Equity Strategy Focus Point

Cash for near term, stocks for L-T, but be wary of bonds

29 March 2023

Equity and Quant Strategy
United States

Savita Subramanian
Equity & Quant Strategist
BofAS
+1 646 855 3878
savita.subramanian@bofa.com

Victoria Roloff
Equity & Quant Strategist
BofAS
+1 646 743 6339
victoria.roloff@bofa.com

Alex Makedon
Cross-Asset & Quant Strategist
BofAS
+1 646 855 5982
alex.makedon@bofa.com

Ohsung Kwon, CFA
Equity & Quant Strategist
BofAS
+1 646 855 1683
ohsung.kwon@bofa.com

Jill Carey Hall, CFA
Equity & Quant Strategist
BofAS
+1 646 855 3327
jill.carey@bofa.com

Nicolas Woods
Equity & Quant Strategist
BofAS
nicolas.woods_barron@bofa.com

QE: quantitative easing

QT: quantitative tightening

Cash for near term, balanced risks for stocks

Cash offers ~5% returns, a compelling alternative to the S&P 500 index especially given that our year-end target (S&P at 4000) suggests limited near-term upside. If financial stability worsens rather than improves, a backdrop of easier Fed / tighter credit hasn't been good for the S&P 500. But sentiment based on our Sell Side Indicator (SSI), suggests that this and other reasons to worry about stocks are well aired, and argue for a *positive* surprise – especially vs. last year's bullish complacency – see last year's SSI.

Signal with good track record says 7%/yr next decade

Our S&P 500 outlook over the next 12 months is neutral, given the balance of risks and rewards, and in the near term, we see more alpha within the benchmark. But for long term investors, the S&P 500's price to normalized earnings has explained 80%+ of subsequent 10-yr S&P 500 returns (Exhibit 10). It now suggests price returns of +5%/yr. Add ~2ppt of dividend yield and this rivals prospects for most other asset classes.

More concerned about 10yr Treasuries

Bond bulls point out that only 20% of S&P stocks yield more than 10-yr Tsys. But this ratio was lower most of the time since '86, and stocks outperformed bonds even in those periods. Long duration bond risks are elevated: we are coming off an all-time low in rates, with yields still below inflation. The two biggest buyers of 10-yr Treasuries (the Fed & China) are no longer buyers. And bond sentiment is euphoric, with Wall Street recommending the highest allocation to bonds in 10 years. Plus, diversification benefits of bonds are impaired today given that QE propped up bonds *and* stocks, pushing return correlations higher. But the S&P 500 itself may be more internally diversified than ever: its 11 sectors offer the best relative diversification vs. one another in years.

The best arbitrage opportunity for stock investors? Time.

There's a reason private equity returns look stable: smoothed mark-to-market. Public equity gets marked every second. Stock investors' eyeballs have collectively moved to the short-term: 0-day S&P options account for ~45% of volume vs. <5% a decade ago. But the probability of losing money in the S&P 500 drops from a coin flip (46%) to a 2-sigma event (6%) by extending one's holding period from a day to a decade (Exhibit 13). Market timing is fraught with peril, and panic selling results in outsized opportunity costs (best days often follow worst days). Since the 1930s, missing the 10 best S&P 500 days per decade would have yielded 33% vs. ~19,000% by remaining invested.

Don't forget about dividends

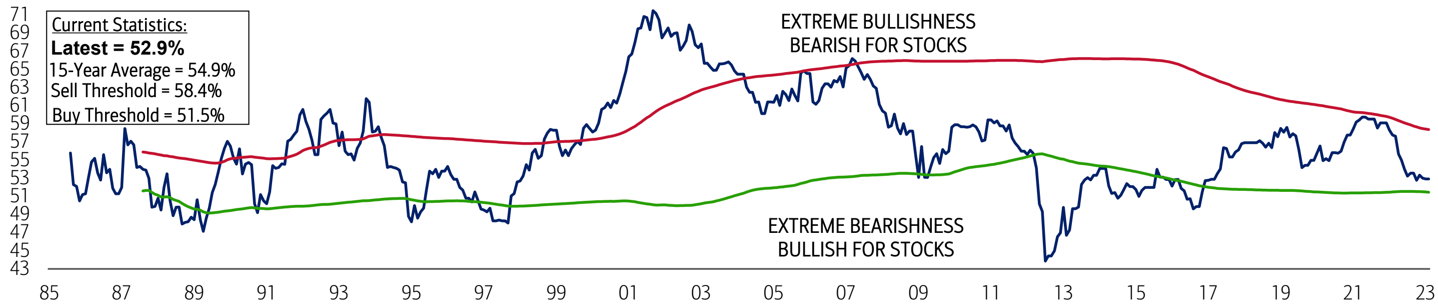
S&P 500 duration (30+yrs) is a negative, but should change over time. The dividend payout ratio is near a record low (30% v. 50% l-t avg). Moreover, right-sizing growth stocks vs. value stocks within the benchmark has just begun, in our view. Corps can shorten duration by returning cash (e.g., META recently), another reason to own stocks over bonds. Since 1936, dividends contributed 37% of total return but <20% over the past decade. From here, dividends' contribution to total returns could rise demonstrably.

Bond euphoria, wall of worry for stocks

Sell side is bearish on equities (see SSI)

Exhibit 1: Equity sentiment dropped 6ppt in 2022

Sell Side Indicator (SSI), as of 2/2023

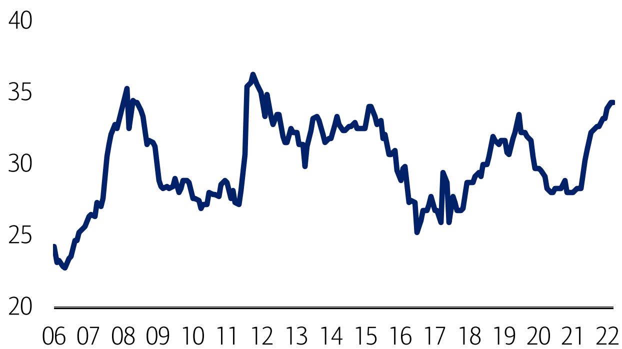


Source: BofA US Equity & Quant Strategy. Disclaimer: The Sell Side Indicator above is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purpose, without the prior written consent of BofA Global Research. This indicator was not created to act as a benchmark. Note: Buy and Sell signals are based on rolling 15-year +/- 1 standard deviation from the rolling 15-year mean. A reading above the red line indicates a Sell signal and a reading below the green line indicates a Buy signal

