

Global Research Marketing

Red Sea not calm but coalition ramping; duration is key

Building Red Sea Tail Risks

Starting in mid-December, ships began diverting away from the Red Sea and Suez Canal after intensifying attacks by Houthi rebels around the Bab-el-Mandeb strait. Shipowners previously focused on redeploying Israeli-owned ships, but we are seeing more vessels divert, with larger shipping companies including MSC, Maersk and Euronav announcing diversions in response to the attacks. Diverted ships are now traveling around Africa's Cape of Good Hope, resulting in voyages that last 1-2 weeks more and higher costs. Looking to address these threats, the US announced Operation Prosperity Guardian on December 18, a coalition of about 20 nations with the goal of "ensuring freedom of navigation for all countries" passing through the Red Sea. Maersk resumed Red Sea transits after news of the coalition only to pause them again after an attack on 12/30.

Container demand could be boosted by 9%

About 28% of container shipping volumes travel through the Suez Canal/Red Sea (Exhibit 1). Nathan Gee estimates that if all sailings were diverted away from the Red Sea, container demand could increase by 9% and earnings for APAC shipping companies could be boosted by up to 10-20% of market cap on two months of disruption as tightening capacity would help pricing and volumes.

Duration matters, so does the Chinese New Year

The pre-Chinese New Year (CNY) mini peak in exports could be disrupted but Nathan Gee's view is that supply chains and rates will have a chance to normalize during the export lull in Feb/Mar, post CNY. If disruptions last longer than ~2 months, the boost to earnings for shipping companies could be greater than 10-20% of market cap, especially in a busier shipping period.

US Navy could defend and escort commercial vessels

On December 19, Ron Epstein and Ken Hoexter [hosted a call with Admiral James Foggo, a retired four-star US Navy admiral and Dean of Center for Maritime Strategy \(see link\)](#). Admiral Foggo expects the newly announced coalition to involve naval convoy escorts. Nearly all naval vessels are now outfitted with the Aegis combat system, which can detect ballistic and cruise missiles several hundred miles out.

Retail sales impact unlikely; more expert events coming

Jan/Feb are lower volume months for retail so Lorraine Hutchinson doesn't believe a 1-2-week delay in receipts will materially impact Spring sales, though freight costs could be higher. Global Research is hosting the [15th Annual BofA Defense and Aerospace forum](#) and a [containership expert](#), both this week. Nathan Gee is [hosting a call with a Linerlytica](#) next week with others to follow.

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.

>> Employed by a non-US affiliate of BofAS and is not registered/qualified as a research analyst under the FINRA rules.

Refer to "Other Important Disclosures" for information on certain BofA Securities entities that take responsibility for the information herein in particular jurisdictions.

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 6 to 7.

12640201

Timestamp: 03 January 2024 08:57AM EST

03 January 2024

Equity
Global

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

Nathan Gee, CFA >>
Research Analyst
Merrill Lynch (Singapore)

Ken Hoexter
Research Analyst
BofAS

Lorraine Hutchinson, CFA
Research Analyst
BofAS

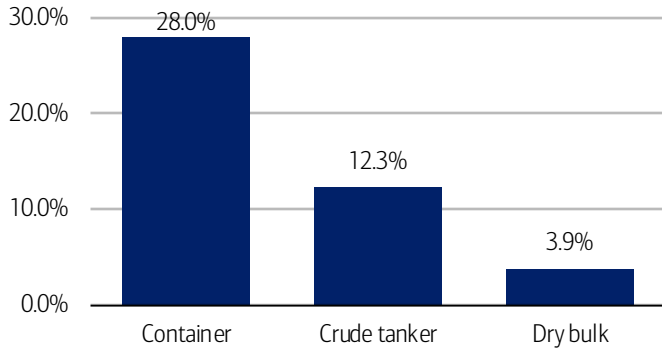
Muneeba Kayani >>
Research Analyst
MLI (UK)

