

Apple Inc.

App store growth improves; Can a mixed reality drive further growth? PO to \$190

Reiterate Rating: NEUTRAL | PO: 190.00 USD | Price: 180.95 USD

Apple's mixed reality (MR) apps could command a premium

Apple is widely expected to launch a MR headset at WWDC (See our [prior note](#) on market sizing). The apps that will likely accompany will command a premium to iOS applications given the potential to have a richer and more immersive experience. Meta's apps for the Quest headset range from free to 10's of dollars (some popular apps approaching \$40, see list at back of the note). If Apple is successful in creating a rich ecosystem with the headset, we could see upside to Services growth rates. We raise PO to \$190 from \$176 on 30x C24 EPS of \$6.30 from 27x prior (we use a higher multiple to reflect an expansion in the market multiple and on improvement in the services growth trajectory with the potential for further acceleration from new product categories). We reiterate Neutral on risk-reward balance, where positive catalysts of new product introduction (MR headset) and stable iPhones is offset by a potentially weaker consumer spending environment in 2H23.

Can price surprise? any killer app for the MR headset?

Consensus opinion is the headset would cost \$3K. Apple could surprise positively with a lower price (recall Apple prices wearables for adoption). With a historical focus on design, creativity, collaboration, and fitness we view killer apps to focus on these areas or a combination of such (imagine an AI powered personal fitness coach, watch a live football game from the vantage of your favorite quarterback on the field, up close concert performances, etc.). See a more exhaustive list at the back of this note.

App store rev increased 2.2% y/y in F3Q23 (Qtr to date)

Global App Store rev in F3Q23 (after 60 days) increased to \$4.2bn (+2.2% y/y through May 31st, according to data from SensorTower), with total downloads (iPhone + iPad) increasing 3.7% y/y (Fig 4). For the month of May, App store rev in China declined 1.8% y/y (Fig 2). So far in F3Q (60 days), we saw app store dollars per download decrease 1.4% y/y. Overall App Store trends marginally improved so far (60 days) from F2Q.

Global gaming rev declined 4.4% QTD in F3Q23 y/y

So far in F3Q23 (as of May 31st), Gaming segment declined 4.4% y/y to \$2.3bn and accounted for 55% of total App store rev vs. 59% a year ago. China gaming segment revenue declined 8% y/y (qtr to date) in F3Q23, while China gaming downloads declined 22% y/y (qtr to date).

Estimates (Sep) (US\$)	2021A	2022A	2023E	2024E	2025E
EPS	5.61	6.11	5.98	6.34	6.82
GAAP EPS	5.61	6.12	5.98	6.34	6.82
EPS Change (YoY)	71.6%	8.9%	-2.1%	6.0%	7.6%
Consensus EPS (Bloomberg)			5.98	6.57	7.25
DPS	0.86	0.90	0.94	0.99	1.04
Valuation (Sep)					
P/E	32.3x	29.6x	30.3x	28.5x	26.5x
GAAP P/E	32.3x	29.6x	30.3x	28.5x	26.5x
Dividend Yield	0.5%	0.5%	0.5%	0.5%	0.6%
EV / EBITDA*	23.4x	21.6x	22.5x	21.7x	20.7x
Free Cash Flow Yield*	3.3%	3.9%	3.0%	3.5%	3.5%

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

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.

12565793

Timestamp: 04 June 2023 11:09PM EDT

04 June 2023

Equity

Key Changes

(US\$)	Previous	Current
Price Obj.	176.00	190.00

Wamsi Mohan
Research Analyst
BofAS
+1 646 855 3854
wamsi.mohan@bofa.com

Ruplu Bhattacharya
Research Analyst
BofAS
+1 646 855 0315
ruplu.bhattacharya@bofa.com

Stock Data

Price	180.95 USD
Price Objective	190.00 USD
Date Established	4-Jun-2023
Investment Opinion	B-2-7
52-Week Range	124.17 USD - 181.78 USD
Mkt Val (mn) / Shares Out (mn)	2846,109 USD / 15,728.7
Average Daily Value (mn)	10380.14 USD
BofA Ticker / Exchange	AAPL / NAS
Bloomberg / Reuters	AAPL US / AAPL.OQ
ROE (2023E)	139.8%
Net Dbt to Eqty (Sep-2022A)	190.3%
ESGMeter TM	High

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](#)".

