

5 FAQs from FAs

What we heard from the thundering herd

Notes from the road

Conversations with investors and advisors highlight a lack of conviction, career risk and loss aversion amid a trendless market with event risk on the horizon (debt ceiling, recession, rate hikes or cuts.) We address five frequent questions.

Q: What's the likely debt ceiling outcome?

A: Our economists pulled forward the X-date projection to June 1, consistent with Treasury Secretary Yellen's guidance. The debt limit will likely be resolved prior to a technical default, but quick resolution is unlikely. Risks of testing the X-date are as high as in 2011. But 2011's 19% S&P 500 decline / Tsy bond rally are less likely given (1) stock vs. bond allocations are 30pts lighter than in 2011 and (2) indebtedness shifted from private to public sectors. We would avoid crowded groups with high gov't exposure.

Q: Is the USD at risk of losing its reserve currency status?

A: USD reactions to debt ceiling drama is unclear, in our FX team's view. But no recent trends justify concerns that USD is losing its global role. In some cases, it has lost share but from high levels, and over decades vs. years. Moreover, there is no single alternative.

Q: Should I put cash to work in stocks or wait until ___?

[Fill in blank: debt ceiling, recession, first rate cut...] A: The frequency of this question suggests heightened levels of sideline cash, that if everyone is waiting for a pullback, a pullback is unlikely, and that sentiment is negative. Positioning in cyclicals vs. defensives and stocks vs. bonds is at GFC-levels. This points to upside risk in stocks and cyclicals relative to bonds and defensives. Our advice: lengthen your time horizon when it comes to the index: 10-yr S&P 500 returns have rarely been negative, but 1-day gain/loss ratios have barely cleared a coin flip. Our valuation framework yields S&P 500 5% price returns p.a. over the next decade, better than the losses forecast last year!

Q: Growth or value?

A: In a 5% cash world, we prefer companies that generate cash (value) to those that borrow and burn cash to grow. Absent more QE, we prefer companies with attractive free cash flow yield to those with long-duration growth. Our US regime model is in its "Downturn" phase during which growth strategies lag. Value is historically inexpensive and unloved. De-globalization and tech demand pull-forward during COVID highlight pressures on new economy/growth vs. old economy/deprived but disciplined Energy, regulated financials, mining etc. Value cycles are long, and we are only a year in.

Q: Should I add gold to my portfolio?

A: After a decade of QE pushing bonds, alternatives and equities higher in tandem, gold still offers stable diversification benefits and plays an important role in efficient portfolios. Our strategists highlight that gold has outperformed after 'incomplete' Fed hiking cycles as well as weak USD cycles. Geopolitical tensions and sanctions could also support investor interest in gold as a hedge.

Trading ideas and investment strategies discussed herein may give rise to significant risk and are not suitable for all investors. Investors should have experience in relevant markets and the financial resources to absorb any losses arising from applying these ideas or strategies.

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 7 to 9.

12 May 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

Nicolas Woods
Equity & Quant Strategist
BofAS
+1 646 556 4179
nicolas.woods_barron@bofa.com

Acronyms:

TMT: technology, media and telecommunication

QE: quantitative easing

QT: quantitative tightening

GFC: global financial crisis

EM: emerging markets

p.a.: per annum

What's the likeliest debt ceiling outcome?

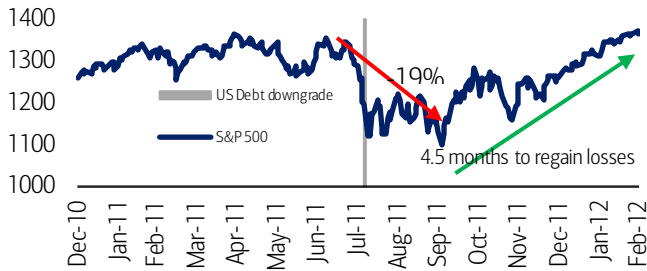
Our economists' and rates strategists' baseline view is that the debt limit will be resolved prior to a technical default, but that quick resolution is unlikely (see note [Economics of debt limit battle](#)). In fact, risks of brinkmanship are higher than since 2011, begging the comparison. The S&P 500 fell 19% when US debt was downgraded in 2011, taking more than four months to recover losses; Treasury bonds rallied despite their being explicitly downgraded amid a flight to quality. 2011's debt crisis - and government shutdowns in general - have been associated with heightened volatility.

