

## Greater China - Autos

# China Dec auto (PV+CV) wholesales +27% YoY; EV wholesales +46% YoY

## Industry Overview

## Dec PV/CV sales +23%/25% YoY back by export growth

CAAM reported Dec total vehicle sales (PV + CV) of 3.16mn units, up 24% YoY/6% MoM. 2023 total vehicle sales were up 12% YoY. Dec PV wholesales totaled 2.79mn units, up 23% YoY/7% MoM. 2023 PV sales were up 11% YoY. On the CV front, Dec wholesales booked 364k units, up 25% YoY/down 0.4% MoM. 2023 CV sales were up 22% YoY. Dec total vehicle export sales came in at 499k units, up 54% YoY/4% MoM; **PV export sales recorded 422k units, up 53% YoY/4% MoM; CV export sales were 78k units, up 60% YoY/3% MoM.** Moreover, NEV exports saw sales of 111k units in Dec, up 37% YoY/15% MoM. The CADA Vehicle Inventory Alert Index (VIA) came in at 53.7% in Dec, down 4.5ppt YoY/6.7ppt MoM, a bit high, in our view.

## Dec EV wholesales +46% YoY, EV penetration at 37.7%

New energy vehicle (NEV) sales volume reached 1.19mn units in Dec, up 46% YoY/16% MoM. BEV/PHEV sales came in at 825k/364k units in Dec, up 32%/93% YoY. 2023 NEV sales rose 38% YoY to 9.5mn units. Dec EV (PEV + CEV) penetration rate was 37.7%, and 2023 EV penetration came in at 31.6%, up 5.9ppt YoY.

## Robust growth amid peak season; NEV/exports new high

Dec sales saw solid YoY growth driven by 1) price cuts and discounts to achieve annual sales volume targets and 2) continued robust growth in exports (+54% YoY) and NEV sales (+46% YoY). 2023 total PV sales were in line with our estimates, and we expect China auto wholesales to grow 3.7% in 2024 but mainly be supported by export sales (+17.5% YoY to 5.7mn), and we expect EV wholesales to grow 23% YoY to 11.5mn units (see our report, Greater China Auto, EV and EV battery: Year Ahead 2024 – look for bottom-up investment opportunity in a gloomy market).

### Exhibit 1: CAAM's monthly sales summary

Total vehicle sales were up 24% YoY, and total export sales were up 54% in Dec

Units	Dec-23	Dec-22	YoY	2023	2022	YoY
PV	2,792,000	2,270,797	23.3%	26,063,000	23,563,287	10.6%
CV	364,000	290,582	25.1%	4,031,000	3,300,458	22.1%
<b>Total vehicle sales</b>	<b>3,156,000</b>	<b>2,561,379</b>	<b>23.5%</b>	<b>30,094,000</b>	<b>26,863,745</b>	<b>12.0%</b>
PV export	422,000	275,277	53.3%	4,140,000	2,529,016	63.7%
CV export	78,000	48,780	59.9%	770,000	582,451	32.2%
<b>Total export sales</b>	<b>500,000</b>	<b>324,058</b>	<b>54.3%</b>	<b>4,910,000</b>	<b>3,111,467</b>	<b>57.9%</b>
NEV export	111,000	81,319	36.5%	1,203,000	677,365	77.6%
ICEV export	388,000	242,046	60.3%	3,707,000	2,432,415	52.4%

Source: CAAM

BofA GLOBAL RESEARCH

12 January 2024

Equity  
Greater China  
Autos

**Ming Hsun Lee, CFA** >>  
Research Analyst  
Merrill Lynch (Hong Kong)  
+852 3508 5006  
minghsun.lee@bofa.com

**Jessie Lo** >>  
Research Analyst  
Merrill Lynch (Singapore)  
+65 6678 1134  
jessie.lo@bofa.com

**Joey Yang, CFA** >>  
Research Analyst  
Merrill Lynch (Hong Kong)  
+852 3508 4021  
joey.z.yang@bofa.com

CADA: China Automobile Dealers Association

CAAM: China Association of Automobile Manufacturers

CEV: Commercial electric vehicle

CV: Commercial vehicle

EV: Electric vehicle

ICEV: Internal combustion engine vehicle

k: Thousand

MoM: Month on month

NEV: New energy vehicle

PEV: Passenger electric vehicle

PV: Passenger vehicle

YoY: Year on year

>> 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 4 to 5.**

12644853

Timestamp: 11 January 2024 12:28PM EST

**Exhibit 2: Major listed OEMs' monthly wholesale**

SAIC PV, GAC Aion, GAC Toyota, GAC Honda, FAW Toyota, GWM, and BYD outperformed in Dec, among the major brands