AI: Artificial Intelligence

WWDC: Worldwide Developers Conference

iQprofileSM Apple Inc.

iQmethodSM – Bus Performance*

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Return on Capital Employed	43.0%	46.6%	44.3%	39.7%	35.3%
Return on Equity	147.4%	175.5%	139.8%	90.5%	65.2%
Operating Margin	31.6%	32.1%	31.2%	30.5%	30.7%
Free Cash Flow	92,953	111,443	86,414	99,628	99,269

iQmethodSM – Quality of Earnings*

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Cash Realization Ratio	1.1x	1.2x	1.0x	1.2x	1.1x
Asset Replacement Ratio	1.0x	1.0x	1.0x	1.1x	1.1x
Tax Rate	13.3%	16.2%	15.7%	16.0%	16.0%
Net Debt-to-Equity Ratio	142.3%	190.3%	89.7%	26.2%	-3.2%
Interest Cover	NM	NM	NM	NM	NM

Income Statement Data (Sep)

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Sales	365,817	394,328	385,642	409,887	428,979
% Change	33.3%	7.8%	-2.2%	6.3%	4.7%
Gross Profit	154,020	172,026	169,654	179,624	191,408
% Change	45.2%	11.7%	-1.4%	5.9%	6.6%
EBITDA	126,873	137,601	132,098	137,160	143,922
% Change	51.8%	8.5%	-4.0%	3.8%	4.9%
Net Interest & Other Income	337	(291)	(754)	(324)	33
Net Income (Adjusted)	94,680	99,803	94,598	98,123	103,500
% Change	64.9%	5.4%	-5.2%	3.7%	5.5%

Free Cash Flow Data (Sep)

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Net Income from Cont Operations (GAAP)	100,530	105,764	100,830	104,759	110,489
Depreciation & Amortization	11,284	11,104	11,793	12,122	12,421
Change in Working Capital	(4,911)	1,200	(15,259)	(5,268)	(11,105)
Deferred Taxation Charge	(4,774)	895	0	0	0
Other Adjustments, Net	1,909	3,188	1,367	1,264	1,331
Capital Expenditure	(11,085)	(10,708)	(12,316)	(13,250)	(13,867)
Free Cash Flow	92,953	111,443	86,414	99,628	99,269
% Change	26.7%	19.9%	-22.5%	15.3%	-0.4%

Balance Sheet Data (Sep)

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Cash & Equivalents	34,940	23,646	31,085	72,381	112,884
Trade Receivables	26,278	28,184	34,338	41,182	49,156
Other Current Assets	73,618	83,575	90,567	90,760	90,982
Property, Plant & Equipment	39,440	42,117	42,957	43,930	45,218
Other Non-Current Assets	176,726	175,233	175,264	175,814	176,370
Total Assets	351,002	352,755	374,211	424,067	474,610
Short-Term Debt	15,613	21,110	10,000	10,000	10,000
Other Current Liabilities	109,868	132,872	129,636	131,955	129,603
Long-Term Debt	109,106	98,959	97,041	97,041	97,041
Other Non-Current Liabilities	53,325	49,142	52,851	52,852	52,851
Total Liabilities	287,912	302,083	289,529	291,848	289,495
Total Equity	63,090	50,672	84,682	132,219	185,114
Total Equity & Liabilities	351,002	352,755	374,211	424,067	474,610

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

Company Sector

IT Hardware

Company Description

Apple Inc. (AAPL) designs, manufactures, and markets consumer electronics and computers, and has developed its own proprietary iOS, Mac OS, tvOS and Watch OS operating systems and related software platform/ecosystem.

Revenues are principally derived from the iPhone line of smartphones, Services, hardware sales of the Macintosh family of notebook and desktop computers, iPad tablets, and wearables.

Investment Rationale

We rate Apple Neutral as we see risk-reward as balanced.

