US\$)	2021A	2022A	2023E	2024E	2025E
EPS	1.17	1.50	2.05	2.25	2.66
GAAP EPS	(0.79)	(1.35)	(1.13)	(0.46)	(0.01)
EPS Change (YoY)	15.8%	28.2%	36.7%	9.8%	18.2%
Consensus EPS (Bloomberg)			1.92	2.16	2.70
DPS	0	0	0	0	0
Valuation (Dec)					
P/E	60.7x	47.4x	34.7x	31.6x	26.7x
EV / EBITDA*	48.0x	37.8x	32.1x	27.5x	21.2x
Free Cash Flow Yield*	-0.3%	0.6%	1.7%	1.9%	3.4%

* For full definitions of *IQmethod*SM measures, see page 8.

21 February 2024

Equity

Key Changes

(US\$)	Previous	Current
2023E Rev (m)	912.0	910.5
2024E Rev (m)	1,060.7	1,057.5
2025E Rev (m)	1,252.8	1,248.9
2023E EPS	1.93	2.05
2024E EPS	2.33	2.25
2025E EPS	2.88	2.66

Michael J. Funk
Research Analyst
BofAS
+1 646 855 5664
michael.j.funk@bofa.com

Matt Bullock
Research Analyst
BofAS
+1 646 556 2903
matthew.bullock2@bofa.com

Stock Data

Price	71.05 USD
Price Objective	61.00 USD
Date Established	8-Nov-2022
Investment Opinion	C-3-9
52-Week Range	51.01 USD - 92.40 USD
Mrkt Val (mn) / Shares Out (mn)	5,242 USD / 73.8
Free Float	98.2%
Average Daily Value (mn)	56.60 USD
BofA Ticker / Exchange	FIVN / NAS
Bloomberg / Reuters	FIVN US / FIVN.OQ
ROE (2023E)	35.3%
Net Dbt to Eqty (Dec-2022A)	40.1%
ESGMeter™	Medium

ESGMeter is not indicative of a company's future stock price performance and is not an investment recommendation or rating. ESGMeter is independent of BofA Global Research's equity investment rating, volatility risk rating, income rating, and price objective for that company. For full details, refer to ["BofA ESGMeter Methodology"](#).

BofA Securities does and seeks to do business with issuers covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.

Refer to important disclosures on page 9 to 11. Analyst Certification on page 7. Price Objective Basis/Risk on page 7.

12662386

Timestamp: 21 February 2024 08:58PM EST

iQprofileSM Five9

iQmethodSM – Bus Performance*

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Return on Capital Employed	6.9%	9.2%	9.6%	9.7%	6.1%
Return on Equity	33.5%	41.0%	35.3%	26.4%	24.5%
Operating Margin	13.7%	13.9%	14.1%	14.7%	16.5%
Free Cash Flow	(13)	33	88	98	180

iQmethodSM – Quality of Earnings*

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Cash Realization Ratio	0.4x	0.8x	0.9x	0.9x	1.1x
Asset Replacement Ratio	1.1x	1.3x	0.8x	1.2x	1.4x
Tax Rate	17.6%	NM	NM	NM	142.6%
Net Debt-to-Equity Ratio	141.5%	40.1%	3.1%	-12.0%	-26.6%
Interest Cover	NA	NA	NA	NA	NA

Income Statement Data (Dec)

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Sales	610	779	910	1,057	1,249
% Change	40.2%	27.8%	16.9%	16.1%	18.1%
Gross Profit	387	477	556	643	766
% Change	35.9%	23.2%	16.5%	15.8%	19.1%
EBITDA	111	140	165	193	250
% Change	29.0%	27.1%	17.7%	16.7%	29.4%
Net Interest & Other Income	(4)	1	23	18	19
Net Income (Adjusted)	82	107	150	171	221
% Change	21.3%	30.1%	40.1%	14.3%	29.3%

Free Cash Flow Data (Dec)

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Net Income from Cont Operations (GAAP)	(53)	(95)	(82)	(34)	(1)
Depreciation & Amortization	39	45	49	48	49
Change in Working Capital	(111)	(87)	(106)	(104)	(77)
Deferred Taxation Charge	NA	NA	NA	NA	NA
Other Adjustments, Net	154	226	269	247	277
Capital Expenditure	(42)	(56)	(41)	(58)	(69)
Free Cash Flow	-13	33	88	98	180
% Change	NM	NM	169.4%	11.4%	83.1%
Share / Issue Repurchase	23	9	9	8	7
Cost of Dividends Paid	0	0	0	0	0
Change in Debt	(1)	0	(1)	0	0

Balance Sheet Data (Dec)

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Cash & Equivalents	470	614	730	838	1,025
Trade Receivables	84	87	97	96	127
Other Current Assets	64	77	96	102	111
Property, Plant & Equipment	126	101	109	119	139
Other Non-Current Assets	449	365	462	580	660
Total Assets	1,193	1,244	1,495	1,735	2,061
Short-Term Debt	0	0	2	2	2
Other Current Liabilities	158	151	165	179	221
Long-Term Debt	769	738	745	745	745
Other Non-Current Liabilities	56	45	44	49	50
Total Liabilities	982	935	956	975	1,017
Total Equity	211	310	538	760	1,043
Total Equity & Liabilities	1,193	1,244	1,495	1,735	2,061

* For full definitions of iQmethodSM measures, see page 8.

Company Sector

Server & Enterprise Software

Company Description

Five9's solution is pure cloud and has a multi-tenant based architecture that is very scalable and also secure. Five9's solution is also unified (inbound, outbound, & blended traffic), easy to administer and manage, and offers multi-channel customer touch points. The solution also offers pre-packaged CRM integrations with salesforce.com, Oracle, NetSuite, others.

Investment Rationale

We rate the stock an Underperform primarily on valuation. We believe market fundamentals are favorable in a \$14bn+ market growing 10%+ through 2024, with growth aided by cloud migration. Five9's technology and product functionality has also improved, establishing the vendor as a leader in the space and helping win larger enterprise deals.

Stock Data

Average Daily Volume

796,688

Quarterly Earnings Estimates

	2022	2023
Q1	0.22A	0.41A
Q2	0.34A	0.52A
Q3	0.39A	0.52A
Q4	0.54A	0.61E

Revenue in line, EPS ahead of the Street

FIVN reported total revenue of 239.1mn (+14.7% YoY) vs our estimate and consensus of \$240.6mn and \$238.0mn respectively. Non-GAAP EPS of \$0.61 was well ahead of our at-consensus estimate of \$0.49. FIVN dollar-based retention rate (DBRR) was stable Q/Q at 110%. FIVN introduced full-year 2024 revenue and non-GAAP EPS guidance of \$1,055mn and \$2.16 at the mid (versus Street at \$1,055mn and \$2.17), respectively, which is in line with previous management commentary regarding its preliminary conservative growth outlook for 2024 of 16%. Management expects 2024 DBRR to remain flat with 2023.

