

Global Automobiles

LVS tracker: Strong Feb 23 points to more upside, pot. credit crisis a downside risk

Industry Overview

Strong Feb-23 SAAR: 88.5m (+12% y/y, +23% m/m)

Global light vehicle sales SAAR slipped in Jan '23 to 72.1m (-8.9% y/y, driven by China) but recovered sharply in Feb '23 to reach 88.5m (+12.2% y/y; +23% m/m) – the best month since April '21. Weaker Jan sales were driven by a payback effect in some markets from EV subsidy phase-outs (China, EU) in Dec '22. We think February is the better trend indicator. All in all, high monthly y/y growth rates remain driven by low year-ago comparison bases. That should become even more extreme in the coming months. For example, **we expect LV sales to grow >20% y/y in Europe and Brazil in March '23 and even by around 100% in China April '23.** The sales volumes increase in February vs January '23 is a positive sign and means that shortages are easing.

By OEM: TSLA (strong), BYD, VW (both weaker)

Key observations by OEM regarding the sales performance for Jan/Feb '23 (see also Exhibit 6 and Exhibit 7): (1) the performance assessment of the various OEMs always depends on whether you look at it from a **y/y or sequential perspective**. Some OEMs gained market share sequentially in Jan/Feb '23 vs Q4 '22 but record sales declines y/y (i.e., Nissan, Mercedes); (2) **Tesla** (TSLA) has been the global winner y-t-d with sales up c50% y/y (global M/S now 2.4% vs 2.2% in Q4 '22) due to price cuts announced in mid-January; (3) in comparison, **BYD** has lost global market share sequentially (from 4.2% in Q4 '22 to 3.6% in 2023 y-t-d) since the Chinese EV market was weak in Jan.; (4) **VW**: following bullish FY23 guidance (+15% global unit sales growth) the company seems to be missing evidence that this can be realized. Global Jan/Feb sales were flat y/y; and (5) **other major successes** globally in Jan/Feb '23: **Suzuki** (+1% global M/S vs Q4 '22), **Kia, Renault** (driven by strong Dacia sales), **Toyota** (the global market leader).

Other highlights: IHS revisions, inventories, credit crisis

(1) New on the agenda: **Higher interest rates and tight credit** (due to recent bank distress in the US & EU) pose downside risks for sales and the real impact probably will not be known for 1-2 quarters (see also: [Autos on collision course w/ tight credit & supply](#)). (2) We show in Exhibit 3 **IHS forecast revisions in March '23**: Toyota, Honda, Renault, BMW Ford and VW suffered downwards revisions for 23e while Stellantis, Tesla, Hyundai and Nissan saw upgrades. (3) **Global inventories** continue to creep up (see Exhibit 40-Exhibit 41 and Exhibit 59-Exhibit 60). (4) **Pricing**: Used car prices surprisingly increased in the US. In Germany, price discounts hit an all-time low in Feb.

FY23: More positive on EU; Special: OEM volume guidance

We increase our global LV sales forecast for 2023 from +2.4% to 2.9% y/y (IHS +6.2% y/y), driven by a higher sales forecast for Europe (up from +3.6% to +7.1% y/y), which is mainly helped by strong order books in the EU and better parts supply. **A special in this report**: We show on the next page how recent FY23 guidance by some large OEMs compare against consensus and IHS forecasts. Are **VW and Ford** too bullish?

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Jargon buster

SAAR = seasonally adjusted annualised rate

LV(S) = Light Vehicle (sales)

OEM = Original Equipment Manufacturer

(B)EV = (Battery) Electric Vehicle

ICE(V) = Internal combustion engine (vehicle)

ATP = Average Transaction Prices

IRA = Inflation Reduction Act

M/S = Market Share

2023 sales guidance: (too?) bullish OEMs

S&P (IHS) forecasts LV sales +6.2%/y and LVP +3.5%, implying a re-stock of 1.4m units. At the mid-point, OEM guidance implies LVS growth of c9.5%/y, a delta of c2.7m units vs S&P. There are two ways of looking at that: (1) S&P (IHS) could be too bearish in its forecast; or (2) some OEMs are too bullish in their view. Looking at the Q1 run rate, we think this question can only be answered in H2. In our view, bullish OEM outlooks assume that H2 will be stronger than H1. Uncertainty about H2 remains high, of course, since it is unknown to what extent the recent banks crisis (in US & Europe) will weight on lease and loan conditions for new vehicles.

Up- and downside variations by OEM vs consensus & S&P

We collated 2023 top-line guides for major OEMs contributing c62% of 2022 global LV sales. The sum of these OEMs' ambitions would see LV sales (and production) grow c9.5%/y (at the mid-point), c3.3ppts higher than S&P's forecast for these carmakers and 0.2% ahead of the Visible Alpha consensus. The largest deviations between company guides and S&P are at VW, Ford and Hyundai (incl. KIA), where companies guide 15%/4.6%/8.5% higher, respectively. The gap versus consensus, however, is lower at +2.9%/+3.0%/+3.7%, respectively. The biggest downside deviations are at Renault, GM and BYD, where guidance is 7.8%, 13.2% and 10.9% below S&P. For these, implied guidance is -18%/+4.4%/-4.3% vs. consensus (Exhibit 1).

VW & Ford: volume guidance optimistic

VW's confidence is led in part by an order bank of 1.8m units in Europe (FY22 sales: 3m), which continues to grow. However, while the company sees supply/demand shifting into balance by 3Q'23, the CFO described the FY23 guide as "ambitious", referring to volumes, in our view. It is worth noting that VW was one of the most affected by the chip shortage. While Ford has guided for c10% market growth in N. America and Europe (80% of its volumes) our US analyst, John Murphy, sees more moderate growth of just 3.1%, as does S&P (+3.3%) and consensus, which stand at +4.8%/y.

