

FX Viewpoint

USD: Bulls versus Bears

Key takeaways

- FX conviction is low, as the market seeks a fresh catalyst for the USD. Here we compare the bullish and bearish USD outlooks:
- USD bears are consensus, seeing further disinflation as soon prompting a dovish Fed pivot, pushing the USD toward equilibrium
- USD bulls emphasize US growth outperformance & see sticky service inflation keeping Fed on hold longer than market is pricing

USD bulls and bears square off

FX conviction is low at present. The USD began the year on the back foot, as expectations for Fed easing in Q1 mounted. Strong data and a more balanced Fed message have upended that, leaving the market thirsty for a fresh catalyst. The USD has recently lost momentum as market pricing of the fed funds path is much closer to the Fed's guidance. Here we present both the bullish and bearish cases for the USD, as it is prudent for investors to consider the risks to their own priors.

A bearish case for the USD

Market consensus sees the USD trading lower this year, as a number of the factors supporting it over recent years are primed to fade. Despite recent upside surprises, US inflation readings are softening, particularly when looking at recent readings of the more policy-relevant core PCE and factoring in possible January distortions. Fed policy is relatively too restrictive for the impending inflationary environment, and a real-rate convergence is on the horizon, bringing the USD lower with it.

A bullish case for the USD

Dollar bulls have clung to the so-called "US exceptionalism" narrative and see broad measures of relative growth outperformance as a cornerstone to capital seeking the US. Despite disinflation trends, stickiness in the more core services component should keep the Fed from pivoting early, as it has widely communicated. Several risk factors (US election, geopolitics, hard landing risks) skew USD positive, while CRE/regional bank flare-ups (likely USD negative) have not been shown to be widespread at present.

Bottom line

Inflation (versus growth) should be a marginally bigger determinant of Fed policy amid a resilient US economy, but interpretation is in the eye of the beholder. We maintain our bearish USD forecasts for the year, consistent with BofA Global Research economists' expected soft landing, but patience is required. That said, upside risks are becoming more glaring, and a further repricing of Fed expectations (which are now at long last in sync with each other) could be the next catalyst to turn this year's consolidation into a bigger trend.

29 February 2024

G10 FX Strategy
Global

Alex Cohen, CFA
FX Strategist
BofAS
+1 646 743 7015
alex.cohen2@bofa.com

CRE: commercial real estate

FOMC: Federal Open Market
CommitteePCE: personal consumption
expenditure

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 12 to 13.

12665256

Timestamp: 29 February 2024 01:02AM EST

FX conviction remains low

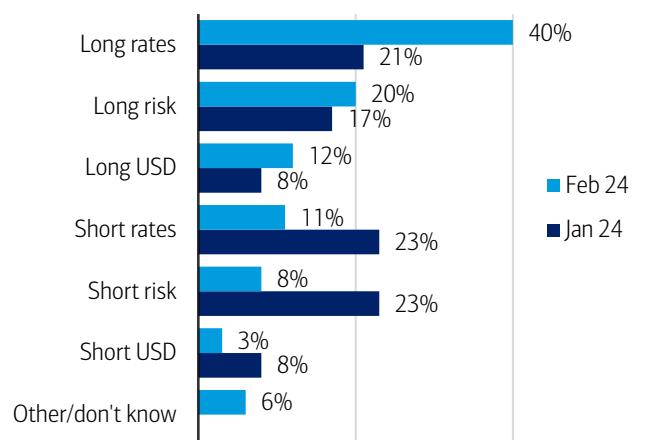
Conviction in the FX market is low. Coming into the year, USD sentiment was clearly on the back foot, as softening inflation readings and a surprisingly dovish December FOMC got the market excited for catching the next big trend lower after years of overvaluation and outperformance. This has all been upended to start the year, as US growth and inflation data has tended to surprise to the upside, while the Fed has struck a much more balanced tone. Market expectations for the Fed's path have reacted accordingly, and as a result, the USD has broadly outperformed. More recently, however, the USD rally has lost some steam, as investors debate the likelihood of further upside catalysts against what some see as noisy and overstated January US data.

This seeming lack of conviction is reflected in our positioning and sentiment data. As seen in our February FX & Rates Sentiment Survey (Exhibit 1), long and short USD views registered among those with the lowest conviction when compared to equity and rates outlooks (see the report, [FX and Rates Sentiment Survey: Self confident 09 February 2024](#)).

Likewise, our FX positioning data (Exhibit 2) indicates neutral USD positioning amongst the broader market, as hedge funds have moved from short to long since last year, while real money has been largely on the sidelines – remaining (but not materially adding to) net-short USD (see the report, [Liquid Cross Border Flows: When in doubt... 26 February 2024](#)).

