

Deere & Co

Does construction provide more visibility than ag? Strangely, yes (into 2024)

Reiterate Rating: NEUTRAL | PO: 455.00 USD | Price: 397.02 USD

Stock reaction to a solid FQ3 underscores the ag dilemma

DE reported a solid FQ3 driven by price vs cost, tax line & execution (page 2). Shares struggled (DE -5.3% vs SPX -0.1%) on the back of 'peak ag' concerns – lowering production in Brazil, order momentum, rising inventories off the lows – in a backdrop where soft commodities are rolling over (Corn -25% since end of Q1) and recent commentary in the used equipment market (old combines, rates) raises some worries.

Is construction a better place to be vs ag into 2024? Yes

Construction cycle fears were rampant just a few months ago (lending, rates, CRE, etc) yet this is one end market that feels more stable heading into 2024. We found DE's tone around C&F rather positive – order books out to 6 months (vs typically 3 months), production rates '24 flat with '23, rental refueling, mega project tailwinds in '24/'25. In our view, underwriting tech adoption in construction equipment is a bit of a stretch (this is where farm equipment shines long-term) yet the momentum into '24 is more in CE.

Ag equip prices: we are a bit skeptical on the bearish view

There is uncertainty on large ag into '24 (i.e., planters early orders flattish) and we expect mixed signs across regions (EU) & products (sprayers, 4WD tractors, combines). DE still expects pricing in the 2-4% range (inclusive of incentives). While pricing momentum is clearly slowing (+20-30% last two years), we would be careful on pricing expectations shifting too negative – take rates on precision ag continue to go up, industry is fairly consolidated/disciplined, inventories are rising yet not overshooting outside of small ag.

Neutral: solid execution but multiple likely 'stuck' for now

We raise our estimates following FQ3. We lower our PO to \$455 (from \$484) based on 13x 2024e EPS as believe a lower multiple is warranted given the peak ag concerns (vs 14x prior). As EPS nears a peak (BofAe \$34-36 range), we belie the multiple could be stuck in a range (11-13x) based on previous cycles. We reiterate Neutral on balanced risk/reward.

Estimates (Oct) (US\$)	2021A	2022A	2023E	2024E	2025E
EPS	18.99	23.28	34.13	35.00	35.50
GAAP EPS	18.99	23.28	34.13	35.00	35.50
EPS Change (YoY)	118.3%	22.6%	46.6%	2.5%	1.4%
Consensus EPS (Bloomberg)			31.85	32.00	31.21
DPS	3.46	4.28	4.83	5.55	6.39
Valuation (Oct)					
P/E	20.9x	17.1x	11.6x	11.3x	11.2x
GAAP P/E	20.9x	17.1x	11.6x	11.3x	11.2x
Dividend Yield	0.9%	1.1%	1.2%	1.4%	1.6%
EV / EBITDA*	15.8x	13.3x	9.5x	9.4x	9.3x
Free Cash Flow Yield*	4.4%	4.4%	8.0%	3.7%	9.1%

* 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.

12595148

Timestamp: 18 August 2023 06:08PM EDT

18 August 2023

Equity

Key Changes

(US\$)	Previous	Current
Price Obj.	484.00	455.00
2023E Rev (m)	54,993.7	55,311.0
2024E Rev (m)	57,653.1	57,545.9
2025E Rev (m)	58,107.4	58,145.2
2023E EPS	32.00	34.13
2024E EPS	34.50	35.00
2025E EPS	35.00	35.50

Michael Feniger

Research Analyst
BofAS
+1 646 855 1923
michael.feniger@bofa.com

Sherif El-Sabbahy

Research Analyst
BofAS
sherif.el-sabbahy@bofa.com

Blake Greenhalgh

Research Analyst
BofAS
blake.greenhalgh@bofa.com

Stock Data

Price	397.02 USD
Price Objective	455.00 USD
Date Established	18-Aug-2023
Investment Opinion	B-2-7
52-Week Range	328.62 USD - 450.00 USD
Mkt Val (mn) / Shares Out (mn)	115,970 USD / 292.1
Average Daily Value (mn)	521.77 USD
BofA Ticker / Exchange	DE / NYS
Bloomberg / Reuters	DE US / DE.N
ROE (2023E)	63.9%
Net Dbt to Eqty (Oct-2022A)	36.1%
ESGMeter TM	High

ESGMeterTM 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"](#).

