

BofA Global Research Podcasts

Bank risks abate but tighter lending, slower economy likely approaching

Key takeaways

- BofA Global Research Podcasts are an ongoing series of discussions covering growth industries and topical market themes.
- Higher rates have impacted the banking sector but are they enough to slow the resilient consumer?
- We discuss how banking stresses could tighten credit and help spawn the much anticipated slowdown.



Economic concerns and increased funding costs may combine to help slow a resilient US economy

The consumer economy has remained strong in the face of rate hikes and labor demand has remained resilient. But recent stresses in the banking sector give Michael Gapen more confidence in his view that the US will see a mild recession later this year. Banks had started to tighten lending by the end of the 4Q and a combination of economic concerns as well as higher cost funding and more regulations could lead to even more tightening. Inflows into money markets are notable and probably don't reverse until the Fed is cutting rates again according to Mark Cabana. 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. You may also enjoy listening to the Merrill Perspectives podcast, featuring conversations on the big stories, news, and trends affecting your everyday financial life.

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 8 to 10.

04 April 2023

Global US Economics

Thomas (T.J.) Thornton Head of Rsch Mktg & Analytics BofAS +1 646 855 2449 thomas.thornton2@bofa.com

Michael Gapen US Economist BofAS

Mark Cabana, CFA Rates Strategist BofAS

Full Podcast Transcript

T.J. Thornton, Head of Product Marketing and Predictive Analytics: Hello and welcome to BofA Global Research Podcast, where we discuss what's rising from growth industries to rising risks and opportunities in global markets. I'm T.J. Thornton, Head of Product Marketing and Predictive Analytics at BofA Global Research, and we're recording this episode on Tuesday, March 28, 2023.

Essentially, banks need to offset the higher liability cost by ensuring that they have higher revenues that are coming from existing loans, that they've got higher rates on the asset side of their balance sheet. And certainly if deposits are leaving the banking system or if they're leaving a certain set of the banking system, those banks that are impacted do need to pass along higher lending costs and that in essence tightens lending standards, which is what Michael has talked about, as potentially having a headwind in terms of the overall economic outlook.

-Mark Cabana, CFA

It was only a few weeks ago that many were talking about how the Fed might need to raise rates to 6% to slow this US economy down. That talk was quickly silenced as two US banks went into FDIC (Federal Deposit Insurance Corporation) receivership and it became clear that higher rates were indeed having impact. But how much impact, and if the economy does slow, will inflation follow suit allowing the Fed to cut? Joining us to answer these questions and more are Mike Gapen, Head of US Economics for BofA Global Research, and Mark Cabana, Head of US Rate Strategy for BofA Global Research. Thanks for joining us, Mike and Mark.

Michael Gapen, Head of US Economics: Thanks for having us.

Mark Cabana, Head of US Rates Strategy: Thanks for having us.

T.J. Thornton: Okay. So Mike, you didn't change your US GDP (Gross Domestic Product) view after the news that SVB (Silicon Valley Bank) had gone into FDIC receivership and the market now expects Fed rate cuts in the second half of this year, something you don't expect. Is it fair to say you are more optimistic on the economy than the street and why?

Michael Gapen: Yeah, thanks for that T.J. I would say no, primarily because we were already looking for the US economy to be in a mild recession beginning later this year. Just immediately prior to the two banks going into receivership, we'd actually written on how bank lending standards were tightening and credit growth was indeed slowing. We viewed recent trends in this area as consistent with our belief that Fed tightening would slow the economy down and that we would be having a mild recession later this year. Now, you're right, we don't have cuts in our forecast until early 2024, but I think the difference between writing down a baseline or most likely outlook, as opposed to market pricing, which has to take into account distributions of potential outcomes, so pricing cuts later this year, on say, fears or risks of a harder landing that makes complete sense to me. I think we are a little more pessimistic than consensus, and recent events leave us comfortable with that view and with our outlook that we are likely to get something that looks like a mild recession later this year, and we're just viewing recent events as another data point that supports that outlook.

T.J. Thornton: Bank willingness to lend had tightened even before the stock prices of these three banks went to zero. Mike, what happens to bank lending from here, do you think? And how much do changes in lending impact the US economy?