Exhibit 1: FIVN reported 4Q23 revenues relatively in line with our estimate

FIVN 4Q23 variance analysis

\$ in Thousands (except per share data)	BofA Estimates	4Q23 Actuals	Variance
Revenues	\$240,555	\$239,062	-0.6%
Cost of revenues	\$93,817	\$92,542	-1%
Gross profit (total)	\$146,739	\$146,520	0%
Operating expenses			
Research and development	\$28,867	\$26,818	-7%
Sales and marketing	\$64,950	\$57,567	-11%
General and administrative	\$20,447	\$24,103	18%
Total operating expense	\$114,264	\$108,488	-5%
EBIT	\$32,475	\$38,032	17%
Other income (expense), net	\$4,908	\$7,163	46%
Net income before taxes	\$37,383	\$45,195	21%
Corporate tax expense	\$935	\$119	-87%
Net income	\$36,449	\$45,076	24%
EPS	0.49	0.61	24%
Weighted average basic and diluted	73,826	73,785	0%
Growth Analysis Y-Y			
Revenues	15.5%	14.7%	-5%
EBIT	-14.6%	0.0%	NA
Net income	-6.4%	15.7%	NA
Cash EPS	-9.3%	12.2%	NA
Margin Analysis			
Total Gross Margin	61.0%	61.3%	0%
Research and development	12.0%	11.2%	-7%
Sales and marketing	27.0%	24.1%	-11%
General and administrative	8.5%	10.1%	19%
Operating Margin	13.5%	15.9%	18%
Pretax Margin	15.5%	18.9%	22%
Tax Rate (pro forma)	2.5%	0.3%	-89%
Net Margin	15.2%	18.9%	24%
Balance Sheet & Cash Flow Analysis			
Total cash and equiv.	723	730	1%
Cash Flow from Operations	32	37	14%
Free Cash Flow	\$18	\$21	16%

Source: BofA Global Research estimates, company filings

BofA GLOBAL RESEARCH



Exhibit 2: We are lowering our 2024 and 2025 revenue estimates

Estimate change summary

	1Q24E				2024E				2025E			
	Previous Estimate	Previous Y/Y Growth	New Estimate	New Y/Y Growth	Previous Estimate	Previous Y/Y Growth	New Estimate	New Y/Y Growth	Previous Estimate	Previous Y/Y Growth	New Estimate	New Y/Y Growth
Total revenues	\$249,746	14.3%	\$243,559	11.5%	\$1,060,738	16.3%	\$1,057,472	16.1%	\$1,252,773	18.1%	\$1,248,915	18.1%
Proforma op. income	30,469	14.4%	28,009	5.1%	157,167	27.5%	155,875	21.0%	218,706	39.2%	205,940	32.1%
Proforma net income	\$34,850	18.4%	\$31,275	6.2%	\$174,987	23.9%	\$171,386	14.4%	\$235,234	34.4%	\$221,451	29.2%
Pro forma EPS	\$0.47	15.2%	0.42	2.9%	\$2.33	20.5%	\$2.25	9.8%	\$2.88	23.7%	\$2.66	18.2%

Source: BofA Global Research estimates

BofA GLOBAL RESEARCH

Exhibit 3: We are modeling 16.1% revenue growth in 2024

FIVN income statement

\$ Thousands, except EPS	YEAR FY21A	YEAR FY22A	YEAR FY23A	Mar 1Q24E	Jun 2Q24E	Sep 3Q24E	Dec 4Q24E	YEAR FY24E	YEAR FY25E	YEAR FY26E
Revenues	609,591	778,846	910,488	243,559	254,085	269,223	290,604	1,057,472	1,248,915	1,514,917
Y/Y rev growth	40.2%	27.8%	16.9%	11.5%	14.0%	17.0%	21.6%	16.1%	18.1%	21.3%
Cost of revenues	222,382	301,661	354,793	96,206	100,364	104,997	112,464	414,030	482,745	577,958
Gross profit (total)	387,209	477,185	555,695	147,353	153,722	164,226	178,140	643,441	766,170	936,959
Operating expenses										
Research and development	77,718	97,429	106,152	29,227	31,761	32,307	31,966	125,261	146,694	162,760
Sales and marketing	158,659	202,690	230,484	65,761	66,062	69,998	69,745	271,566	314,486	373,808
General and administrative	67,273	68,821	90,231	24,356	21,597	21,538	23,248	90,739	99,050	110,220
Total operating expense	303,650	368,940	426,867	119,344	119,420	123,843	124,960	487,566	560,230	646,788
EBITDA	110,503	140,436	165,324	36,534	43,195	49,806	63,352	192,886	249,652	343,193
EBIT	83,559	108,245	128,828	28,009	34,302	40,383	53,180	155,875	205,940	290,171
Other income (expense), net	(4,078)	1,031	23,385	3,775	4,420	4,725	5,080	18,001	18,680	22,514
Net income before taxes	79,481	109,276	152,213	31,785	38,722	45,109	58,260	173,876	224,620	312,685
Corporate tax expense	(2,712)	2,558	2,341	510	606	660	713	2,490	3,169	4,391
Net income	82,193	106,718	149,872	31,275	38,115	44,449	57,547	171,386	221,451	308,294
EPS	1.17	1.50	2.05	0.42	0.50	0.58	0.74	2.25	2.66	3.44
GAAP Net Income	(53,000)	(94,650)	(81,764)	(21,252)	(10,557)	(6,797)	4,120	(34,486)	(947)	46,433
GAAP EPS	(0.79)	(1.35)	(1.13)	(0.29)	(0.14)	(0.09)	0.05	(0.46)	(0.01)	0.53
Basic shares	67,505	69,920	72,042	73,626	74,326	75,026	75,526	74,626	81,276	87,776
Weighted average basic and diluted	70,186	71,229	73,035	74,685	75,585	76,485	77,385	76,035	83,135	89,635