EU = Europe

DE = Deere

CE = construction equipment

CRE = commercial real estate

4WD = four wheel drive

iQprofileSM Deere & Co

iQmethodSM – Bus Performance*

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Return on Capital Employed	20.1%	26.4%	37.8%	30.9%	24.9%
Return on Equity	46.3%	52.2%	63.9%	46.8%	34.0%
Operating Margin	17.8%	18.3%	22.7%	22.0%	22.0%
Free Cash Flow	5,055	5,108	9,288	4,248	10,543

iQmethodSM – Quality of Earnings*

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Cash Realization Ratio	1.0x	0.9x	1.1x	0.5x	1.1x
Asset Replacement Ratio	0.8x	1.1x	1.4x	0.9x	0.9x
Tax Rate	21.5%	21.6%	22.4%	23.7%	23.6%
Net Debt-to-Equity Ratio	26.4%	36.1%	20.4%	1.1%	-23.3%
Interest Cover	19.3x	22.5x	31.7x	29.8x	30.1x

Income Statement Data (Oct)

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Sales	39,738	47,916	55,311	57,546	58,145
% Change	27.1%	20.6%	15.4%	4.0%	1.0%
Gross Profit	10,619	12,575	17,545	18,242	18,432
% Change	39.9%	18.4%	39.5%	4.0%	1.0%
EBITDA	7,731	9,179	12,779	12,936	13,116
% Change	77.0%	18.7%	39.2%	1.2%	1.4%
Net Interest & Other Income	(633)	(826)	(685)	(715)	(715)
Net Income (Adjusted)	5,964	7,130	10,055	10,048	10,148
% Change	116.6%	19.6%	41.0%	-0.1%	1.0%

Free Cash Flow Data (Oct)

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Net Income from Cont Operations (GAAP)	5,964	7,130	10,055	10,048	10,148
Depreciation & Amortization	1,043	1,041	1,191	1,241	1,291
Change in Working Capital	(475)	(1,269)	(308)	(5,941)	204
Deferred Taxation Charge	(369)	8	0	0	0
Other Adjustments, Net	(263)	(671)	0	0	0
Capital Expenditure	(845)	(1,131)	(1,650)	(1,100)	(1,100)
Free Cash Flow	5,055	5,108	9,288	4,248	10,543
% Change	28.2%	1.0%	81.8%	-54.3%	148.2%

Balance Sheet Data (Oct)

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Cash & Equivalents	7,191	3,828	5,582	8,752	16,887
Trade Receivables	8,431	9,559	9,886	13,716	13,541
Other Current Assets	6,781	8,495	8,506	10,623	10,733
Property, Plant & Equipment	5,783	6,021	6,480	6,339	6,148
Other Non-Current Assets	10,966	11,305	11,305	11,305	11,305
Total Assets	39,152	39,208	41,759	50,735	58,614
Short-Term Debt	1,662	1,132	1,132	1,132	1,132
Other Current Liabilities	11,493	13,342	13,372	13,378	13,518
Long-Term Debt	8,915	7,917	7,917	7,917	7,917
Other Non-Current Liabilities	4,239	2,351	2,351	2,351	2,351
Total Liabilities	26,309	24,742	24,772	24,778	24,918
Total Equity	12,843	14,466	16,987	25,957	33,696
Total Equity & Liabilities	39,152	39,208	41,759	50,735	58,614

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

Company Sector

Agricultural Machinery

Company Description

Deere is the largest manufacturer/distributor of agricultural equipment worldwide with leading market shares in large farm-equipment segments. DE's 3 main areas: 1) Agriculture and Turf (farm equipment, lawn and garden, other outdoor products), 2) Construction and Forestry (construction earth-moving material-handling and timber-harvesting equipment), 3) Credit (financing).

Investment Rationale

Deere is the global market leader and best in class operator in farm equipment. We see the company widening its competitive advantage in precision agriculture in coming years, which should continue to drive pricing power, improving mix, and share gains. That said we are more cautious on the farm economy as the macro economic environment shifts. We expect the C&F segment to benefit from a revival of construction activity, boost in rental capex, and potential infrastructure stimulus.

Stock Data

Average Daily Volume 1314215

Quarterly Earnings Estimates

	2022	2023
Q1	2.92A	6.55A
Q2	6.81A	9.65A
Q3	6.16A	10.20A
Q4	7.43A	7.77E

Q3 Results

3Q23 Results

DE reported a beat & raise in 3Q23. Adj EPS of \$10.20 was above BofAe of \$8.22 by 24% and cons of \$8.14 by 25%. We attribute half the beat to a lower tax rate with the other half of the beat driven by execution. Total sales of \$14.3bn beat BofAe by 2.1% and cons by 1.2%. Total operating margin of 24%, up 540bps YoY, was better than consensus estimates of 21.6%. PPA operating margin of 26.2% beat cons by 80bps, Small Ag and turf of 19.6% beat cons by 400bps, and C&F of 19.1% beat cons by 170bps. This is driven by a combination of positive price vs cost, easing supply chains, and hitting production schedules.