Negatives are: a) weaker iPhone 14 cycle on consumer spending risk, b) weaker n-t services trajectory where App Store & Licensing can decelerate, c) gross profit dollars declining y/y in the next few quarters, d) iPads/Macs reverting to pre-COVID levels, and e) stronger dollar.

Positives are: a) stronger sales of Pro iPhone models, b) est. revisions can be lower vs. peers, c) potential new products (AR/VR), and d) services (advertising).

Stock Data

Average Daily Volume 57,364,708

Quarterly Earnings Estimates

	2022	2023
Q1	2.10A	1.88A
Q2	1.52A	1.52A
Q3	1.20A	1.16E
Q4	1.29A	1.41E

What type of MR apps could Apple release over time?

Apple's speculated mixed reality headset could pave the way for numerous innovative applications. Given Apple's ecosystem and the diverse capabilities of mixed reality (MR) technology, there are several areas that could potentially be "killer applications" driving user adoption:

1. **Augmented Work and Productivity:** Apple's MR headset could significantly enhance remote work and collaboration. Think virtual meeting rooms, shared virtual whiteboards, 3D model interaction for industries like engineering or architecture, or even coding in a 3D interface.
2. **Gaming and Entertainment:** Given the success of mobile gaming on iOS, it's reasonable to expect Apple to push for high-quality, immersive gaming experiences in MR. Combining the physical world with digitally augmented elements could create engaging games that are both physically and socially interactive. Imagine a virtual game of Catan with your favorite group of family/friends or an immersive MarioKart like racing game.
3. **Fitness and Wellness:** Following the success of Apple Fitness+, Apple could provide immersive fitness experiences. Imagine yoga classes in a virtual serene forest, or interactive, gamified workout routines.
4. **Education and Training:** MR can create immersive educational experiences, ranging from historical tours in augmented reality to immersive language learning environments. It could also offer training simulations for professionals such as medical staff or mechanics.
5. **Healthcare:** The MR headset could be used in therapeutic settings, such as guiding physical therapy with augmented instructions, or assisting in mental health treatment by providing calming or focused virtual environments.
6. **Shopping and E-commerce:** Apple could redefine online shopping with virtual fitting rooms, 3D product previews, or even augmented storefronts that let users browse and shop as if they were in a physical store.
7. **Social Media and Communication:** Given the rise of virtual spaces (like in VR chatrooms or platforms like Roblox), Apple could create a new social media or communication platform built around MR.
8. **Art and Creativity:** The MR headset could open up new avenues for digital art and design, allowing users to create and interact with their works in a 3D space.

While these applications hold promise, their success will rely on other factors like the price, comfort, battery life, and usability of the MR headset, as well as the privacy and security measures implemented by Apple. It's also important to remember that the adoption of new technology often requires time for users to adjust to new ways of interacting and working

Most Popular apps/games for META Quest Pro:

- Among Us VR (\$8.99)
- Bonelab (\$31.99)
- Cooking Simulator VR (\$24.99)
- Marvel's Iron Man VR (\$39.99)
- NFL Pro Era (\$24.99)
- Surgeiner (\$9.99)



META Quest Pro's Best Creative Tools:

- Figma XR (\$19.99)
- MultiBrush (\$19.99)
- Painting VR (\$15.99)
- PatchWorld (\$29.99)
- Virtuoso (\$19.99)
- Vermillion VR Painting (\$19.99)

META Quest Pro's Best Social Experiences

- Gymclass - Basketball VR (Free)
- Innerworld (Free)
- Nock: Bow+Arrow Soccer (\$9.99)
- Smash Drums (\$19.99)
- Wands Alliances (\$19.99)
- Zenith: The Last City (\$29.99)

META Quest Pro's Best Active Apps

- First Person Tennis -The Real Tennis Simulator (\$22.99)
- Litesport (Free)
- WIN Reality Baseball (Free)