Michael Gapen: Right, there's probably some just correlation here and correspondence between bank lending standards tighten as the outlook for the economy weakens and you would expect loan growth to slow on the back of that, and the data was pointing to that as I mentioned. And I would say in nominal terms, lending to commercial and industrial loans, what we would call C&I (Commercial and Industrial) loans and lending to



households have been kind of running about between zero and 5% in nominal terms, if you look on a three month annualized basis. Loan growth has indeed slowed, so we would expect loan growth to slow further in the coming months and quarters, whether it's loans to business, whether it's loans to households, commercial real estate or residential real estate. And do these things matter for the overall economy? They absolutely do. Analysis that we've done and published suggests a significant tightening, or in this case what could be an excess tightening and lending standards above and beyond what the fundamental environment might warrant, that those could lead to declines in personal consumption spending, as well as spending by business on equipment and structures. And it would be consistent with perhaps some job losses. Now obviously whether all that materializes and to what degree, depends on the size of the shock that we're experiencing, how much lending standards in terms tighten further from here that we don't know. It's just we've been characterizing this as saying it opens up some downside risk to the outlook. If bank lending standards continue to tighten, then I would expect some adverse shock to credit growth, which again would likely downstream into less spending by consumers in business and maybe lead to less hiring.

T.J. Thornton: Okay. And as a quick follow up there, is it fair to just think about big ticket items maybe as being at more risk, if we did see a tightening in lending rather than some of these smaller ticket items that a consumer might purchase like apparel or of course consumer staples?

Michael Gapen: Yeah, in general, that's exactly right. Some of this is a desired outcome by the Fed in the sense that they're tightening policy to slow down aggregate demand. Obviously, they don't want to overdo it, if they could avoid it. But lower credit availability and higher cost of credit will tend to hit those bigger durable items first because households do finance those, most of the time. So you would expect, if credit standards tighten appreciably that you would see lower demand and lower spending on durable items like new cars, used cars and household appliances. But it also means that the ability to use, say credit cards or unused balances on credit cards or other contingent credit lines by small business, that those may be curtailed as well. Total lending capacity generally comes down, but you're right, T.J., we would expect to see it perhaps most explicitly in some of those durables items.

T.J. Thornton: Okay. And when the two year yield fell dramatically in the wake of the bank news and the Treasury yield curve steepened as a result, there was some talk about how when you see that amount of steepening, it often coincides actually with the beginning of a recession. Mark, what sort of information content is there in these dramatic steepening episodes and does the one we saw suggest that we may actually finally be in the midst of this highly anticipated recession?

Mark Cabana: Certainly what we have seen the market price is a shallower path of policy from the Fed, i. e., a terminal rate that won't need to be as high from the Fed and a path of rate cuts that has deepened and been pulled forward to some extent. There's also no doubt some elements of 'flight to quality' in the recent episode, when you're uncertain about the outlook and you're worried about broader banking systemic risks, you want to 'fly' or you want to move your money into the perception of safer assets. And no doubt, treasuries and front-end treasuries were a beneficiary of this to some extent. Now, do the dramatic moves mean a recession is coming? Do lower 2-year rates mean that you're going to get a sharp slowdown in the economy? No, they don't mean that - it just means that there are increased concerns about that and that there's also clearly some preference to own safer haven, lower risk securities due to increased concerns about systemic banking risks.

T.J. Thornton: And Mark, there are two main things driving deposit shifts. One is risk aversion where depositors want to diversify and shift deposits, and the other one is just that depositors are chasing higher rates because their current accounts aren't giving them attractive rates when they can get 4% plus in some cases. Could you explain how



that second issue in particular impacts bank lending? Because it seems like that's something that's not going to go away even once concerns of a run fade a bit.

Mark Cabana: Sure. Essentially, the possibility that deposits are leaving the banking system chasing higher yielding alternatives is very much a function of the Fed's broader setting of monetary policy. It's consistent with higher interest rates and how money markets have moved to reflect the overall setting of higher interest rates that the Fed has established. If there is a broader flight of deposits out of the banking system, then you would think that that will certainly challenge bank's ability to make loans or to make loans on similarly attractive terms. And if a bank is worried about deposits that are leaving, moving into money market alternatives, then they're going to fight that and they're going to fight that by trying to raise deposit costs. And if they do raise deposit costs, then that by definition means that their Net Interest Margin or their NIM is going to compress. And banks should be fighting any type of NIM compression by increasing borrowing costs and increasing lending costs to their ultimate clients or their borrowers. Essentially, banks need to offset the higher liability cost by ensuring that they have higher revenues that are coming from existing loans, that they've got higher rates on the asset side of their balance sheet. And certainly if deposits are leaving the banking system or if they're leaving a certain set of the banking system, those banks that are impacted do need to pass along higher lending costs and that in essence tightens lending standards, which is what Michael has talked about, as potentially having a headwind in terms of the overall economic outlook.

