BofA Global Research Podcasts

Yield curve discounting a fall in prices not the economy

17 July 2023

Rates
United States

Thomas (T.J.) Thornton
Head of Research Marketing
BofAS
+1 646 855 2449
thomas.thornton2@bofa.com

Meghan Swiber, CFA
Rates Strategist
BofAS

Key takeaways

- BofA Global Research Podcasts are an ongoing series of discussions covering growth industries and topical market themes
- Many point to an inverted yield curve as suggesting recession, but our Rates Strategy team's analysis shows. . .
- . . .that while the curve discounts Fed rate cuts, that's a result of what should be a further drop in inflation.

Bond market expects the Fed to get the job done

Despite all the talk of sticky, structurally higher inflation, Meghan Swiber and the US Rates Strategy team find that after disaggregating the yield curve the message from rates markets may be a bit different than the popular discourse. Yes, the yield curve inversion suggests the market is pricing in Fed rate cuts. But looking at implied real rates suggests these cuts are expected because inflation should come down to the Fed's target, not because of a big slowdown in the economy. As inflation falls, real rates become more positive and the Fed reacts by cutting. We'll also discuss positioning in Treasuries and long term inflation expectations.

BofA Global Research Podcasts can now be found on public podcast platforms, including Spotify, Apple Podcasts, Google Podcasts, and Amazon Music. These podcasts are first released to clients and then to the platforms.

Refer to important disclosures on page 5 to 6.
12579044

Timestamp: 17 July 2023 06:00AM EDT

Full Podcast Transcript

T.J. Thornton, Head of Product Marketing: Hello and welcome to BofA Global Research Podcast, where we discuss what's rising from growth industries and rising risks and opportunities in global markets. I'm T.J. Thornton, Head of Product Marketing at BofA Global Research, and we're recording this episode on Friday, July 7, 2023.

One way that you can look at this is through the five year/five year break even, which is effectively the market's read of the average year over year CPI inflation rate between 5 and 10 years. And this has actually fluctuated just between 2% and 2.5% since we began to see upward pressure on CPI and that really reflects a lot of conviction by the market in the Fed's ability to get inflation back down to target.

-Meghan Swiber

We've heard what the market prognosticators think about recession. We've heard about how inflation isn't letting up much, how your brother-in-law thinks that prices at the grocery store are out of control, but around $600 billion of US Treasuries are traded every day. Surely there's some information value from where those dollars are heading and joining us today to discuss what's priced into rate markets and whether we should be paying closer attention is Meghan Swiber from US Rate Strategy at BofA Global Research. Thanks Meghan for joining us today.

Meghan Swiber, US Rates Strategist: Thanks so much for having me T.J.

T.J. Thornton: Meghan, as mentioned, market participants and the press have been fixated on this idea that a recession is imminent, that it could be deep, that inflation might also stay high, but actually the rates market through the yield curve tells a somewhat different story. What is the yield curve telling us now about market expectations?

Meghan Swiber: Sure, T.J., the deep inversion of the yield curve flags a high probability in recession models that account for the shape of the curve in how they're calculating this. But what curve inversion really tells us at the end of the day is that the market's pricing an expectation for the Fed to cut rates. And when we look back in recent history, like during the pandemic and the global financial crisis, the Fed was of course cutting in a recessionary environment. But the Fed can also be cutting for another reason, which is confidence that inflation is coming down closer to its target. And this is because the way that the Fed thinks about how restrictive they are is through the real policy rate, which is just simply the nominal rate less inflation. Now that inflation number can be spot or inflation expectations, but a 5.5% policy rate when inflation's at 2.5% is more restrictive than a 5.5% policy rate when inflation's at 4%. And what the market's pricing right now is the Fed cutting the nominal policy rate alongside inflation falling back down towards the Fed's 2% target so that the real policy rate itself doesn't get overly restrictive. One way you can check to see this is through what the market's pricing of forward real rates. In the US we see that the one year/one year real rate, which is the market's assessment of the average real policy rate between July 2024 and July 2025, is still well above the longer run real policy rate. And usually we see that short term real rates tend to trend with real GDP growth, so the markets still not reflecting real policy rates declining materially alongside expectations for a deterioration in growth. Instead we're still seeing real policy rates at near term, relatively well elevated reflecting less of this concern about a downfall in GDP or something that would feel to the market like a recession.