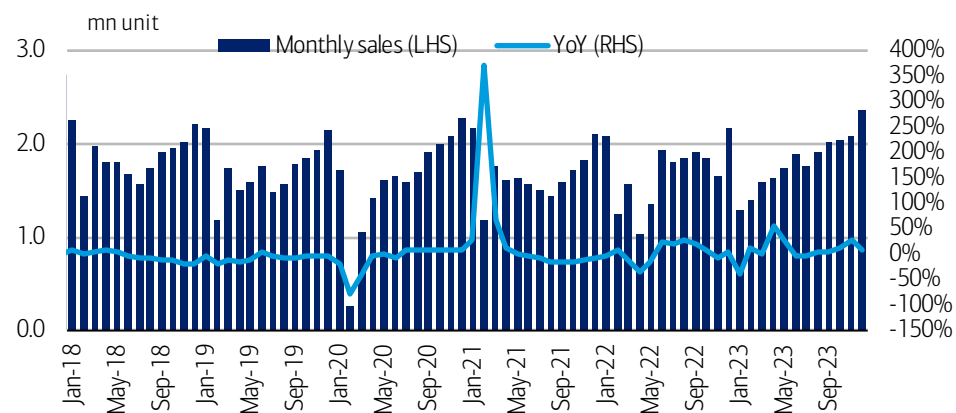
Units	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	2023
SAIC (600104 CH)	536,370	238,023	301,342	351,803	373,949	400,799	405,725	400,204	423,319	482,188	491,433	515,114	636,966	5,020,865
SVW	121,501	72,008	73,303	81,019	88,323	92,803	95,833	99,003	110,033	120,003	120,013	120,013	142,649	1,215,003
SGM-Wuling	193,616	30,000	72,000	90,500	105,300	110,300	112,000	111,300	120,000	135,000	155,000	160,000	201,666	1,403,066
SGM	94,201	55,001	68,157	62,800	80,000	92,000	93,000	85,301	88,000	100,000	85,000	87,000	104,758	1,001,017
SAIC PV	86,891	55,698	58,499	82,258	68,256	73,687	72,401	71,771	75,602	92,340	93,956	104,664	136,886	986,018
BYD (1211 HK)	235,197	151,341	193,655	207,080	210,295	240,220	253,046	262,161	274,386	287,454	301,833	301,903	341,043	3,024,417
GAC (2238 HK)	206,001	146,921	161,219	231,735	177,224	209,606	236,199	189,199	196,761	243,599	224,449	227,124	259,138	2,245,837
GAC Toyota	74,192	75,500	63,200	81,300	72,000	73,600	87,200	70,000	70,600	92,400	80,800	86,000	97,408	950,008
GAC Honda	58,393	38,143	41,221	70,110	25,418	54,408	60,628	42,008	42,469	61,442	63,512	61,778	79,329	640,466
GAC Aion	30,007	8,206	30,086	40,025	41,012	44,875	45,013	45,025	45,026	51,596	41,503	41,567	45,947	434,056
GAC Trumpchi	37,982	23,277	25,145	35,179	29,235	34,093	41,131	31,344	37,585	37,286	38,010	37,216	35,325	371,180
Dongfeng (0489 HK)	211,644	108,088	154,197	192,337	142,496	169,247	179,119	163,458	181,420	200,897	205,624	219,644	171,658	2,088,185
DF Nissan & Venucia	65,672	34,837	66,429	62,971	44,086	57,358	69,513	51,635	59,617	60,433	75,704	78,091	62,465	723,139
DF Honda	60,963	30,516	31,325	46,568	29,028	47,208	42,358	54,826	59,025	71,588	63,895	72,876	55,587	604,800
DF PSA	10,446	5,265	5,425	10,100	7,766	8,004	7,657	5,006	8,028	6,523	5,810	6,127	4,634	80,345
FAW VW (exclude Audi)	102,152	81,133	66,007	109,296	80,269	96,438	130,133	89,792	96,527	116,229	106,355	116,379	127,682	1,216,240
FAW Toyota	60,421	36,464	54,888	61,857	66,847	67,026	71,909	69,740	74,622	75,694	69,714	61,648	89,690	800,099
FAW Audi	52,150	30,900	39,000	56,188	41,986	47,933	67,588	50,688	54,500	65,112	48,928	62,300	70,835	635,958
GWM (2333 HK)	77,442	61,519	68,209	90,240	93,107	101,020	104,957	109,091	114,096	121,632	131,308	122,849	112,502	1,230,530
Haval	44,326	39,192	39,162	47,419	52,264	55,600	59,007	62,967	66,523	73,766	78,698	75,012	65,578	715,188
Pickup	13,787	11,680	17,156	19,981	18,651	18,605	16,523	15,841	17,040	17,197	17,333	16,291	16,032	202,330
Tank	11,022	5,915	6,344	11,950	10,916	10,429	12,773	13,490	14,674	18,054	22,105	18,577	17,312	162,539
Ora	6,927	3,676	4,475	9,615	8,901	10,616	10,015	10,116	10,206	10,021	10,826	10,025	10,026	108,518
WEY	1,380	1,056	1,072	1,275	2,375	5,770	6,602	6,652	5,618	2,548	2,256	2,866	3,512	41,602
Brilliance BMW	60,119	58,267	52,871	61,628	49,656	55,443	56,236	60,985	61,362	62,607	57,396	69,383	64,166	710,000