T.J. Thornton: Mike, back to the point I made in the intro. There was surprising strength in the US economy. It's still strong looking at the current data, with maybe some suggestions of a bit of a slowdown, but there have been a few explanations for this strength, the fact that most homeowners have fixed rate mortgages, high excess savings from the pandemic, even the recent passage of the IRA (Inflation Reduction Act), which people think may be contributing to some of the strength in hiring that we're seeing now. Do you think any of this might keep monetary policy from working as it's supposed to work?

Michael Gapen: I think on a first order effect, I would say no. Does this mean that monetary policy isn't potent and that the Fed cannot guide the economy towards its longer term macro objectives? I think, no, but I would say that on a second order effect, it certainly affects how much the Fed may have to do and may also affect the lag time with which policy works. I think you're exactly right to point to the strength in the underlying economy is coming mainly from consumer balance sheets, and I do think that's related to the massive wealth accumulation piled up during the pandemic, excess saving, as well as a very strong labor market. But outside of that, we were certainly seeing the effects in other areas of the economy that monetary policy was working. Housing did screech to a halt for much of last year, business spending on equipment and structures slowed, manufacturing output started to decline at the end of the year, and as we've been discussing here, most recently bank lending standards have tightened and credit growth has started to slow. There was certainly plenty of evidence that higher policy rates were having their effect on interest rate sensitive sectors of the economy, but in terms of recession expansion, it's about having that policy tightening migrate onto consumer balance sheets and there certainly are some tailwinds there that monetary policy would say having trouble migrating or navigating. I think monetary policy is working as it's supposed to work, but some of the things that you mentioned like excess saving and strong labor markets mean it may take longer for this to make its way into consumer behavior. The Fed's 'higher for longer' outlook, they're trying to blend some combination of a restricted policy rate plus the notion that we're going to have to lean against some of this underlying support from the consumer for a period of time in order to bring inflation down. It certainly makes their job trickier and more difficult from my perspective.

T.J. Thornton: Okay. And Mark, we've often seen big spikes in money market fund flows when there's skittishness on risk markets. We've certainly seen a big spike right now, and



some have referred to it as a bubble in money market funds. What tends to happen after these spikes? Does the money get redeployed into other areas like equities and do you think things might be different this time because of the high rates that are being offered by these money markets?

Mark Cabana: Well certainly, money funds are not allocating the inflows that they receive into equities. They're mandated to have a much more conservative allocation. Typically, what the inflows that we see into money funds are ultimately redeployed into are money market instruments and the instruments that they're deployed into will depend upon where we're seeing the money market inflows. Recently, the inflows that we have seen have been going largely to government money market mutual funds, not prime money market mutual funds. Government money market mutual funds will buy treasury bills, they will buy agency debt, short dated agency debt, or they will invest in Repo (Repurchase Agreement). Number one, they've been going into agency debt issuance in particular Federal Home Loan Bank debt issuance. Essentially what was happening is that banks were borrowing from the home loans. The home loans were then borrowing from money market mutual funds. And in a way, the money that was leaving some of the banks was ending up recycled back into them, but via money funds and the home loan channel. The other thing that money funds are investing in heavily is repo, and they are in particular investing in repo with the Federal Reserve. This repo, it's done through a facility called the Fed's Overnight Reverse Repo facility, ON RRP, as some will describe it. Now, over time, you would think that if banking system risks stabilize, and if money market rates become less attractive, let's say if the Fed were two cut rates over time, you would expect to see some outflows from money market mutual funds, and you would expect to see that this cash ultimately gets deployed in other parts of the economy. But I think it is safe to say that we are unlikely to see very large scale money market mutual fund outflows, until we see banking system stress subside or until we see the Fed ultimately cut rates and using Michael's forecasts, we probably then won't see terribly large money market mutual fund outflows until 2024 or deeper into 2024, as the Fed eventually lowers rates back towards where we expected they'll settle in the longer run.

T.J. Thornton: Mike, goods spend has weakened, goods prices have weakened, commodity prices are well off highs, but services prices remain sticky, and that's something that people are watching closely to understand where inflation goes from here. So Mike, what gets those services prices to ease or at least slow their ascent? And between restaurants and travel, have we already passed a peak in terms of pent up demand for some of these services?