More details in our recent [LVP tracker: Special edition. Upward pressures mount](#)

Exhibit 1: OEM 2023 guidance vs S&P forecast

OEMs are on average 3.1ppts more optimistic about 2023 sales volume growth than S&P and 0.2ppts vs. VA consensus

OEM	2023 volume guide	2022 unit sales	Implied for 2023 (mid-point)	% growth y/y	S&P forecast 2023	% growth y/y	Visible Alpha Cons	% growth y/y	Variance: guide vs. S&P	Variance: guide vs. VA cons
European OEMs										
BMW Group ¹	"Slightly up"	2,399,636	2,471,625	3.0%	2,446,912	2.0%	2,413,774	0.6%	1.0%	2.4%
Mercedes-Benz	-2% to +2%	2,435,535	2,435,535	0.0%	2,514,100	3.2%	2,529,643	3.9%	-3.1%	-3.7%
Renault ²	"Slightly grow Europe"	2,051,174	2,112,709	3.0%	2,290,424	11.7%	2,575,058	25.5%	-7.8%	-18.0%
Stellantis ³	4%	5,782,000	6,013,280	4.0%	6,055,259	4.7%	6,059,400	4.8%	-0.7%	-0.8%
Volkswagen	15%	8,262,800	9,500,000	15.0%	8,257,795	-0.1%	9,235,900	11.8%	15.0%	2.9%
US OEMs										
Ford ⁴	SAAR 15m US, 13m Europe	4,231,000	4,654,100	8.0%	4,369,739	3.3%	4,435,300	4.8%	4.6%	3.0%
General Motors	5% to 10%	3,634,000	3,906,550	7.5%	4,079,949	12.3%	3,743,100	3.0%	-4.3%	4.4%
Tesla ⁵	37%	1,313,851	1,800,000	37.0%	1,863,462	41.8%	1,850,300	40.8%	-3.4%	-2.7%
Asian OEMs										
BYD	BofAe: +50%	1,853,510	2,786,337	50.3%	3,125,651	68.6%	2,912,500	57.1%	-10.9%	-4.3%
Hyundai ⁶	9.2 to 10.2%	3,560,824	3,906,224	9.7%	3,767,289	5.8%	4,045,100	13.6%	3.7%	-3.4%
Kia	8.70%	2,788,182	3,150,000	13.0%	2,733,648	-2.0%	2,759,530	-1.0%	15.2%	14.1%
Toyota ⁷	FY23 10.4m units, FY24 TBC	10,545,900	10,835,600	2.7%	10,394,840	-1.4%	10,835,600	2.7%	4.2%	0.0%
Total		48,858,412	53,487,340	9.5%	51,899,068	6.2%	53,395,205	9.3%	3.1%	0.2%
% of global LVS		62%	66%		64%		66%			

Source: BofA Global Research estimates, company data, S&P. 1. BMW: we interpret "slightly up" as +3%/y. 2. Renault: we interpret as +3%/y. 3. Calculated based on Stellantis regional industry outlook for 2023 and its exposures (N. America, Europe, ME & Africa, AsiaPac +5%, China, S. America +3%). 4. Ford: based on SAAR guide for EU & NA (80% of regional exposure), with China JVs flat y/y. 5. Tesla: Production guidance 1.8m units vs. sales of 1.3m in 2022. 6. Toyota: March fiscal year-end. We apply FY23E guidance for calendar Q1 and consensus estimates for Q2-Q4. Guidance for Q2-Q4 to be published with fiscal 23 earnings in Apr'23.

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BofA Global LV Sales forecast and most recent BofA reports on volumes

Exhibit 2: BofA Global sales forecast by region

We forecast solid growth in Europe due to a low base and strong order book, while the Chinese market should reaccelerate starting 2024e

Sales forecasts	2019	2020	2021	2022	Q1 2023e	Q2 2023e	Q3 2023e	Q4 2023e	2023E	2024E	2025E	2026E
West Europe	16,713,061	12,748,130	12,719,947	11,895,943	3,439,469	3,287,226	3,004,959	3,055,399	12,787,053	13,437,255	13,622,641	13,490,062
y-o-y %	0.9%	-23.7%	-0.2%	-6.5%	17.8%	10.1%	7.2%	-4.2%	7.5%	5.1%	1.4%	-1.0%
Central Europe	1,730,959	1,336,648	1,391,054	1,314,050	341,835	346,154	335,030	342,636	1,365,654	1,403,637	1,424,120	1,458,226
y-o-y %	5.6%	-22.8%	4.1%	-5.5%	7.4%	0.1%	3.0%	5.5%	3.9%	2.8%	1.5%	2.4%
EU 28	18,444,020	14,084,778	14,111,001	13,209,993	3,781,304	3,633,379	3,339,989	3,398,035	14,152,707	14,840,892	15,046,761	14,948,288
y-o-y %	1.3%	-23.6%	0.2%	-6.4%	16.8%	9.1%	6.8%	-3.3%	7.1%	4.9%	1.4%	-0.7%
East Europe	2,741,677	2,901,033	2,896,070	1,882,925	411,162	453,010	463,849	580,928	1,908,949	2,052,150	2,186,039	2,240,268
y-o-y %	-3.3%	5.8%	-0.2%	-35.0%	-24.9%	7.8%	19.3%	10.3%	1.4%	7.5%	6.5%	2.5%
North America	20,314,687	17,094,349	17,743,931	16,464,989	3,785,903	4,392,243	4,421,028	4,391,714	16,990,889	18,399,294	20,022,450	20,902,432
y-o-y %	-2.0%	-15.9%	3.8%	-7.2%	-3.0%	4.2%	8.5%	2.8%	3.2%	8.3%	8.8%	4.4%
Asia ex-China	13,926,523	11,769,307	12,617,782	13,680,558	3,795,593	3,141,660	3,553,018	3,677,201	14,167,473	14,430,549	14,621,633	14,909,439
y-o-y %	-4.6%	-15.5%	7.2%	8.4%	8.4%	-1.9%	2.2%	5.1%	3.6%	1.9%	1.3%	2.0%
China	25,276,636	24,134,323	24,367,542	24,616,156	5,924,201	5,971,014	5,766,344	6,954,597	24,616,156	25,330,025	25,937,945	26,550,219
y-o-y %	-8.2%	-4.5%	1.0%	1.0%	-2.2%	16.8%	-15.1%	4.6%	0.0%	2.9%	2.4%	2.4%
South America	4,465,403	3,222,856	3,762,955	3,784,036	976,522	901,470	1,025,776	1,033,988	3,937,756	4,111,380	4,278,887	4,435,065
y-o-y %	-4.6%	-27.8%	16.8%	0.6%	19.4%	-1.7%	-0.1%	1.2%	4.1%	4.4%	4.1%	3.6%
Middle East/Africa	3,886,579	3,228,256	3,834,505	4,041,366	1,110,692	935,588	1,043,421	1,095,369	4,185,069	4,375,360	4,552,275	4,712,537
y-o-y %	-10.3%	-16.9%	18.8%	5.4%	6.7%	-5.3%	6.4%	6.2%	3.6%	4.5%	4.0%	3.5%
Oceania	1,197,545	1,017,229	1,202,381	1,233,403	288,707	306,712	298,709	314,934	1,209,061	1,223,552	1,185,572	1,140,149
y-o-y %	-7.2%	-15.1%	18.2%	2.6%	-4.7%	1.6%	-2.5%	-2.3%	-2.0%	1.2%	-3.1%	-3.8%
Global LV Sales	90,253,070	77,452,131	80,536,167	78,913,426	20,074,084	19,735,077	19,912,134	21,446,765	81,168,060	84,763,201	87,831,562	89,838,396
y-o-y %	-4.2%	-14.2%	4.0%	-2.0%	3.4%	6.7%	-1.3%	2.9%	2.9%	4.4%	3.6%	2.3%