BAIC Benz	44,715	44,010	52,300	53,696	42,200	51,306	57,700	51,200	55,100	55,301	39,057	35,400	53,320	590,590
BAIC Hyundai	25,056	15,028	17,003	27,013	16,003	19,262	24,018	12,530	20,177	22,394	18,827	21,661	28,525	242,441
YoY	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	2023
SAIC (600104 CH)	-18.8%	-47.8%	-6.4%	-20.6%	124.5%	10.2%	-16.1%	-21.0%	-17.3%	-6.8%	-2.4%	4.5%	18.8%	-5.3%
SVW	-11.0%	-44.9%	-19.1%	-26.4%	194.3%	6.2%	-24.0%	-23.6%	-13.8%	-7.8%	-4.2%	7.3%	17.4%	-8.0%
SGM-Wuling	-10.2%	-72.7%	9.1%	-39.7%	38.5%	10.3%	-6.7%	-23.3%	-17.3%	-17.8%	-3.1%	-5.9%	4.2%	-12.3%
SGM	-41.4%	-50.0%	-10.3%	-29.1%	235.7%	10.8%	-25.8%	-25.9%	-26.7%	-10.7%	-28.6%	-15.5%	11.2%	-14.5%
SAIC PV	-17.5%	-17.6%	-9.2%	32.2%	268.6%	4.5%	-12.4%	-16.9%	-10.4%	23.4%	38.3%	43.0%	57.5%	17.5%
BYD (1211 HK)	137.3%	58.6%	112.6%	97.4%	98.3%	109.0%	88.8%	61.3%	56.9%	42.8%	38.6%	31.0%	45.0%	61.9%
GAC (2238 HK)	-11.8%	-38.1%	12.4%	1.9%	42.9%	14.5%	0.8%	-14.0%	-9.7%	2.7%	5.6%	19.3%	25.8%	-7.7%
GAC Toyota	-24.7%	-24.4%	26.1%	-16.2%	5.1%	-12.2%	-13.5%	-16.7%	-16.6%	-3.8%	0.0%	0.9%	31.3%	-5.5%
GAC Honda	-25.5%	-51.4%	-27.8%	-8.8%	6.4%	15.5%	-18.1%	-44.3%	-40.2%	-11.0%	-0.1%	31.8%	35.9%	-13.7%
GAC Aion	106.9%	-48.8%	252.9%	97.0%	301.6%	113.1%	86.7%	79.9%	66.6%	71.9%	38.1%	44.5%	53.1%	60.1%
GAC Trumpchi	18.1%	-36.3%	5.7%	16.9%	45.3%	16.2%	25.9%	0.0%	25.5%	11.3%	21.1%	44.2%	-7.0%	2.4%
Dongfeng (0489 HK)	-17.9%	-64.4%	-25.0%	-13.7%	29.7%	11.9%	-25.7%	-31.4%	-13.4%	0.9%	-5.6%	42.7%	-18.9%	-15.3%
DF Nissan & Venucia	-36.0%	-72.6%	-22.6%	1.1%	6.4%	-2.4%	-22.7%	-43.2%	-30.1%	-25.9%	-8.8%	57.7%	-4.9%	-21.5%
DF Honda	-18.6%	-60.6%	-47.2%	-35.5%	75.2%	31.0%	-44.5%	-30.8%	15.8%	63.1%	23.3%	98.8%	-8.8%	-8.5%
DF PSA	-25.5%	-59.5%	-28.9%	-6.9%	-4.7%	-2.5%	-10.2%	-50.1%	-20.4%	-53.2%	-60.2%	-36.9%	-55.6%	-35.8%
FAW VW (exclude Audi)	-23.5%	-32.5%	-23.1%	20.4%	84.7%	-4.4%	-6.8%	-18.5%	-7.6%	-13.5%	13.6%	40.0%	25.0%	0.6%
FAW Toyota	-31.9%	-29.1%	-27.7%	-11.6%	112.6%	15.6%	-29.5%	-15.7%	-3.1%	-10.9%	-7.0%	-6.4%	48.4%	-4.1%
FAW Audi	-20.8%	-50.7%	-9.4%	79.0%	199.8%	-4.1%	-8.8%	-14.3%	-6.0%	18.4%	-6.8%	51.9%	35.8%	7.2%
GWM (2333 HK)	-52.3%	-45.0%	-3.6%	-10.6%	73.1%	26.2%	3.7%	7.0%	29.3%	29.9%	31.0%	40.3%	45.3%	15.3%
Haval	-53.0%	-44.2%	-6.7%	-13.0%	79.4%	33.2%	15.1%	2.8%	32.0%	36.7%	23.4%	39.1%	47.9%	16.0%
Pickup	-44.9%	-9.2%	47.4%	8.3%	41.2%	9.4%	-22.2%	-2.8%	9.5%	0.5%	10.4%	17.8%	16.3%	8.4%
Tank	-7.8%	-42.9%	-1.9%	33.9%	80.0%	30.1%	-10.4%	8.2%	46.6%	43.1%	73.3%	70.1%	57.1%	31.2%
Ora	-66.9%	-72.2%	-28.5%	-32.6%	188.2%	-1.4%	-13.0%	14.6%	11.4%	31.8%	94.3%	47.9%	44.7%	4.3%
WEY	-86.3%	-79.3%	-75.8%	-73.2%	3.6%	129.0%	128.7%	119.2%	81.8%	8.2%	-7.0%	35.8%	154.5%	14.4%
Brilliance BMW	21.6%	-26.3%	21.4%	72.5%	56.4%	-11.4%	-9.5%	20.3%	3.7%	-11.0%	11.8%	18.5%	6.7%	6.8%
BAIC Benz	-15.0%	-18.2%	30.8%	10.8%	55.7%	26.7%	1.1%	-18.1%	6.0%	-17.1%	-20.8%	-28.6%	19.2%	-0.2%
BAIC Hyundai	-37.9%	-37.5%	3.3%	58.0%	59.8%	128.4%	32.7%	-47.9%	-22.6%	-32.2%	-29.1%	0.5%	13.8%	-3.2%