Michael Gapen: Yeah, T.J., I think that our underlying thesis, or one of the reasons we're projecting at least a mild recession in the US economy is that we do think getting inflation down to the Fed's target of 2% stable prices will require, as you point out, reversing some of the stickiness in the services side of the economy when it comes to prices. We should get some payback on goods, as you mentioned, and fallen commodity prices as you also mentioned, but when those kind of wash out, it's about where's underlying services inflation that's still likely too high for the Fed's outlook and where they want inflation to go. Our view is to say, well, to get inflation down to 2%, to get services inflation consistent with 2% outcomes; you probably do need to reverse imbalances in the labor market in a way that would look like a traditional recession. We're not suggesting that has to be a deep recession. We're suggesting kind of a mild recession by historical standards should be enough. But there, in terms of thinking, "well, inflation's just going to come down on its own and pass through and we'll be back to 2%", we doubt that that's going to happen. It will likely involve a backup in the unemployment rate to somewhere between 4.5%-5% over time. I don't think we've passed the peak in pent up demand for some of these services, but to get overall services inflation in-line with the Fed's target, we're thinking you need at least a mild recession. It's consistent with what history would suggest to get the amount of disinflation that we're looking for, going from inflation rates of 6%-8% year on year down to 2%, it has typically required some weakening in labor market conditions and



some backup in the unemployment rate. So we're relying kind of on some of that historical evidence to inform our view.

T.J. Thornton: Okay. Last question and this is for both of you. There's a popular view out there that yes, inflation will likely fall some more, especially if we go into recession, but then once things recover, inflation in rates will be a lot higher than they were pre-COVID because of a lot of recent changes. There's been this shift to more domestic supply chains, geopolitical tensions, which are related - the shift to net-zero, which is going to be expensive. Do you agree with this view? And what about technologies like AI (Artificial Intelligence), which actually could be somewhat disinflationary, how do you think that all washes out once we get past this cycle?

Michael Gapen: I do think it's reasonable to think that we're in for some sort of reset in terms of where rates settle out and where inflation settles out and what a new terminal rate or an average terminal rate from the Fed may look like. With pre-COVID, we were in a world where underlying inflation was running around 1.5% and the neutral policy rate of interest was viewed at, let's say around 2% and 10-year treasury yields weren't necessarily higher or much higher. I would say we probably are in for some upward reset on all of those. Underlying inflation is likely to have risen, how high, we don't know, but maybe somewhere between 2%-2.5% from my perspective, which could mean a neutral rate of interest out of the Fed, somewhere between 2.75%, maybe as high as 3%. So I do think some modest reset upward is likely, I'm just not convinced that it's a dramatic material shift higher. But I do think the answer is up and we'll find out over time just how high.

Mark Cabana: From the rates market's perspective, I think that it's safe to say that the market is not pricing a particularly elevated expectation for inflation in the longer run, but we have seen inflation expectations move up from where they were pre-COVID. If you just look pre-COVID, in the 5-years prior, so let's say early 2015 to early 2020, 5 and 10-year break even rates of inflation averaged around 1.75%. Today they are closer to 2.25%, 2.3%. There's been about a 50 basis point increase in the market's pricing of longer run inflation expectations. Now these inflation expectations are still quite low. What the TIPS (Treasury Inflation-Protected Securities) market is reflecting is CPI (Consumer Price Index), as we all know, there's a differential between CPI and the Fed's preferred inflation measure, PCE (Personal Consumption Expenditures). And if you adjust for where PCE is expected to be these breakeven inflation rates really suggest that the Fed may not be successful at achieving their 2% inflation target in time. And what the rates team has been writing about is that we think that some of the market-based measures of inflation expectations just look too low. They don't necessarily properly account for, we think, some of the potential sustained inflationary pressures that we could see over time. Or even if inflation is not realized there, we don't think that they necessarily adequately capture the upside inflation risk premium that may be realized, if we indeed do see some of these structural shifts that result in a more sustained and elevated inflationary pressure over time. So again, the TIPS market does not appear to be particularly concerned about elevated inflation. And we do think that there is certainly some scope for the market to price in greater expectations of upside inflation risk premium, especially if the Fed is seen as turning a bit more cautious in the current setting of monetary policy due to the tightening and lending standards that we have discussed on this call.

T.J. Thornton: Mike, Mark, thanks very much to the two of you for joining us today.