The key difference today that supports equities relative to fixed income is that positioning in stocks vs. bonds is about 30ppt lighter than in 2011, and the public sector is far more indebted whereas the private sector is healthier than in 2011.

Defense and Health Care stocks are consensus overweights by institutional fund managers today amid a war-time economy with recession fears, but these companies could be at risk from public spending cuts. Gov't exposed companies have lagged on average during prior government shutdowns.

Exhibit 1: In 2011, S&P fell 19%, bonds rallied

S&P 500 performance around US debt downgrade in 2011 and European debt crisis

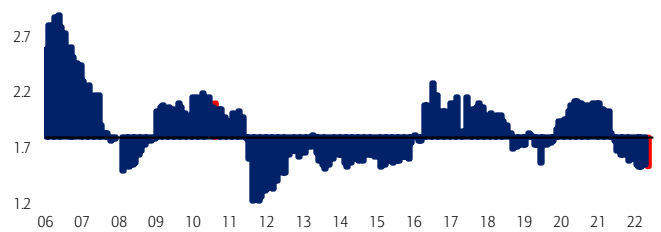


Source: Bloomberg, BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Exhibit 2: Stock - bond allocations in 2011 were ~30ppt higher than today

Strategists' avg recommended allocation to stocks less bonds (in ppt) in balanced fund

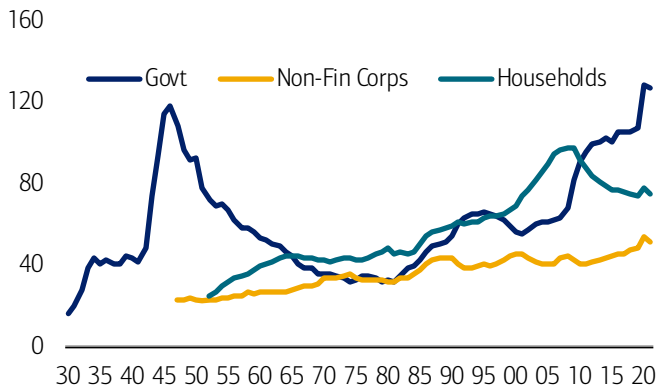


Source: BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Exhibit 3: Public sector is more levered, private less so vs. 2011

US public debt to GDP, US non-financial corporate debt/GDP, US household debt/GDP, fiscal years 1930-present

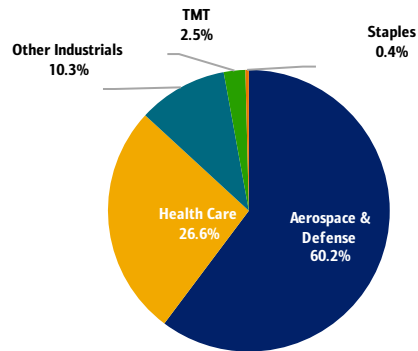


Source: Haver Analytics/Federal Reserve, BofA US Equity & US Quant Strategy

BofA GLOBAL RESEARCH

Exhibit 4: Defense & Health Care: crowded, high gov't exposure

Gov't dollars obligated for industry as a % of dollars obligated for S&P 500 companies (based on top 100 federal contractors in FY2021)



Source: BofA US Equity & Quant Strategy, Top 100 Contractors Report - SAM.gov

BofA GLOBAL RESEARCH



Can the USD lose reserve currency status?

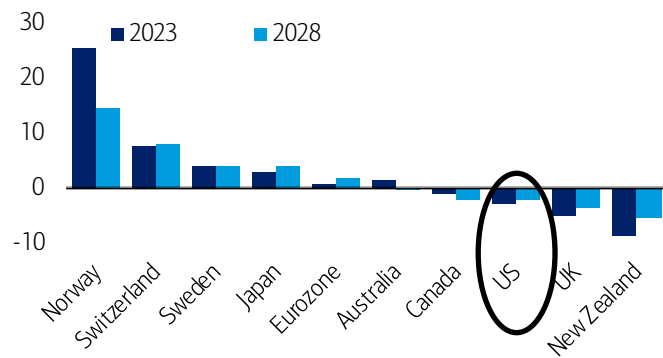
The debt ceiling implications on the USD are unclear, according to our G10 Currency team. Gridlock and brinkmanship, the possibility of technical default and pricing of Fed rate cuts should be negative, but risk-off flight to quality sentiment could more than offset these factors as we saw in 2011 when the USD strengthened especially relative to EM currencies. The difference today is that the USD is a high-yielder, meaning that lower rates and higher volatility might be more negative than in 2011. A bigger risk may be in USD funding costs which remain relatively contained but spiked during the 2011 episode. But the risk of the dollar being unseated as the world's reserve currency is low, in our FX strategists' view.