Source: BofA Global Research estimates, company filings

Exhibit 4: FIVN ended 2023 with \$730mn in cash and equivalents

FIVN balance sheet

\$ Thousands	YEAR FY21A	YEAR FY22A	YEAR FY23A	Mar 1Q24E	Jun 2Q24E	Sep 3Q24E	Dec 4Q24E	YEAR FY24E	YEAR FY25E	YEAR FY26E
Current Assets										
Total cash and equiv.	90,878	180,520	143,201	143,345	166,978	210,764	250,628	250,628	437,625	727,822
Marketable securities	378,980	433,743	587,096	587,096	587,096	587,096	587,096	587,096	587,096	587,096
Accounts receivable, net	83,731	87,494	97,424	90,117	88,930	94,228	95,899	95,899	126,523	146,245
Prepaid expenses and other current assets	63,637	29,711	34,622	34,098	35,572	32,307	40,685	40,685	48,862	59,106
Deferred contract acquisition cost, net		47,242	61,711	61,711	61,711	61,711	61,711	61,711	61,711	61,711
							1,036,01	1,036,01	1,261,81	1,581,98
Total Current Assets	617,226	778,710	924,054	916,367	940,287	986,106	9	9	6	0
PP&E, incl. capital leases going forward	126,488	101,221	108,572	110,800	113,239	115,980	119,149	119,149	138,533	164,631
Intangible assets, net	39,897	28,192	38,323	38,323	38,323	38,323	38,323	38,323	38,323	38,323
Goodwill	165,420	165,420	227,412	227,412	227,412	227,412	227,412	227,412	227,412	227,412
Other assets	243,911	170,942	196,207	231,382	261,708	282,684	313,852	313,852	394,565	466,719
	1,192,94	1,244,48	1,494,56	1,524,28	1,580,96	1,650,50	1,734,75	1,734,75	2,060,64	2,479,06
Total Assets	2	5	8	4	9	5	6	6	9	6
Current Liabilities										
Accounts Payable	20,510	23,629	24,399	26,792	27,949	29,615	31,966	31,966	36,379	45,213
Accrued liabilities	78,577	53,092	62,131	46,276	48,276	51,152	55,215	55,215	77,179	86,845
Accrued federal fees	2,282	2,471	-	-	-	-	-	-	-	-
Sales tax liability	2,660	2,973	-	-	-	-	-	-	-	-
Notes payable	-	169	-	-	-	-	-	-	-	-
Finance lease ST	-	-	1,767	1,767	1,767	1,767	1,767	1,767	1,767	1,767
Operating lease ST	9,826	10,626	10,731	10,731	10,731	10,731	10,731	10,731	10,731	10,731
Deferred Revenue	43,720	57,816	68,187	66,362	69,648	74,871	80,636	80,636	96,532	116,958
Total Current liabilities	157,575	150,776	167,215	151,928	158,371	168,135	180,315	180,315	222,588	261,514
Accrued federal fees	-	-	-	-	-	-	-	-	-	-
Sales tax liability	877	899	-	-	-	-	-	-	-	-
Revolving line of credit	-	-	-	-	-	-	-	-	-	-
Notes payable	768,599	738,376	742,125	742,125	742,125	742,125	742,125	742,125	742,125	742,125
Finance lease LT	-	-	2,877	2,877	2,877	2,877	2,877	2,877	2,877	2,877
Operating lease LT	47,088	41,389	36,378	36,378	36,378	36,378	36,378	36,378	36,378	36,378
Preferred stock warrant liability	-	-	-	-	-	-	-	-	-	-
Other Long Term Liability	7,671	3,080	7,888	8,036	7,623	10,769	13,077	13,077	13,380	17,580
									1,017,34	1,060,47
Total Liabilities	981,810	934,520	956,483	941,344	947,374	960,284	974,772	974,772	9	4
									1,043,30	1,418,59
Stockholders' Equity	211,132	309,965	538,085	582,940	633,595	690,221	759,984	759,984	1	2
	1,192,94	1,244,48	1,494,56	1,524,28	1,580,96	1,650,50	1,734,75	1,734,75	2,060,64	2,479,06
Total liabilities and shareholder equity	2	5	8	4	9	5	6	6	9	6

Source: BofA Global Research estimates, company filings

Exhibit 5: FIVN generated \$129mn in CFO during 2023

FIVN cash flow statement

\$ Thousands, except EPS	YEAR FY21A	YEAR FY22A	YEAR FY23A	Mar 1Q24E	Jun 2Q24E	Sep 3Q24E	Dec 4Q24E	YEAR FY24E	YEAR FY25E	YEAR FY26E
Cash Flows from Operations:										
Net Income	(53,000)	(94,650)	(81,764)	(21,252)	(10,557)			(34,486)	(947)	46,433
Depreciation and Amortization	38,732	44,671	48,515	11,168	11,536	12,066	12,814	47,584	49,307	57,222
Amortization of op lease ROU assets	8,698	10,377	12,642	3,161	3,217	3,295	3,270	12,943	13,011	13,023
Amortization of deferred contract acq costs	26,050	41,034	55,384	12,500	12,500	12,500	12,500	50,000	50,000	50,000
Amortization of premium mktable investments	6,385	(90)	(11,351)							
Provision for doubtful accounts	808	1,105	989	247	230	235	226	938	928	927
Stock based compensation	108,805	172,507	206,292	46,276	43,195	45,768	47,950	183,188	213,008	257,661
Loss (gain) on extinguishment of debt	-	-	-					-	-	-
Noncash interest expense	-	-	3,749					-	-	-
Changes in fair value of convertible preferred stock warrant liability	5,640	260	-					-	-	-
Reversal of interest and penalties on accrued federal fees	-	-	-					-	-	-
Others	(2,554)	1,119	860					-	-	-
Changes in Working Capital Accounts										
Changes in Accounts Receivable	(35,986)	(4,899)	(9,844)	7,307	1,187	(5,298)	(1,671)	1,525	(30,623)	(19,722)
Changes in Prepaids	(14,193)	661	(3,532)	524	(1,474)	3,265	(8,378)	(6,063)	(8,177)	(10,245)
Changes in Other Assets	(1,216)	(85,516)	(95,532)	(35,175)	(30,327)	(20,976)	(31,168)	(117,645)	(80,713)	(72,154)
Changes in Accounts Payable	4,305	845	2,932	2,393	1,158	1,665	2,352	7,567	4,413	8,834
Accrued and other current liabilities	(51,315)	(8,379)	(9,274)	(15,855)	2,000	2,876	4,062	(6,916)	21,965	9,665
Changes in Deferred Revenue	10,462	13,176	4,958	(1,825)	3,285	5,223	5,765	12,449	15,896	20,426
Other Liabilities	(22,623)	(3,356)	3,814	148	(414)	3,146	2,308	5,189	303	4,200
Total Cash Flow from Operating Activities	28,998	88,865	128,838	9,617	35,537	56,968	54,150	156,273	248,371	366,270
EBITDA	110,503	140,436	165,324	36,534	43,195	49,806	63,352	192,886	249,652	343,193
Investing Activities:										
PPE/Includes capital lease going forward	(42,216)	(56,171)	(40,771)	(13,396)	(13,975)	(14,807)	(15,983)	(58,161)	(68,690)	(83,320)
Cash restricted for financing activities	-	-	-					-	-	-
Purchases/proceeds from investments	(108,262)	89,400	(138,203)					-	-	-
Other Investing Activities including M&A	-	(2,266)	(80,588)					-	-	-
Total Cash Flow from Investing Activities	(150,478)	30,963	(259,562)	(13,396)	(13,975)	(14,807)	(15,983)	(58,161)	(68,690)	(83,320)
Financing Activities:										
Net proceeds from issuance of convertible preferred stock, convertible senior notes	-	-	-					-	-	-
Repurchase of portion of 2023 convertible senior notes net costs	(24,688)	(34,067)	-					-	-	-
Proceeds from unwinding of converts	-	-	74,453					-	-	-
Proceeds from exercise of common stock options	22,799	8,522	9,127	2,282	2,071	1,625	1,697	7,675	7,316	7,247
Payments of capital leases (capex)	(612)	-	(989)					-	-	-
Proceeds from equipment financing	-	-	-					-	-	-
Payments for deferred offering costs	(5,000)	-	-					-	-	-
Other	-	(4,687)	11,988					-	-	-
Changes in Financing Activities	(7,501)	(30,232)	94,579	2,282	2,071	1,625	1,697	7,675	7,316	7,247
Adjustments	(128,981)	89,596	(36,145)	(1,497)	23,633	43,786	39,865	105,786	186,997	290,197
Change in Cash and Cash Equivalents	220,372	91,391	180,987	144,842	143,345	166,978	210,764	144,842	250,628	437,625
Cash Beginning Balance	91,391	180,987	144,842	143,345	166,978	210,764	250,628	250,628	437,625	727,822