BofA GLOBAL RESEARCH

Exhibit 2: Sell side loves bonds

Average recommended allocation to bonds by Wall Street strategists (as of 2/2023)

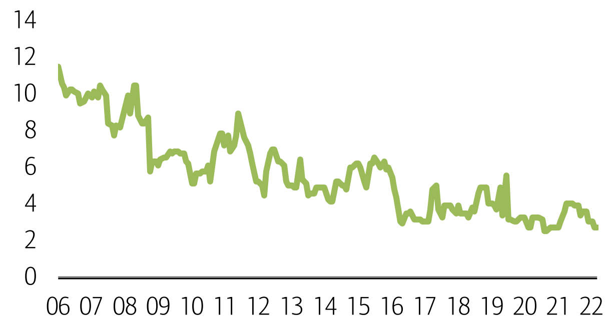


Source: BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Exhibit 3: Despite highest cash yields in 15 years, sell side is underweight cash

Average recommended allocation to cash by Wall Street strategists (as of 2/2023)



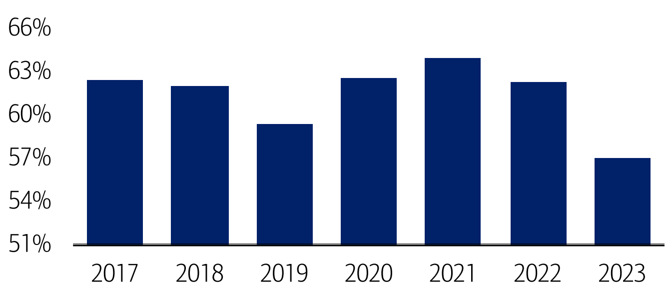
Source: BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Individuals shunning stocks, adding to bonds (GWIM note)

Exhibit 4: Equity allocation slipped 5ppt to survey-history lows

Average equity allocation % (2017-2023 surveys)

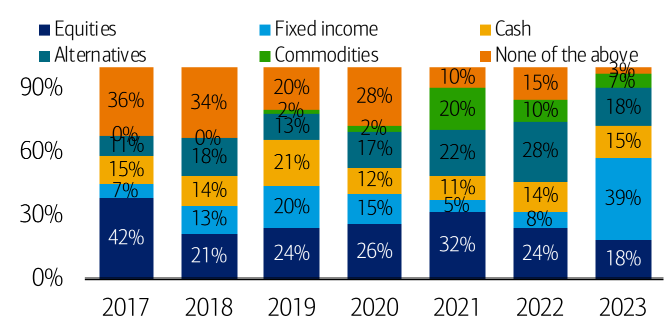


Source: Wealth Management Marketing Research, BofA US Equity & US Quant Strategy

BofA GLOBAL RESEARCH

Exhibit 5: More $ moving into bonds

How are you currently changing your asset allocation? Moving more into...



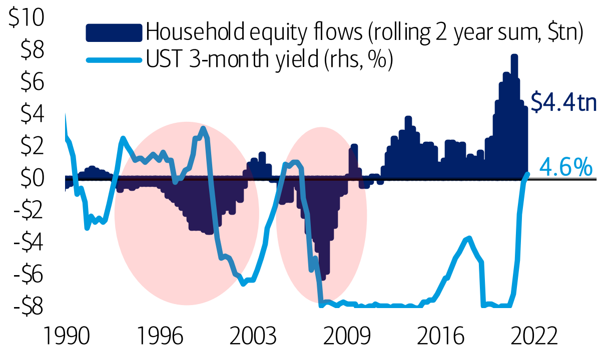
Source: Wealth Management Marketing Research, BofA US Equity & US Quant Strategy

BofA GLOBAL RESEARCH

Cash & credit for the short term

There is an alternative: cash

Exhibit 6: Households typically lighten up on stocks if cash > 4.5%
3-month US treasury yield vs US household equity flows



Source: BofA Research Investment Committee, Haver, Federal Reserve FoF, Bloomberg. Note: Flow data through 4Q22. Household equity flows are based on buying/selling of single name equities and equity mutual fund shares.

BofA GLOBAL RESEARCH

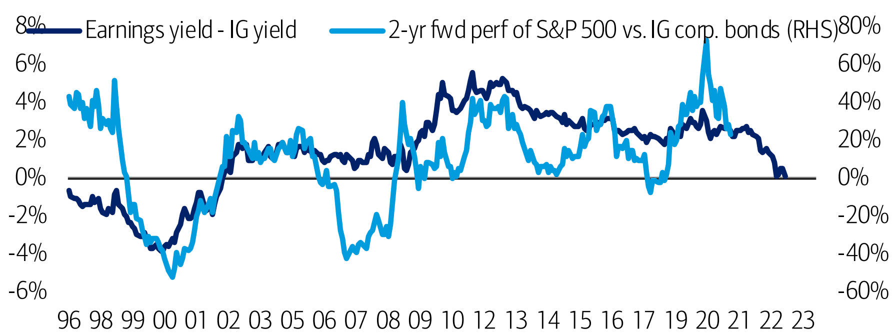
Exhibit 7: Cash for the short-term, stocks for the long-term
S&P 500 annualized returns & standard deviation vs. current risk-free rates by holding periods

S&P 500	**3mo.**	**6mo.**	**1yr**	**2yr**	**5yr**	**10yr**	**30yr**
Avg. annualized ret. (since 1936)	16%	13%	12%	11%	11%	11%	11%
Std. Dev. (since 1936)	34%	24%	17%	12%	7%	5%	1%
Current risk-free rate	4.6%	4.8%	4.4%	4.0%	3.5%	3.5%	3.7%
Risk-adj. ret. [(Re - Rf) / std. dev.]	0.33	0.35	0.44	0.62	**1.05**	**1.51**	**6.47**
Post-GFC risk-adjusted returns	*0.68*	*0.91*	*1.38*	*2.30*	*4.71*	*NA*	*NA*
% rank of current Rf vs. S&P ret.	38%	34%	30%	23%	18%	7%	NA