No recent trends would justify concerns or arguments that the USD is losing its global role.

Our FX strategists highlight that in some cases, the USD has been losing share, but only from very high levels and only over decades, not years. Moreover, no single alternative is currently evident. See note [FX Viewpoint](#).

Exhibit 5: The US has a current account deficit, but it is not excessive

G10 Current Account balance/GDP

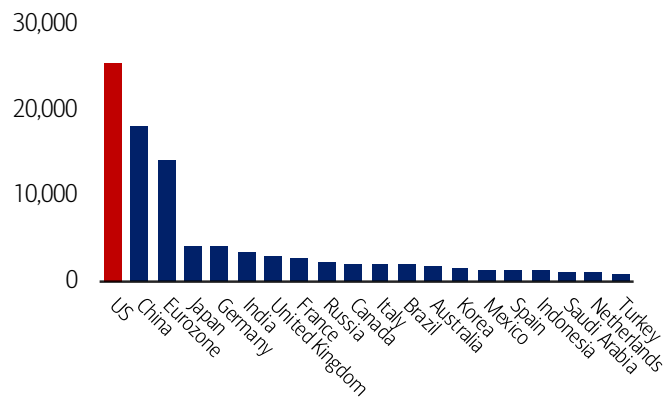


Source: IMF. Forecasts for 2003-28.