Exhibit 1: Highest conviction view to start 2024, according to survey

Long rates conviction has strengthened despite positioning concerns

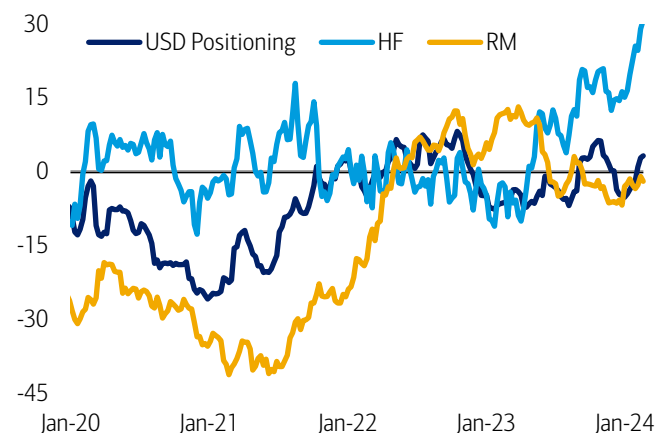


Source: BofA Global Research FX and Rates Sentiment Survey

BofA GLOBAL RESEARCH

Exhibit 2: BofA USD Positioning: Aggregate, Hedge Funds, & Real Money

Aggregate positioning data continues to reflect lack of USD conviction



Source: BofA Securities

BofA GLOBAL RESEARCH

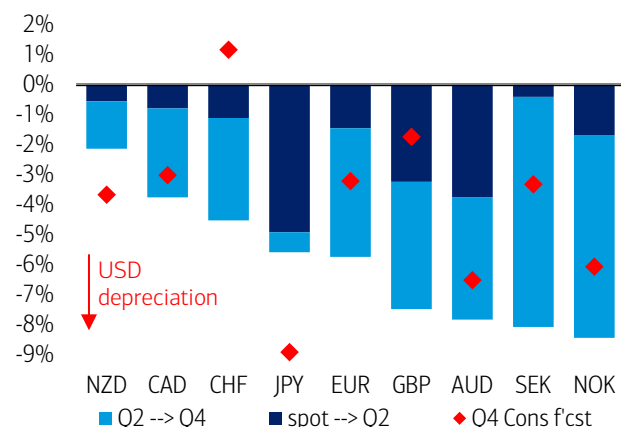
Nevertheless, market consensus still calls for broader USD downside this year. As seen in Exhibit 3, the median forecasts (as proxied by submission to Bloomberg) imply a lower USD vis-à-vis all G10 currencies except CHF. Our forecasts similarly call for the USD to depreciate against the board. Here, a few nuances are key to point out.

1. We mostly see USD depreciation as more of an H2 story, rather than H1 (see light blue bars versus dark blue bars),
2. For the year, we are more bearish USD than consensus for all pairs except NZD and JPY.

Using EUR/USD as an example, Exhibit 4 reflects how evenly distributed consensus forecasts are, with the center of the distribution closer to our Q2/Q3 call.

Exhibit 3: Implied USD move: BofA and Consensus Forecasts for 2024

We expect greater USD depreciation this year than consensus for most pairs; mainly a story for H2



Source: Bloomberg; BofA Global Research

BofA GLOBAL RESEARCH

Against this backdrop, we dig deeper into both the bull and bear cases for the USD this year. This can be informative, regardless of which (if either) side of the fence one finds themselves – either by reinforcing views or presenting risks to consider.

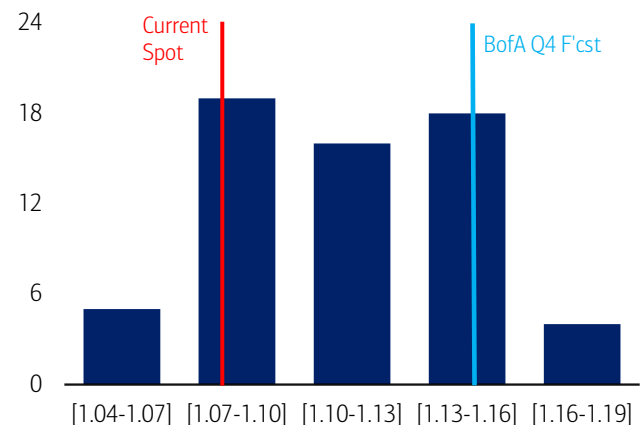
Bearish case for the USD

We start with the bearish USD view, given that this view is embedded in our (and consensus) FX forecasts. The bearish narrative goes something like this:

- After two years of justifiable USD outperformance (US growth outperformance, the Fed's credible fight against inflation, high nominal and real rates leading to positive carry versus most of the G10, US energy independence shielding the economy from global shocks, delayed China re-opening from COVID, flight to quality insurance), the global economic normalization process should finally start to get under way.
- Whereas the US had "decoupled" higher from the rest of the world, this year should be more about the US "recoupling" lower. As inflation falls globally, the Fed and most other G10 central banks will likely embark on the process of lowering rates to prevent excessively tight monetary conditions. Pessimism outside the US is well priced in.
- Even if other central banks are reducing rates alongside the Fed, the lower US rates should benefit foreign entities with USD liabilities and should matter more for global risk sentiment, supporting equities and higher-beta currencies versus the USD.
- Furthermore, given the US's rate advantage, there is theoretically more room for the Fed to cut, all else equal. With the USD being the most overvalued G10 currency by most metrics, the global cutting cycle finally getting under way should allow the USD to finally adjust lower towards equilibrium (Exhibit 6, Exhibit 6).

Exhibit 4: Distribution of 2024 Q4 EURUSD Forecasts

BofA on the right side of EURUSD distribution for Q4 forecasts

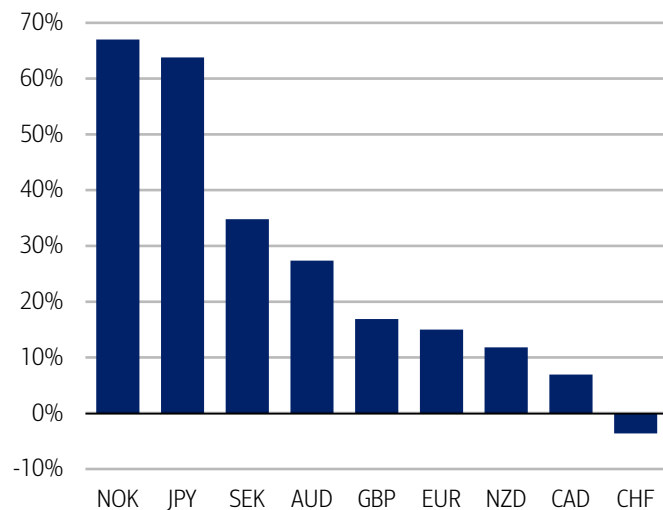


Source: Bloomberg; BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 5: Misalignment from equilibrium, USD G10 crosses, based on BEER model (positive for overvalued USD)