Source: BofA Global Research estimates, IHS

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Further relevant research on volume trends by regions:

North America: [Autos on collision course w/ tight credit & supply](#), 17 March 2023

Recent banking sector volatility could lead to higher rates for loans/leases, which combined with a lack of confidence could drive consumers to postpone vehicle purchases. Additionally, with news reports of some ABS deals being paused, we highlight that there is risk that financial institutions could further tighten lending standards, potentially restricting availability of credit to vehicle buyers.

Greater China: [February PV insurance: channel restocking; EV sales up 60% YoY](#), 13 March

In February, passenger vehicle (PV) insurance registrations (retail sales) came in at 1.23mn, up 10% YoY/down 1% MoM. YT-February, retail sales declined 25% YoY. Based on the variation between wholesale (1.65mn, +11% YoY, as reported by CAAM (China Association of Automobile Manufacturers)) and insurance registrations, and considering export volumes (271k units), we estimate inventory at channels rose by 150k units in February. Locally manufactured EVs' insurance registrations totaled 394k in February, up 60% YoY/ 35% MoM. Among OEMs, BYD, Changan, GAC Aion, NIO, and Li Auto outperformed EV market growth in February.

Japan: [Feb US SAAR: Japanese OEM slump continues, but Mazda still strong](#)

USA: [Encouraging February sales with 14.9mm SAAR](#)



Global Sales forecasts of OEMs by IHS

Exhibit 3: Light vehicle sales forecast by IHS and recent changes in forecast by OEMs (Mar-23 vs Jan-23)

IHS significantly revised downwards 2023e sales for Renault, Toyota, Ford, BMW and VW, while STLA, Volvo Cars and Tesla saw positive revisions

