

CrowdStrike Holdings Inc.

4Q24 preview: channel checks indicate solid quarter trends

Reiterate Rating: BUY | PO: 365.00 USD | Price: 322.44 USD

Expecting another good quarter for CrowdStrike

CrowdStrike reports F4Q24 results on March 5 and we expect another solid quarter driven by improving macro conditions, better sales cycles, and strong net retention. Our latest channel checks were especially positive for CrowdStrike and we are constructive on the company's cross-selling of Cloud security, which saw 45% YoY customer count growth in F3Q24 and should support another strong quarter of +120% net retention rate. We believe F4Q24 should see robust growth for CrowdStrike's identity protection and log management solutions. Valuation is a risk given the 176% stock return in the LTM, however, the industry's current tailwinds seem strong and we remain confident on CrowdStrike's competitive positioning and long-term growth opportunities. We reiterate our Buy and raise our PO to \$365 from \$325, based on 17x FY25 EV/Sales, vs. 15x prior.

Improving macro conditions to support growth

We expect a solid F4Q24. The Street is expecting a 1-2% revenue beat, in-line with recent quarters, and we think the company could meet or beat this bar given feedback from our channel checks that pointed to signs of year-end budget flush, better macro conditions and solid deal activity. We model CrowdStrike's net new ARR in 4Q to grow 12% YoY to \$247mn, vs. Street's 9% (\$241mn). We also believe CrowdStrike could guide F1Q25 revenues at or above the consensus estimate of \$899mn (30% YoY growth) and we model topline at \$908mn, given the recovering macro backdrop and sales cycles.

Upsell growth exceeds contribution from new customers

CrowdStrike has recently emphasized that it is gaining traction down-market and through partnerships, and any success could help the revenue growth beyond current expectations. The company only reports its total subscription customer count in 4Q, with consensus expecting ~29.4k customers (28% YoY growth). We flag that the reported number could potentially come below this figure, given recent quarters' decline in the contribution of new customers and/or any success with MSSP customers which are counted as a single customer regardless of the number of underlying buyers. Lastly, CrowdStrike could potentially be eligible for S&P 500 inclusion as early as F1Q25, assuming the company continues to remain GAAP EPS positive this quarter.

Estimates (Jan) (US\$)	2022A	2023A	2024E	2025E	2026E
EPS	0.67	1.54	2.95	3.55	4.47
GAAP EPS	(0.99)	(0.79)	0.38	0.62	0.87
EPS Change (YoY)	139.3%	129.9%	91.6%	20.3%	25.9%
Consensus EPS (Bloomberg)			2.96	3.76	4.69
DPS	0	0	0	0	0
Valuation (Jan)					
P/E	481.3x	209.4x	109.3x	90.8x	72.1x
GAAP P/E	NM	NM	848.5x	520.1x	370.6x
EV / EBITDA*	191.8x	115.0x	76.3x	74.6x	62.1x
Free Cash Flow Yield*	0.6%	0.9%	1.3%	1.7%	2.2%

* For full definitions of *IQmethod*SM measures, see page 5.

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 6 to 8. Analyst Certification on page 4. Price Objective Basis/Risk on page 4.

12659033

Timestamp: 14 February 2024 06:02AM EST

14 February 2024

Equity

Key Changes

(US\$)	Previous	Current
Price Obj.	325.00	365.00

Tal Liani

Research Analyst

BofAS

+1 646 855 5107

tal.liani@bofa.com

Jonathan Eisenson

Research Analyst

BofAS

+1 646 743 0186

jonathan.eisenson@bofa.com

Tomer Zilberman

Research Analyst

BofAS

+1 646 855 3203

tomer.zilberman@bofa.com

Madeline Brooks

Research Analyst

BofAS

+1 646 855 1971

madeline.brooks@bofa.com

Stock Data

Price	322.44 USD
Price Objective	365.00 USD
Date Established	14-Feb-2024
Investment Opinion	C-1-9
52-Week Range	108.65 USD - 336.99 USD
Mrkt Val (mn) / Shares Out (mn)	73,397 USD / 227.6
Free Float	98.3%
Average Daily Value (mn)	1032.63 USD
BofA Ticker / Exchange	CRWD / NAS
Bloomberg / Reuters	CRWD US / CRWD.OQ
ROE (2024E)	38.2%
Net Dbt to Eqty (Jan-2023A)	-115.3%
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".