Source: Company report



**Exhibit 3: China's PV monthly retail sales**

Monthly retail sales were up 9% YoY to 2.35mn units in Dec

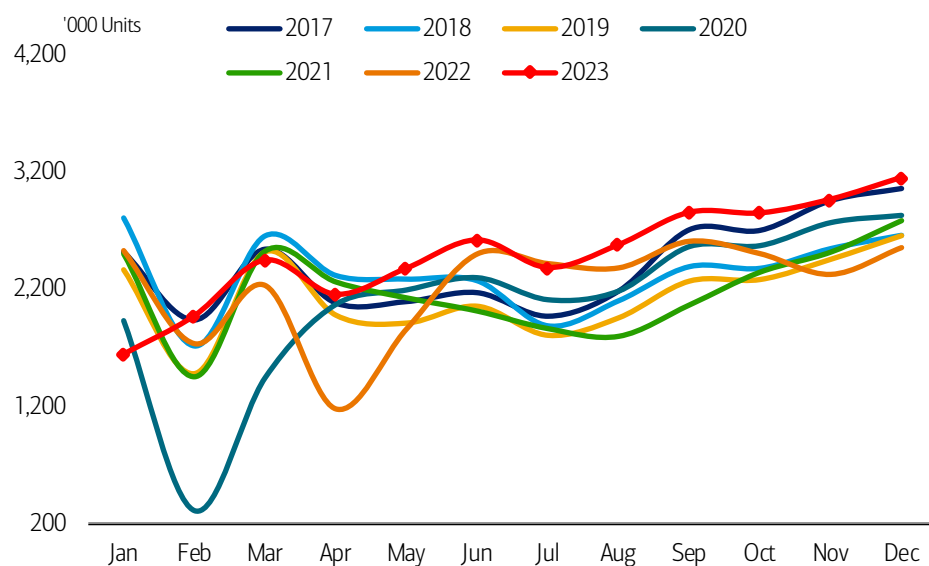


Source: CPCA

BofA GLOBAL RESEARCH

**Exhibit 4: China's total vehicle sales volume (2017-23)**

China's auto market's monthly total wholesale volume (PV and CV) was 3.16mn in Dec 2023



Source: CAAM

BofA GLOBAL RESEARCH

# 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.

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.bofam.com/BofASEdisclaimer](http://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 (HKSCF); 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 HKSCF; 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 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.