Retail sales (units)	2020	2021	2022	2023e	2024e	2025e	2026e	2027e	2028e
Latest IHS forecasts	2021	2022	2023e	2024e	2025e	2026e	2027e	2028e	
VW Group	8,791,038	8,220,936	7,697,430	7,671,655	7,909,885	8,124,253	8,284,680	8,265,177	8,239,203
y-o-y %		-6.5%	-6.4%	-0.3%	3.1%	2.7%	2.0%	-0.2%	-0.3%
Mercedes Benz	2,128,041	2,005,988	2,002,684	2,136,776	2,269,761	2,388,708	2,461,353	2,433,054	2,473,214
y-o-y %		-5.7%	-0.2%	6.7%	6.2%	5.2%	3.0%	-1.1%	1.7%
BMW Group	2,327,910	2,494,332	2,378,361	2,427,503	2,568,941	2,652,360	2,671,674	2,670,849	2,769,354
y-o-y %		7.1%	-4.6%	2.1%	5.8%	3.2%	0.7%	0.0%	3.7%
Stellantis	6,473,286	6,685,846	5,944,679	6,356,445	6,828,662	7,113,972	7,163,339	7,030,166	6,942,160
y-o-y %		3.3%	-11.1%	6.9%	7.4%	4.2%	0.7%	-1.9%	-1.3%
Renault Group	2,359,647	2,235,901	2,043,590	2,212,585	2,363,560	2,503,350	2,564,787	2,654,606	2,622,004
y-o-y %		-5.2%	-8.6%	8.3%	6.8%	5.9%	2.5%	3.5%	-1.2%
Volvo Cars	661,102	679,469	618,274	608,204	671,348	721,886	756,649	791,664	743,584
y-o-y %		2.8%	-9.0%	-1.6%	10.4%	7.5%	4.8%	4.6%	-6.1%
EU Car Makers in total	22,741,024	22,322,472	20,685,018	21,413,168	22,612,157	23,504,529	23,902,482	23,845,516	23,789,519
y-o-y %		-1.8%	-7.3%	3.5%	5.6%	3.9%	1.7%	-0.2%	-0.2%
Ford	4,251,992	3,966,188	3,735,915	3,836,315	4,007,979	4,143,367	3,977,136	3,912,355	3,960,165
y-o-y %		-6.7%	-5.8%	2.7%	4.5%	3.4%	-4.0%	-1.6%	1.2%
GM	5,004,137	4,348,437	4,291,587	4,418,629	4,633,300	4,584,589	4,490,186	4,429,683	4,545,787
y-o-y %		-13.1%	-1.3%	3.0%	4.9%	-1.1%	-2.1%	-1.3%	2.6%
Tesla	499,545	927,258	1,321,665	1,919,578	2,236,754	2,363,557	2,606,557	3,184,244	3,483,918
y-o-y %		85.6%	42.5%	45.2%	16.5%	5.7%	10.3%	22.2%	9.4%
Toyota	8,518,968	9,422,531	9,373,675	9,479,830	9,715,696	9,648,296	9,750,851	9,915,765	10,136,487
y-o-y %		10.6%	-0.5%	1.1%	2.5%	-0.7%	1.1%	1.7%	2.2%
Honda	4,471,814	4,453,948	3,798,506	3,988,390	4,191,313	4,371,710	4,349,852	4,236,812	4,255,499
y-o-y %		-0.4%	-14.7%	5.0%	5.1%	4.3%	-0.5%	-2.6%	0.4%
Nissan	4,638,744	4,631,812	3,926,489	4,109,669	4,126,965	4,082,246	4,155,737	4,399,981	4,492,920
y-o-y %		-0.1%	-15.2%	4.7%	0.4%	-1.1%	1.8%	5.9%	2.1%
Hyundai Group	6,253,875	6,796,105	6,552,947	6,541,433	6,621,901	6,783,499	6,848,037	6,864,626	6,989,422
y-o-y %		8.7%	-3.6%	-0.2%	1.2%	2.4%	1.0%	0.2%	1.8%
Changes in IHS forecasts (Mar vs Jan)	2020	2021	2022	2023e	2024e	2025e	2026e	2027e	2028e
VW Group			2,668	-33,739	-79,945	-129,757	-65,319	-69,538	-116,098
% change			0.0%	-0.4%	-1.0%	-1.6%	-0.8%	-0.8%	-1.4%
Mercedes-Benz			-7,207	12,937	12,446	16,363	28,552	38,353	13,356
% change			-0.4%	0.6%	0.6%	0.7%	1.2%	1.6%	0.5%
BMW Group			-3,433	-19,409	-30,695	14,123	-4,922	-3,439	-18,415
% change			-0.1%	-0.8%	-1.2%	0.5%	-0.2%	-0.1%	-0.7%
Stellantis			-5,007	68,667	103,614	100,454	9,047	-52,289	-111,342
% change			-0.1%	1.1%	1.5%	1.4%	0.1%	-0.7%	-1.6%
Renault Group			3,382	-74,477	-72,167	-36,966	-8,687	-4,665	-66,011
% change			0.2%	-3.3%	-3.0%	-1.5%	-0.3%	-0.2%	-2.5%
Volvo Cars			18,079	10,822	24,367	22,478	55,131	86,249	78,790
% change			3.0%	1.8%	3.8%	3.2%	7.9%	12.2%	11.9%
Ford			16,482	-33,424	24,284	47,554	-53,108	40,846	65,693
% change			0.4%	-0.9%	0.6%	1.2%	-1.3%	1.1%	1.7%
GM			-6,029	-14,914	-56,840	-98,359	-64,724	-34,315	-32,945
% change			-0.1%	-0.3%	-1.2%	-2.1%	-1.4%	-0.8%	-0.7%
Tesla			-28,118	56,116	102,586	73,277	112,721	106,324	201,632
% change			-2.1%	3.0%	4.8%	3.2%	4.5%	3.5%	6.1%
Toyota			-10,864	-108,109	-151,336	-161,875	-151,277	-43,488	-22,174
% change			-0.1%	-1.1%	-1.5%	-1.7%	-1.5%	-0.4%	-0.2%
Honda			11,507	-41,977	-76,216	-16,343	-104,204	-191,019	-215,886
% change			0.3%	-1.0%	-1.8%	-0.4%	-2.3%	-4.3%	-4.8%
Nissan			-152	42,410	-35,439	-34,600	-68,393	-69,181	-113,088
% change			0.0%	1.0%	-0.9%	-0.8%	-1.6%	-1.5%	-2.5%
Hyundai Group			-11,015	40,496	-47,694	-94,633	-102,057	-140,962	-45,384
% change			-0.2%	0.6%	-0.7%	-1.4%	-1.5%	-2.0%	-0.6%

Source: IHS; all the numbers above are not BofA estimates, but reflect the IHS view; we consider IHS as the most used data source in the automotive industry (by suppliers, OEMs, consultants, etc)

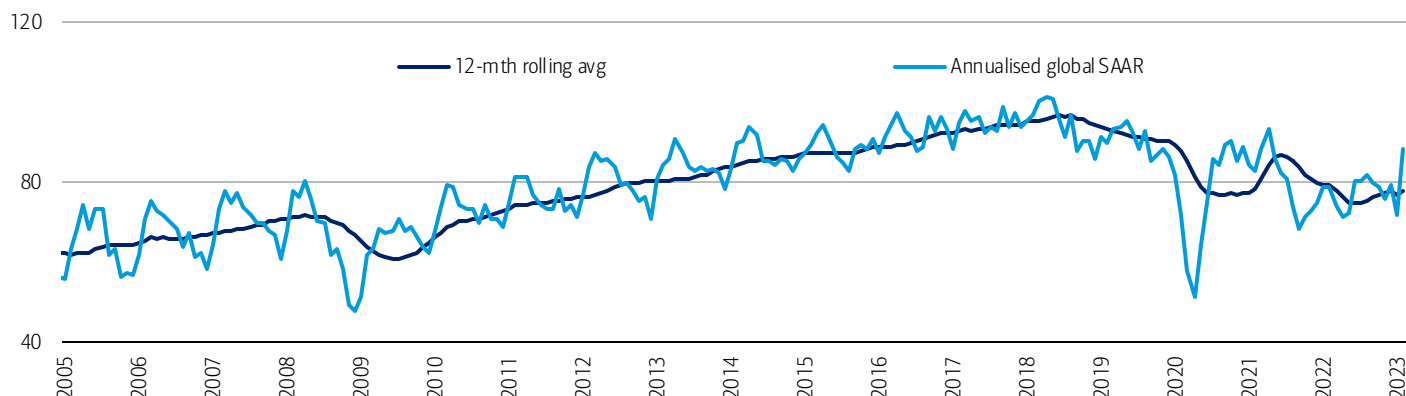
BofA GLOBAL RESEARCH

BofA Global Auto Sales SAAR

We have built a global SAAR indicator from our analysis of over 70% of global auto sales tracked market by market, assuming that rest of the world markets develop similarly to countries we track. Our indicator fell from 88m in Dec '19 to 49m in Apr '20 (close to early 2009). Sales have weakened since 2021 due to the global supply shortage, but we are seeing a reversal now. January 23 was weak month with a SAAR of just 72.1m vehicles but has spiked in February to c88.5m, the highest level since Apr-21.