T.J. Thornton: Meghan, you mentioned that the rates market believes that inflation will ultimately get to the Fed's target of 2%, but does the market have any credibility when it comes to that? I know a lot of people have been pushing out these expectations for falling inflation as inflation has stayed higher for longer.

Meghan Swiber: One thing that we can check on this is how the inflation swap has been pricing the path of CPI to evolve over time. And despite the market re-pricing the Fed terminal rate higher and higher over the past year, one thing that's remained pretty consistent is the expected trajectory for inflation. The sharp decline in year over year inflation by the middle of this year has long been expected, albeit to varying degrees over the past 12 months. Where inflation prints over the next quarter is really going to test whether this narrative for a fast convergence as possible and generally dictate the performance of the curve and the duration view more broadly. This expectation for declining inflation has continuously underpinned the ability of the market to price subsequent rate cuts and therefore this inversion of the yield curve that we've been seeing. Should inflation prove stickier in coming months, the faith in subsequent rate cuts in 2024 and the consensus long US duration view are two things that would be challenged.

T.J. Thornton: A quick follow up on that, cause I know there are probably a lot of people who are skeptical that they'll be this big moderation in the middle part of this year, but did people point to this shelter component, which I know has been high, but there are reasons to think that will come off when you look at things like asking rent? Do you think that has anything to do with this market expectation?

Meghan Swiber: Yes, that's certainly a big component of it, but there's many different stories that folks have been tracking who model inflation from this bottoms up perspective, shelter is definitely one component of it. Another important component that we've been seeing is this broader goods disinflation story, looking at small components like used cars, it's really been this endorsing message that we've seen across the inflation basket over the past couple CPI prints that disinflation is moving across multiple components of the basket. And the question right now is are they all going to be able to moderate in tandem and be able to generate core month over month CPI prints that will print to a level that kind of confirms to the Fed that inflation is on its way down.

T.J. Thornton: Thanks for that. Let's shift to the longer term. There's been a view out there that inflation would be structurally higher, this is because of factors like de-globalization and aging workforce, and then more recently there's been this fixation with AI which is arguably disinflationary. Have you seen anything in the rates market to suggest the rates market buys this story that inflation's going to be higher structurally and then also more recently, has rates market reacted at all to these developments in AI?

Meghan Swiber: Yeah, great question T.J. Despite a lot of volatility in spot current inflation over the past couple of years, one thing that's remained remarkably stable is longer term inflation expectations priced by the rates market. One way that you can look at this is through the five year/five year break even, which is effectively the market's read of the average year over year CPI inflation rate between 5 and 10 years. And this has actually fluctuated just between 2% and 2.5% since we began to see upward pressure on CPI. That really reflects a lot of conviction by the market in the Fed's ability to get inflation back down to target. Just to note as well here, market prices CPI, while the Fed's target is PCE (Personal Consumption Expenditure) and historically we see year over year CPIs about 20 to 30 basis points above PCE. Even if we're talking at the top of that range of 2.5% that's still very close to the 2% PCE inflation rate target. Persistent inflation or in the matter of AI, persistent deflation is not something that we've seen the market too worried about at least when you're looking at these longer term measures of inflation compensation. And it's probably been the one place the Fed can look back to during this episode and feel really good about its credibility and communication.

T.J. Thornton: Thank you for that Meghan. Let's talk a little bit about equity markets. Strength this year has surprised a lot of people. Do you think that the message from rates markets, which is that maybe inflation can come down to the Fed's target without much of a recession. Do you think that's gotten into the equity market as well? Could that explain some of the strength that we've seen?

