Euro Area Watch

ECB Review: Schrodinger's pause

14 September 2023

Macro
Europe

Global Economics Rates & FX
BofAS

Ruben Segura-Cayuela
Europe Economist
BofA Europe (Madrid)
+34 91 514 3053
ruben.segura-cayuela@bofa.com

Sphia Salim
Rates Strategist
MLI (UK)
+44 20 7996 2227
sphia.salim@bofa.com

Ralf Preusser, CFA
Rates Strategist
MLI (UK)
+44 20 7995 7331
ralf.preusser@bofa.com

Athanasios Vamvakidis
FX Strategist
MLI (UK)
+44 20 7995 0279
athanasios.vamvakidis@bofa.com

A low-conviction pause

We expected the ECB to hike once more this week and then to be done until the first cut in June 2024. It indeed hiked all three rates by 25bp (surprising consensus). At the same time, it signalled a potential end of the hiking cycle while emphasizing data dependence and leaving all options (except a cut) open. In other words, the hiking bias is not fully gone but it seems to have been significantly reduced. The bar for another hike is high, but the door is not closed.

We would argue that this is a low-conviction signal. Indeed, while the endpoint for headline inflation is below target (1.9% in 4Q25), core inflation should remain above target by then. This was seen as the justification for the hike at this meeting but, at the same time, we see some internal tension between signalling that they could be done and those forecasts. A bit more and/or rates on hold for longer could be the implicit signal. In any case, it feels like an imperfect compromise in a still very divided governing council.

Are they really done? A high bar for further hikes

The outcome of the meeting fits well with our call that they would be done after one final hike this week. But they remain data-dependent and keep a small hawkish bias. The bar for more hikes is quite high, but the hiking bias is not fully gone. Given the move in oil prices and the exchange rate since the cut-off date for the forecasts, we would not assign a zero probability to them hiking again in the future. At the end of the day, the movement in oil, if persistent enough, would likely move inflation expectations from consumers. Concerns about second-round effects could again intensify. They remain extremely data-dependent from here and have reacted to supply shocks before with hikes.

In any case, this is not something to worry about for the October meeting, we think. Lagarde suggested the next reassessment would come with the next set of projections. December will be in focus and there is plenty of time for external assumptions to undo some of the recent moves. And, by then, we would expect core inflation to have adjusted significantly lower. For now, we stick to our call of no more hikes and the first cut in June 2024, but the recent moves in external assumptions could lead, at least, to later cuts than we have in our base case.

The return of forward guidance

The dovish reaction from the market today highlights what we have said before. It will be very hard for the ECB to stop the market from undoing some of the tightening by reacting dovishly down the line. We would expect the ECB to eventually provide some forward guidance on the conditions that determine a cut as a way of anchoring that. We think such a move likely requires certainty that the hiking cycle is over. This is more likely in December, we think.

Refer to important disclosures on page 5 to 7.
12602756

Timestamp: 14 September 2023 11:36AM EDT

ECB forecasts: subdued, but still optimistic

As we expected, growth was revised lower, 0.9% in 2023, 1.5% in 2024 and 1.6% in 2025, very close to what we expected. We think these forecasts are still optimistic but less so in 2H23 (the revision lower in 2Q23 has not been incorporated). It is hard to see significant downside surprises to the ECB outlook before 2024.

Exhibit 1: ECB forecasts, September vs June
Headline higher in 2023/2024 but closer to target in 2025. Core revised marginally lower in 2024 and 2025.