BofA GLOBAL RESEARCH

Exhibit 7: The US remains the largest economy in the world

\$GDP, billion, 2022

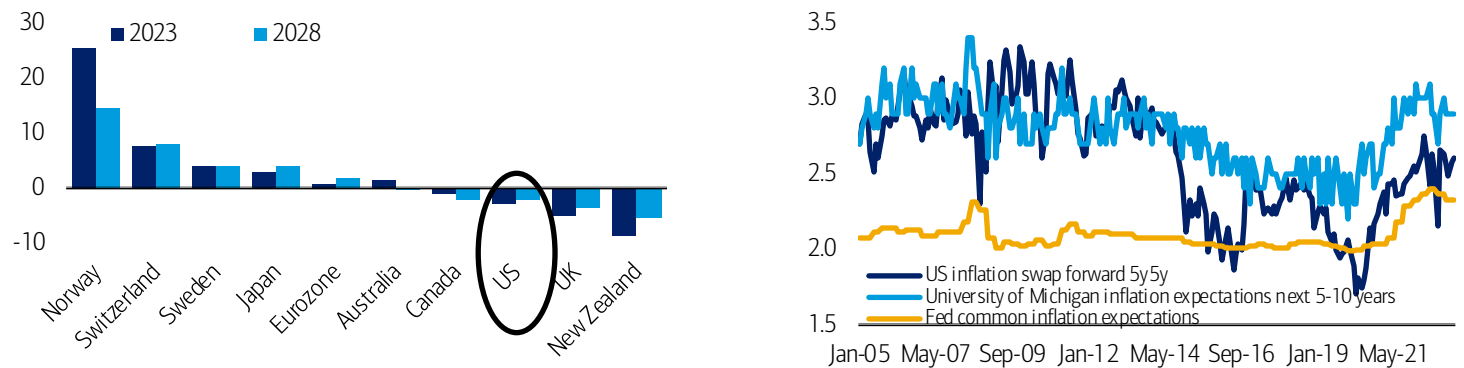


Source: IMF

BofA GLOBAL RESEARCH

Exhibit 6: Inflation expectations remain anchored

US inflation expectations

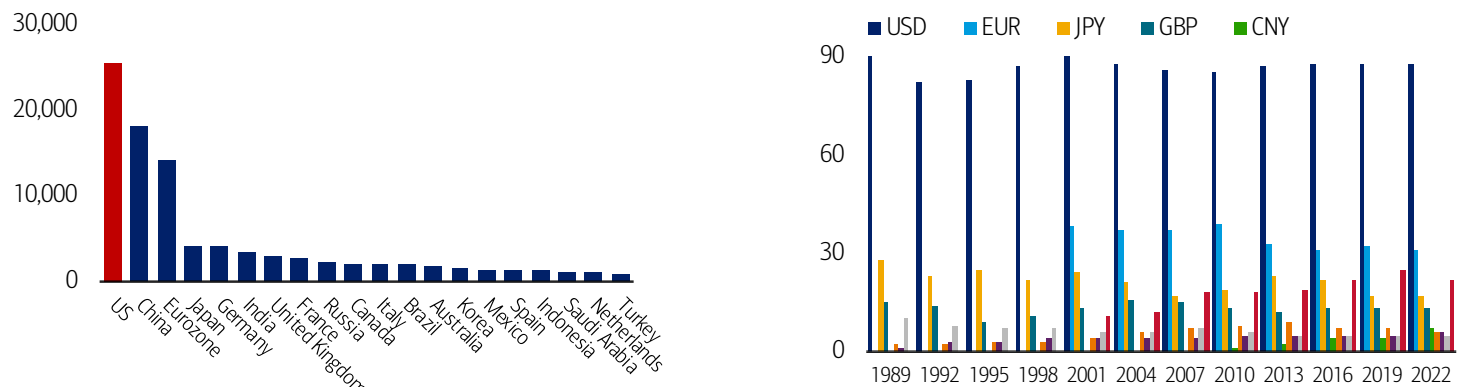


Source: Bloomberg and BofA Global Research.

BofA GLOBAL RESEARCH

Exhibit 8: No sign of the USD losing market share in the last 30 years.

Turnover of OTC foreign exchange instruments, by currency (share)



Source: BIS Triennial Central Bank Survey of foreign exchange and Over-the-counter (OTC) derivatives markets.

BofA GLOBAL RESEARCH



Should I put cash to work or wait until ... ?

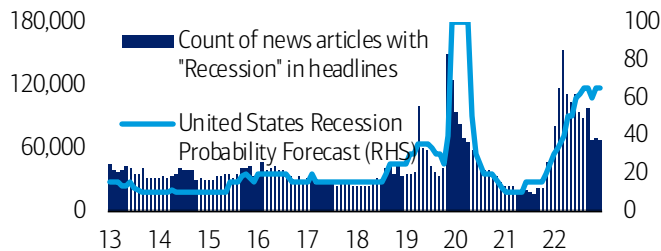
...the debt ceiling x-date / the recession that hovers two quarters in the distance / the Fed cuts rates / inflation subsides / Russia/Ukraine cease-fire / [fill in blank]?

The good news is everyone is talking about the bad news. News trends are at levels only seen during actual recessions. Our economists forecast a recession with a peak to trough declines of 0.8ppt, half the magnitude of a typical recession, and the Fed has latitude to soften the impact after hiking rates by 5ppt. We expect trough earnings in 4Q, and productivity gains are likely in the next cycle from AI/automation spend. Inflation volatility is off fever pitch levels arguing for a lower risk premium for stocks.

Our advice: lengthen your time horizons when it comes to the index. 10-yr S&P 500 returns have rarely been negative, but the one-day loss ratio is just slightly better than a coin flip. Our valuation framework—a powerful long-term signal that has explained 80% of returns variability over subsequent 10-year time horizons - suggests the S&P 500 could offer 5% price returns (~7% total returns) p.a. over the next decade. But not without volatility, thus we recommend picking one's spots for the near-term.

Exhibit 9: Forecasted probability of recession at levels only seen during recessions

Count of news articles with "Recession" in headlines vs. United States Recession Probability Forecast (RHS)

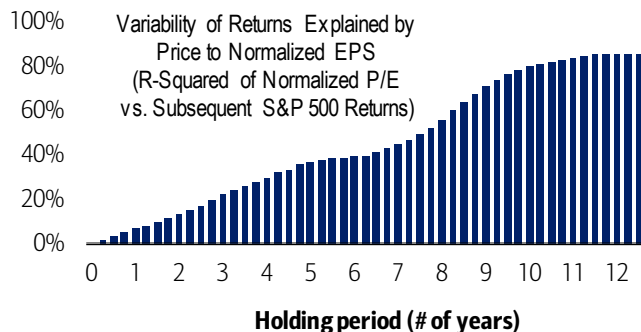


Source: Bloomberg

BofA GLOBAL RESEARCH

Exhibit 11: Price to normalized EPS has explained 80% of returns variability over subsequent 10yrs