Source: BofA US Equity & Quant Strategy, Bloomberg

BofA GLOBAL RESEARCH

Exhibit 8: IG credit still attractive vs. stocks
Spread between S&P 500 forward earnings yield and investment-grade bond yield vs. 2-yr forward performance of S&P 500 vs. IG corp. bonds (1996-Fe 2023; 55% correlation)



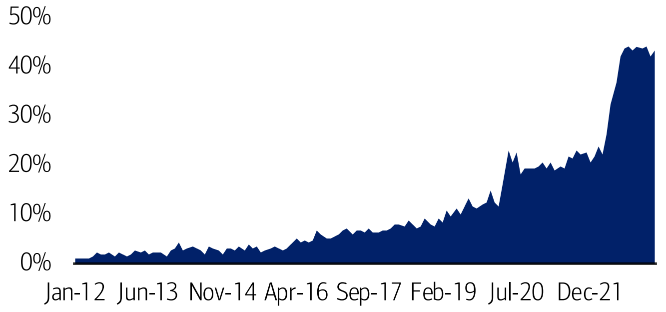
Source: BofA US Equity & Quant Strategy, FactSet, Bloomberg

BofA GLOBAL RESEARCH

Stocks for the long-term

Exhibit 9: 0-day S&P options volume now accounts for nearly 45% of all S&P options volume

SPX 0-days to expiry option volume as a % of total options volume



Source: BofA Global Research, Bloomberg. Data from Jan-12 to March-23.

BofA GLOBAL RESEARCH

Investors' eyeballs have shifted to the short-term

0-day S&P options volume surged in 2022 and now accounts for nearly 45% of all S&P options volume. This compares to less than 5% of all S&P options volume 10 years ago.

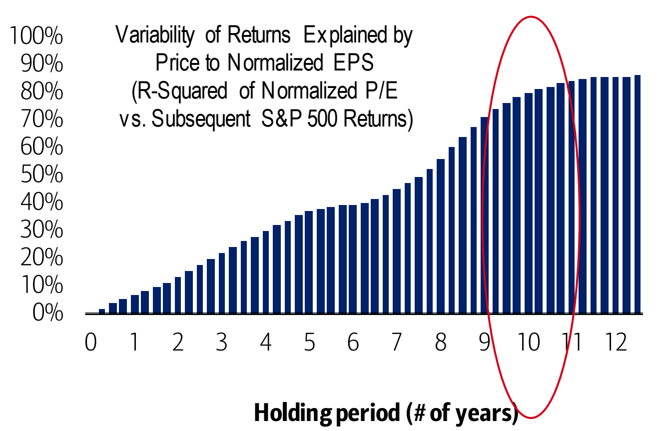
7% total return for S&P 500 over next 10 years?

Valuations may not explain much in the near term, but they may be all that matters over the long-term for the S&P 500, based on our work. And valuations currently suggest 5% p.a. price return (or 7% total return) for the next decade.

Valuations explain 60% to 90% of subsequent returns over a 10-year time horizon based on a variety of measures (Exhibit 12). Price to normalized earnings, our preferred valuation metric for the S&P 500, explains about 80% of returns over the subsequent 10 years (Exhibit 10). We have yet to find any factor with such strong predictive power for the market over the short or medium term.

Exhibit 10: Price to Normalized earnings explains 80% of returns over the subsequent 10yrs

Price to normalized earnings predictive power on subsequent holding period returns (since 1987)

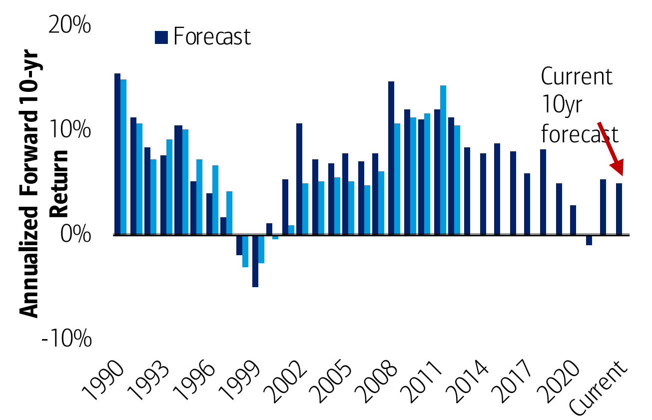


Source: BofA US Equity & US Quant Strategy, Haver Analytics

BofA GLOBAL RESEARCH

Exhibit 11: Valuation currently suggests ~5ppt p.a. price returns over the next decade (better than beginning of 2022's loss forecast)

S&P 500 normalized P/E vs. subsequent annualized returns (since 1987, as of 2/2023)



Source: FactSet, Haver Analytics, BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Exhibit 12: Strong predictive power of S&P 500 valuation measures vs. forward 10-yr returns (60-90% r-sq) indicate expected returns of 5% p.a.
Predictive power of various S&P 500 valuation metrics on total returns (as of 2/28/2023)

Metric	Current	Avg	% above (below) avg	10 yr RSQ	Implied 10yr Annlzd Total Return	90% Confidence Interval	Dates
Trailing PE	17.9	16.5	8%	63%	8.6%	3% - 14%	1960-present
Forward PE	17.9	15.7	14%	86%	6.2%	3% - 10%	1986-present
Normalized PE	22.1	19.5	13%	80%	7.0%	3% - 11%	7/1987-present
Shiller PE	30.4	19.0	60%	63%	4.1%	-1% - 9%	1936-present
P/BV	4.0	2.6	51%	86%	3.2%	0% - 7%	1978-present
EV/EBITDA	13.0	10.5	24%	74%	3.9%	-1% - 8%	1986-present
P/OCF	14.9	11.2	33%	88%	2.6%	0% - 6%	1986-present
P/FCF	25.5	27.9	-8%	42%	11.1%	4% - 18%	1986-present
EV/Sales	2.6	2.0	30%	79%	3.1%	-1% - 7%	1986-present
Market Cap/GDP	1.4	0.8	81%	55%	-0.3%	-6% - 5%	1952-present
				Median:	**4.0%**	**0% - 9%**	
				Average:	**5.0%**	**0% - 9%**	