Source: BofA Global Research estimates, company filings

Price objective basis & risk

Five9 (FIVN)

Our PO of \$61 is based on a CY25e EV/Sales multiple of 3.6x, a discount with 20-30% growth software group. We believe this is justified based on slower growth and an intensifying competitive environment. While we believe CCaaS is an attractive market, we see risk to long term revenue growth projections.

Downside risks to our PO are any slowdown in the enterprise sales ramp and productivity, failure to execute new large deals, slower than expected EBITDA and FCF margin expansion, and heightened competition in the contact center market. Upside risks are improving success upmarket with larger enterprises, partnerships with or acquisition by larger platform vendors, better than expected contact center demand.

Analyst Certification

I, Michael J. Funk, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

US - Enterprise Software Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	8x8	EGHT	EGHT US	Michael J. Funk
	Adobe	ADBE	ADBE US	Brad Sills
	Alarm.com	ALRM	ALRM US	Michael J. Funk
	Amplitude, Inc.	AMPL	AMPL US	Koji Ikeda, CFA
	BILL	BILL	BILL US	Brad Sills
	CCC Intelligent Solutions	CCCS	CCCS US	Michael J. Funk
	Dynatrace	DT	DT US	Koji Ikeda, CFA
	Elastic NV	ESTC	ESTC US	Koji Ikeda, CFA
	GitLab Inc.	GTLB	GTLB US	Koji Ikeda, CFA
	Global-e Online Ltd.	GLBE	GLBE US	Koji Ikeda, CFA
	HubSpot	HUBS	HUBS US	Brad Sills
	Informatica Inc.	INFA	INFA US	Koji Ikeda, CFA
	Intapp Inc.	INTA	INTA US	Koji Ikeda, CFA
	Intuit	INTU	INTU US	Brad Sills
	JFrog Ltd	FROG	FROG US	Koji Ikeda, CFA
	MeridianLink, Inc.	MLNK	MLNK US	Koji Ikeda, CFA
	Microsoft Corporation	MSFT	MSFT US	Brad Sills
	MongoDB Inc	MDB	MDB US	Brad Sills
	nCino, Inc.	NCNO	NCNO US	Adam Bergere
	NICE Ltd.	NICE	NICE US	Michael J. Funk
	NICE Ltd.	NCSYF	NICE IT	Michael J. Funk
	PagerDuty	PD	PD US	Koji Ikeda, CFA
	PowerSchool Holdings, Inc.	PWSC	PWSC US	Koji Ikeda, CFA
	RingCentral	RNG	RNG US	Michael J. Funk
	Salesforce.com	CRM	CRM US	Brad Sills
	ServiceNow	NOW	NOW US	Brad Sills
	UiPath	PATH	PATH US	Brad Sills
	Unity	U	U US	Michael J. Funk
	Weave	WEAV	WEAV US	Michael J. Funk
	Workday Inc.	WDAY	WDAY US	Brad Sills
	Zeta Global	ZETA	ZETA US	Koji Ikeda, CFA
	ZoomInfo	ZI	ZI US	Koji Ikeda, CFA
NEUTRAL				
	Autodesk	ADSK	ADSK US	Michael J. Funk
	Bentley Systems	BSY	BSY US	Michael J. Funk
	BigCommerce Holdings, Inc.	BIGC	BIGC US	Koji Ikeda, CFA
	Coveo	YCVO	CVO CN	Koji Ikeda, CFA
	Datadog Inc	DDOG	DDOG US	Koji Ikeda, CFA



US - Enterprise Software Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
	DocuSign	DOCU	DOCU US	Brad Sills
	Freshworks, Inc.	FRSH	FRSH US	Adam Bergere
	HashiCorp	HCP	HCP US	Brad Sills
	Jamf	JAMF	JAMF US	Koji Ikeda, CFA
	Lightspeed Commerce Inc.	LSPD	LSPD US	Koji Ikeda, CFA
	Lightspeed Commerce Inc.	YLSPD	LSPD CN	Koji Ikeda, CFA
	Oracle Corporation	ORCL	ORCL US	Brad Sills
	Paycom	PAYC	PAYC US	Adam Bergere
	Paylocity	PCTY	PCTY US	Adam Bergere
	Shopify, Inc.	SHOP	SHOP US	Brad Sills
	Snowflake	SNOW	SNOW US	Brad Sills
	Veeva Systems, Inc.	VEEV	VEEV US	Brad Sills
	Zoom Video Communications	ZM	ZM US	Michael J. Funk