Exhibit 4: Global autos sales SAAR based on tracked sales (light vehicles)

Global SAAR up c12% YoY to 88.5m in Feb-23; up 23% on MoM basis

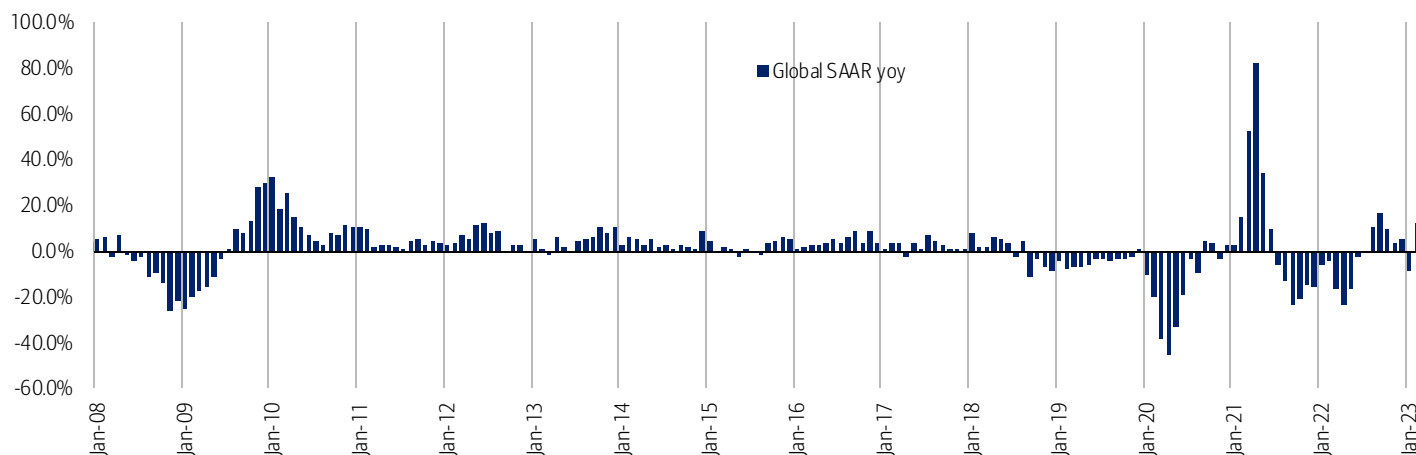


Source: BofA Global Research. The indicator identified as Global auto sales SAAR above is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purpose, without the prior written consent of BofA Global Research. This indicator was not created to act as a benchmark

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Exhibit 5: Global auto SAAR based on tracked sales (YoY %)

Jan-23 SAAR down 8.9% on a YoY basis while Feb-23 was up 12.2% YoY



Source: BofA Global Research. The indicator identified as Global auto sales SAAR above is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purpose, without the prior written consent of BofA Global Research. This indicator was not created to act as a benchmark

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Global Sales & Market share (I) by OEM

Exhibit 6: Sales and market share of key OEMs (Monthly)

Japanese OEMs regained 3.4ppts between Feb-23 & Dec-22, while Chinese OEMs lost 2.6ppts in the same period; STLA is the only EU OEM gaining share