Michael Gapen: Thank you.

Mark Cabana: Thanks so much for having us.

T.J. Thornton: While market expectations around a recession and Fed policy changed after the bank news, Mike Gapen didn't change his GDP forecast. He had been forecasting a mild recession in the second half of this year. The market had become skeptical of this view and then the market came around again as the FDIC stepped in. The reasons to be concerned about bank lending from here are multiple. Fears around a



slowdown can impact lending, but so does deposit flight and the higher cost of deposits. This could be a headwind for consumer purchases of durables that are financed and for business spending. And keep in mind that even before the SVB news, parts of the economy were already slowing, even if the consumer showed resilience. Tougher labor markets may change that resilience, but will also help to ease the very high services inflation that we've been seeing. Thanks for joining.



Disclosures

Important Disclosures

FUNDAMENTAL EQUITY OPINION KEY: Opinions include a Volatility Risk Rating, an Investment Rating and an Income Rating. VOLATILITY RISK RATINGS, indicators of potential price fluctuation, are: A - Low, B - Medium and C - High. INVESTMENT RATINGS reflect the analyst's assessment of both a stock's: absolute total return potential as well as its attractiveness for investment relative to other stocks within its Coverage Cluster (defined below). There are three investment ratings: 1 - Buy stocks are expected to have a total return of at least 10% and are the most attractive stocks in the coverage cluster; 2 - Neutral stocks are expected to remain flat or increase in value and are less attractive than Buy rated stocks and 3 - Underperformstocks are the least attractive stocks in a coverage cluster. Analysts assign investment ratings considering, among other things, the 0-12 month total return expectation for a stock and the firm's guidelines for ratings dispersions (shown in the table below). The current price objective for a stock should be referenced to better understand the total return expectation at any given time. The price objective reflects the analyst's view of the potential price appreciation (depreciation).

Investment rating	Total return expectation (within 12-month period of date of initial	Ratings dispersion guidelines for coverage cluster ^{R1}
	rating)	
Dung	> 100/-	< 700/-

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

INCOME RATINGS, indicators of potential cash dividends, are: 7 - same/higher (dividend considered to be secure), 8 - same/lower (dividend not considered to be secure) and 9 - pays no cash dividend. Coverage Cluster is comprised of stocks covered by a single analyst or two or more analysts sharing a common industry, sector, region or other classification(s). A stock's coverage cluster is included in the most recent BofA Global Research report referencing the stock.

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 Prudential regulation (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 (Hong Kong): Merrill (Hong Ko (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): Merrill Lynch (Canada): Merrill Lynch (Mexico): Mexico): Merrill Lynch (Mexico): Merrill Lynch (Mexico): Mexico (Mexico): Mexico (Mexico): Mexico (Mexico): Mexico (Mexico): Mexic 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): Merrill Lynch (Israel): 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



Ratings dispersions may vary from time to time where BofA Global Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

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. 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.

Copyright 2023 Bank of America Corporation. All rights reserved. iQdatabase® is a registered service mark of Bank of America Corporation. This information is prepared for the use of BofA Securities clients and may not be redistributed, retransmitted or disclosed, in whole or in part, or in any form or manner, without the express written consent of BofA Securities. BofA Global Research information is distributed simultaneously to internal and client websites and other portals by BofA Securities and is not publicly-available material. Any unauthorized use or disclosure is prohibited. Receipt and review of this information constitutes your agreement not to redistribute, retransmit, or disclose to others the contents, opinions, conclusion, or information contained herein (including any investment recommendations, estimates or price targets) without first obtaining express permission from an authorized officer of BofA Securities. Materials prepared by BofA Global Research personnel are based on public information. Facts and views presented in this material have not been reviewed by, and may not reflect information known to, professionals in other business areas of BofA Securities, including investment banking personnel. BofA Securities has established information barriers between BofA Global Research and certain business groups. As a result, BofA Securities does not disclose certain client relationships with, or compensation received from, such issuers. To the extent this material discusses any legal proceeding or issues, it has not been prepared as nor is it intended to express any legal conclusion, opinion or advice. Investors should consult their own legal advisers as to issues of law relating to the subject matter of this material. BofA Global Research personnel's knowledge of legal proceedings in which any BofA Securities entity and/or its directors, officers and employees may be plaintiffs, defendants, co-defendants or co-plaintiffs with or involving issuers mentioned in this material is based on public inform

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.