Ronald J. Epstein
Research Analyst
BofAS

Warren Russell, CFA
Commodity Strategist
BofAS

Exhibit 1: Shipping volumes using Suez/Red Sea by segment

Container shipping is most exposed to disruption to Suez/Red Sea

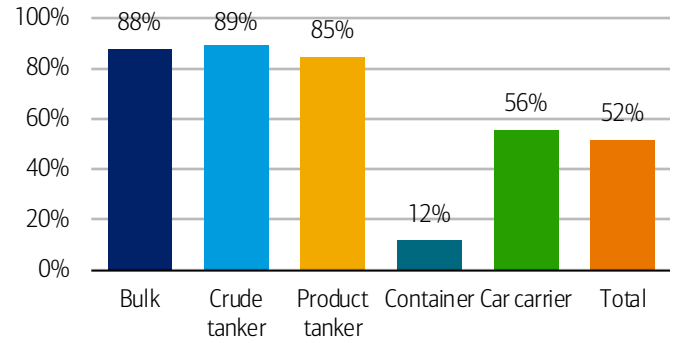


Source: Clarksons, BofA Global Research estimates

BofA GLOBAL RESEARCH

Exhibit 2: Red Sea capacity in past 7 days as % of 1H Dec average

Container and car carrier seeing most disruptions

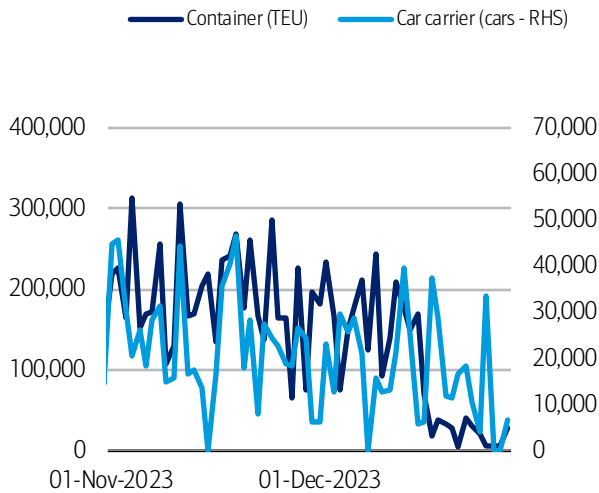


Source: Clarksons

BofA GLOBAL RESEARCH

Exhibit 3: Container & car carrier capacity arriving in Red Sea (TEU and CEU), 2023

Container has seen biggest disruption of all segments

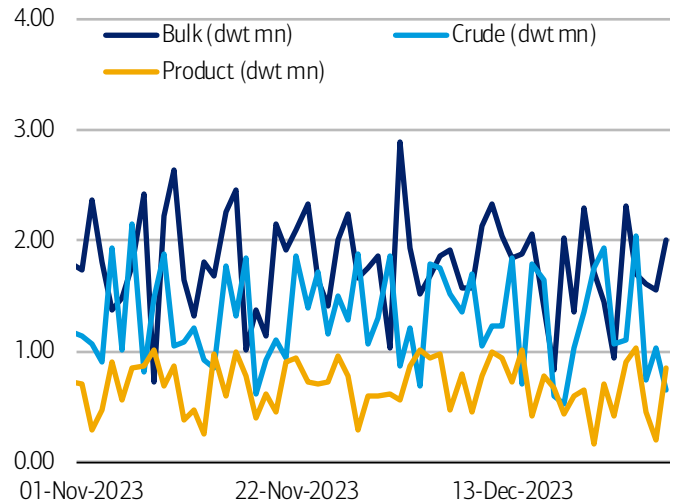


Source: Clarksons

BofA GLOBAL RESEARCH

Exhibit 4: Bulk, crude tanker and product tanker capacity arriving in Red Sea (mn dwt), 2023

Limited disruption to bulk & tanker for now



Source: Clarksons

BofA GLOBAL RESEARCH

Recent Notes on Red Sea Implications

Nathan Gee – [Shipping - Global: Supply chains, interrupted 01 January 2024](#)

- Red Sea supply chain disruptions worsened in 2H December. Container looks most disrupted, but tanker and bulk less impacted.
- Upside risks to container rates in Jan 2024, but our base case is supply chains and rates normalize in Feb-Mar 2024 on...
- ...post-CNY slack season and note that peak disruptions might have passed with some liners already returning to the Red Sea.