Updating 2023 Guidance

DE updated 2023 guidance in some segments. DE raised net income to \$9.75 - \$10bn (from \$9.25 - \$9.5bn), partly due to a lower tax rate to 21-23% (from 23-25%). Other areas of revisions: Small Ag & Turf, sales remained +5% YoY but operating margin was raised to 17-18% (from 15.5-16.5%). 2023 capex and R&D estimates were increased to \$1,650mn (from \$1,500mn) and 15% (from 14%), respectively. Pricing expectations remain steady across all segments with a bump up in C&F (raised to 11% from 10%).

EOP (Early Order Program) commentary

DE provided updates on their EOP (early order programs). While they do not have a fully formed view at this stage, we extracted some trends across a few product lines. Sprayer's EOP started in May and ended in July – DE sold out all of model year 2024 production slots with unit sales up DD YoY – this was the most constrained product in 2023, thus there is more of a rebound here. The DD increase was driven by improved supply chain conditions. Phase 2 of planters opened in mid-July with orders flat YoY (closes in August). In our view, this could be more of a proxy of underlying large ag demand as planters were less constrained last year. DE is seeing favorable mix towards larger planters and higher take rates on technology (up on a YoY basis). Combine program recently opened in August but remains too early to extrapolate any data for 2024 (closes in November). Tractor order books opened this week for 2Q24 – no data to share but the order book is currently full through the calendar year 2023 – and 4WD tractors was one of the more constrained products. In our view, the EOP trends highlight a more mixed picture heading into 2024.



Price objective basis & risk

Deere & Co (DE)

Our \$455 PO is based on 13x our FY24 EPS forecast. Our target 13x PE multiple is below the long term average range of 15-17x given the rising rate environment, lower ag commodity prices, and macro concerns. Our target multiple is above other Machinery peer multiples. We believe this is justifiable as we see a strong argument for Deere to re-rate permanently higher given improved cycle to cycle profitability underscored by the recent raising of its long-term mid cycle segment margin targets from 15% to 20%.

Risks to our PO: 1) slowdown in the farm economy due to better expected yields later this year, 2) disappointment in construction equipment, 3) peak in the the used equipment market, 4) extended improvement in commodity prices reverses, 5) ongoing supply chain disruption leads to earnings misses.

Analyst Certification

I, Michael Feniger, 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 - Machinery Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	AECOM	ACM	ACM US	Michael Feniger
	Blue Bird Corp	BLBD	BLBD US	Sherif El-Sabbahy
	Caterpillar Inc	CAT	CAT US	Michael Feniger
	CNH Industrial NV	CNHI	CNHI US	Michael Feniger
	Construction Partners Inc.	ROAD	ROAD US	Michael Feniger
	Cummins Inc	CMI	CMI US	Michael Feniger
	Finning International Inc.	YFTT	FTT CN	Sherif El-Sabbahy
	GFL Environmental Inc	GFL	GFL US	Michael Feniger
	GFL Environmental Inc	YGFL	GFL CN	Michael Feniger
	H&E Equipment Services Inc	HEES	HEES US	Sherif El-Sabbahy
	Republic Services	RSG	RSG US	Michael Feniger
	Techtronic Industries Co Ltd	TTNDF	669 HK	Michael Feniger
	Techtronic Industries Co Ltd	TTNDY	TTNDY US	Michael Feniger
	United Rentals Inc	URI	URI US	Michael Feniger
	Vulcan Materials	VMC	VMC US	Michael Feniger
	Waste Connections Inc	WCN	WCN US	Michael Feniger
	WillScot Mobile Mini	WSC	WSC US	Sherif El-Sabbahy
NEUTRAL				
	AGCO Corp	AGCO	AGCO US	Michael Feniger
	Deere & Co	DE	DE US	Michael Feniger
	ESAB Corp	ESAB	ESAB US	Sherif El-Sabbahy
	Jacobs Eng.	J	J US	Michael Feniger
	Kennametal Inc.	KMT	KMT US	Michael Feniger
	Martin Marietta Materials	MLM	MLM US	Michael Feniger
	NV5 Global Inc.	NVEE	NVEE US	Michael Feniger
	Ritchie Bros	RBA	RBA US	Michael Feniger
	Terex Corp.	TEX	TEX US	Michael Feniger
	Timken Company	TKR	TKR US	Michael Feniger
	Waste Management	WM	WM US	Michael Feniger
UNDERPERFORM				
	Allison Transmission Holdings Inc.	ALSN	ALSN US	Sherif El-Sabbahy
	Casella	CWST	CWST US	Michael Feniger
	Herc Holdings Inc	HRI	HRI US	Sherif El-Sabbahy
	IPG Photonics	IPGP	IPGP US	Michael Feniger
	Lightning e-Motors	ZEV	ZEV US	Sherif El-Sabbahy
	Oshkosh Corp.	OSK	OSK US	Michael Feniger