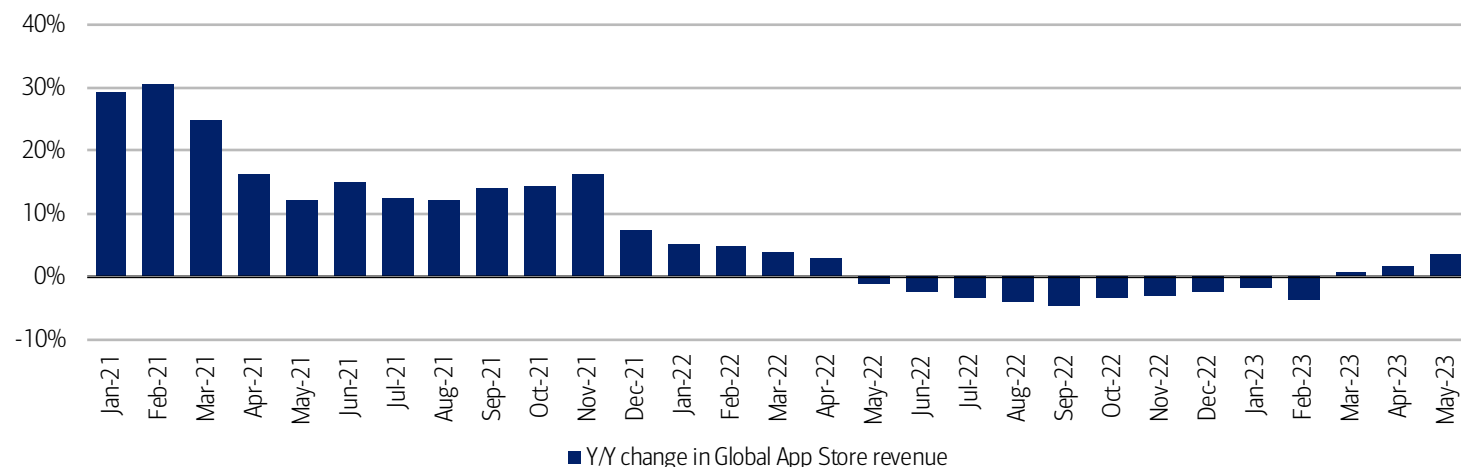
META Quest Pro's Best Apps for Productivity

- Arkio (Free)
- Nanome (Free)
- Woorld (\$14.99)
- Zoe (Free)

Apple Services related charts (see next page)