[See related Channel Checks note](#)

ARR: Annual recurring revenue

MSSP: Managed Security Service Provider

iQprofileSM CrowdStrike Holdings Inc.

iQmethodSM – Bus Performance*

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Return on Capital Employed	8.7%	12.5%	18.0%	19.1%	19.5%
Return on Equity	16.8%	29.2%	38.2%	32.6%	30.5%
Operating Margin	13.5%	15.9%	20.8%	21.4%	22.6%
Free Cash Flow	442	677	923	1,234	1,611

iQmethodSM – Quality of Earnings*

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Cash Realization Ratio	3.6x	2.6x	1.6x	1.7x	1.7x
Asset Replacement Ratio	0.8x	1.0x	0.8x	2.4x	2.4x
Tax Rate	8.8%	8.8%	4.8%	7.6%	9.1%
Net Debt-to-Equity Ratio	-121.2%	-115.3%	-110.3%	-118.6%	-125.0%
Interest Cover	NA	NA	NA	NA	NA

Income Statement Data (Jan)

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Sales	1,452	2,241	3,050	3,957	4,970
% Change	66.0%	54.4%	36.1%	29.7%	25.6%
Gross Profit	1,111	1,702	2,372	3,089	3,908
% Change	67.4%	53.1%	39.4%	30.2%	26.5%
EBITDA	372	620	934	957	1,148
% Change	111.0%	66.8%	50.6%	2.4%	20.1%
Net Interest & Other Income	(16)	(29)	(29)	(60)	(94)
Net Income (Adjusted)	161	368	716	880	1,130
% Change	156.6%	129.3%	94.4%	22.9%	28.4%

Free Cash Flow Data (Jan)

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Net Income from Cont Operations (GAAP)	(235)	(183)	89	152	219
Depreciation & Amortization	176	265	299	112	140
Change in Working Capital	322	332	178	514	683
Deferred Taxation Charge	NA	NA	NA	NA	NA
Other Adjustments, Net	312	527	602	728	911
Capital Expenditure	(133)	(264)	(245)	(272)	(342)
Free Cash Flow	442	677	923	1,234	1,611
% Change	50.9%	53.2%	36.4%	33.6%	30.5%
Share / Issue Repurchase	66	66	52	0	0
Cost of Dividends Paid	0	0	0	0	0
Change in Debt	(2)	0	0	0	0

Balance Sheet Data (Jan)

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Cash & Equivalents	1,997	2,455	3,236	4,469	6,080
Trade Receivables	368	626	689	845	881
Other Current Assets	206	559	588	650	746
Property, Plant & Equipment	261	492	641	801	1,004
Other Non-Current Assets	787	894	1,134	1,397	2,142
Total Assets	3,618	5,027	6,287	8,162	10,853
Short-Term Debt	0	0	0	0	0
Other Current Liabilities	1,407	2,109	2,848	3,658	4,980
Long-Term Debt	740	741	742	742	742
Other Non-Current Liabilities	434	689	436	620	859
Total Liabilities	2,581	3,539	4,026	5,021	6,581
Total Equity	1,038	1,487	2,261	3,142	4,272
Total Equity & Liabilities	3,618	5,027	6,287	8,162	10,853

* For full definitions of iQmethodSM measures, see page 5.

Company Sector

Cyber Security

Company Description

CrowdStrike is a leader in the Endpoint Protection Platform (EPP) market. EPP solutions help protect enterprises' internet-connected devices from cyber attacks, and there is a market shift from signature-based on-prem solutions to cloud-based platforms using AI and machine learning. CrowdStrike's platform is one of the few 100% cloud-based architectures and is uniquely positioned to displace incumbents with its platform breadth, including advanced detection and remediation capabilities.

Investment Rationale

We believe that CrowdStrike is positioned to gain share in the Endpoint Protection Platform market and expand into other areas of security over time with its scalable cloud-native, next-generation endpoint platform. We favor CrowdStrike's best-in-class subscription growth and net retention rates and expect the company's Software as a Service (SaaS) model and new offerings to deliver sustainable high growth as the company invests to gain market share.

Stock Data

Average Daily Volume 3,202,543

Quarterly Earnings Estimates

	2023	2024
Q1	0.31A	0.57A
Q2	0.36A	0.74A
Q3	0.40A	0.82A
Q4	0.47A	0.82E

BofA Expectations vs. Consensus

Exhibit 1: BofA estimates vs. Street's expectations

We compare our estimates against consensus estimates for the next two quarters and FY25

(mns \$)	F4Q24 Expectations			F1Q25 Expectations			FY25 Expectations		
	BofA	Consensus	Delta	BofA	Consensus	Delta	BofA	Consensus	Delta
Net new ARR	\$247.29	\$241.25	2.5%	\$194.27	\$190.09	2.2%	\$912.55	\$917.11	-0.5%
YoY growth (%)	11.5%	8.8%		11.5%	9.1%		8.5%	10.0%	
Total revenue	\$840.01	\$839.56	0.1%	\$907.85	\$898.79	1.0%	\$3,957.24	\$3,940.49	0.4%
YoY growth (%)	31.8%	31.7%		31.1%	29.8%		29.7%	29.2%	
Gross margin (%)	77.6%	77.7%	(10.1) bps	77.9%	78.1%	(17) bps	78.1%	78.1%	(7) bps
Operating margin (%)	22.4%	22.4%	(5.6) bps	20.4%	20.9%	(54) bps	21.4%	22.3%	(94) bps
EPS	0.82	0.83	-1.0%	0.80	0.82	-3.0%	3.55	3.78	-6.2%
Free Cash Flow	266.78	265.96	0.3%	287.20	293.77	-2.2%	1,233.73	1,241.86	-0.7%
FCF margin (%)	31.8%	31.7%		31.6%	32.7%		31.2%	31.5%	