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

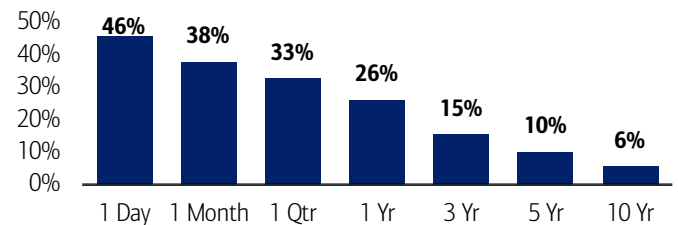


Source: BofA US Equity & US Quant Strategy, Haver Analytics

BofA GLOBAL RESEARCH

Exhibit 10: As time horizons increase, the percentage of negative returns has dropped

Probability of negative returns, based on S&P 500 total returns from 1929-2/28/2023

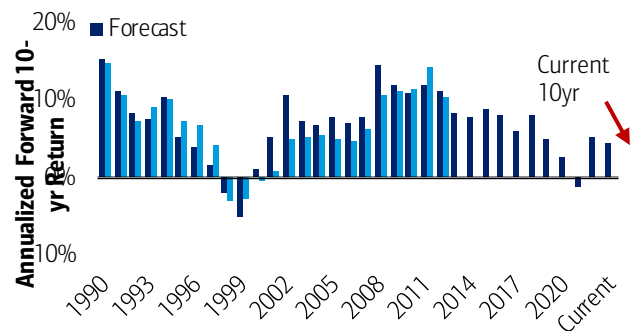


Source: S&P, Bloomberg, BofA US Equity & Quant Strategy

BofA GLOBAL RESEARCH

Exhibit 12: Valuation suggests ~5ppt p.a. price returns over the next decade (better than 2022's loss forecast)

S&P 500 normalized P/E vs. subsequent annualized returns (since 1987, as of 1/2023)



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

BofA GLOBAL RESEARCH



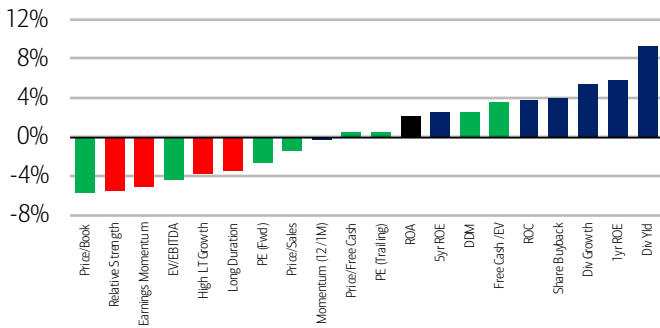
Should I tilt to growth or value?

We prefer Value to Growth, with a preference for Free Cash Flow based valuation rather than deep value strategies. Why?

First, our US Regime Indicator (see [Quantitative Regime note](#)) is in its Downturn phase, during which cash flow based valuation, quality and cash return strategies have outperformed, but growth strategies have lagged (Exhibit 13). (2) Value trades at an historical discount to Growth (Exhibit 15). (3) Value is underweight by active managers (Exhibit 16). (4) After the Fed paused in the 70s and early 80s, Value outperformed Growth over the next 12 months. (5) the Growth index earnings are forecast to grow ~5ppt more than Value over the next two years, an average spread that is consistent with periods during which Value outperformed and during which Growth outperformed (i.e., not a predictive signal). (6) Value has outperformed over the long haul, has had long cycles and we are just one year in.

Growth stocks need capital to grow, whereas value stocks throw off cash. With cash yields at 5% we prefer sources of cash over users of cash.

Exhibit 13: Downturn: Growth lags, Value mixed; Cash & Quality wins
Top Decile S&P 500 avg. rel. perf. during Downturn regimes

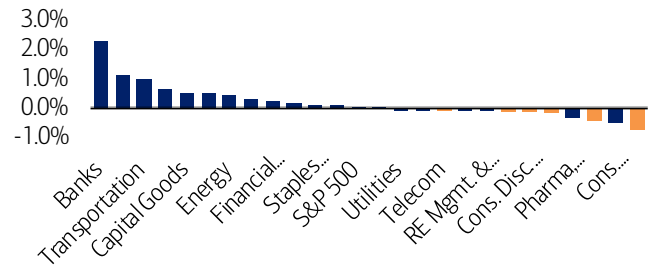


Source: BofA US Equity & US Quant Strategy (Green = value, red = growth, blue = cash & quality)