UNDERPERFORM

	AvidXchange, Inc.	AVDX	AVDX US	Brad Sills
	Blackbaud, Inc.	BLKB	BLKB US	Koji Ikeda, CFA
	BlackLine, Inc.	BL	BL US	Koji Ikeda, CFA
	C3.ai	AI	AI US	Brad Sills
	Confluent	CFLT	CFLT US	Brad Sills
	CS Disco, Inc.	LAW	LAW US	Koji Ikeda, CFA
	Dropbox	DBX	DBX US	Michael J. Funk
	Enfusion, Inc.	ENFN	ENFN US	Koji Ikeda, CFA
	Five9	FIVN	FIVN US	Michael J. Funk
	Guidewire Software, Inc.	GWRE	GWRE US	Michael J. Funk
	Twilio	TWLO	TWLO US	Michael J. Funk
	Vertex, Inc.	VERX	VERX US	Brad Sills

RSTR

	Splunk	SPLK	SPLK US	Brad Sills
--	--------	------	---------	------------

iQmethodSM Measures Definitions**Business Performance**

Return On Capital Employed

Return On Equity

Operating Margin

Earnings Growth

Free Cash Flow

Numerator

NOPAT = (EBIT + Interest Income) × (1 – Tax Rate) + Goodwill Amortization

Net Income

Operating Profit

Expected 5 Year CAGR From Latest Actual

Cash Flow From Operations – Total Capex

Denominator

Total Assets – Current Liabilities + ST Debt + Accumulated Goodwill

Amortization

Shareholders' Equity

Sales

N/A

N/A

Quality of Earnings

Cash Realization Ratio

Asset Replacement Ratio

Tax Rate

Net Debt-To-Equity Ratio

Interest Cover

Numerator

Cash Flow From Operations

Capex

Tax Charge

Net Debt = Total Debt – Cash & Equivalents

EBIT

Denominator

Net Income

Depreciation

Pre-Tax Income

Total Equity

Interest Expense

Valuation Toolkit

Price / Earnings Ratio

Price / Book Value

Dividend Yield

Free Cash Flow Yield

Enterprise Value / Sales

Numerator

Current Share Price

Current Share Price

Annualised Declared Cash Dividend

Cash Flow From Operations – Total Capex

EV = Current Share Price × Current Shares + Minority Equity + Net Debt +

Other LT Liabilities

Enterprise Value

Denominator

Diluted Earnings Per Share (Basis As Specified)

Shareholders' Equity / Current Basic Shares

Current Share Price

Market Cap = Current Share Price × Current Basic Shares

Sales

Basic EBIT + Depreciation + Amortization

iQmethodSM is the set of BofA Global Research standard measures that serve to maintain global consistency under three broad headings: Business Performance, Quality of Earnings, and valuations. The key features of iQmethod are: A consistently structured, detailed, and transparent methodology. Guidelines to maximize the effectiveness of the comparative valuation process, and to identify some common pitfalls.

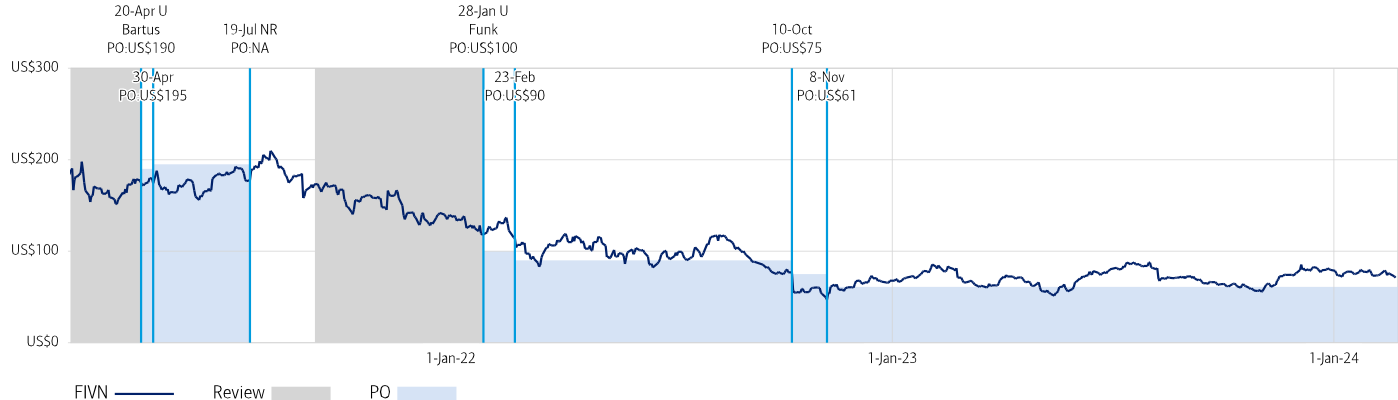
iQdatabase[®] is our real-time global research database that is sourced directly from our equity analysts' earnings models and includes forecasted as well as historical data for income statements, balance sheets, and cash flow statements for companies covered by BofA Global Research.

iQprofileSM, iQmethodSM are service marks of Bank of America Corporation. iQdatabase[®] is a registered service mark of Bank of America Corporation.

Disclosures

Important Disclosures

Five9 (FIVN) Price Chart



B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

The Investment Opinion System is contained at the end of the report under the heading "Fundamental Equity Opinion Key". Dark grey shading indicates the security is restricted with the opinion suspended. Medium grey shading indicates the security is under review with the opinion withdrawn. Light grey shading indicates the security is not covered. Chart is current as of a date no more than one trading day prior to the date of the report.

Equity Investment Rating Distribution: Technology Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	215	53.09%	Buy	111	51.63%
Hold	97	23.95%	Hold	45	46.39%
Sell	93	22.96%	Sell	24	25.81%

Equity Investment Rating Distribution: Global Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	1895	53.62%	Buy	1083	57.15%
Hold	832	23.54%	Hold	454	54.57%
Sell	807	22.84%	Sell	383	47.46%

^{R1} Issuers that were investment banking clients of BofA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

FUNDAMENTAL EQUITY OPINION KEY: Opinions include a Volatility Risk Rating, an Investment Rating and an Income Rating. **VOLATILITY RISK RATINGS**, indicators of potential price fluctuation, are: A - Low, B - Medium and C - High. **INVESTMENT RATINGS** reflect the analyst's assessment of both a stock's absolute total return potential as well as its attractiveness for investment relative to other stocks within its Coverage Cluster (defined below). Our investment ratings are: 1 - Buy stocks are expected to have a total return of at least 10% and are the most attractive stocks in the coverage cluster; 2 - Neutral stocks are expected to remain flat or increase in value and are less attractive than Buy rated stocks and 3 - Underperform stocks are the least attractive stocks in a coverage cluster. An investment rating of 6 (No Rating) indicates that a stock is no longer trading on the basis of fundamentals. Analysts assign investment ratings considering, among other things, the 0-12 month total return expectation for a stock and the firm's guidelines for ratings dispersions (shown in the table below). The current price objective for a stock should be referenced to better understand the total return expectation at any given time. The price objective reflects the analyst's view of the potential price appreciation (depreciation).

Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster ^{R2}
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

^{R2} Ratings dispersions may vary from time to time where BofA Global Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

INCOME RATINGS, indicators of potential cash dividends, are: 7 - same/higher (dividend considered to be secure), 8 - same/lower (dividend not considered to be secure) and 9 - pays no cash dividend. **Coverage Cluster** is comprised of stocks covered by a single analyst or two or more analysts sharing a common industry, sector, region or other classification(s). A stock's coverage cluster is included in the most recent BofA Global Research report referencing the stock.

Price Charts for the securities referenced in this research report are available on the [Price Charts website](#), or call 1-800-MERRILL to have them mailed.

BofAS or one of its affiliates acts as a market maker for the equity securities recommended in the report: Five9.

BofAS or an affiliate has received compensation from the issuer for non-investment banking services or products within the past 12 months: Five9 Inc.

The issuer is or was, within the last 12 months, a non-securities business client of BofAS and/or one or more of its affiliates: Five9 Inc.

BofAS or one of its affiliates is willing to sell to, or buy from, clients the common equity of the issuer on a principal basis: Five9.

The issuer is or was, within the last 12 months, a securities business client (non-investment banking) of BofAS and/or one or more of its affiliates: Five9 Inc.

BofA Global Research personnel (including the analyst(s) responsible for this report) receive compensation based upon, among other factors, the overall profitability of Bank of America Corporation, including profits derived from investment banking. The analyst(s) responsible for this report may also receive compensation based upon, among other factors, the overall profitability of the Bank's sales and trading businesses relating to the class of securities or financial instruments for which such analyst is responsible.



Other Important Disclosures

From time to time research analysts conduct site visits of covered issuers. BofA Global Research policies prohibit research analysts from accepting payment or reimbursement for travel expenses from the issuer for such visits.

Prices are indicative and for information purposes only. Except as otherwise stated in the report, for any recommendation in relation to an equity security, the price referenced is the publicly traded price of the security as of close of business on the day prior to the date of the report or, if the report is published during intraday trading, the price referenced is indicative of the traded price as of the date and time of the report and in relation to a debt security (including equity preferred and CDS), prices are indicative as of the date and time of the report and are from various sources including BofA Securities trading desks.

The date and time of completion of the production of any recommendation in this report shall be the date and time of dissemination of this report as recorded in the report timestamp.

Recipients who are not institutional investors or market professionals should seek the advice of their independent financial advisor before considering information in this report in connection with any investment decision, or for a necessary explanation of its contents.

Officers of BofA or one or more of its affiliates (other than research analysts) may have a financial interest in securities of the issuer(s) or in related investments.

Refer to [BofA Global Research policies relating to conflicts of interest](#).

'BofA Securities' includes BofA Securities, Inc. ('BofAS') and its affiliates. Investors should contact their BofA Securities representative or Merrill Global Wealth Management financial advisor if they have questions concerning this report or concerning the appropriateness of any investment idea described herein for such investor. 'BofA Securities' is a global brand for BofA Global Research.

Information relating to Non-US affiliates of BofA Securities and Distribution of Affiliate Research Reports:

BofAS and/or Merrill Lynch, Pierce, Fenner & Smith Incorporated ("MLPF&S") may in the future distribute, information of the following non-US affiliates in the US (short name: legal name, regulator): Merrill Lynch (South Africa): Merrill Lynch South Africa (Pty) Ltd., regulated by The Financial Service Board; MLI (UK): Merrill Lynch International, regulated by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA); BofASE (France): BofA Securities Europe SA is authorized by the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers (AMF). BofA Securities Europe SA ("BofASE") with registered address at 51, rue La Boétie, 75008 Paris is registered under no 842 602 690 RCS Paris. In accordance with the provisions of French Code Monétaire et Financier (Monetary and Financial Code), BofASE is an établissement de crédit et d'investissement (credit and investment institution) that is authorised and supervised by the European Central Bank and the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers. BofASE's share capital can be found at www.bofam.com/BofASEdisclaimer; BofA Europe (Milan): Bank of America Europe Designated Activity Company, Milan Branch, regulated by the Bank of Italy, the European Central Bank (ECB) and the Central Bank of Ireland (CBI); BofA Europe (Frankfurt): Bank of America Europe Designated Activity Company, Frankfurt Branch regulated by BaFin, the ECB and the CBI; BofA Europe (Madrid): Bank of America Europe Designated Activity Company, Sucursal en España, regulated by the Bank of Spain, the ECB and the CBI; Merrill Lynch (Australia): Merrill Lynch Equities (Australia) Limited, regulated by the Australian Securities and Investments Commission; Merrill Lynch (Hong Kong): Merrill Lynch (Asia Pacific) Limited, regulated by the Hong Kong Securities and Futures Commission (HKSCF); Merrill Lynch (Singapore): Merrill Lynch (Singapore) Pte Ltd, regulated by the Monetary Authority of Singapore (MAS); Merrill Lynch (Canada): Merrill Lynch Canada Inc, regulated by the Canadian Investment Regulatory Organization; Merrill Lynch (Mexico): Merrill Lynch Mexico, SA de CV, Casa de Bolsa, regulated by the Comisión Nacional Bancaria y de Valores; Merrill Lynch (Argentina): Merrill Lynch Argentina SA, regulated by Comisión Nacional de Valores; BofAS Japan: BofA Securities Japan Co., Ltd., regulated by the Financial Services Agency; Merrill Lynch (Seoul): Merrill Lynch International, LLC Seoul Branch, regulated by the Financial Supervisory Service; Merrill Lynch (Taiwan): Merrill Lynch Securities (Taiwan) Ltd., regulated by the Securities and Futures Bureau; BofAS India: BofA Securities India Limited, regulated by the Securities and Exchange Board of India (SEBI); Merrill Lynch (Israel): Merrill Lynch Israel Limited, regulated by Israel Securities Authority; Merrill Lynch (DIFC): Merrill Lynch International (DIFC Branch), regulated by the Dubai Financial Services Authority (DFSA); Merrill Lynch (Brazil): Merrill Lynch S.A. Corretora de Títulos e Valores Mobiliários, regulated by Comissão de Valores Mobiliários; Merrill Lynch KSA Company: Merrill Lynch Kingdom of Saudi Arabia Company, regulated by the Capital Market Authority.