Figure 1: YoY change in Global App Store revenue

Global App Store revenue increased 3.7% YoY in May 2023

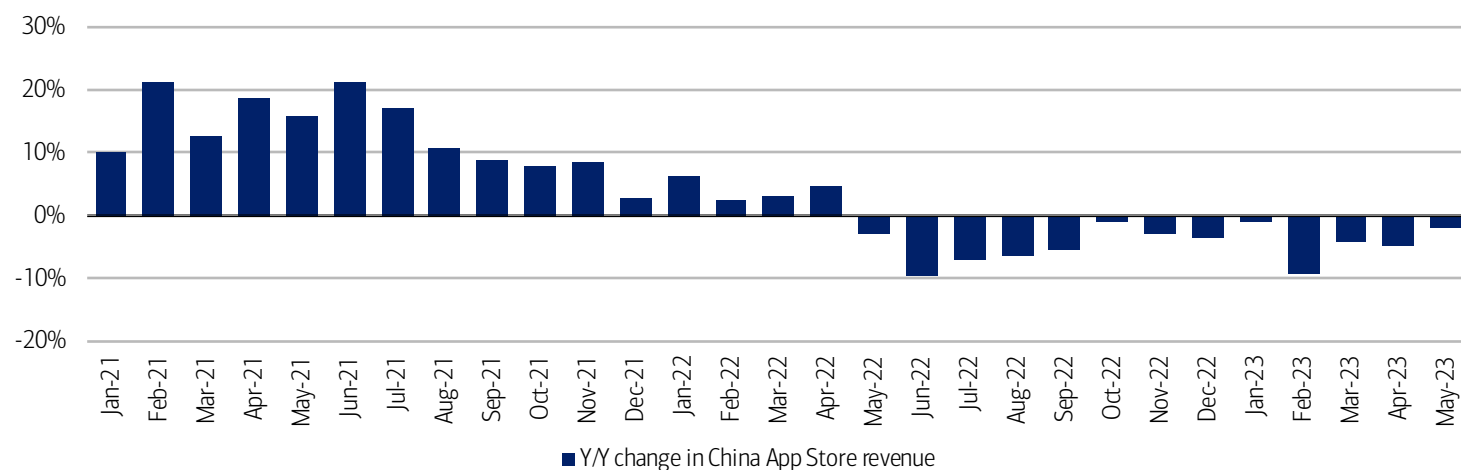


Source: SensorTower, BofA Global Research

BofA GLOBAL RESEARCH

Figure 2: YoY change in China App Store revenue

China App Store revenue decreased 1.8% YoY in May 2023



Source: SensorTower, BofA Global Research

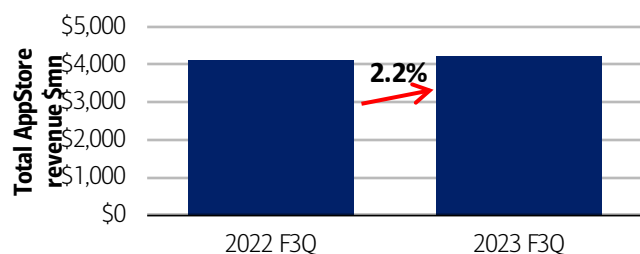
BofA GLOBAL RESEARCH

Key takeaways for F3Q23 (till May 31st 2023)

- Apple App Store generated approximately \$4.2bn revenue in F3Q23 (qtr to date), compared to \$4.1bn in the year-ago period. This represents 2.2% YoY growth. (Fig 3)
- App Store downloads were 5.3bn in F3Q23 (qtr to date) vs 5.1bn in the year-ago period increasing 3.7% YoY. (Fig 4)
- Average dollars per download decreased 1.4% (qtr to date) YoY to \$0.79 in F3Q23, compared to \$0.81 in the year-ago period. (Fig 5)
- Downloads in China declined 5.2% (qtr to date) YoY from 1,116mn in F3Q22 to 1,058mn in F3Q23. (Fig 6)

Figure 3: YoY growth in App Store revenue – F3Q23 vs F3Q22 (till May 31st 2023)

Global App Store revenue increased 2.2% YoY

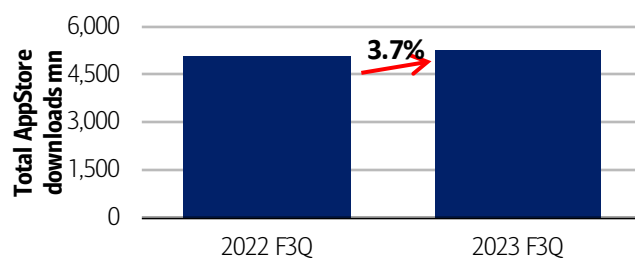


Source: SensorTower, BofA Global Research

BofA GLOBAL RESEARCH

Figure 4: YoY growth in App Store downloads – F3Q23 vs F3Q22 (till May 31st 2023)

Global App Store downloads grew 3.7% YoY

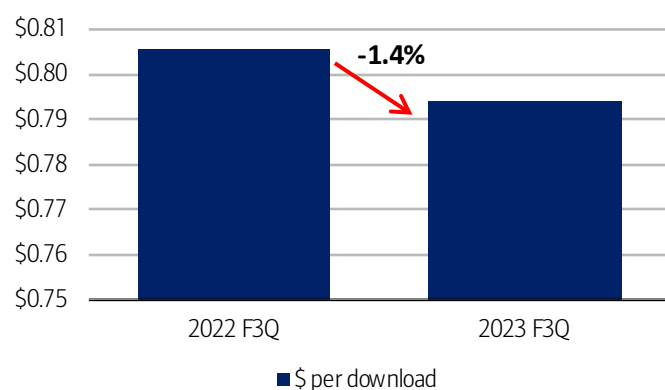


Source: SensorTower, BofA Global Research

BofA GLOBAL RESEARCH

Figure 5: YoY growth in App Store ASP – F3Q23 vs F3Q22 (till May 31st 2023)