Meghan Swiber: Yeah, I think so T.J., broadly speaking, the fact that the economy, namely the labor market, has just proved so resilient despite 500 basis point of rate hikes has really surprised a lot of economists and I think many at the Fed included. The June inflation print is an important one, in proving whether or not we can see core inflation fall alongside this very resilient economy. Many economists, including our own at BofA are expecting a step down in month over month core inflation, which either affirms this bullish view that is very consensus in the rates market right now, and would I guess by extension confirm more of this bullish equity bias or is likely challenge them, if it comes in stronger. Right now the one macro hedge for a long duration exposure in interest rates, or perhaps call it a long equity exposure is to own inflation compensation. Because the one thing that will challenge the view that we're really right around the corner from the end of the Fed hiking cycle or that the Fed is able to cut rates next year is an inflation picture that challenges the sharp moderation and inflation that's priced over the second half of this year.

T.J. Thornton: Megan, last question for you. Would love to hear about your perspective on flows into Treasuries, I know there was a lot of bullishness on bonds going into this year. You did mention though in a recent note that in flows into Treasuries had slowed somewhat. Where do you think sentiment is right now on the bond market?

Meghan Swiber: Our FX and Rate Sentiment Survey, which is a survey of global benchmark investors, suggests that folks were at some of the most overweight US duration positions that they've been in the 20 years that we've been conducting the survey. And certainly that most recent survey that I'm talking about was done in June, so perhaps some of this positioning has shifted since then, but we've seen that largely corroborated by other indicators such as the asset manager positioning that we see from the CFTC (Commodity Futures Trading Commission) data. We've seen a moderation in some flows into US fixed income, but that's from very notable levels that we've seen really since the start of the year. It's investors looking at interest rate levels that we've seen in the US, levels that we haven't seen in a very long time and saying, "wow, this looks pretty attractive" when I'm thinking about the broader global macro environment, which is still quite uncertain at this point. Another thing that we tend to see too and what drives a lot of this conviction and being long duration is that typically when we look at the 12 months following the Fed's final hike of the cycle; we see the 10-year rate rally, and that's something that we tend to see really very notably consistent in hiking cycles going back to the mid-eighties. I think that there is this view across the real money asset manager community that they'd rather be a little bit too early to the party than be too late and miss this expected rally. But the issue with this is that data that pushes back on the Fed hike being just around the corner or pushes back on cuts that are priced for 2024 are going to challenge this consensus long duration view, which means that you're going to see outsized price action. You're going to have days where rates sell off more than they would otherwise because of this stretched positioning.

T.J. Thornton: All right, Meghan, thank you very much for joining us today.

Meghan Swiber: Thank you so much for having me, T.J.

T.J. Thornton: It seems there are a number of interesting things to take away from what rates markets are pricing in, for one, expectations for real rates don't suggest much concern about recession. Two, despite all the talk about how inflation may be structurally higher going forward and more recent discussions about AI driving disinflation or even deflation, long-term inflation expectations based on rates markets have been very steady over the last several years and they sit in the 2%-2.5% range. Third, people are very long duration. They're very bullish on long-term Treasuries. Maybe that's the right call, but it does set up for some pain when the data is stronger or more inflationary than expected. Thanks for joining today.

Disclosures

Important Disclosures

BofA Global Research personnel (including the analyst(s) responsible for this report) receive compensation based upon, among other factors, the overall profitability of Bank of America Corporation, including profits derived from investment banking. The analyst(s) responsible for this report may also receive compensation based upon, among other factors, the overall profitability of the Bank's sales and trading businesses relating to the class of securities or financial instruments for which such analyst is responsible.

Other Important Disclosures

From time to time research analysts conduct site visits of covered issuers. BofA Global Research policies prohibit research analysts from accepting payment or reimbursement for travel expenses from the issuer for such visits.

Prices are indicative and for information purposes only. Except as otherwise stated in the report, for any recommendation in relation to an equity security, the price referenced is the publicly traded price of the security as of close of business on the day prior to the date of the report or, if the report is published during intraday trading, the price referenced is indicative of the traded price as of the date and time of the report and in relation to a debt security (including equity preferred and CDS), prices are indicative as of the date and time of the report and are from various sources including BofA Securities trading desks.

The date and time of completion of the production of any recommendation in this report shall be the date and time of dissemination of this report as recorded in the report timestamp.

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.

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.

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.

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.