	Sep-23				Jun-23			
	2022	2023	2024	2025	2022	2023	2024	2025
GDP	3.4	0.7	1.0	1.5	3.5	0.9	1.5	1.6
HICP	8.4	5.6	3.2	2.1	8.4	5.4	3.0	2.2
Core HICP	3.9	5.1	2.9	2.2	3.9	5.1	3.0	2.3

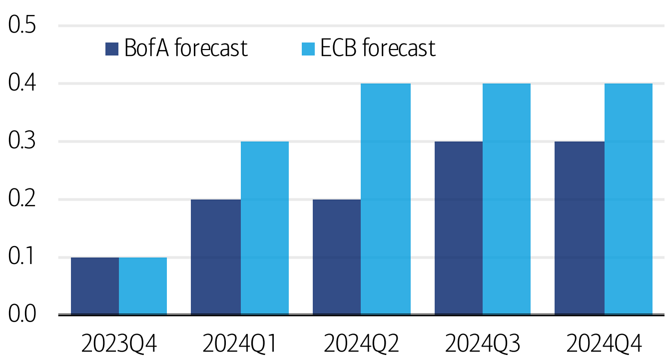
Source: ECB

BofA GLOBAL RESEARCH

Meanwhile inflation was revised higher in 2023 and 2024 but closer to target in 2025 (2.1% with the fourth quarter below target). Higher energy prices were the main driver since core inflation has been marginally revised lower in 2024 and 2025 (less than we expected, see Exhibit 1).

Overall, while there are upside risks to headline given the move in oil prices of the last few days, ECB forecasts for core inflation are quite close to ours for the remainder of this year. Once again, if we are right, we don't see room for the ECB to be surprised on the downside in terms of core inflation from now until December (but certainly so in 2024).

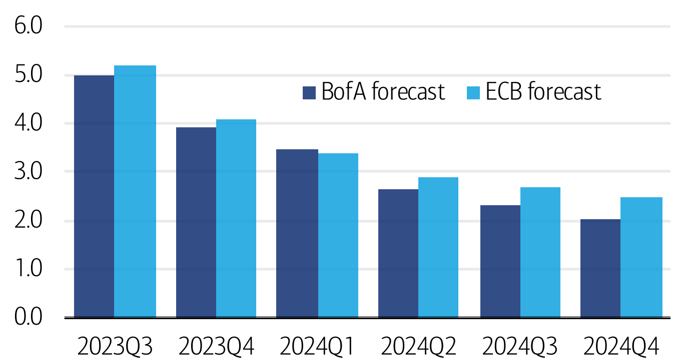
Exhibit 2: GDP qoq growth forecast (%)
We remain well below ECB forecasts for growth



Source: ECB, BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 3: Core inflation, quarterly yoy forecast (%)
ECB forecasts for core are quite close to ours for the remainder of this year



Source: ECB, BofA Global Research

BofA GLOBAL RESEARCH

Rates: dip buying on the "final" hike; periphery supported

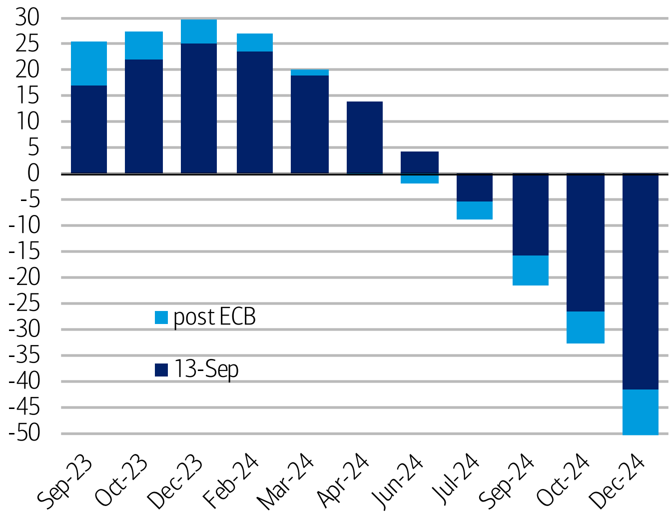
Even as the ECB hiked rates, which was only 2/3 priced, Bund yields declined following the release of the ECB's monetary policy decision. The market repriced the terminal rate modestly higher but priced in more cuts ahead: 13bp more cuts from peak to end of '24 (Exhibit 4) with an implied trough in overnight rates 3y forward that is also c. 11bp lower (Exhibit 5). We attribute this rates rally to three factors:

(1) Investors probably expected that the ECB will keep the door open for more hikes, and not be as explicit in signalling the pause.