This information: has been approved for publication and is distributed in the United Kingdom (UK) to professional clients and eligible counterparties (as each is defined in the rules of the FCA and the PRA) by MLI (UK), which is authorized by the PRA and regulated by the FCA and the PRA - details about the extent of our regulation by the FCA and PRA are available from us on request; has been approved for publication and is distributed in the European Economic Area (EEA) by BofASE (France), which is authorized by the ACPR and regulated by the ACPR and the AMF; has been considered and distributed in Japan by BofAS Japan, a registered securities dealer under the Financial Instruments and Exchange Act in Japan, or its permitted affiliates; is issued and distributed in Hong Kong by Merrill Lynch (Hong Kong) which is regulated by HKSCF; is issued and distributed in Taiwan by Merrill Lynch (Taiwan); is issued and distributed in India by BofAS India; and is issued and distributed in Singapore to institutional investors and/or accredited investors (each as defined under the Financial Advisers Regulations) by Merrill Lynch (Singapore) (Company Registration No 198602883D). Merrill Lynch (Singapore) is regulated by MAS. Merrill Lynch Equities (Australia) Limited (ABN 65 006 276 795), AFS License 235132 (MLEA) distributes this information in Australia only to 'Wholesale' clients as defined by s.761G of the Corporations Act 2001. With the exception of Bank of America N.A., Australia Branch, neither MLEA nor any of its affiliates involved in preparing this information is an Authorised Deposit-Taking Institution under the Banking Act 1959 nor regulated by the Australian Prudential Regulation Authority. No approval is required for publication or distribution of this information in Brazil and its local distribution is by Merrill Lynch (Brazil) in accordance with applicable regulations. Merrill Lynch (DIFC) is authorized and regulated by the DFSA. Information prepared and issued by Merrill Lynch (DIFC) is done so in accordance with the requirements of the DFSA conduct of business rules. BofA Europe (Frankfurt) distributes this information in Germany and is regulated by BaFin, the ECB and the CBI. BofA Securities entities, including BofA Europe and BofASE (France), may outsource/delegate the marketing and/or provision of certain research services or aspects of research services to other branches or members of the BofA Securities group. You may be contacted by a different BofA Securities entity acting for and on behalf of your service provider where permitted by applicable law. This does not change your service provider.

Please refer to the [Electronic Communications Disclaimers](#) for further information.

This information has been prepared and issued by BofAS and/or one or more of its non-US affiliates. The author(s) of this information may not be licensed to carry on regulated activities in your jurisdiction and, if not licensed, do not hold themselves out as being able to do so. BofAS and/or MLPF&S is the distributor of this information in the US and accepts full responsibility for information distributed to BofAS and/or MLPF&S clients in the US by its non-US affiliates. Any US person receiving this information and wishing to effect any transaction in any security discussed herein should do so through BofAS and/or MLPF&S and not such foreign affiliates. Hong Kong recipients of this information should contact Merrill Lynch (Asia Pacific) Limited in respect of any matters relating to dealing in securities or provision of specific advice on securities or any other matters arising from, or in connection with, this information. Singapore recipients of this information should contact Merrill Lynch (Singapore) Pte Ltd in respect of any matters arising from, or in connection with, this information. For clients that are not accredited investors, expert investors or institutional investors Merrill Lynch (Singapore) Pte Ltd accepts full responsibility for the contents of this information distributed to such clients in Singapore.

General Investment Related Disclosures:

Taiwan Readers: Neither the information nor any opinion expressed herein constitutes an offer or a solicitation of an offer to transact in any securities or other financial instrument. No part of this report may be used or reproduced or quoted in any manner whatsoever in Taiwan by the press or any other person without the express written consent of BofA Securities.

This document provides general information only, and has been prepared for, and is intended for general distribution to, BofA Securities clients. Neither the information nor any opinion expressed constitutes an offer or an invitation to make an offer, to buy or sell any securities or other financial instrument or any derivative related to such securities or instruments (e.g., options, futures, warrants, and contracts for differences). This document is not intended to provide personal investment advice and it does not take into account the specific investment objectives, financial situation and the particular needs of, and is not directed to, any specific person(s). This document and its content do not constitute, and should not be considered to constitute, investment advice for purposes of ERISA, the US tax code, the Investment Advisers Act or otherwise. Investors should seek financial advice regarding the appropriateness of investing in financial instruments and implementing investment strategies discussed or recommended in this document and should understand that statements regarding future prospects may not be realized. Any decision to purchase or subscribe for securities in any offering must be based solely on existing public information on such security or the information in the prospectus or other offering document issued in connection with such offering, and not on this document.

Securities and other financial instruments referred to herein, or recommended, offered or sold by BofA Securities, are not insured by the Federal Deposit Insurance Corporation and are not deposits or other obligations of any insured depository institution (including, Bank of America, N.A.). Investments in general and, derivatives, in particular, involve numerous risks, including, among others, market risk, counterparty default risk and liquidity risk. No security, financial instrument or derivative is suitable for all investors. Digital assets are extremely speculative, volatile and are largely unregulated. In some cases, securities and other financial instruments may be difficult to value or sell and reliable information about the value or risks related to the security or financial instrument may be difficult to obtain. Investors should note that income from such securities and other financial instruments, if any, may fluctuate and that price or value of such

securities and instruments may rise or fall and, in some cases, investors may lose their entire principal investment. Past performance is not necessarily a guide to future performance. Levels and basis for taxation may change.

This report may contain a short-term trading idea or recommendation, which highlights a specific near-term catalyst or event impacting the issuer or the market that is anticipated to have a short-term price impact on the equity securities of the issuer. Short-term trading ideas and recommendations are different from and do not affect a stock's fundamental equity rating, which reflects both a longer term total return expectation and attractiveness for investment relative to other stocks within its Coverage Cluster. Short-term trading ideas and recommendations may be more or less positive than a stock's fundamental equity rating.

BoFA Securities is aware that the implementation of the ideas expressed in this report may depend upon an investor's ability to "short" securities or other financial instruments and that such action may be limited by regulations prohibiting or restricting "shortselling" in many jurisdictions. Investors are urged to seek advice regarding the applicability of such regulations prior to executing any short idea contained in this report.

Foreign currency rates of exchange may adversely affect the value, price or income of any security or financial instrument mentioned herein. Investors in such securities and instruments, including ADRs, effectively assume currency risk.

BoFA or one of its affiliates is a regular issuer of traded financial instruments linked to securities that may have been recommended in this report. BoFA or one of its affiliates may, at any time, hold a trading position (long or short) in the securities and financial instruments discussed in this report.