Source: BofA Global Research estimates, company report, Bloomberg

BofA GLOBAL RESEARCH

Partner Commentary

"4Q deal flow for CrowdStrike ramped quite quickly and was largely driven by their enablement of the channel partners. We did not work with them in the beginning of 2023, but ramped up with us throughout the year. Finally started really doing deals with the partners in 4Q. Our understanding is that they have recently been focusing more on developing the channel relationships." – **North American Partner**

"SentinelOne is one of the favorites in endpoint security and they have great relationships within the channels. Alongside Palo Alto, SentinelOne would come up more within the channel as CrowdStrike's penetration with partners was not as mature. Saw solid budget flush benefits for SentinelOne in 4Q." – **North American Partner**

"Saw many net new customers for SentinelOne in 4Q but have not seen them take any deals from CrowdStrike. SentinelOne continues to win with the smaller customers, while CrowdStrike beats them head-to-head at larger enterprises." – **Global Partner**

"We have seen a good majority of the mid-market that has already made the transition away from legacy vendors to the SentinelOne's and CrowdStrike's of the world." – **Global Partner**

"CrowdStrike is still 15-25% more expensive than SentinelOne, though they have more of the platform consolidation focus." – **North American Partner**



Price objective basis & risk

CrowdStrike Holdings Inc. (CRWD)

Our PO of \$365 is based on roughly 17x our CY25E EV/Sales, which is a premium to high-growth SaaS peers that trade closer to 13x. Our premium valuation is supported by CrowdStrike's strong competitive positioning in endpoint security and long-term growth opportunities across Cloud security, log management, and identity protection. In addition, we note CrowdStrike's higher growth profile and potential to take meaningful share in new markets that would increase TAM and potentially accelerate growth. The positives of CrowdStrike's high growth and long-term opportunities are somewhat offset by lower margins and expected growth deceleration.

Downside risks to our PO are 1) investor sentiment and sensitivity to the premium valuation levels, 2) a lower take-rate of new offerings, 3) potential slowdown in new customer adoption and expansion deals, 4) risk of security breaches, and 5) an increase in competition from incumbent vendors and newer next-generation players.

Analyst Certification

I, Tal Liani, 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 - Telecom and Data Networking Equipment Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	Akamai	AKAM	AKAM US	Madeline Brooks
	Amdocs	DOX	DOX US	Tal Liani
	Arista Networks	ANET	ANET US	Tal Liani
	Check Point Software Technologies	CHKP	CHKP US	Tal Liani
	Ciena	CIEN	CIEN US	Tal Liani
	CrowdStrike Holdings Inc.	CRWD	CRWD US	Tal Liani
	CyberArk	CYBR	CYBR US	Tal Liani
	Fastly	FSLY	FSLY US	Madeline Brooks
	Fortinet	FTNT	FTNT US	Tal Liani
	Gen Digital, Inc.	GEN	GEN US	Jonathan Eisenson
	InterDigital, Inc.	IDCC	IDCC US	Tal Liani
	Motorola Solutions	MSI	MSI US	Tomer Zilberman
	Qualcomm	QCOM	QCOM US	Tal Liani
	Zscaler	ZS	ZS US	Tal Liani
NEUTRAL				
	Cellebrite	CLBT	CLBT US	Tal Liani
	Cisco Systems	CSCO	CSCO US	Tal Liani
	Palo Alto Networks	PANW	PANW US	Tal Liani
	SentinelOne, Inc.	S	S US	Tal Liani
UNDERPERFORM				
	Cloudflare	NET	NET US	Madeline Brooks
	CommScope	COMM	COMM US	Tal Liani
	F5 Inc	FFIV	FFIV US	Tal Liani
	Okta Inc	OKTA	OKTA US	Madeline Brooks
	SecureWorks	SCWX	SCWX US	Tal Liani

iQmethodSM Measures Definitions

Business Performance

Return On Capital Employed

Return On Equity

Operating Margin

Earnings Growth

Free Cash Flow

Quality of Earnings

Cash Realization Ratio

Asset Replacement Ratio

Tax Rate

Net Debt-To-Equity Ratio

Interest Cover

Valuation Toolkit

Price / Earnings Ratio

Price / Book Value

Dividend Yield

Free Cash Flow Yield

Enterprise Value / Sales

EV / EBITDA

Numerator

$\text{NOPAT} = (\text{EBIT} + \text{Interest Income}) \times (1 - \text{Tax Rate}) + \text{Goodwill Amortization}$