US - Machinery Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
	PACCAR Inc	PCAR	PCAR US	Michael Feniger
	XOS Inc.	XOS	XOS US	Sherif El-Sabbahy
RVW				
	Fluor	FLR	FLR US	Michael Feniger

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

EV / EBITDA

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.

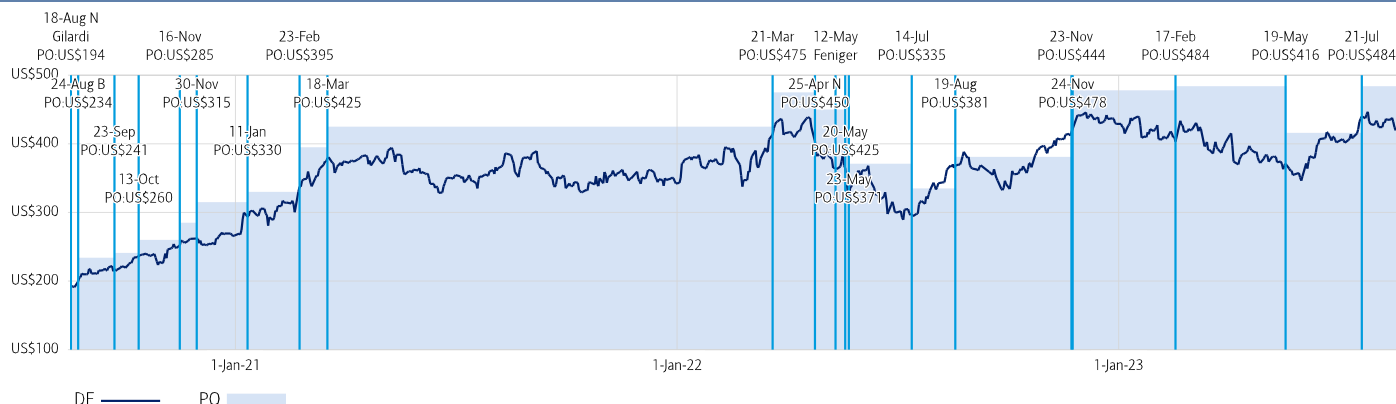
iQdatabase[®] is our real-time global research database that is sourced directly from our equity analysts' earnings models and includes forecasted as well as historical data for income statements, balance sheets, and cash flow statements for companies covered by BofA Global Research.

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

Disclosures

Important Disclosures

Deere & Co (DE) 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: Machinery/Diversified Manufacturing Group (as of 30 Jun 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	31	46.97%	Buy	11	35.48%
Hold	18	27.27%	Hold	6	33.33%
Sell	17	25.76%	Sell	8	47.06%

Equity Investment Rating Distribution: Global Group (as of 30 Jun 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	1877	53.28%	Buy	1040	55.41%
Hold	815	23.13%	Hold	464	56.93%
Sell	831	23.59%	Sell	385	46.33%

^{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: Deere & Co.

The issuer is or was, within the last 12 months, an investment banking client of BofAS and/or one of its affiliates: Deere & Co.

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

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

BofAS or an affiliate has received compensation for investment banking services from this issuer within the past 12 months: Deere & Co.

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: Deere & Co.

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: Deere & Co.



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: Deere & Co.

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: Deere & Co.

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 (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 Investment Industry Regulatory Organization of Canada; 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.

BofAS or one of its affiliates is a regular issuer of traded financial instruments linked to securities that may have been recommended in this report. BofAS 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 BofAS for the provision of research services for a separate fee, and in connection therewith BofAS may be deemed to be acting as an investment adviser, such status relates, if at all, solely to the person with whom BofAS has contracted directly and does not extend beyond the delivery of this report (unless otherwise agreed specifically in writing by BofAS). If such recipient uses the services of BofAS in connection with the sale or purchase of a security referred to herein, BofAS may act as principal for its own account or as agent for another person. BofAS 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 2023 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 BofAS 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 BofAS 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.