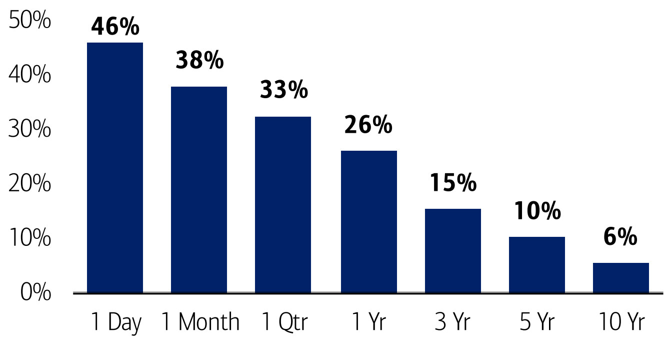
Source: FactSet, First Call, Compustat, Shiller, BofA US Equity & US Quant Strategy

BofA GLOBAL RESEARCH

For stocks, the best recipe for loss avoidance is time.

The probability of losing money in the S&P 500 over one day is a little worse than a coin-flip (46%), but the probability declines to just 6% over a 10-year time horizon, based on data back to 1929.

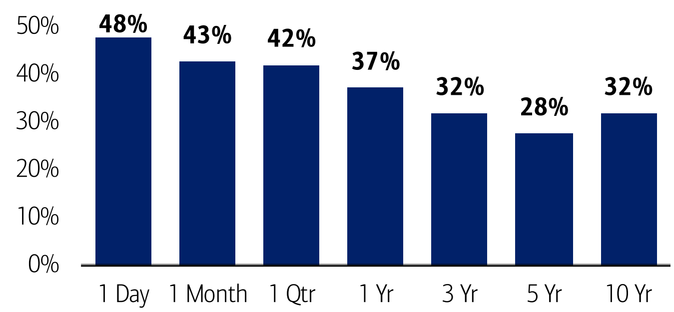
Exhibit 13: As time horizons increase, equity losses drop
Probability of negative returns, based on S&P 500 total returns from 1929-2/28/2023



Source: S&P, Bloomberg, BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Exhibit 14: Time is not as compelling for other asset classes (like oil)
Probability of negative returns, based on WTI oil returns from 1929-present for annual/3yr/5yr/10yr, 1974-present for quarterly/monthly and 1986-present for daily



Source: EIA, CME, BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Exhibit 15: Returns by decade have rarely been negative
S&P 500 Returns by Decade (1930s -2010s)

Decade	Total Return	Avg Annual Return
1930s	-1%	-0.1%
1940s	149%	9.5%
1950s	486%	19.3%
1960s	112%	7.8%
1970s	77%	5.9%
1980s	404%	17.5%
1990s	431%	18.2%
2000s	-9%	-0.9%
2010s	256%	13.6%

Source: BofA US Equity & Quant Strategy, Bloomberg

BofA GLOBAL RESEARCH

Negative 10-yr stock returns are rare

Outside of the 1930s, the 2000s was the only decade with negative total returns.

Exhibit 16: Market timing can lead to missing out on the best days
S&P 500 returns by decade excluding the 10 best and 10 worst days, as of 2/28/23

Decade	Price return	Excluding best 10d per decade	Excluding worst 10d per decade	Excluding best/worst 10d per decade
1930	-42%	-79%	39%	-50%
1940	35%	-14%	136%	51%
1950	257%	167%	425%	293%
1960	54%	14%	107%	54%
1970	17%	-20%	59%	8%
1980	227%	108%	572%	328%
1990	316%	186%	526%	330%
2000	-24%	-62%	57%	-21%
2010	190%	95%	351%	203%
2020	25%	-30%	140%	33%
Since 1930	**18,761%**	**33%**	**4,049,834%**	**28,450%**

Source: S&P, Bloomberg, BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Market timing has its perils....

Since the 1930s, if an investor sat out the 10 best return days per decade, his/her returns would be just 33% compared to ~18,761% returns from remaining invested.

Exhibit 17: Returns 3m prior to the best 10-days per decade were -11% on average
S&P 500 returns leading up to the best 10 days in each decade, as of 2/28/2023

	Returns prior to 10 best days per decade			
Decade	**Prior 3 mos.**	**Prior 1 mo.**	**Prior 5 days**	**Prior 1 day**
1930	6.1%	4.0%	-1.4%	-0.2%
1940	-13.8%	-9.4%	-2.1%	-0.9%
1950	-3.1%	-2.8%	-1.9%	-1.0%
1960	-13.2%	-7.8%	-4.3%	-0.8%
1970	-15.4%	-7.1%	-2.4%	-0.5%
1980	-9.6%	-7.3%	-5.8%	-1.4%
1990	-7.0%	-6.9%	-2.9%	-1.3%
2000	-27.0%	-16.8%	-9.0%	-2.3%
2010	-11.6%	-9.0%	-5.2%	-1.9%
2020	-17.2%	-16.9%	-6.0%	-3.8%
Avg.	**-11.2%**	**-8.0%**	**-4.1%**	**-1.4%**

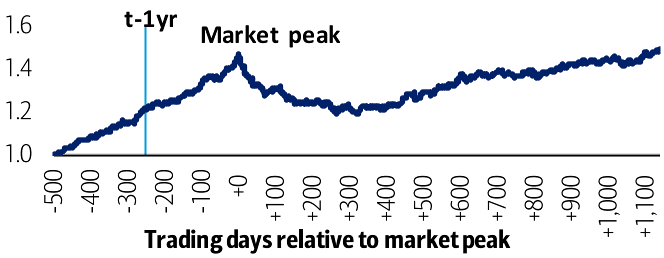
Source: S&P, Bloomberg, BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Panic selling is often a bad idea

The best periods for stocks often follow the worst periods. Returns leading up to the best 10 days in each decade were deeply negative (-11% in the prior 3 months, on average).