(2) The large downward revisions to GDP projections, with Lagarde also highlighting that the balance of risks on that front remains to the downside.

(3) Investors buying duration based on the mantra that rates rally post the last CB hike.

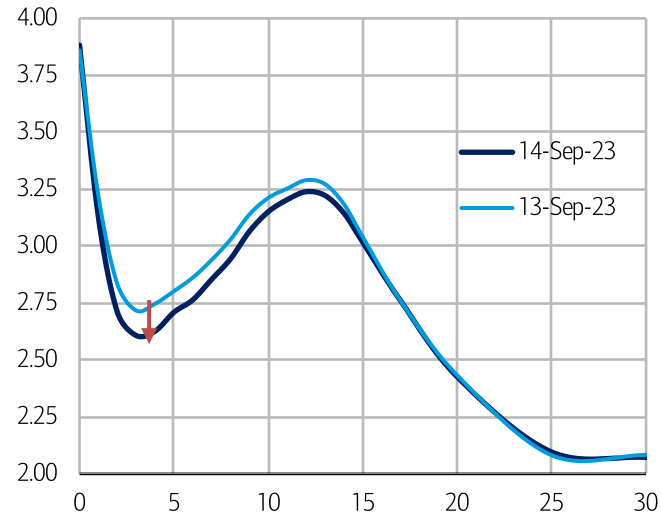
Exhibit 4: Cumulative basis points of hikes priced vs spot €str
The ECB hike resulted in pricing of higher terminal but more cuts in '24



Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 5 Market implied path of 1y €str, in years forward
The market has repriced the trough (3y1y) lower by 11bp, to 2.61%



Source: BofA Global Research

BofA GLOBAL RESEARCH

Curve: dynamics to be belly led again, now that we are past Sep meeting

The 2s10s curve flattened post ECB, with the 5-10y part leading the rally. With the ECB meeting out of the way, we continue to think that falling inflation in Q4 will mean that the 5-10y can drive curve moves, in the same way it did this summer. The front-end should remain stable, especially as the ECB insists on high rates for long, leaving the 5-10y in the driver seat - selling off on upside data surprises and rallying otherwise.

The two challenges to this belly-led curve dynamic in Q4 would be (a) upside surprises in inflation, leading to bear flattening – we watch commodity prices carefully, and (b) a shock that would warrant more immediate rate cuts, bringing forward a bull steepening.

Periphery: lower rates and vol help tighten spreads – more to go.

Periphery spreads tightened significantly both at the publication of the statement as well as during the press conference. There is an element of "fear of missing out" at play, we think, but more fundamentally, we can explain the c.5bp tightening by:

1. The removal of the hawkish bias along with recognition of the restrictive level of rates and fast transmission of policy
2. The resulting drop in rates volatility.
3. Lack of any hint about the need to accelerate Eurosystem's balance sheet run-off

We maintain our bullish bias on BTP spreads, seeing the recent widening on the back of domestic noise on fiscal policy as a buying opportunity.

Given the market reaction this week, we think there is another ~5bp in fiscal premia built in the 10y BTP-Bund spread (therefore 10-15bp total currently) which we expect to be priced out by end of October. We may see minor upside revisions to deficits this year and relative to the 2024 projection, but this should not be a surprise and should not change the picture materially on the debt sustainability and supply/demand fronts – the rally in rates and reduction in monetary policy forecasting uncertainty we expect in the months ahead remains the dominating driver for BTP spreads, in our view.

ECB Balance sheet & deposits' remuneration: no discussion, let alone decision

The ECB made no change to its guidance on asset purchases, maintaining the commitment to full PEPP reinvestments until end of 2024. We learnt that no discussion took place on PEPP QT or active QT for APP. The ECB didn't announce any change either to the remuneration rates of deposits it receives, from banks, govts and/or foreign CBs.