NOK, JPY most undervalued, CHF, USD most overvalued in G10

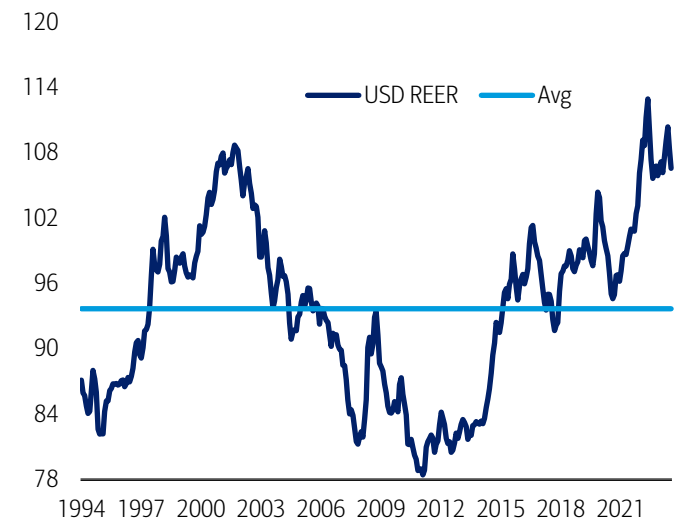


Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 6: USD Real Effective Exchange Rate

USD REER elevated below the multi-decade highs



Source: Bloomberg; BIS; BofA Global Research

BofA GLOBAL RESEARCH

USD weakness: It's all about (dis)inflation

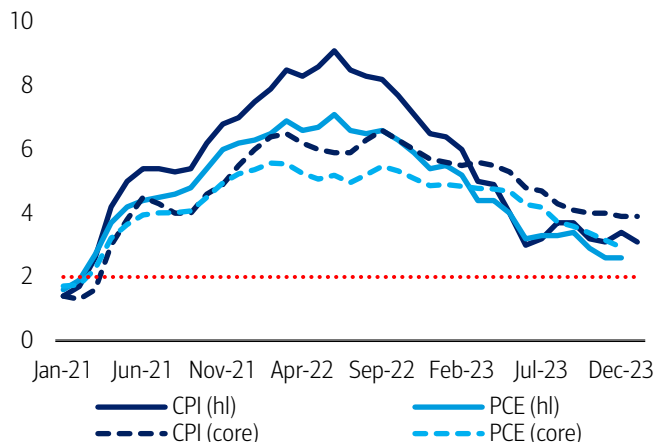
Various inflation prints in the US this year have often read like a “choose your own adventure” book. While the narrative recently has been the recent upside CPI reports, dollar bears have emphasized a variety of “under-the-hood” aspects to downplay otherwise hot readings, arguing that a shift towards rate cuts should be more imminent.

First, recent readings point to an apparent wedge forming between CPI and PCE (Exhibit 7). This is due in large part to housing inflation [rent and owners-equivalent rent (OER)], which gets notably more weight in CPI than PCE. Given the current structure of the US housing market, the transmission of tighter monetary policy to housing prices has lagged, as higher rates exacerbate housing supply constraints, pushing up demand for rents.

With core PCE being the Fed's preferred inflation gauge, USD bears have been quick to overlook the more upside CPI readings in favor of the closer to 2% PCE readings. This narrative reached its apex last month, as the upside December CPI was overshadowed by softer PPI and PCE readings (see the report, [US Watch: December PCE inflation tracking: Another step closer for the Fed 12 January 2024](#), [US Watch: Soft inflation, strong spending keep a March cut in balance 29 January 2024](#)).

Exhibit 7: US CPI and PCE inflation readings (YoY)

Fed's preferred measure (PCE) structurally below CPI



Source: Bloomberg; BofA Global Research

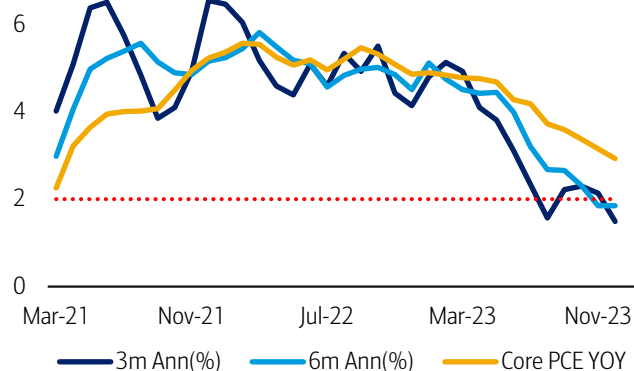
BofA GLOBAL RESEARCH

The bearish dollar case is also argued from the perspective of recent disinflation trends. Rather than focusing on YoY readings, improvements in inflation can be better seen, so this argument goes, in the 3- and 6-month annualized figures. As seen in Exhibit 8, when looking at the 6-month annualized core PCE reading, dollar bears could argue that inflation is already essentially at target. This point is further emphasized in Exhibit 9, demonstrating that the most recent outsized MoM readings occurred last August and September, which will soon fall out of the 6-month annualized calculations.

Finally, the most recent soft-inflation/USD-bearish interpretation came after the upside January CPI report (see the report, [US Watch: January CPI Inflation: detour from disinflation 13 February 2024](#)). Indeed, while the prints exceeded expectations across the board, USD bears were quick to point to the abnormal divergence of OER (above rental inflation), impacts of weather distortions, and January seasonality as reasons to be skeptical of the print. Similar arguments were made about the recent pickup in hourly earnings in the January employment report, as a concurrent drop in hours worked suggested the potential for more signal than noise in the reading (Exhibit 10).