Exhibit 18: Unless you can pinpoint the peak of the market to within 12 months, you are typically better off staying invested
Average daily performance index of S&P 500 before and after market peaks, since 1937



Source: BofA US Equity & Quant Strategy, Bloomberg, S&P

BofA GLOBAL RESEARCH

Time heals most wounds

Recovering bear market losses has historically required remaining invested for about 1,100 trading days (over four years), but some market recoveries, like in 2020, have been much swifter.

And don't forget about dividends

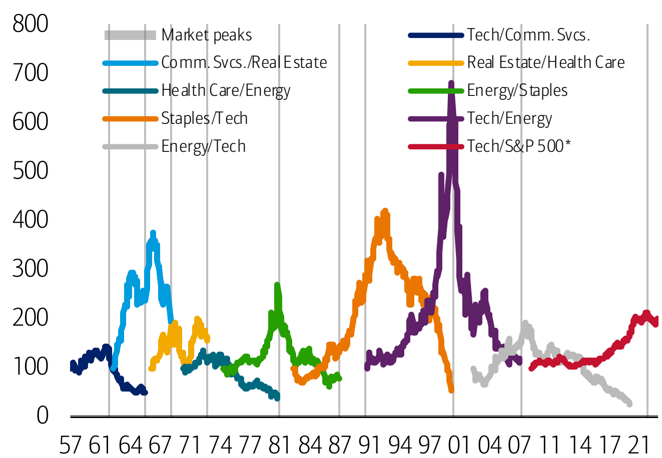
S&P 500 duration risk is a key reason we are neutral, but this could change meaningfully. The dividend payout ratio is near a century low (30% vs. 50% avg.) and right-sizing long-duration / growth vs. cash return / value within the benchmark has just begun, in our view. If companies shorten duration by returning cash (e.g., META recently) this offers another reason to own stocks (especially since earnings track inflation). Dividends have contributed 37% of total returns since 1936 but just 17% over the past decade amid PE expansion. From here, we think the contribution of dividends to returns could rise demonstrably.

Exhibit 19: Record duration risk in S&P 500
S&P 500 duration based on our DDM framework (as of 2/2023)

Source: BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

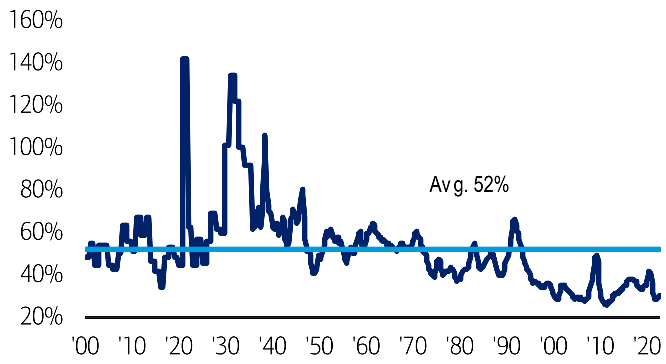
Exhibit 20: But right-sizing of long-duration Tech may have just begun
Relative performance of prior bull market leader vs. the next bull market leader (beginning of bull market = 100)



Source: BofA US Equity & Quant Strategy, FactSet *the next leader unknown

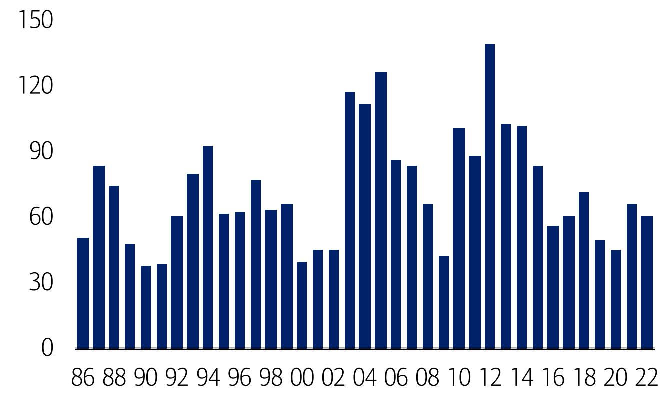
BofA GLOBAL RESEARCH

Exhibit 21: Dividend payout ratio is ~30% today vs. long-term average of ~50%
S&P 500 dividend payout ratio 1900-4Q2022



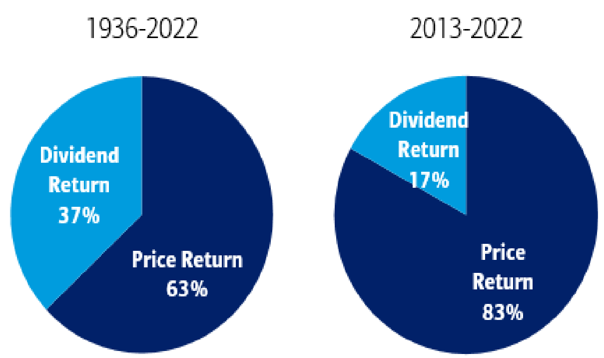
Source: Haver Analytics/S&P, FactSet, BofA US Equity & US Quant Strategy
BofA GLOBAL RESEARCH

Exhibit 22: New dividends have scarcity value
The number of Russell 3000 companies initiating dividends 1986-2022



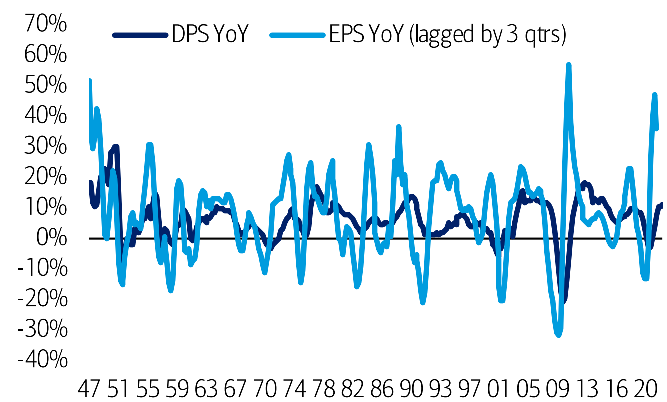
Source: FactSet, Bloomberg, BofA US Equity & Quant Strategy
BofA GLOBAL RESEARCH