BofA GLOBAL RESEARCH

Exhibit 14: Old economy cyclicals are pricing in more risk, new economy Tech/Media/Telecom less risk

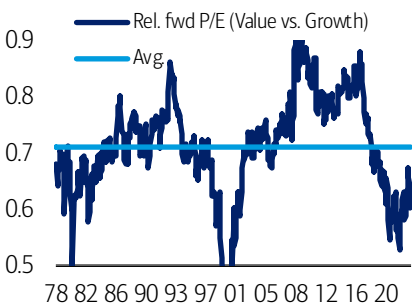
Change in equity risk premium (ERP = trailing earnings yield – 10-yr real rates) since 2/28/23 (as of 4/30/23); orange = TMT industry groups



Source: FactSet, Bloomberg, BofA US Equity & Quant Strategy; 50%+ of Consumer Discretionary Distribution & Retail is AMZN

BofA GLOBAL RESEARCH

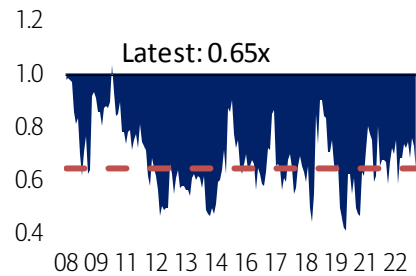
Exhibit 15: Value is historically inexpensive
Relative forward P/E of Russell 1000 Growth vs Value style indices as of 4/2023



Source: BofA US Equity and Quant Strategy, FactSet

BofA GLOBAL RESEARCH

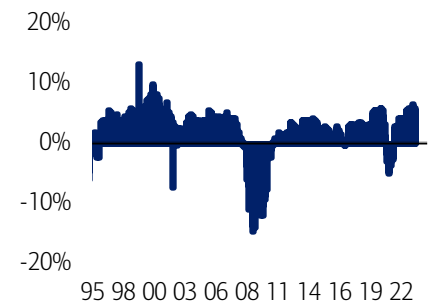
Exhibit 16: Value stocks are neglected, Growth stocks are crowded
Long only positioning in Value vs Growth proxied by Price to Book Value vs Long-Term Growth of S&P 500 (9/2008-4/2023)



Source: BofA US Equity & Quant Strategy, FactSet Ownership

BofA GLOBAL RESEARCH

Exhibit 17: Growth index forecast to outgrow Value index by 5ppt (avg)
Spread of next 24 months net income growth rate (annualized) for RLG and RLV



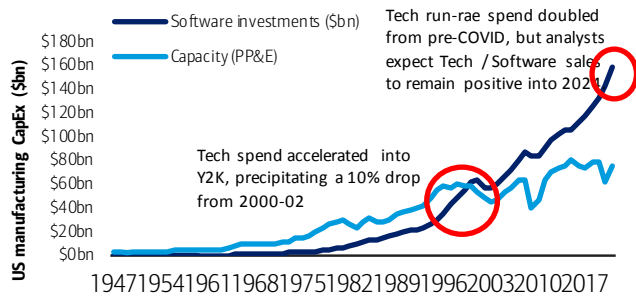
Source: BofA US Equity & Quant Strategy, FactSet

BofA GLOBAL RESEARCH



Exhibit 18: Tech (growth) capex at risk after Y2K like COVID sales surge

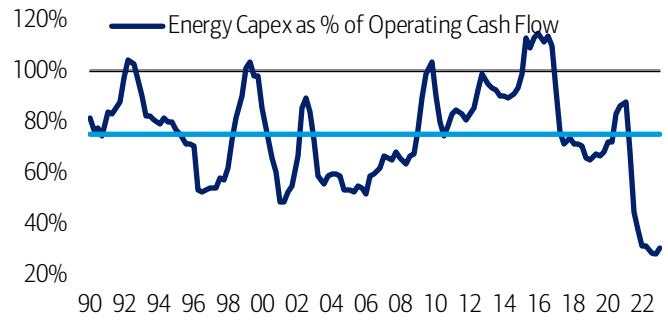
US Manufacturing Capex spending: software vs. "core" industrial equipment (1990-2021)



Source: Software investments include 3rd -party purchased and custom software. Equipment investments include industrial and transportation equipment and exclude information processing equipment (e.g. computers, communication equipment, etc.). BofA Global Research, BEA
BofA GLOBAL RESEARCH