Global App Store ASP declined 1.4% YoY

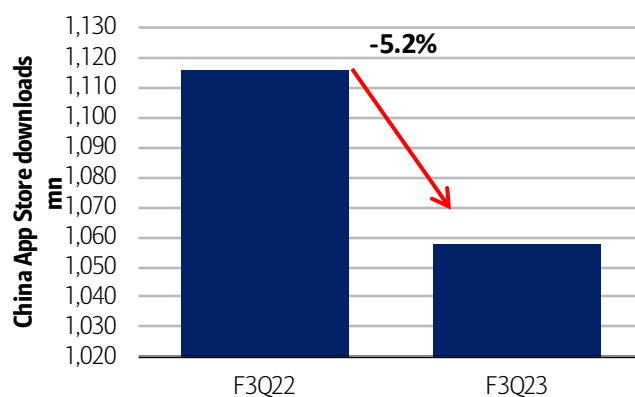


Source: SensorTower, BofA Global Research

BofA GLOBAL RESEARCH

Figure 6: YoY growth in China App Store downloads – F3Q23 vs F3Q22 (till May 31st 2023)

China App Store downloads declined 5.2% YoY



Source: SensorTower, BofA Global Research

BofA GLOBAL RESEARCH

Price objective basis & risk

Apple Inc. (AAPL)

Our PO of \$190 is based on approx. 30x our C24E EPS of \$6.40. Our target multiple compares to the long-term historical range of 9-34x (median 14x). We believe a multiple at the higher end of the historical range is justified given a large cash balance and opportunity to diversify into new end markets, increasing mix and diversity of services.

Downside risks are: a) weaker iPhone 14 cycle on consumer spending risk, b) weaker near-term services trajectory where App Store & Licensing can decelerate, c) gross profit dollars declining y/y next few quarters, d) iPads/Macs reverting to pre-COVID levels, and e) stronger dollar. Other risks are potential trade conflicts, tariffs, longer iPhone replacement cycles, commoditization in the smartphone market, intensifying competition in the tablet market, ability to manage beat and raise expectations for EPS estimates, and requirement to maintain pace of product innovation.

Upside risks are: a) stronger sales of Pro iPhone models which can help average selling price and help the mix of the business, b) est. revisions can be lower vs. peers, c) potential new products (AR/VR), and services (advertising). Other upside risks are stronger than expected 5G cycle, gross margin upside from better mix of higher end iPhones, tailwinds from lower memory costs, and a faster than expected recovery in emerging markets.

Analyst Certification

I, Wamsi Mohan, 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 - IT Hardware and Technology Supply Chain Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	Amphenol	APH	APH US	Wamsi Mohan
	Concentrix Corporation	CNXC	CNXC US	Ruplu Bhattacharya
	Corning Inc.	GLW	GLW US	Wamsi Mohan
	Dell Technologies Inc.	DELL	DELL US	Wamsi Mohan
	DigitalOcean	DOCN	DOCN US	Wamsi Mohan
	Flex Ltd.	FLEX	FLEX US	Ruplu Bhattacharya
	International Business Machines Corp.	IBM	IBM US	Wamsi Mohan
	Jabil Inc.	JBL	JBL US	Ruplu Bhattacharya
	Roku, Inc.	ROKU	ROKU US	Ruplu Bhattacharya
	Seagate Technology	STX	STX US	Wamsi Mohan
	Sensata Technologies Holdings Plc	ST	ST US	Wamsi Mohan
	TD Synnex Corp	SNX	SNX US	Ruplu Bhattacharya
	TE Connectivity Ltd.	TEL	TEL US	Wamsi Mohan
	Teradata Corporation	TDC	TDC US	Wamsi Mohan
	Vizio	VZIO	VZIO US	Wamsi Mohan
	Western Digital Corporation	WDC	WDC US	Wamsi Mohan
NEUTRAL				
	Apple Inc.	AAPL	AAPL US	Wamsi Mohan
	Arrow Electronics Inc.	ARW	ARW US	Ruplu Bhattacharya
	Avnet Inc.	AVT	AVT US	Ruplu Bhattacharya
	CDW Corp	CDW	CDW US	Ruplu Bhattacharya
	Hewlett-Packard Enterprise	HPE	HPE US	Wamsi Mohan
	Nutanix Inc	NTNX	NTNX US	Wamsi Mohan
	Pure Storage	PSTG	PSTG US	Wamsi Mohan