Exhibit 23: Dividends contributed 36% of total returns since 1936 but just 17% over the last decade
S&P 500 price return and dividend contributions to total return



Source: BofA US Equity & Quant Strategy, Bloomberg
BofA GLOBAL RESEARCH

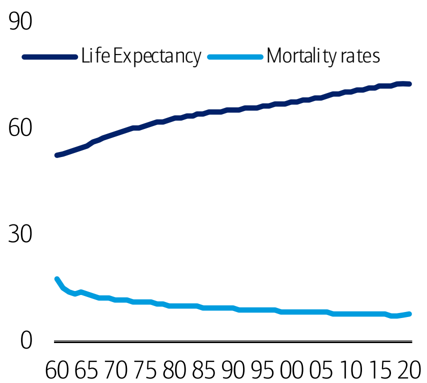
Exhibit 24: Dividend growth lagged earnings growth by 40% in 2021. Expect some catch up.
S&P 500 TTM div. per share vs. EPS YoY with a 3-qtr lag (1945-present)



Source: BofA US Equity & Quant Strategy, FactSet, Haver Analytics
BofA GLOBAL RESEARCH

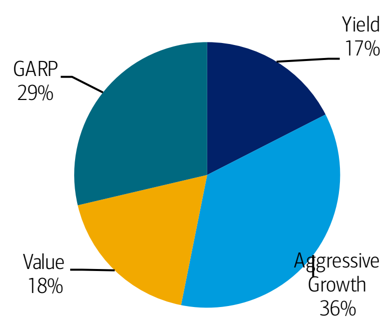
Demand still skews to income over capital appreciation

Exhibit 25: Demographics argue for income over capital appreciation
Life expectancy vs mortality rates, 1960-2020



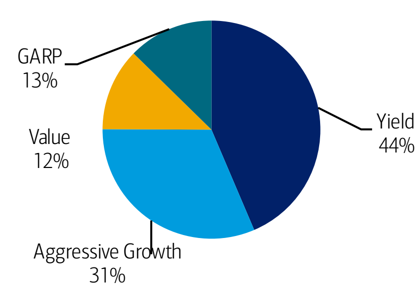
Source: World Bank
BofA GLOBAL RESEARCH

Exhibit 26: Income funds have grown from less than 20% of active AUM in 2010…
Active equity AUM landscape by fund category – Aug 2010



Source: BofA US Equity & US Quant Strategy, FactSet Ownership
BofA GLOBAL RESEARCH

Exhibit 27: …To 44% of active funds today
Active equity AUM landscape by fund category – present

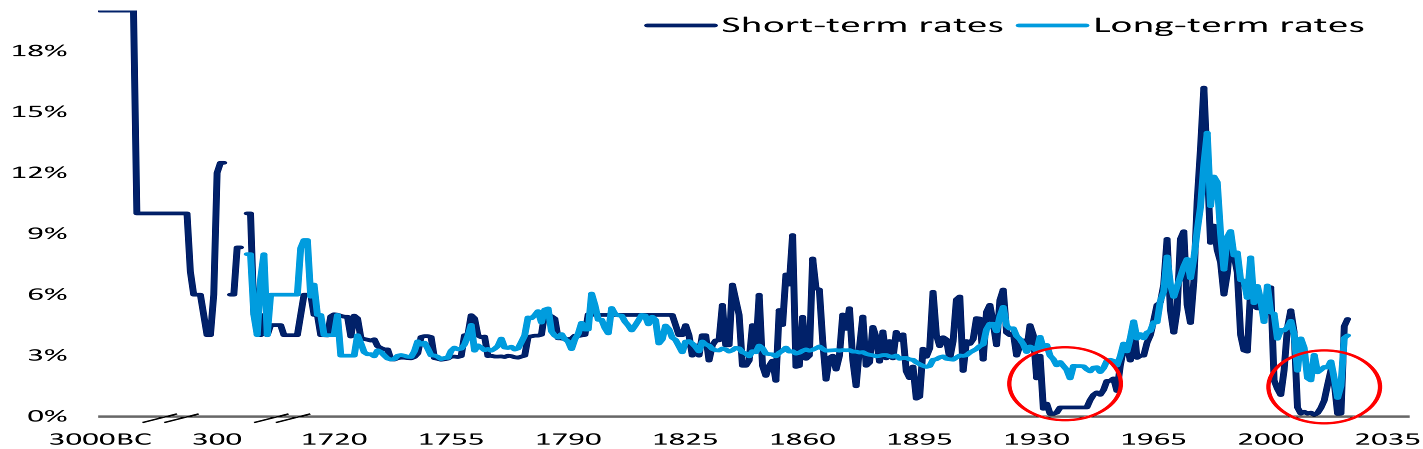


Source: BofA US Equity & US Quant Strategy, FactSet Ownership
BofA GLOBAL RESEARCH

Stocks don't keep us up at night, long bonds do

Only 20% of S&P stocks' dividend yield clears 10-yr yields, say the bond bulls. But during months when this ratio was lower since '86 (in fact, the majority of months) stocks still outperformed bonds by a median of 50bp. Long bond risks are elevated: we are coming off an all-time low in rates. The two biggest buyers of 10-yr treasuries over the past few decades (the Fed & China) are no longer buying. Bond sentiment has hit euphoria - Wall Street recommends the highest allocation to bonds in 10 years, and our recent survey (see GWIM note) shows individuals moving more assets out of stocks into bonds. Even diversification benefits of bonds are impaired today given that quantitative easing (QE) propped up bonds and stocks in tandem, pushing return correlations into positive territory.