Units Sales	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23
BMW	124,819	155,709	126,369	148,233	162,150	150,844	142,014	162,731	155,272	170,417	191,997	139,331	134,892
Daimler	108,055	147,640	120,278	121,374	147,795	139,910	130,505	145,670	133,164	137,331	165,097	111,232	128,040
Stellantis	347,141	401,496	354,555	391,293	429,135	361,134	325,699	368,340	351,458	362,358	383,319	315,951	354,131
RNO	133,425	147,784	109,639	117,980	181,722	127,708	115,302	140,040	127,389	147,119	180,263	142,130	143,689
VW	455,409	545,986	410,659	551,279	678,582	605,031	581,410	617,964	564,492	552,465	697,064	512,222	499,068
Ford	188,075	230,917	235,970	221,216	216,734	225,000	221,379	228,793	234,440	220,374	258,657	201,386	218,660
GM	250,767	293,368	271,228	266,755	307,981	297,878	322,190	316,274	319,031	295,753	360,238	258,778	255,126
Tesla	81,927	156,401	51,417	59,010	148,898	53,265	87,283	163,764	66,246	137,977	142,658	90,572	117,697
TOYOTA	458,776	608,760	477,924	488,862	547,255	538,831	503,902	545,850	547,262	506,240	577,213	459,723	511,943
NISSAN	189,263	247,334	184,098	165,088	206,745	198,622	190,926	205,487	209,156	170,550	197,365	172,327	197,960
HONDA	265,161	306,996	249,426	218,091	281,660	273,636	264,348	255,818	253,812	229,079	296,934	211,702	222,876
SUZUKI	206,097	226,822	184,130	194,937	196,790	211,234	200,710	228,751	214,882	210,379	184,370	220,231	222,005
Hyundai	241,979	253,024	250,867	264,606	279,585	270,833	263,495	280,802	262,343	270,570	293,712	241,135	247,589
KIA	176,050	206,687	195,715	188,128	209,180	203,015	184,891	195,327	183,964	191,998	182,552	180,399	191,860
Chang'An	60,682	120,437	53,708	72,688	107,112	113,957	103,791	104,970	123,655	101,458	167,722	117,023	92,802
BYD	89,102	103,229	104,770	113,768	132,553	158,957	168,885	191,237	205,789	217,624	223,678	139,755	176,662
BAIC	3,809	9,647	4,020	3,678	7,966	8,199	8,823	12,007	11,153	9,282	15,379	5,286	7,261
SAIC	59,858	52,478	28,981	38,731	58,110	53,185	55,494	50,805	49,126	47,344	63,468	41,328	42,417
Geely	86,115	118,477	69,791	87,591	120,233	122,658	110,247	120,935	147,950	140,425	152,204	108,730	109,887
YoY growth	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23
BMW	-1.0%	-22.5%	-26.6%	-19.1%	-13.4%	-2.9%	2.0%	14.6%	11.7%	13.8%	25.1%	-20.9%	8.1%
Daimler	0.1%	-14.7%	-24.9%	-18.8%	5.3%	15.3%	34.9%	46.9%	17.3%	5.9%	12.2%	-23.0%	18.5%
Stellantis	-14.2%	-26.2%	-20.7%	-18.1%	-9.2%	-7.4%	0.5%	-0.9%	-4.0%	-0.9%	-5.6%	-6.4%	2.0%
RNO	-9.0%	-25.3%	-35.6%	-29.1%	-17.3%	-18.7%	-13.0%	-7.6%	-11.4%	-8.9%	-7.1%	9.1%	7.7%
VW	-14.9%	-33.1%	-39.5%	-24.4%	-4.7%	0.9%	12.6%	16.9%	11.6%	7.0%	12.1%	-15.5%	9.6%
Ford	-19.7%	-29.9%	-17.6%	-8.2%	8.1%	15.4%	9.0%	-2.3%	-5.7%	-0.7%	4.8%	-5.4%	16.3%
GM	-15.7%	-24.4%	-27.9%	-29.6%	-6.5%	-2.3%	42.9%	46.5%	28.7%	11.4%	20.4%	-5.3%	1.7%
Tesla	80.2%	89.0%	32.4%	-1.0%	92.8%	50.0%	84.0%	44.2%	38.1%	68.1%	-7.0%	50.0%	43.7%
TOYOTA	-9.0%	-13.7%	-19.2%	-16.5%	-7.7%	-12.4%	-0.8%	22.8%	24.4%	-1.9%	-1.8%	-5.0%	11.6%
NISSAN	-20.3%	-26.1%	-28.9%	-34.5%	-15.9%	-10.9%	-10.7%	-5.2%	-1.6%	-21.1%	-17.4%	-22.1%	4.6%
HONDA	0.0%	-24.2%	-34.0%	-39.9%	-17.7%	-14.1%	-4.7%	-9.3%	-18.1%	-20.8%	-13.1%	-27.7%	-15.9%
SUZUKI	-6.5%	-7.1%	-11.8%	106.4%	6.7%	5.6%	20.4%	87.6%	23.5%	15.0%	-3.8%	14.0%	7.7%
Hyundai	-3.6%	-22.6%	-18.0%	-9.7%	-12.8%	-10.9%	-1.7%	8.6%	1.3%	5.4%	9.0%	-2.9%	2.3%
KIA	5.5%	-7.7%	-10.1%	-15.7%	-5.7%	-4.7%	3.0%	0.9%	0.4%	8.7%	8.2%	1.3%	9.0%
Chang'An	-37.6%	17.2%	-45.3%	-17.5%	36.0%	31.2%	40.0%	25.1%	26.8%	13.9%	134.4%	-18.5%	52.9%
BYD	340.4%	161.4%	138.4%	159.5%	171.6%	172.6%	153.5%	144.3%	134.6%	125.1%	128.6%	47.1%	98.3%
BAIC	42.7%	48.1%	-38.6%	-29.5%	32.8%	-1.0%	-5.5%	32.6%	23.5%	4.2%	25.6%	-6.1%	90.6%
SAIC	35.4%	-26.0%	-51.5%	-47.6%	-10.4%	-15.3%	-14.2%	-32.8%	-40.8%	-40.3%	-38.8%	-63.7%	-29.1%
Geely	-6.8%	-9.9%	-39.4%	-20.9%	-2.5%	10.2%	6.6%	10.1%	28.8%	4.4%	-2.5%	-24.5%	27.6%
Market Share	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23
BMW	3.0%	3.0%	3.1%	3.4%	3.1%	3.1%	3.0%	3.1%	3.1%	3.5%	3.4%	3.2%	3.0%
Daimler	2.6%	2.8%	3.0%	2.8%	2.9%	2.9%	2.7%	2.8%	2.7%	2.8%	2.9%	2.6%	2.8%
Stellantis	8.3%	7.7%	8.8%	9.0%	8.3%	7.4%	6.8%	7.0%	7.0%	7.4%	6.8%	7.3%	7.8%
RNO	3.2%	2.8%	2.7%	2.7%	3.5%	2.6%	2.4%	2.7%	2.5%	3.0%	3.2%	3.3%	3.2%
Total VW	10.9%	10.5%	10.1%	12.7%	13.1%	12.3%	12.2%	11.8%	11.3%	11.2%	12.4%	11.9%	11.0%
Ford	4.5%	4.5%	5.8%	5.1%	4.2%	4.6%	4.6%	4.4%	4.7%	4.5%	4.6%	4.7%	4.8%
GM	6.0%	5.7%	6.7%	6.2%	6.0%	6.1%	6.8%	6.0%	6.4%	6.0%	6.4%	6.0%	5.6%
Tesla	2.0%	3.0%	1.3%	1.4%	2.9%	1.1%	1.8%	3.1%	1.3%	2.8%	2.5%	2.1%	2.6%
TOYOTA	11.0%	11.7%	11.8%	11.3%	10.6%	11.0%	10.6%	10.4%	10.9%	10.3%	10.3%	10.7%	11.3%
NISSAN	4.5%	4.8%	4.5%	3.8%	4.0%	4.0%	4.0%	3.9%	4.2%	3.5%	3.5%	4.0%	4.4%
HONDA	6.4%	5.9%	6.2%	5.0%	5.5%	5.6%	5.5%	4.9%	5.1%	4.7%	5.3%	4.9%	4.9%
SUZUKI	5.0%	4.4%	4.5%	4.5%	3.8%	4.3%	4.2%	4.4%	4.3%	4.3%	3.3%	5.1%	4.9%
Hyundai	5.8%	4.9%	6.2%	6.1%	5.4%	5.5%	5.5%	5.4%	5.2%	5.5%	5.2%	5.6%	5.4%
KIA	4.2%	4.0%	4.8%	4.3%	4.0%	4.1%	3.9%	3.7%	3.7%	3.9%	3.2%	4.2%	4.2%
Chang'An	1.5%	2.3%	1.3%	1.7%	2.1%	2.3%	2.2%	2.0%	2.5%	2.1%	3.0%	2.7%	2.0%
BYD	2.1%	2.0%	2.6%	2.6%	2.6%	3.2%	3.5%	3.7%	4.1%	4.4%	4.0%	3.2%	3.9%
BAIC	0.1%	0.2%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.1%	0.2%
SAIC	1.4%	1.0%	0.7%	0.9%	1.1%	1.1%	1.2%	1.0%	1.0%	1.0%	1.1%	1.0%	0.9%
Geely	2.1%	2.3%	1.7%	2.0%	2.3%	2.5%	2.3%	2.3%	3.0%	2.9%	2.7%	2.5%	2.4%