Exhibit 8: US Core PCE: YOY, 3m annualized, 6m annualized

Recent monthly core PCE readings suggest pronounced disinflation

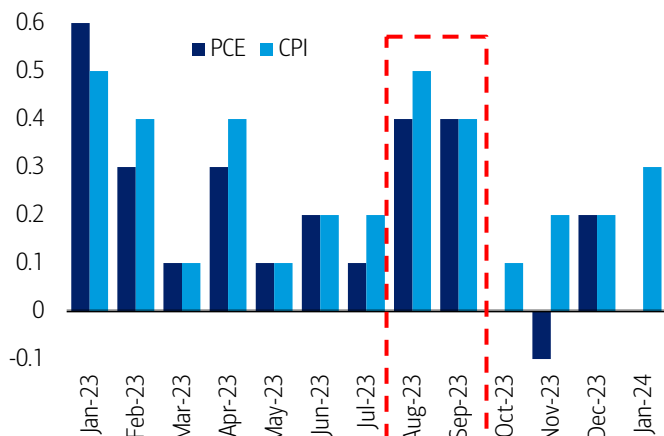


Source: Bloomberg; BofA Global Research. m = month.

BofA GLOBAL RESEARCH

Exhibit 9: US CPI and PCE: MoM

Elevated monthly readings from August and September soon to fall from 6-m calculations

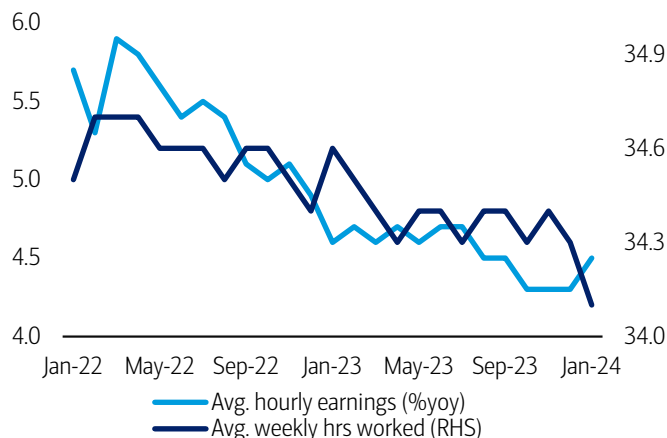


Source: Bloomberg; BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 10: US wages and hours worked in January

January wage pickup coincides with drop in hours worked, suggesting weather distortions



Source: Bloomberg; BofA Global Research

BofA GLOBAL RESEARCH

“The Fed is fickle; it won’t take much to pivot again”

It was not long ago when the Fed seemed much more comfortable with impending easing, than it has communicated recently. Dollar bears see the Fed as still susceptible to another abrupt dovish pivot, consistent with the inflation outlook discussed above.

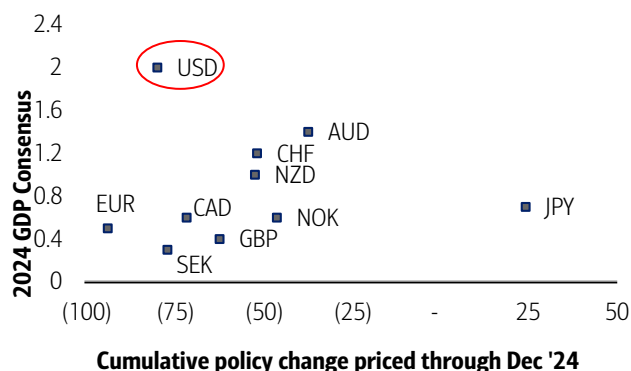
The about-face between the December and January FOMC meetings has been well covered at this point, as Powell’s surprise commentary late in the January press conference that a March cut was unlikely served to support the USD amid a notable re-pricing of expectations.

However, prior to that specific pushback on a potential March cut, the meeting had some dovish overtones. Most notably, when discussing conditions to cut at the press conference, Powell downplayed robust growth and employment being a hindrance: “...We have had a very strong labor market, and we have had inflation coming down. So, I think, whereas a year ago we were thinking we needed to see some softening in economic activity, that hasn’t been the case. So, I think we look at stronger growth -- we don’t look at it as a problem.” USD bears see this reason to discount the upside growth and employment data as a roadblock to easing, thus placing greater weight on disinflation signals. As shown in Exhibit 11, despite stand-out relative growth expectations for the US this year, rate markets still price the Fed to cut around as much or more than most of the G10 (except the ECB).

Nevertheless, upside growth and inflation data, along with Fed guidance, has brought the expected policy path much closer to the Fed’s dot-plot from December (Exhibit 12). However, more recently, the USD uptrend has lost momentum, likely suggesting that another fresh catalyst is necessary for dollar upside to continue.

Exhibit 11: 2024: Real GDP Forecasts vs. implied CB rate change

Despite stand-out US growth expectations, Fed expected to cut as much/more than other G10 central banks

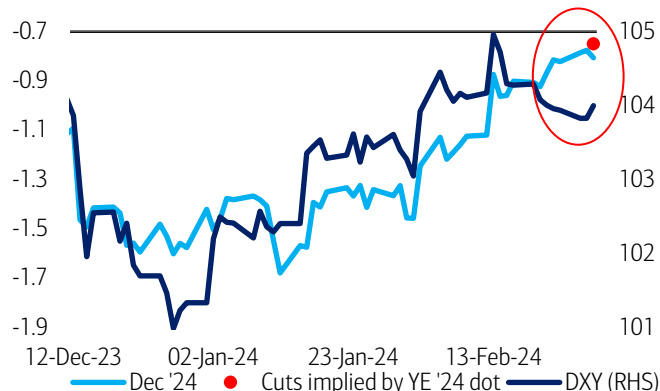


Source: Bloomberg; BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 12: DXY & cumulative Fed cuts implied by Dec FOMC (OIS)