US - IT Hardware and Technology Supply Chain Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
UNDERPERFORM	HP Inc.	HPQ	HPQ US	Wamsi Mohan
	NetApp Inc.	NTAP	NTAP US	Wamsi Mohan
	Vishay Intertechnology, Inc.	VSH	VSH US	Ruplu Bhattacharya
RVW	Latch Inc.	LTCH	LTCH US	Wamsi Mohan

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

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

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
EV = Current Share Price × Current Shares + Minority Equity + Net Debt + Other LT Liabilities
Enterprise Value

Denominator

Total Assets – Current Liabilities + ST Debt + 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
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 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.

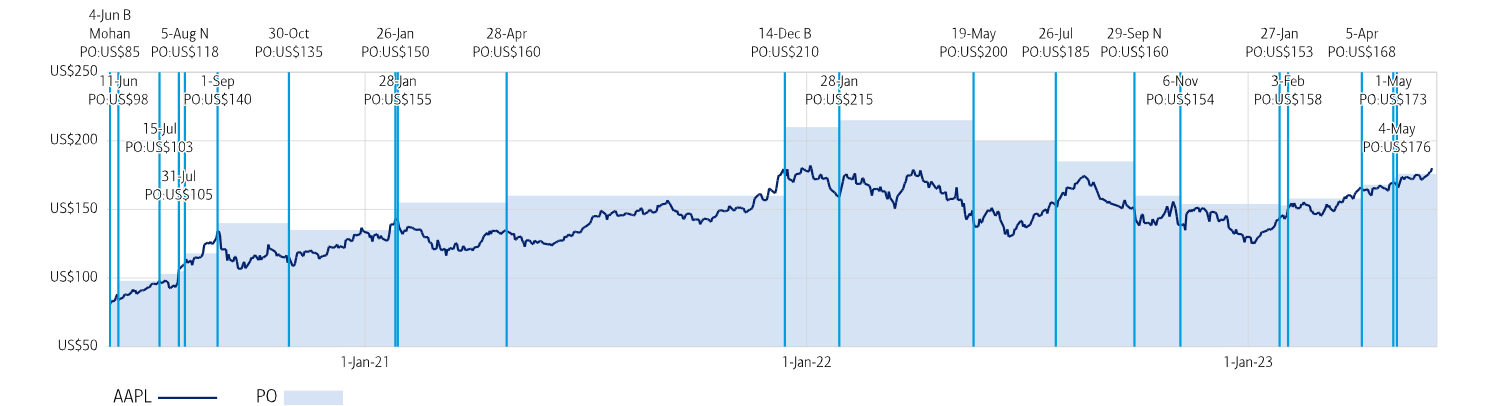
IQdatabase[®] is our real-time global research database that is sourced directly from our equity analysts' earnings models and includes forecasted as well as historical data for income statements, balance sheets, and cash flow statements for companies covered by BofA Global Research.

IQprofileSM, *IQmethodSM* are service marks of Bank of America Corporation. *IQdatabase[®]* is a registered service mark of Bank of America Corporation.

Disclosures

Important Disclosures

Apple Inc. (AAPL) 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 Mar 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	229	53.88%	Buy	107	46.72%
Hold	105	24.71%	Hold	50	47.62%
Sell	91	21.41%	Sell	29	31.87%

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

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	1869	53.01%	Buy	1030	55.11%
Hold	827	23.45%	Hold	476	57.56%
Sell	830	23.54%	Sell	389	46.87%

^{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). There are three investment ratings: 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. 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: Apple Inc.

BofAS or an affiliate was a manager of a public offering of securities of this issuer within the last 12 months: Apple Inc.

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

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

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

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: Apple Inc.

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: Apple 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: Apple Inc.

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: Apple 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 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.

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 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 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.