Exhibit 28: Expecting rates to mean revert from last year's move? Rates are just off a 5000yr low
Interest rates since 3000 B.C

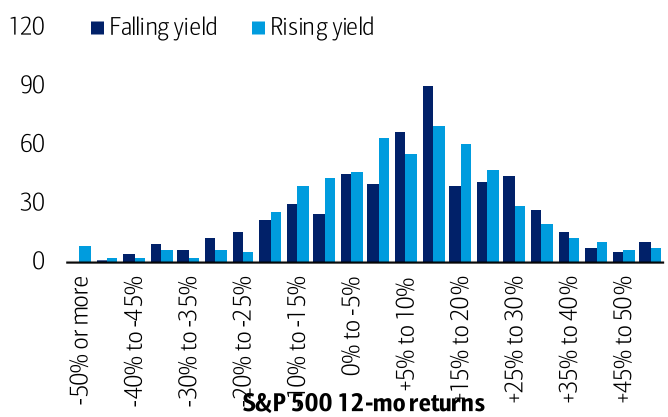


Source: BofA Global Investment Strategy, Bloomberg, Bank of England, Global Financial Data, Homer and Sylla "A History of Interest Rates" (2005).

BofA GLOBAL RESEARCH

Rate risk is unequivocally bad for bonds, not always bad for stocks

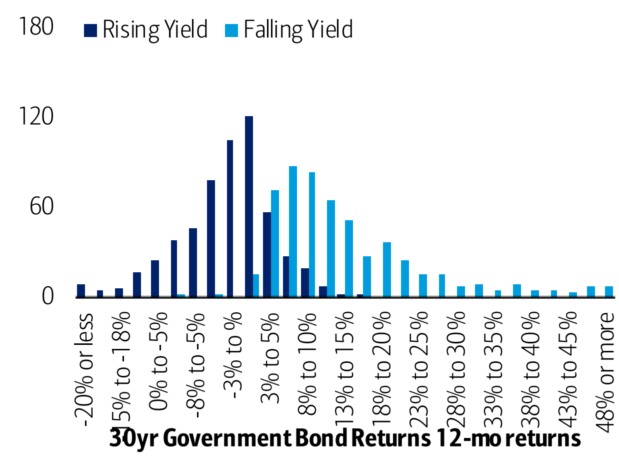
Exhibit 29: No clear relationship between rates & stock returns...
S&P 500 12-mo. return distribution by YoY changes in long-term (10yr+) treasury yield (1928-present)



Source: Bloomberg, Haver Analytics, BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

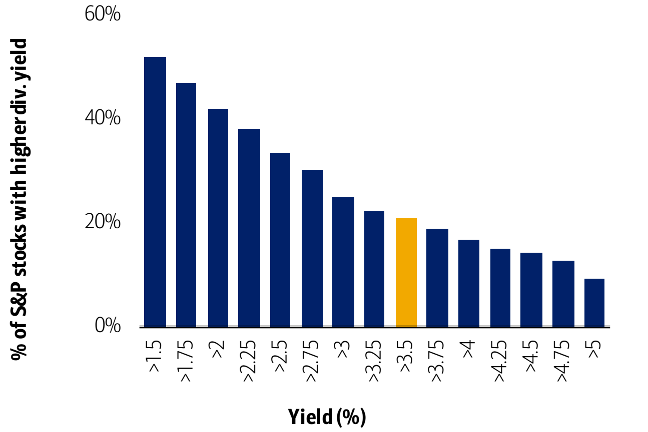
Exhibit 30: ...whereas bonds exhibit clear directionality
12m return distribution of 30yr government bond by YoY changes in long-term (10yr+) treasury yield (1928-present)



Source: Bloomberg, Haver Analytics, BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

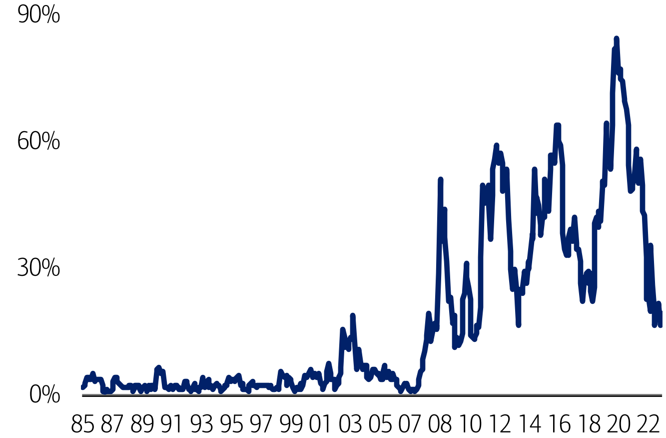
Exhibit 31: Bond bulls cite that only 20% of stocks have a dividend yield above the 10-yr
% of S&P 500 stocks with a div. yield above stated levels, as of 3/21/23



Source: BofA US Equity & Quant Strategy, FactSet

BofA GLOBAL RESEARCH

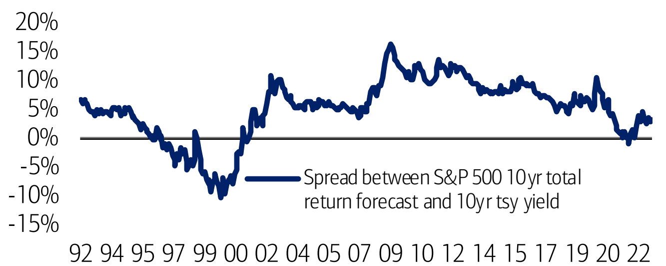
Exhibit 32: For most of the 80s and 90s, despite a less favorable yield backdrop for stocks, stocks beat bonds
% of S&P 500 stocks with trailing dividend yield > 10yr Treasury yield (1/86-3/21/2023)



Source: BofA US Equity & Quant Strategy, FactSet

BofA GLOBAL RESEARCH

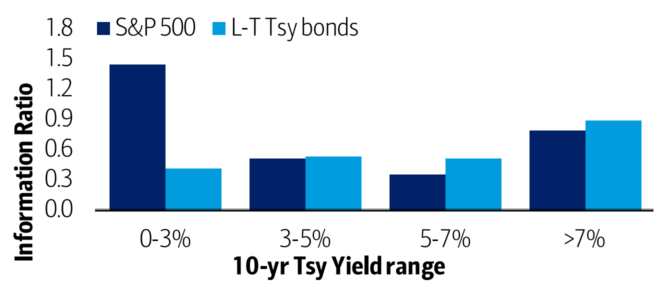
Exhibit 33: Valuations suggest ~7% p.a. in total returns over the next decade (higher than 10yr Tsy yield)
Spread between S&P 500 10yr total return forecast based on our long-term valuation model and 10yr treasury yield