USD upside momentum has waned as market approached Fed dot plot



Source: Bloomberg; BofA Global Research

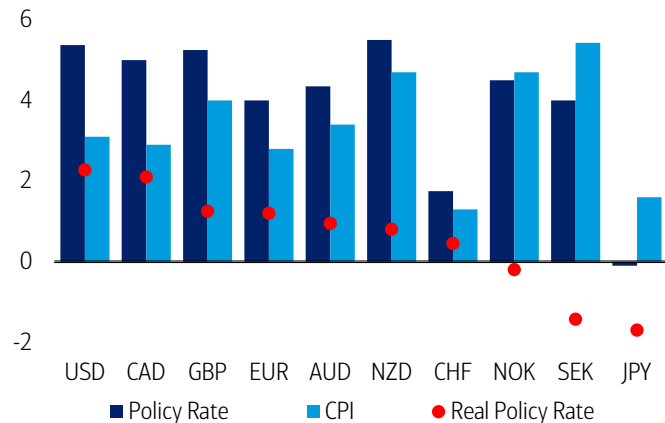
BofA GLOBAL RESEARCH

Dollar bears see that catalyst as elusive, and if disinflation trends continue, the Fed should have increasing scope to cut. Here, real rates, as a measure of relative accommodativeness/restrictiveness, can be a useful guide. Indeed, as seen in Exhibit 13, US policy rates less headline CPI is highest among the G10, a key factor supporting the USD over recent years. All else equal, this suggests that in a more benign inflationary environment, the US has relatively more scope to reduce rates to reach neutral. Conversely, these same dynamics imply that other countries possibly having scope for relatively more restrictive policy, though growth considerations act as a hindrance.

Exhibit 14 shows the DXY against a measure of DXY weighted 5-year sovereign inflation adjusted yields. Since last year, the USD has undershot this real-rate differential compared to the run-up through 2022, possibly indicating that the market has been pricing an anticipated real yield compression into the USD.

Exhibit 13: G10: Policy Rates, CPI, & Real Rates

US has the highest real policy rate in the G10

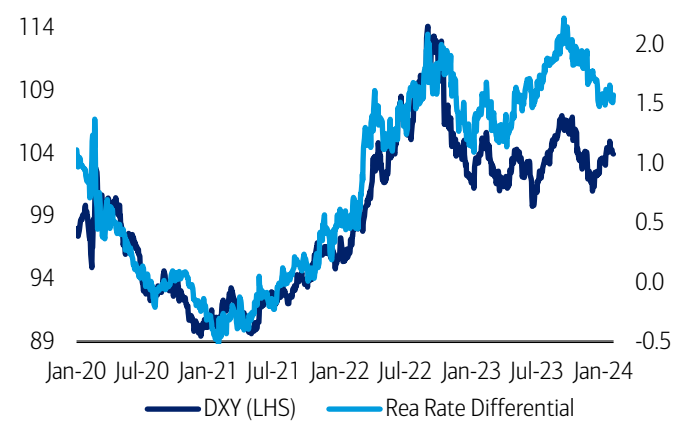


Source: Bloomberg; BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 14: DXY & Real rate differential (DXY weighted)

USD has lagged recent widening in real rate differentials



Source: Bloomberg; BofA Global Research

BofA GLOBAL RESEARCH

Bullish case for the USD

Dollar bulls generally acknowledge aspects of the bear case, particularly as relates to valuation, the broader disinflationary trend, and eventual policy normalization. However, the differences largely relate to 1) assessment of the incoming data, 2) the Fed's perceived reaction function and timing, and 3) USD directionality of a number of risk factors.

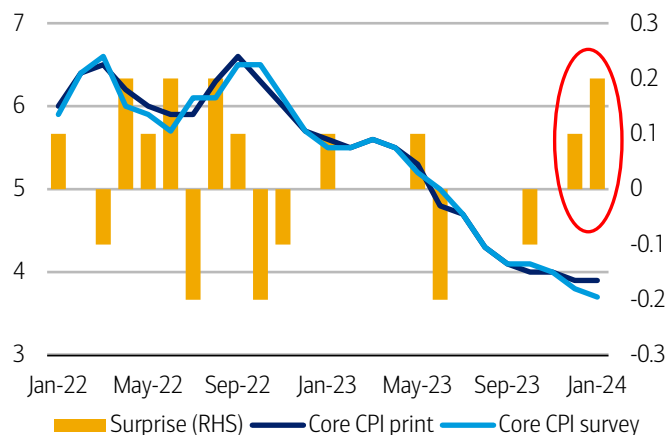
USD strength – It's all about inflation

While inflation is coming down, it is difficult to rule out the scenario whereby inflation at best remains sticky on the way to 2% or even resurges (see the report, [The Global Thinker: Let's talk about inflation risks 30 January 2024](#)). Despite various reasons (discussed above) that USD bears might be skeptical with recent inflation readings, CPI has nonetheless surpassed expectations for the past two months, as did the January PPI (see the report, [US Watch: January PCE inflation tracking: Two steps back 16 February 2024](#) and Exhibit 15).

The bullish dollar camp tends to also look beyond the headline readings to emphasize signs of stickiness in the sub-components. Most notable here is the ongoing divergence between core goods and core services, with the latter being the main source of overall inflation (Exhibit 16). Moreover, the Fed has consistently placed particular significance on the core services ex-housing component, which for CPI recently printed at its highest monthly level since April 2022. This fits in with the adage that the so-called "last mile" of inflation fighting is the hardest and will require policy to remain tight for longer than many would like to see (see the report, [Liquid Insight: The difficult last inflation mile 26 February 2024](#)).