Net Income

Operating Profit

Expected 5 Year CAGR From Latest Actual

Cash Flow From Operations – Total Capex

Numerator

Cash Flow From Operations

Capex

Tax Charge

Net Debt = Total Debt – Cash & Equivalents

EBIT

Numerator

Current Share Price

Current Share Price

Annualised Declared Cash Dividend

Cash Flow From Operations – Total Capex

$\text{EV} = \text{Current Share Price} \times \text{Current Shares} + \text{Minority Equity} + \text{Net Debt} +$

Other LT Liabilities

Enterprise Value

Denominator

$\text{Total Assets} - \text{Current Liabilities} + \text{ST Debt} + \text{Accumulated Goodwill}$

Amortization

Shareholders' Equity

Sales

N/A

N/A

Denominator

Net Income

Depreciation

Pre-Tax Income

Total Equity

Interest Expense

Denominator

Diluted Earnings Per Share (Basis As Specified)

Shareholders' Equity / Current Basic Shares

Current Share Price

$\text{Market Cap} = \text{Current Share Price} \times \text{Current Basic Shares}$

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 validations. 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.

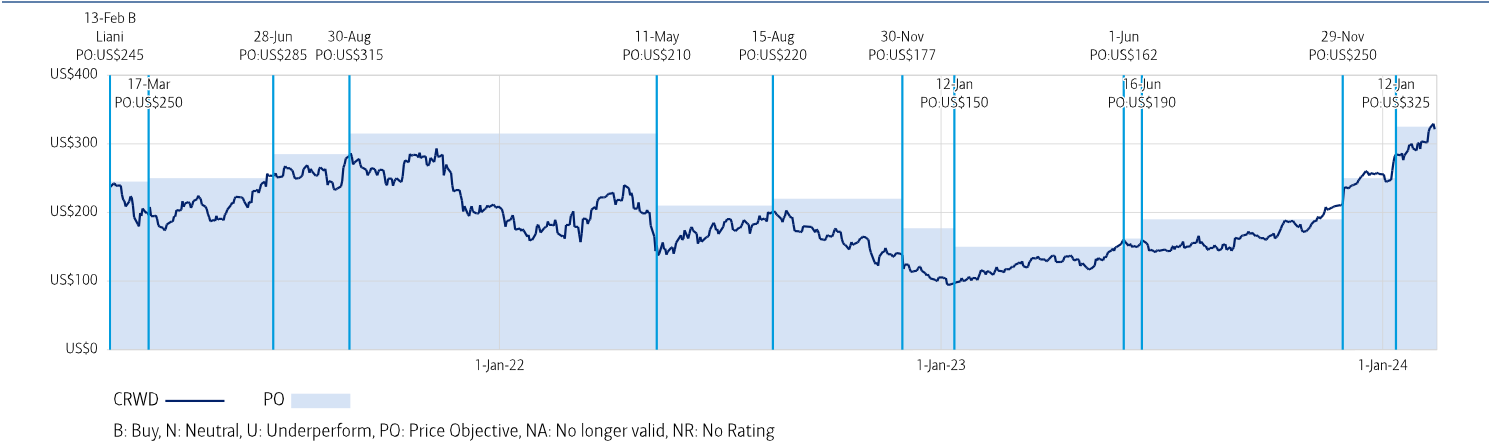
iQprofileSM, iQmethodSM are service marks of Bank of America Corporation. iQdatabase[®] is a registered service mark of Bank of America Corporation.



Disclosures

Important Disclosures

CrowdStrike (CRWD) Price Chart



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: Telecommunications Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	57	51.82%	Buy	43	75.44%
Hold	27	24.55%	Hold	17	62.96%
Sell	26	23.64%	Sell	12	46.15%

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: CrowdStrike. The issuer is or was, within the last 12 months, an investment banking client of BofAS and/or one or more of its affiliates: CrowdStrike. BofAS or an affiliate has received compensation from the issuer for non-investment banking services or products within the past 12 months: CrowdStrike. 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: CrowdStrike. BofAS or an affiliate expects to receive or intends to seek compensation for investment banking services from this issuer or an affiliate of the issuer within the next three months: CrowdStrike. BofAS together with its affiliates beneficially owns one percent or more of the common stock of this issuer. If this report was issued on or after the 9th day of the month, it reflects the ownership position on the last day of the previous month. Reports issued before the 9th day of a month reflect the ownership position at the end of the second month preceding the date of the report: CrowdStrike. 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: CrowdStrike.



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: CrowdStrike. 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 BofAS 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 (HKSF); 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 HKSF; 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.