BoFA Securities, through business units other than BoFA Global Research, may have issued and may in the future issue trading ideas or recommendations that are inconsistent with, and reach different conclusions from, the information presented herein. Such ideas or recommendations may reflect different time frames, assumptions, views and analytical methods of the persons who prepared them, and BoFA Securities is under no obligation to ensure that such other trading ideas or recommendations are brought to the attention of any recipient of this information.

In the event that the recipient received this information pursuant to a contract between the recipient and BoFA for the provision of research services for a separate fee, and in connection therewith BoFA may be deemed to be acting as an investment adviser, such status relates, if at all, solely to the person with whom BoFA has contracted directly and does not extend beyond the delivery of this report (unless otherwise agreed specifically in writing by BoFA). If such recipient uses the services of BoFA in connection with the sale or purchase of a security referred to herein, BoFA may act as principal for its own account or as agent for another person. BoFA is and continues to act solely as a broker-dealer in connection with the execution of any transactions, including transactions in any securities referred to herein.

BoFA ESGMeter Methodology:

ESGMeter is a proprietary metric based on quantitative analysis and fundamental analyst inputs that reflects our assessment of a company's Environmental, Social and Governance-related attributes. The ESGMeter is intended to indicate a company's likelihood of experiencing stronger financial stability (higher return on equity and lower earnings and price volatility) over the next three years relative to peer group. There are three ESGMeter levels - Low, Medium, and High - which indicate whether a company has attributes most likely to translate into superior financial stability (in the case of a High level) or weaker financial stability (in the case of a Low level) over the next three years relative to its peer group. A Medium level suggests that a company exhibits ESG characteristics that are likely associated with financial stability results in line with its peer group over the next three years. Full details of our methodology, financial stability definition and disclaimers are available at [BoFA ESGMeter methodology](#). ESGMeter is not indicative of a company's future stock price performance and is not an investment recommendation or rating.

ESGMeter is independent of the BoFA Global Research fundamental equity analyst's investment rating, volatility risk rating, income rating or price objective for that company.

Copyright and General Information:

Copyright 2024 Bank of America Corporation. All rights reserved. iQdatabase® is a registered service mark of Bank of America Corporation. This information is prepared for the use of BoFA Securities clients and may not be redistributed, retransmitted or disclosed, in whole or in part, or in any form or manner, without the express written consent of BoFA Securities. BoFA Global Research information is distributed simultaneously to internal and client websites and other portals by BoFA Securities and is not publicly-available material. Any unauthorized use or disclosure is prohibited. Receipt and review of this information constitutes your agreement not to redistribute, retransmit, or disclose to others the contents, opinions, conclusion, or information contained herein (including any investment recommendations, estimates or price targets) without first obtaining express permission from an authorized officer of BoFA Securities.

Materials prepared by BoFA Global Research personnel are based on public information. Facts and views presented in this material have not been reviewed by, and may not reflect information known to, professionals in other business areas of BoFA Securities, including investment banking personnel. BoFA Securities has established information barriers between BoFA Global Research and certain business groups. As a result, BoFA Securities does not disclose certain client relationships with, or compensation received from, such issuers. To the extent this material discusses any legal proceeding or issues, it has not been prepared as nor is it intended to express any legal conclusion, opinion or advice. Investors should consult their own legal advisers as to issues of law relating to the subject matter of this material. BoFA Global Research personnel's knowledge of legal proceedings in which any BoFA Securities entity and/or its directors, officers and employees may be plaintiffs, defendants, co-defendants or co-plaintiffs with or involving issuers mentioned in this material is based on public information. Facts and views presented in this material that relate to any such proceedings have not been reviewed by, discussed with, and may not reflect information known to, professionals in other business areas of BoFA Securities in connection with the legal proceedings or matters relevant to such proceedings.

This information has been prepared independently of any issuer of securities mentioned herein and not in connection with any proposed offering of securities or as agent of any issuer of any securities. None of BoFA or any of its affiliates or their research analysts has any authority whatsoever to make any representation or warranty on behalf of the issuer(s). BoFA Global Research policy prohibits research personnel from disclosing a recommendation, investment rating, or investment thesis for review by an issuer prior to the publication of a research report containing such rating, recommendation or investment thesis.

Any information relating to the tax status of financial instruments discussed herein is not intended to provide tax advice or to be used by anyone to provide tax advice. Investors are urged to seek tax advice based on their particular circumstances from an independent tax professional.

The information herein (other than disclosure information relating to BoFA Securities and its affiliates) was obtained from various sources and we do not guarantee its accuracy. This information may contain links to third-party websites. BoFA Securities is not responsible for the content of any third-party website or any linked content contained in a third-party website. Content contained on such third-party websites is not part of this information and is not incorporated by reference. The inclusion of a link does not imply any endorsement by or any affiliation with BoFA Securities. Access to any third-party website is at your own risk, and you should always review the terms and privacy policies at third-party websites before submitting any personal information to them. BoFA Securities is not responsible for such terms and privacy policies and expressly disclaims any liability for them.

All opinions, projections and estimates constitute the judgment of the author as of the date of publication and are subject to change without notice. Prices also are subject to change without notice. BoFA Securities is under no obligation to update this information and BoFA Securities ability to publish information on the subject issuer(s) in the future is subject to applicable quiet periods. You should therefore assume that BoFA Securities will not update any fact, circumstance or opinion contained herein.

Subject to the quiet period applicable under laws of the various jurisdictions in which we distribute research reports and other legal and BoFA Securities policy-related restrictions on the publication of research reports, fundamental equity reports are produced on a regular basis as necessary to keep the investment recommendation current.

Certain outstanding reports or investment opinions relating to securities, financial instruments and/or issuers may no longer be current. Always refer to the most recent research report relating to an issuer prior to making an investment decision.

In some cases, an issuer may be classified as Restricted or may be Under Review or Extended Review. In each case, investors should consider any investment opinion relating to such issuer (or its security and/or financial instruments) to be suspended or withdrawn and should not rely on the analyses and investment opinion(s) pertaining to such issuer (or its securities and/or financial instruments) nor should the analyses or opinion(s) be considered a solicitation of any kind. Sales persons and financial advisors affiliated with BoFA or any of its affiliates may not solicit purchases of securities or financial instruments that are Restricted or Under Review and may only solicit securities under Extended Review in accordance with firm policies.

Neither BoFA Securities nor any officer or employee of BoFA Securities accepts any liability whatsoever for any direct, indirect or consequential damages or losses arising from any use of this information.