Nathan Gee – [Shipping - Global: Building Red Sea tail risks 18 December 2023](#)

- Ships are diverting away from the Red Sea given worsening attacks. Persistent rerouting is a positive for shipping rates...
- ...by increasing journeys by 30% with container most impacted. But watch US taskforce announcement which could encourage...
- sailing to return to Red Sea. Tanker and dry bulk offer cheaper option on Red Sea disruption, more selective on container.

Nathan Gee – [Shipping - Asia-Pacific: Red Sea disruptions: How to think about possible earnings scenarios? 21 December 2023](#)

- The Red Sea situation is fast evolving, and we brace for disruptions of at least a few weeks until Operation Prosperity...
- ...Guardian can stabilize the situation. We present earnings scenarios to our base forecasts depending on freight rates and...
- ...duration of disruption. Our scenarios show incremental earnings of up to 10-20% of market cap on a two-month disruption.

Ken Hoexter – [Transportation: Red Sea Call Takeaway: Adm. Foggo sees near-term challenges in restoring fluidity 19 December 2023](#)

- We co-host Adm. Foggo, Dr. Wills, Dr. Ralby, and Mr. McCown w/ Aerospace & Defense Ron Epstein to discuss Red Sea Attacks.
- Sees no miracle solution in the near term as Houthis represent a dynamic threat. Naval fleet upgraded since 1980s Tanker Wars.
- Nearby proximity of aircraft carrier units provide additional support. Rising cost imply aligned interests in restoring trade.

Lorraine Hutchinson – [Specialty Retailing: Supply chain delays: here we go again! 22 December 2023](#)

- Retailers' significant 2023 gross margin recapture is now at risk from supply chain disruption (Red Sea attacks).
- 30% of all containers go through Suez Canal; the move to avoid it adds 1-2 weeks to retailers' shipping timeframe.
- Jan/Feb are lower volume months; we do not think a 1-2 week delay in receipts will materially impact spring selling season.

Warren Russell – [Global Energy Weekly: Freight fright 19 December 2023](#)



- Freight was mostly bearish in 2023, with Baltic Clean, Dirty, and Dry indices and containership earnings falling 40-60% YoY.
- We see downside for containership earnings, clean tanker rates in 2024 and a supportive outlook for dirty tankers, bulkers...
- ...but acknowledge that a worsening of conditions at the Suez Canal/Red Sea and Panama Canal would be bullish most freight.

Nathan Gee – [Shipping - Global: Another look at the tail risks of Suez and Panama Canal disruptions 05 December 2023](#)

- Shipping relies on free passage of the Suez and Panama Canals, but disruption risk is rising from drought and Red Sea attacks.
- We see some early evidence of vessel diversion at both Panama and Suez. Container could see the most upside to fundamentals.
- If the two canals are closed, while tanker and dry bulk also could benefit from smaller boost from longer distance flows.

Upcoming Events on Red Sea Implications

January 3-4, 2024 – [Aerospace & Defense - 15th Annual BofA Defense and Aerospace Forum](#)

- We invite you to attend our 15th annual BofA Defense Outlook and Aerospace Forum on January 3-4, 2024.
- Day 1: Defense - speakers will focus on the evolving geopolitical landscape and the outlook for the US defense industry.
- Day 2: Commercial Aerospace - speakers will focus on commercial OEM, AM, MRO, bizjets, aero supply chain, and emerging tech.

January 4, 2024 – [Red Sea disruption: implications for container shipping with Lars Jensen](#)

- Please join us for an expert call with Lars Jensen to discuss the impact of the Red Sea disruption on container shipping.
- This call will be on Thursday 4th January 2024 at 2pm UK, 9am ET, 10pm HK time.