Source: BofA Global Research, ACEA, Autodata, CPCA, Anfavea, IHS, local car authorities. Note: Market share is calculated as total sales of each OEM in tracked regions divide by total sales of all the tracked regions. These include EU, US, China, Korea, Japan, Russia, India, Turkiye, Singapore

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Global Sales & Market share (II) by OEM

Exhibit 7: Sales and market share of key OEMs (Quarterly and Annually)

RNO, Tesla, BYD and Suzuki are gaining the most market share in 2023YTD relative to 2022 averages, at the expense of VW, Honda, SAIC and GM

Unit Sales	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	FY 2019	FY 2020	FY 2021	FY 2022	YTD 2023
BMW	486,716	542,747	436,632	442,203	456,717	436,752	455,589	517,686	2,046,458	1,792,213	1,908,298	1,866,744	274,223
Daimler	445,128	450,027	317,270	390,453	400,060	389,447	416,085	435,592	2,016,791	1,770,485	1,602,878	1,641,184	239,272
Stellantis	1,311,620	1,397,622	1,085,768	1,137,576	1,086,056	1,174,983	1,055,173	1,097,135	6,338,779	4,888,336	4,932,586	4,413,347	670,082
RNO	479,322	556,386	441,251	499,235	411,501	409,341	383,050	454,771	2,600,015	2,094,466	1,976,194	1,658,663	285,819
VW	2,059,833	2,119,300	1,644,790	1,643,972	1,607,250	1,640,520	1,804,405	1,814,021	9,321,687	7,967,808	7,467,895	6,866,196	1,011,290
Ford	800,643	727,884	632,317	717,126	631,773	673,920	675,172	713,471	3,911,136	3,184,870	2,877,970	2,694,336	420,046
GM	1,064,347	1,084,195	746,134	812,730	817,456	845,964	936,342	975,022	4,958,915	4,348,358	3,707,406	3,574,784	513,904
Tesla	170,117	175,651	196,532	283,416	298,701	259,325	304,312	346,881	256,821	440,705	825,716	1,209,219	208,269
TOYOTA	1,748,859	1,769,701	1,567,793	1,543,777	1,551,296	1,514,041	1,588,583	1,630,715	6,499,515	6,094,957	6,630,130	6,284,635	971,666
NISSAN	863,096	756,987	653,269	667,739	657,694	555,931	595,035	577,071	3,773,815	2,984,812	2,941,091	2,385,731	370,287
HONDA	991,893	1,083,455	878,002	940,716	864,814	749,177	793,802	779,825	4,279,269	3,843,059	3,894,066	3,187,618	434,578
SUZUKI	673,472	487,587	488,749	548,658	626,166	575,857	640,695	609,631	1,953,154	1,659,474	2,198,466	2,452,349	442,236
Hyundai	850,381	919,364	830,530	784,976	743,366	795,058	815,130	826,625	3,588,869	2,999,342	3,385,251	3,180,179	488,724
KIA	567,174	662,640	586,043	528,621	560,858	593,023	583,233	558,514	2,169,011	1,996,714	2,344,478	2,295,628	372,259
Chang'An	348,000	265,028	244,854	258,151	324,675	233,508	322,718	392,835	769,479	942,100	1,116,033	1,273,736	209,825
BYD	101,630	136,594	203,207	282,266	287,363	351,091	519,079	647,091	455,949	417,192	723,697	1,804,624	316,417
BAIC	16,703	17,758	26,668	30,182	19,085	15,664	29,029	35,814	234,605	106,240	91,311	99,592	12,547
SAIC	197,918	198,436	203,103	265,985	226,256	125,822	159,484	159,938	999,740	812,460	865,442	671,500	83,745
Geely	387,479	349,241	324,603	405,402	348,676	277,615	353,840	440,579	1,672,417	1,536,030	1,466,725	1,420,710	218,617