Exhibit 19: Energy (value) companies have found supply discipline and capital discipline

S&P 500 Energy capex as % of operating cash flow (1990-4Q22)



Source: BofA US Equity & Quant Strategy, FactSet

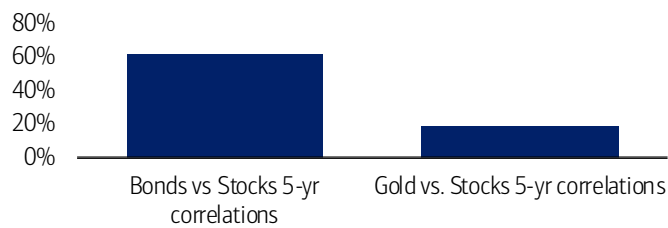
BofA GLOBAL RESEARCH

Should I buy/add exposure to gold?

The long-term diversification benefits of gold are compelling: After a decade of QE pushing bonds, alternatives and equities higher together, gold still offers stable diversification benefits. Our commodities team highlights the benefits of an improved Information Ratio from adding gold to a conservative portfolio. Short-term factors are also supportive: real rates and the USD tend to be more sustained drivers of gold markets. The relationship between gold and rates/USD has been patchy at times, but our commodity strategists highlight that gold recoupled with rates and the USD this year (Exhibit 22). Also see note [Gold rallies as the Fed stops hiking](#).

Exhibit 20: Bond/stock correlations increased with QE; gold offers better diversification benefits vs. equities

Correlation of monthly returns over the last 5 years

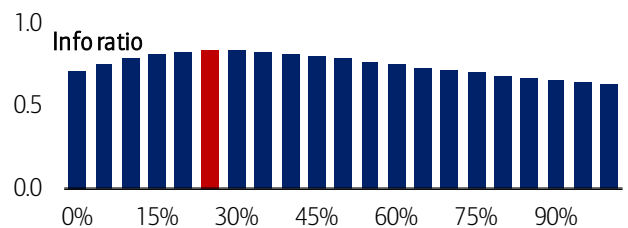


Source: FactSet, BofA US Equity & US Quant Strategy

BofA GLOBAL RESEARCH

Exhibit 21: Information ratios in a conservative, diversified portfolio peak at a gold share of 25%

Information ratios and gold share in a conservative, diversified portfolio



Source: Bloomberg, BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 22: Gold has relinked to rates and EURUSD

Correlation between gold and rates/ EURUSD

	US, 10 year real rates	EURUSD
YTD	-0.8083	0.9290
2022	-0.1619	0.4723
2021	0.5780	0.5124
2020	0.0614	0.2695
2019	-0.1680	0.3871
2018	-0.3511	-0.0548

Source: Bloomberg, BofA Global Research

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 Lynch 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 Lynch Global Wealth Management financial advisor if they have questions concerning this report or concerning the appropriateness of any investment idea described herein for such investor. "BofA Securities" is a global brand for BofA Global Research.

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

BofAS and/or Merrill Lynch, Pierce, Fenner & Smith Incorporated ("MLPF&S") may in the future distribute, information of the following non-US affiliates in the US (short name: legal name, regulator): Merrill Lynch (South Africa): Merrill Lynch South Africa (Pty) Ltd., regulated by The Financial Service Board; MLI (UK): Merrill Lynch International, regulated by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA); BofASE (France): BofA Securities Europe SA is authorized by the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers (AMF). BofA Securities Europe SA ("BofASE") with registered address at 51, rue La Boétie, 75008 Paris is registered under no. 842 602 690 RCS Paris. In accordance with the provisions of French Code Monétaire et Financier (Monetary and Financial Code), BofASE is an établissement de crédit et d'investissement (credit and investment institution) that is authorised and supervised by the European Central Bank and the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers. BofASE's share capital can be found at www.bofam.com/BofASEdisclaimer; BofA Europe (Milan): Bank of America Europe Designated Activity Company, Milan Branch, regulated by the Bank of Italy, the European Central Bank (ECB) and the Central Bank of Ireland (CBI); BofA Europe (Frankfurt): Bank of America Europe Designated Activity Company, Frankfurt Branch regulated by BaFin, the ECB and the CBI; BofA Europe (Madrid): Bank of America Europe Designated Activity Company, Sucursal en España, regulated by the Bank of Spain, the ECB and the CBI; Merrill Lynch (Australia): Merrill Lynch Equities (Australia) Limited, regulated by the Australian Securities and Investments Commission; Merrill Lynch (Hong Kong): Merrill Lynch (Asia Pacific) Limited, regulated by the Hong Kong Securities and Futures Commission (HKSF); Merrill Lynch (Singapore): Merrill Lynch (Singapore) Pte Ltd, regulated by the Monetary Authority of Singapore (MAS); Merrill Lynch (Canada): Merrill Lynch Canada Inc, regulated by the 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 HKSF; is issued and distributed in Taiwan by Merrill Lynch (Taiwan); is issued and distributed in India by BofAS