January 11, 2024 – [Container outlook with Linerlytica – Transporting into 2024 call series](#)

- The BofA Global Research Transport team is pleased to host Huajoo Tan, Founder of Linerlytica.
- Mr. Tan will discuss the 2024 outlook for container shipping and supply chains.
- The call will be held on Thursday 11 January at 5pm Hong Kong time, 6pm Tokyo time and 9am London time.

January 17, 2024 – [Car carrier outlook with Hoegh Autoliners – Transporting into 2024 call series](#)

- BofA Transport team is pleased to host Per Øivind Rosmo, CFO Höegh Autoliners & My Linh Vu, Head of Finance, Treasury and IR.

- Mr. Rosmo and Ms. Vu will be discussing the 2024 outlook on car carrier shipping market.
- The call will be held on Wednesday 17 January 2024 at 5pm Hong Kong time, 6pm Tokyo time and 9am London time.

January 24, 2024 – [Air Cargo outlook with TIACA – Transporting into 2024 call series](#)

- BofA Transport team is pleased to host Mr Glyn Hughes, Director General at The International Air Cargo Association (TIACA).
- During the call, we will discuss the outlook for air cargo demand, supply and freight rates.
- The call will be held on Wednesday 24 January 2024 at 9pm Hong Kong time, 1pm London and 8am New York time.

January 30, 2024 – [Tanker shipping outlook with Gibson – Transporting into 2024 call series](#)

- BofA Transport team is pleased to host Richard Matthews, Director of Consultancy & Research at EA Gibson Shipbrokers.
- Mr. Matthews will discuss the outlook for tanker freight markets into 2024 across crude, product and LNG shipping.
- The call will be held on Tuesday 30 January 2024 at 5pm Hong Kong time, 6pm Tokyo time, and 9am London time.

February 1, 2024 – [Supply chain outlook with Flexport – Transporting into 2024 call series](#)

- BofA Transport team is pleased to host Sanne Manders, COO, and Trine Nielsen, Head of EMEA Ocean, Flexport.
- Mr. Manders and Ms. Nielsen will discuss the 2024 outlook for supply chains.
- The call will be held on Thursday 1 February 2024 at 5pm Hong Kong time, 6pm Tokyo time and 9am London time.

February 5, 2024 – [Container outlook with Hapag Lloyd – Transporting into 2024 call series](#)

- The BofA Transport team is pleased to host Mark Frese, Chief Financial Officer, Hapag-Lloyd.
- Mr. Frese will discuss the 2024 outlook for container shipping and supply chain market.
- The call will be held on Monday 5 February 2024 at 5pm Hong Kong time, 6pm Tokyo time and 9am London time.

Disclosures

Important Disclosures

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

Other Important Disclosures

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

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

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

This report may refer to fixed income securities or other financial instruments that may not be offered or sold in one or more states or jurisdictions, or to certain categories of investors, including retail investors. Readers of this report are advised that any discussion, recommendation or other mention of such instruments is not a solicitation or offer to transact in such instruments. Investors should contact their BofA Securities representative or Merrill Global Wealth Management financial advisor for information relating to such instruments.