Exhibit 15: US Core CPI: Actual and Expected

Recent core CPI readings have printed notably to the upside, supporting US rates and the USD

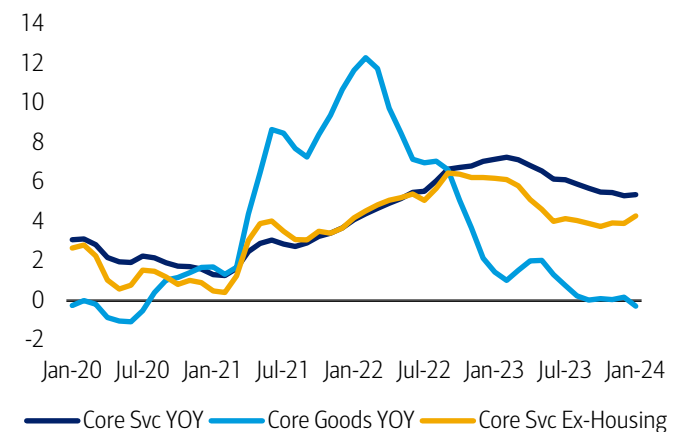


Source: Bloomberg; BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 16: US core CPI components: goods, services, services ex-housing

US services inflation remains sticky



Source: Bloomberg; BofA Global Research

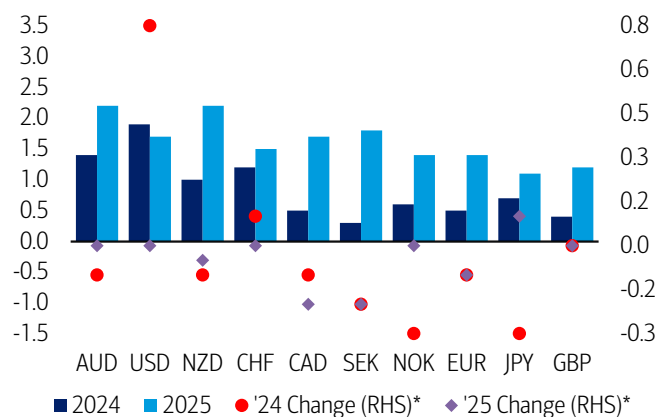
BofA GLOBAL RESEARCH

“US exceptionalism”? Don’t write it off just yet

Beyond these select inflation trends, dollar bulls also look towards a broader set of growth measures to assess the overall US economic picture, often citing so-called “US exceptionalism” related to other major global economies. As noted above, US real GDP expectations stand out among the G10, both for 2024 and 2025, and expectations have been notably upgraded in recent months (Exhibit 17). Further, the highly watched Atlanta Fed GDP Nowcast has trended upward this year and currently is above 3%. Consistently, while other economies are showing greater expansion of the services sector than the US, it and Norway are the only two G10 with above-50 manufacturing and services PMIs (Exhibit 18).

Exhibit 17: 2024/25 Consensus real GDP and 3m changes

US growth expectations stand out among G10 and were recently revised higher

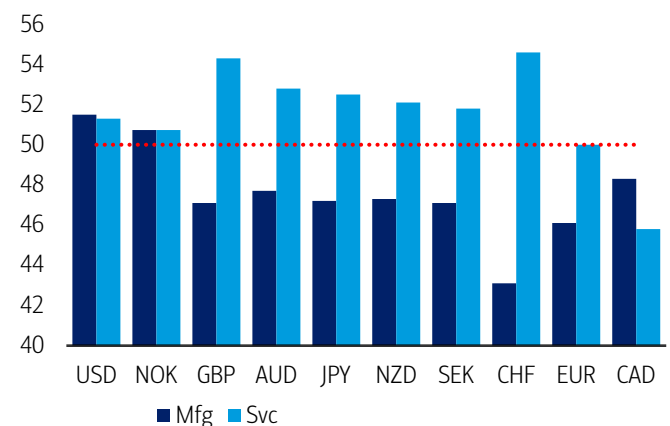


Source: Bloomberg; BofA Global Research; *change since Nov 23

BofA GLOBAL RESEARCH

Exhibit 18: Global PMIs: Services and Manufacturing

US PMIs both in expansionary territory



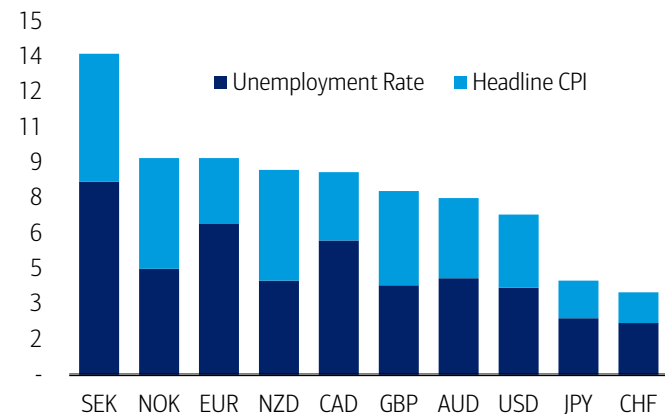
Source: Bloomberg; BofA Global Research

BofA GLOBAL RESEARCH

Elsewhere, signals from the labor market and consumer also stack up well for the US on balance. While unemployment remains relatively low all across the G10, the resilient labor market in the US has been a focal point of this cycle. Viewing the inflation data in this context, we note that the so-called “misery index” (inflation + unemployment) in the US is the lowest in the G10, with the exception of Switzerland and Japan – two economies with structurally low inflation and unemployment (Exhibit 19). On this basis, the US economy is relatively better equipped to withstand tighter monetary conditions. On the consumer side, confidence readings across the G10 indicate above-average conditions only in the US, using a 10-year Z-Score across measures (Exhibit 20).