India; and is issued and distributed in Singapore to institutional investors and/or accredited investors (each as defined under the Financial Advisers Regulations) by Merrill Lynch (Singapore) (Company Registration No 198602883D). Merrill Lynch (Singapore) is regulated by MAS. Merrill Lynch Equities (Australia) Limited (ABN 65 006 276 795), AFS License 235132 (MLEA) distributes this information in Australia only to 'Wholesale' clients as defined by s.761G of the Corporations Act 2001. With the exception of Bank of America N.A., Australia Branch, neither MLEA nor any of its affiliates involved in preparing this information is an Authorised Deposit-Taking Institution under the Banking Act 1959 nor regulated by the Australian Prudential Regulation Authority. No approval is required for publication or distribution of this information in Brazil and its local distribution is by Merrill Lynch (Brazil) in accordance with applicable regulations. Merrill Lynch (DIFC) is authorized and regulated by the DFSA. Information prepared and issued by Merrill Lynch (DIFC) is done so in accordance with the requirements of the DFSA conduct of business rules. BofA Europe (Frankfurt) distributes this information in Germany and is regulated by BaFin, the ECB and the CBI. BofA Securities entities, including BofA Europe and BofASE (France), may outsource/delegate the marketing and/or provision of certain research services or aspects of research services to other branches or members of the BofA Securities group. You may be contacted by a different BofA Securities entity acting for and on behalf of your service provider where permitted by applicable law. This does not change your service provider. Please refer to the [Electronic Communications Disclaimers](#) for further information.

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

General Investment Related Disclosures:

Taiwan Readers: Neither the information nor any opinion expressed herein constitutes an offer or a solicitation of an offer to transact in any securities or other financial instrument. No part of this report may be used or reproduced or quoted in any manner whatsoever in Taiwan by the press or any other person without the express written consent of BofA Securities. This document provides general information only, and has been prepared for, and is intended for general distribution to, BofA Securities clients. Neither the information nor any opinion expressed constitutes an offer or an invitation to make an offer, to buy or sell any securities or other financial instrument or any derivative related to such securities or instruments (e.g., options, futures, warrants, and contracts for differences). This document is not intended to provide personal investment advice and it does not take into account the specific investment objectives, financial situation and the particular needs of, and is not directed to, any specific person(s). This document and its content do not constitute, and should not be considered to constitute, investment advice for purposes of ERISA, the US tax code, the Investment Advisers Act or otherwise. Investors should seek financial advice regarding the appropriateness of investing in financial instruments and implementing investment strategies discussed or recommended in this document and should understand that statements regarding future prospects may not be realized. Any decision to purchase or subscribe for securities in any offering must be based solely on existing public information on such security or the information in the prospectus or other offering document issued in connection with such offering, and not on this document.

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

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

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

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

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:

Copyright 2023 Bank of America Corporation. All rights reserved. iQdatabase® is a registered service mark of Bank of America Corporation. This information is prepared for the use of BofA Securities clients and may not be redistributed, retransmitted or disclosed, in whole or in part, or in any form or manner, without the express written consent of BofA Securities. BofA Global Research information is distributed simultaneously to internal and client websites and other portals by BofA Securities and is not publicly-available material. Any unauthorized use or disclosure is prohibited. Receipt and review of this information constitutes your agreement not to redistribute, retransmit, or disclose to others the contents, opinions, conclusion, or information contained herein (including any investment recommendations, estimates or price targets) without first obtaining express permission from an authorized officer of BofA Securities.

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

This information has been prepared independently of any issuer of securities mentioned herein and not in connection with any proposed offering of securities or as agent of any issuer of any securities. None of BofAS 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.

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

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

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