As we had been arguing, it was too early for these discussions. Instead, we expect them to be formulated as part of the ECB's operation framework review. Ultimately, by year-end, we think the ECB will take steps to minimise the costs of its large balance sheet (see The ECB's cost minimisation problem). These include:

(1) Lowering the remuneration of governments deposits to 0%, in a replica of the change the Bundesbank announced unilaterally for Oct 1st (European Rates Watch). This would then also affect foreign official deposits at the ECB.

(2) Bringing forward the date of PEPP QT. We pencil in that full PEPP reinvestments will end in Jun-24, even as the ECB currently plans on continuing until end of 2024.

(3) At the extreme, a potential small negative tiering for banks' excess reserves at the ECB. But we think a lot of the noise in markets on this punitive tiering is overdone.

We do not expect active QT anytime soon, as this would lead to the crystallisation of additional losses, on top of the negative carry that the central bank is running (see ECB active QT: first cost estimates). We also read the discussion on a potential increase in banks' minimum reserve requirements in the account of the July meeting as suggesting that such a decision is unlikely at least in the near term, and rightly so in our view. We would flag that increased min reserve requirements (paid at 0%) and a negative tiering of excess reserves could have different implications for money market rates as banks would react differently to each. The ECB will want to conduct more analysis on this.

EUR: Dovish hike, as pause is now the default

Although a hike was not fully priced today, the ECB's signal that they may be pausing was what drove the EUR down, to the lower EURUSD level since early June. The market was not expecting one more hike to begin with, but was also not expecting the ECB to signal a pause. The ECB told us that based on their current assessment they would not need to do more and that they would do so only if their assessment was to change in the future. This is effectively a shift from data dependence based on the latest data print when they were catching up, to data dependence based on a critical mass of data that would change their assessment.

We note that the ECB has also made it very clear that it is way too early to think about rates cuts, consistent with our view, but we don't think this is the market focus right now and in any case this can change depending on data in the next few months. We stick with our EURUSD forecast of 1.05 by year-end and today's ECB meeting makes us even more confident about it.

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.
BofA Securities fixed income analysts regularly interact with sales and trading desk personnel in connection with their research, including to ascertain pricing and liquidity in the fixed income markets.

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.
Rule 144A securities may be offered or sold only to persons in the U.S. who are Qualified Institutional Buyers within the meaning of Rule 144A under the Securities Act of 1933, as amended.
SECURITIES OR OTHER FINANCIAL INSTRUMENTS DISCUSSED HEREIN MAY BE RATED BELOW INVESTMENT GRADE AND SHOULD THEREFORE ONLY BE CONSIDERED FOR INCLUSION IN ACCOUNTS QUALIFIED FOR SPECULATIVE INVESTMENT.
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.
The securities or other financial instruments discussed in this report may be traded over-the-counter. Retail sales and/or distribution of this report may be made only in states where these instruments are exempt from registration or have been qualified for sale.
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.
This report, and the securities or other financial instruments discussed herein, may not be eligible for distribution or sale in all countries or to certain categories of investors, including retail investors.
Individuals identified as economists do not function as research analysts under U.S. law and reports prepared by them are not research reports under applicable U.S. rules and regulations. Macroeconomic analysis is considered investment research for purposes of distribution in the U.K. under the rules of the Financial Conduct Authority.
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.

Futures and options are not appropriate for all investors. Such financial instruments may expire worthless. Before investing in futures or options, clients must receive the appropriate risk disclosure documents. Investment strategies explained in this report may not be appropriate at all times. Costs of such strategies do not include commission or margin expenses.

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.

This report may contain a trading idea or recommendation which highlights a specific identified near-term catalyst or event impacting a security, issuer, industry sector or the market generally that presents a transaction opportunity, but does not have any impact on the analyst's particular "Overweight" or "Underweight" rating (which is based on a three month trade horizon). Trading ideas and recommendations may differ directionally from the analyst's rating on a security or issuer because they reflect the impact of a near-term catalyst or event.

Foreign currency rates of exchange may adversely affect the value, price or income of any security or financial instrument mentioned in this report. Investors in such securities and instruments 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 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