Exhibit 19: G10 “Misery Index” (Unemployment and CPI)

US Unemployment and inflation third lowest in the G10

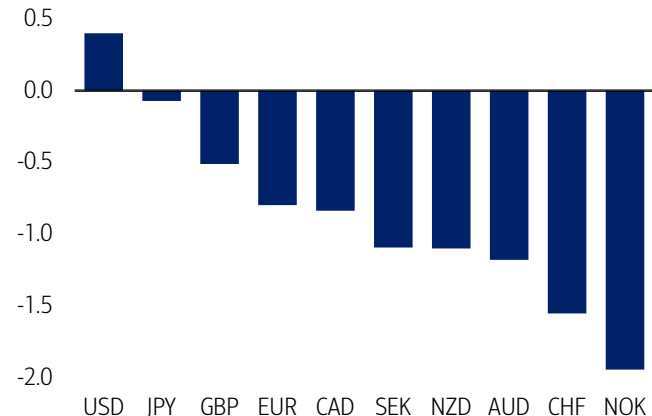


Source: Bloomberg; BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 20: G10 Consumer Confidence Z-Scores (10-year lookback)

US only G10 economy with above-average consumer confidence readings



Source: Bloomberg; BofA Global Research

BofA GLOBAL RESEARCH

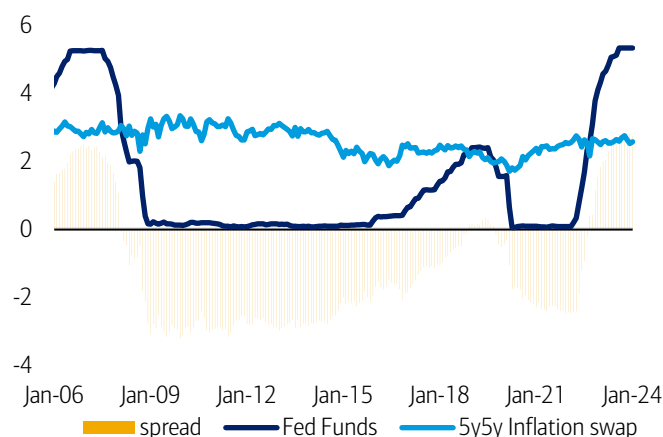
“Fed credibility is alive and well – don’t fight the Fed”

Over the course of the last year, much of the USD bearish case centered on expectations that the Fed would blink at the first sign of financial stress/economic softness, thus causing yields to drop substantially and the USD to sell off. Such an outcome could have forced inflation expectations higher and made Fed policy look inappropriately less restrictive. Clearly, this did not happen, as evidenced by the spread of fed funds to inflation expectations (5y5y swap) reaching its widest level since just ahead of the financial crisis in 2008 (Exhibit 21). This creditability should continue to keep inflation expectations at bay, serving as a foundation for USD support amid a clear commitment to appropriately restrictive policy.

Interestingly, this relative policy tightness has not translated into overly tight financial conditions, as many had feared (Exhibit 22). Toward the end of last year, the Fed was vocal about the implications that tightening financial conditions would have on the economy, possibly necessitating less actual monetary restrictiveness. Clearly, this has not played out, likely due in part to buoyant equity markets fueled by exuberance in Tech/artificial intelligence (AI)-related stocks and the effects of loose fiscal policy. But regardless, easy financial conditions should imply less urgency from the Fed to pivot to rate cuts, all else equal, as doing so would push financial conditions even easier, risking a resurgence of inflation. Across the board, this lack of urgency for cuts has been a common thread in recent Fed official communications.

Exhibit 21: Fed Funds & 5y5y Inflation Expectations

Fed Funds in excess of inflation expectations around highest level since pre-2008 crisis

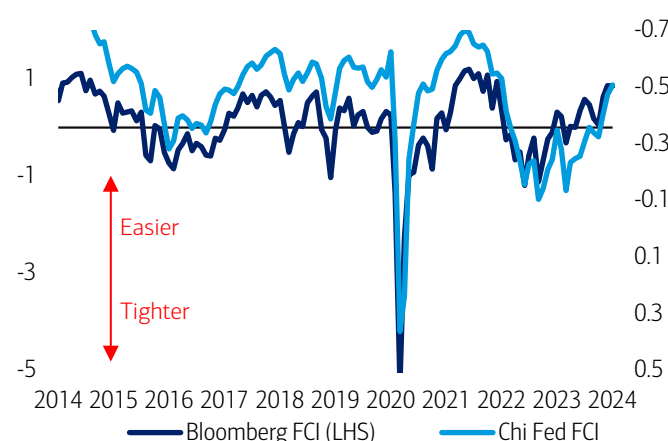


Source: Bloomberg; BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 22: Financial Conditions Indices (Bloomberg and Chicago Fed)

Various FCI measures at easiest levels since 2021



Source: Bloomberg; BofA Global Research

BofA GLOBAL RESEARCH

Finally of note, last month, we explored the thought exercise of how currencies would be impacted if no central bank cut rates in 2024 (see the report, [Liquid Insight: Thinking the unthinkable: what if no central bank cuts rates this year? 16 January 2024](#)). We would view the USD as among the outperformers in this scenario, and while clearly not the base case, it feels much less implausible today than it did just 6 weeks ago.

Risks for both bears and bulls

Other than the standard macroeconomic and policy effects on currencies, here we touch on other themes that are not prevalent drivers of FX at the moment but have the potential to be later in the year.

US election

We covered the election risks for the USD last month, focusing on the stylized example of the biggest potential policy impact – a shift from status quo toward a Republican sweep (see the report, [FX Viewpoint: USD Year Ahead: A winding road to depreciation 25 January 2024](#)). In short, dollar bears emphasize the prospect of tailwinds to risk appetite from tax cuts and de-regulation as well as an anticipated shift over time to more dovish nominations to key Fed positions. Conversely, USD bulls see the election through the lens of possibly inflationary trade, labor, foreign and fiscal policies, keeping US yields elevated on net and posing greater economic challenges abroad. The near-term balance of these skews in the USD's favor, but it is still premature for the spot market to start pricing them in, given uncertainties.