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

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

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

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

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

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

This information has been approved for publication and is distributed in the United Kingdom (UK) to professional clients and eligible counterparties (as each is defined in the rules of the FCA and the PRA) by MLI (UK), which is authorized by the PRA and regulated by the FCA and the PRA - details about the extent of our regulation by the FCA and PRA are available from us on request; has been approved for publication and is distributed in the European Economic Area (EEA) by BofASE (France), which is authorized by the ACPR and regulated by the ACPR and the AMF; has been considered and distributed in Japan by BofAS Japan, a registered securities dealer under the Financial Instruments and Exchange Act in Japan, or its permitted affiliates; is issued and distributed in Hong Kong by Merrill Lynch (Hong Kong) which is regulated by HKSF; is issued and distributed in Taiwan by Merrill Lynch (Taiwan); is issued and distributed in India by BofAS India; and is issued and distributed in Singapore to institutional investors and/or accredited investors (each as defined under the Financial Advisers Regulations) by Merrill Lynch (Singapore) (Company Registration No 198602883D). Merrill Lynch (Singapore) is regulated by MAS. Merrill Lynch Equities (Australia) Limited (ABN 65 006 276 795), AFS License 235132 (MLEA) distributes this information in Australia only to 'Wholesale' clients as defined by s.761G of the Corporations Act 2001. With the exception of Bank of America N.A., Australia Branch, neither MLEA nor any of its affiliates involved in preparing this information is an Authorised Deposit-Taking Institution under the Banking Act 1959 nor regulated by the Australian Prudential Regulation Authority. No approval is required for publication or distribution of this information in Brazil and its local distribution is by Merrill Lynch (Brazil) in accordance with applicable regulations. Merrill Lynch (DIFC) is authorized and regulated by the DFSA. Information prepared and issued by Merrill Lynch (DIFC) is done so in accordance with the requirements of the DFSA conduct of business rules. BofA Europe (Frankfurt) distributes this information in Germany and is regulated by BaFin, the ECB and the CBI. BofA Securities entities, including BofA Europe and BofASE (France), may outsource/delegate the marketing and/or provision of certain research services or aspects of research services to other branches or members of the BofA Securities group. You may be contacted by a different BofA Securities entity acting for and on behalf of your service provider where permitted by applicable law. This does not change your service provider. Please refer to the [Electronic Communications Disclaimers](#) for further information.

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

General Investment Related Disclosures:

Taiwan Readers: Neither the information nor any opinion expressed herein constitutes an offer or a solicitation of an offer to transact in any securities or other financial instrument. No part of this report may be used or reproduced or quoted in any manner whatsoever in Taiwan by the press or any other person without the express written consent of BofA Securities.



This document provides general information only, and has been prepared for, and is intended for general distribution to, BofA Securities clients. Neither the information nor any opinion expressed constitutes an offer or an invitation to make an offer, to buy or sell any securities or other financial instrument or any derivative related to such securities or instruments (e.g., options, futures, warrants, and contracts for differences). This document is not intended to provide personal investment advice and it does not take into account the specific investment objectives, financial situation and the particular needs of, and is not directed to, any specific person(s). This document and its content do not constitute, and should not be considered to constitute, investment advice for purposes of ERISA, the US tax code, the Investment Advisers Act or otherwise. Investors should seek financial advice regarding the appropriateness of investing in financial instruments and implementing investment strategies discussed or recommended in this document and should understand that statements regarding future prospects may not be realized. Any decision to purchase or subscribe for securities in any offering must be based solely on existing public information on such security or the information in the prospectus or other offering document issued in connection with such offering, and not on this document.

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

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

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

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

BofAS or one of its affiliates is a regular issuer of traded financial instruments linked to securities that may have been recommended in this report. BofAS or one of its affiliates may, at any time, hold a trading position (long or short) in the securities and financial instruments discussed in this report.

BofA Securities, through business units other than BofA Global Research, may have issued and may in the future issue trading ideas or recommendations that are inconsistent with, and reach different conclusions from, the information presented herein. Such ideas or recommendations may reflect different time frames, assumptions, views and analytical methods of the persons who prepared them, and BofA Securities is under no obligation to ensure that such other trading ideas or recommendations are brought to the attention of any recipient of this information.

In the event that the recipient received this information pursuant to a contract between the recipient and BofAS for the provision of research services for a separate fee, and in connection therewith BofAS may be deemed to be acting as an investment adviser, such status relates, if at all, solely to the person with whom BofAS has contracted directly and does not extend beyond the delivery of this report (unless otherwise agreed specifically in writing by BofAS). If such recipient uses the services of BofAS in connection with the sale or purchase of a security referred to herein, BofAS may act as principal for its own account or as agent for another person. BofAS is and continues to act solely as a broker-dealer in connection with the execution of any transactions, including transactions in any securities referred to herein.

Copyright and General Information:

Copyright 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.