Source: BofA US Equity & Quant Strategy, Bloomberg, Haver Analytics

BofA GLOBAL RESEARCH

Exhibit 34: At current rates, stocks and bonds have offered similar risk-adjusted returns
Median 12-mth forward S&P 500 return divided by the std. dev. of returns during different 10-yr Tsy yld ranges, 1962-present



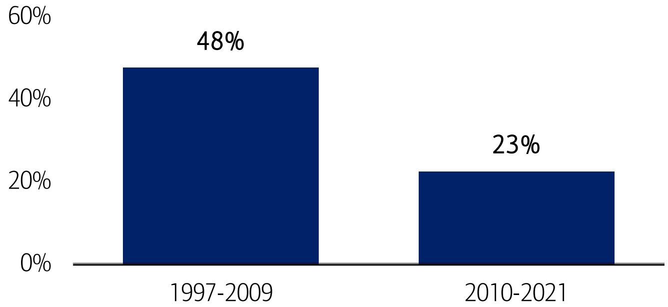
Source: BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Do bonds still diversify?

After years of QE pushing stocks and bonds up together, the correlation between the two asset classes has swung into positive territory.

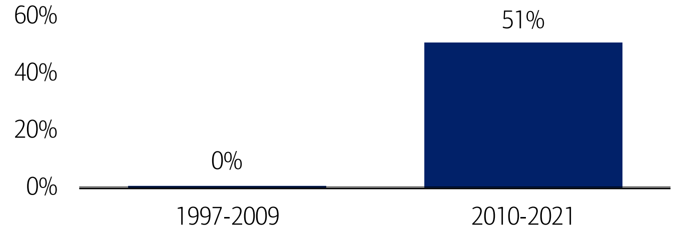
Exhibit 35: Earnings only explained 23% of post-GFC market returns
R-sq of S&P 500 fwd EPS YoY vs. S&P 500 price returns on a monthly basis (5/97-12/21)



Source: FactSet, BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Exhibit 36: Fed balance sheet expansion since GFC was a bigger driver of stocks
R-sq of Fed balance sheet YoY vs. YoY change in S&P 500 market cap that is not driven by earnings (5/97-12/21)

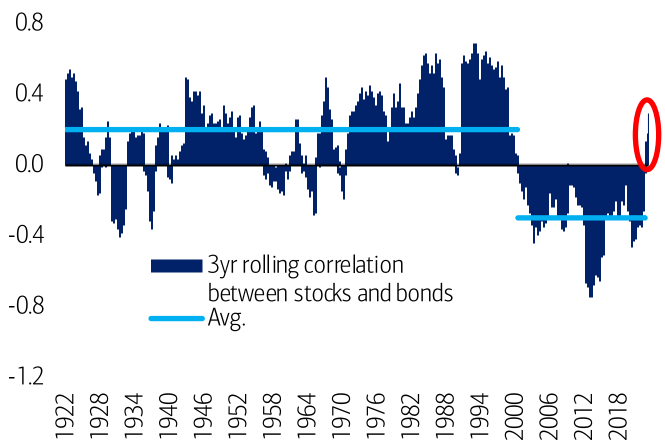


Source: FactSet, BofA US Equity & Quant Strategy
*Non-earnings driven market cap change = [total market cap change] – [historical avg. fwd P/E] x [chg. in fwd EPS]

BofA GLOBAL RESEARCH

Bonds and stocks are now moving together. But the S&P 500 appears to be auto-diversifying, with better internal diversification benefits than in prior decades from low sector co-movement.

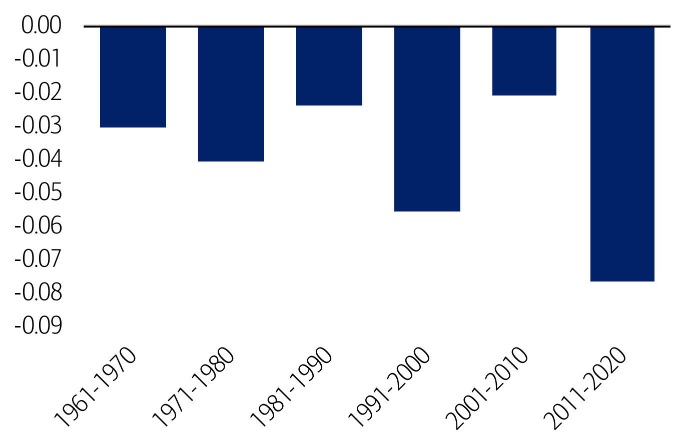
Exhibit 37: Diversification benefits of bonds from 90s, 00s and 10s is behind us
3yr rolling correlation of S&P 500 vs. 30yr government bonds



Source: Global Financial Data, Bloomberg, BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Exhibit 38: S&P 500 as a self-diversifying asset class? Sectors less correlated with one another than ever
Average 3-yr correlation of S&P 500 sectors' relative performance throughout various decades



Source: Global Financial Data, FactSet, Bloomberg, BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Disclosures

Important Disclosures

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[R1]
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

[R1] 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.

Due to the nature of strategic analysis, the issuers or securities recommended or discussed in this report are not continuously followed. Accordingly, investors must regard this report as providing stand-alone analysis and should not expect continuing analysis or additional reports relating to such issuers and/or securities.
Due to the nature of quantitative analysis, the issuers or securities recommended or discussed in this report are not continuously followed. Accordingly, investors must regard this report as providing stand-alone analysis and should not expect continuing analysis or additional reports relating to such issuers and/or securities.
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

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.

This report may refer to fixed income securities or other financial instruments that may not be offered or sold in one or more states or jurisdictions, or to certain categories of investors, including retail investors. Readers of this report are advised that any discussion, recommendation or other mention of such instruments is not a solicitation or offer to transact in such instruments. Investors should contact their BofA Securities representative or Merrill Global Wealth Management financial advisor for information relating to such instruments.
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.bofaml.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 (HKSFC); 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 HKSFC; 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.

Copyright and General Information:

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 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