Hard landing

The main bearish and bullish cases discussed above implicitly fit into the “soft landing” and “no landing” scenarios, respectively. Still unexplored here is the “hard landing” scenario and what that could mean for the USD. While not in the consensus base case, we view this scenario as one that is not necessarily straightforward and depends a lot on the severity as well as the global nature of such an outcome (see the report, [FX Viewpoint: Various landing scenarios & the USD 01 March 2023](#)).

A hard landing shock that comes on quickly would likely be bullish USD, at least for a period of time, as the market adjusts to a risk-off trading stance amid deleveraging and flight to the USD as a “safe haven.” However, over time, the presumed sharp drop in US yields, even if accompanied by rate cuts elsewhere would likely eventually prompt allocation out of USD assets, as yield spreads compress and global risk appetite bottoms. Moreover, a slower building hard landing more isolated to the US could see more initial USD depreciation.

CRE/regional banks

Concerns over regional banks reached fever pitch about a year ago and from an FX perspective was seen as dollar negative, at least initially, as US banks were expected to significantly tighten lending standards, which could result in quicker/deeper Fed cuts (see the report, [FX Watch: Financial turmoil, Fed re-pricing & the USD 29 March 2023](#)). Clearly, this did not play out as feared then, and even recent wobbles in this space (which did weigh on the USD for a select number of days in late January/early February) have not persisted. Fed officials have suggested that these risks are distributed enough to not be systemic, but it nevertheless remains a vulnerability for the USD or any other currency closer to the epicenter of emerging risks.

Geopolitics/China

As we outlined in our year-ahead report, other key risks this year related to ongoing economic malaise in China and/or a supply induced oil price spike could present upside risks to the USD (see the report, [FX Viewpoint: G10 FX Year Ahead: The year of the landing 20 November 2023](#)). Perhaps surprisingly, Middle East tensions and Red Sea supply disruptions have yet to meaningfully be reflected in broader currency markets, but possible signs of stagflationary impact in Europe bear watching.

Bottom Line

If this year is anything like last year, the narrative shifts will come fast and frequently, pushing sentiment along with it. Inflation (versus growth) should be a marginally bigger determinant of Fed policy amid a resilient US economy, but interpretation is in the eye of the beholder. We maintain our bearish USD views for the remainder of the year, consistent with the BofA Global Research economic team's expected soft landing, but patience is required. That said, upside risks are becoming more glaring, and a further pushing out of the market's Fed expectations (which are now at long last in sync with each other) could be the next catalyst to turn this year's consolidation into a bigger trend.



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.

Recipients who are not institutional investors or market professionals should seek the advice of their independent financial advisor before considering information in this report in connection with any investment decision, or for a necessary explanation of its contents.

Officers of BofA or one or more of its affiliates (other than research analysts) may have a financial interest in securities of the issuer(s) or in related investments.

Refer to [BofA Global Research policies relating to conflicts of interest](#).

"BofA Securities" includes BofA Securities, Inc. ("BofAS") and its affiliates. Investors should contact their BofA Securities representative or Merrill Global Wealth Management financial advisor if they have questions concerning this report or concerning the appropriateness of any investment idea described herein for such investor. "BofA Securities" is a global brand for BofA Global Research.

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

BofAS and/or Merrill Lynch, Pierce, Fenner & Smith Incorporated ("MLPF&S") may in the future distribute, information of the following non-US affiliates in the US (short name: legal name, regulator): Merrill Lynch (South Africa): Merrill Lynch South Africa (Pty) Ltd., regulated by The Financial Service Board; MLI (UK): Merrill Lynch International, regulated by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA); BofASE (France): BofA Securities Europe SA is authorized by the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers (AMF). BofA Securities Europe SA ("BofASE") with registered address at 51, rue La Boétie, 75008 Paris is registered under no 842 602 690 RCS Paris. In accordance with the provisions of French Code Monétaire et Financier (Monetary and Financial Code), BofASE is an établissement de crédit et d'investissement (credit and investment institution) that is authorised and supervised by the European Central Bank and the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers. BofASE's share capital can be found at www.bofamli.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 Canadian Investment Regulatory Organization; 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; BofA 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.

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.

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:

Copyright 2024 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 or any of its affiliates or their research analysts has any authority whatsoever to make any representation or warranty on behalf of the issuer(s). BofA Global Research policy prohibits research personnel from disclosing a recommendation, investment rating, or investment thesis for review by an issuer prior to the publication of a research report containing such rating, recommendation or investment thesis.

Any information relating to the tax status of financial instruments discussed herein is not intended to provide tax advice or to be used by anyone to provide tax advice. Investors are urged to seek tax advice based on their particular circumstances from an independent tax professional.

The information herein (other than disclosure information relating to BofA Securities and its affiliates) was obtained from various sources and we do not guarantee its accuracy. This information may contain links to third-party websites. BofA Securities is not responsible for the content of any third-party website or any linked content contained in a third-party website. Content contained on such third-party websites is not part of this information and is not incorporated by reference. The inclusion of a link does not imply any endorsement by or any affiliation with BofA Securities. Access to any third-party website is at your own risk, and you should always review the terms and privacy policies at third-party websites before submitting any personal information to them. BofA Securities is not responsible for such terms and privacy policies and expressly disclaims any liability for them.

All opinions, projections and estimates constitute the judgment of the author as of the date of publication and are subject to change without notice. Prices also are subject to change without notice. BofA Securities is under no obligation to update this information and BofA Securities ability to publish information on the subject issuer(s) in the future is subject to applicable quiet periods. You should therefore assume that BofA Securities will not update any fact, circumstance or opinion contained herein.

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.