YoY growth	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	FY 2019	FY 2020	FY 2021	FY 2022	YTD 2023
BMW	28.9%	48.3%	-16.1%	-16.3%	-6.2%	-19.5%	4.3%	17.1%	5.7%	-12.4%	6.5%	-2.2%	-8.9%
Daimler	14.4%	20.3%	-37.8%	-21.5%	-10.1%	-13.5%	31.1%	11.6%	6.4%	-12.2%	-9.5%	2.4%	-5.2%
Stellantis	9.4%	56.4%	-20.9%	-20.0%	-17.2%	-15.9%	-2.8%	-3.6%	-4.3%	-22.9%	0.9%	-10.5%	-2.1%
RNO	1.1%	34.4%	-24.0%	-20.2%	-14.1%	-26.4%	-13.2%	-8.9%	-0.3%	-19.4%	-5.6%	-16.1%	8.4%
VW	22.6%	28.6%	-26.7%	-31.3%	-22.0%	-22.6%	9.7%	10.3%	2.1%	-14.5%	-6.3%	-8.1%	-4.7%
Ford	3.7%	14.5%	-29.3%	-18.7%	-21.1%	-7.4%	6.8%	-0.5%	-7.5%	-18.6%	-9.6%	-6.4%	4.8%
GM	12.8%	21.6%	-35.8%	-39.8%	-23.2%	-22.0%	25.5%	20.0%	-6.3%	-12.3%	-14.7%	-3.6%	-1.9%
Tesla	80.7%	153.4%	67.6%	77.2%	75.6%	47.6%	54.8%	22.4%	765.7%	71.6%	87.4%	46.4%	46.4%
TOYOTA	24.0%	43.3%	-4.8%	-14.4%	-11.3%	-14.4%	1.3%	5.6%	2.2%	-6.2%	8.8%	-5.2%	3.1%
NISSAN	20.0%	22.2%	-16.4%	-22.8%	-23.8%	-26.6%	-8.9%	-13.6%	-8.1%	-20.9%	-1.5%	-18.9%	-9.8%
HONDA	27.8%	29.9%	-18.1%	-19.0%	-12.8%	-30.9%	-9.6%	-17.1%	1.2%	-10.2%	1.3%	-18.1%	-22.1%
SUZUKI	37.4%	182.6%	3.9%	4.2%	-7.0%	18.1%	31.1%	11.1%	-13.4%	-15.0%	32.5%	11.5%	10.7%
Hyundai	25.5%	45.8%	2.2%	-10.7%	-12.6%	-13.5%	-1.9%	5.3%	-1.4%	-16.4%	12.9%	-6.1%	-0.3%
KIA	23.4%	50.2%	4.9%	-1.7%	-1.1%	-10.5%	-0.5%	5.7%	-2.0%	-7.9%	17.4%	-2.1%	5.1%
Chang'An	124.9%	21.2%	-6.8%	-15.7%	-6.7%	-11.9%	31.8%	52.2%	-6.9%	22.4%	18.5%	14.1%	2.7%
BYD	67.7%	43.3%	90.4%	82.6%	182.8%	157.0%	155.4%	129.2%	-4.9%	-8.5%	73.5%	149.4%	71.8%
BAIC	-11.4%	-29.4%	-19.9%	4.4%	14.3%	-11.8%	8.9%	18.7%	-17.1%	-54.7%	-14.1%	9.1%	32.9%
SAIC	45.6%	1.8%	-4.9%	-0.7%	14.3%	-36.6%	-21.5%	-39.9%	-12.9%	-18.7%	6.5%	-22.4%	-51.8%
Geely	42.1%	-6.4%	-19.3%	-16.9%	-10.0%	-20.5%	9.0%	8.7%	-7.9%	-8.2%	-4.5%	-3.1%	-5.0%
Market Share	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	FY 2019	FY 2020	FY 2021	FY 2022	YTD 2023
BMW	3.1%	3.4%	3.2%	3.0%	3.2%	3.2%	3.1%	3.3%	3.0%	3.1%	3.2%	3.2%	3.1%
Daimler	2.8%	2.8%	2.3%	2.7%	2.8%	2.9%	2.8%	2.8%	3.0%	3.0%	2.7%	2.8%	2.7%
Stellantis	8.3%	8.8%	7.9%	7.7%	7.6%	8.7%	7.1%	7.1%	9.3%	8.4%	8.2%	7.6%	7.6%
RNO	3.0%	3.5%	3.2%	3.4%	2.9%	3.0%	2.6%	2.9%	3.8%	3.5%	3.3%	2.8%	3.2%
Total VW	13.1%	13.4%	12.0%	11.2%	11.3%	12.1%	12.1%	11.7%	13.6%	13.6%	12.4%	11.8%	11.4%
Ford	5.1%	4.6%	4.6%	4.9%	4.4%	5.0%	4.5%	4.6%	5.7%	5.5%	4.8%	4.7%	4.7%
GM	6.8%	6.9%	5.5%	5.5%	5.7%	6.2%	6.3%	6.3%	7.3%	7.5%	6.2%	6.1%	5.8%
Tesla	1.1%	1.1%	1.4%	1.9%	2.1%	1.9%	2.0%	2.2%	0.4%	0.7%	1.4%	2.0%	2.3%
TOYOTA	11.1%	11.2%	11.5%	10.5%	10.9%	11.2%	10.7%	10.5%	9.5%	10.5%	11.1%	10.8%	11.0%
NISSAN	5.5%	4.8%	4.8%	4.5%	4.6%	4.1%	4.0%	3.7%	5.5%	5.2%	4.9%	4.1%	4.2%
HONDA	6.3%	6.9%	6.4%	6.4%	6.1%	5.5%	5.3%	5.0%	6.3%	6.6%	6.5%	5.5%	4.9%
SUZUKI	4.3%	3.1%	3.6%	3.7%	4.4%	4.2%	4.3%	3.9%	2.9%	2.8%	3.7%	4.2%	5.0%
Hyundai	5.4%	5.8%	6.1%	5.3%	5.2%	5.9%	5.5%	5.3%	5.3%	5.2%	5.7%	5.5%	5.5%
KIA	3.6%	4.2%	4.3%	3.6%	3.9%	4.4%	3.9%	3.6%	3.2%	3.5%	3.9%	4.0%	4.2%
Chang'An	2.2%	1.7%	1.8%	1.8%	2.3%	1.7%	2.2%	2.5%	1.1%	1.6%	1.9%	2.2%	2.4%
BYD	0.6%	0.9%	1.5%	1.9%	2.0%	2.6%	3.5%	4.2%	0.7%	0.7%	1.2%	3.1%	3.6%
SAIC	1.3%	1.3%	1.5%	1.8%	1.6%	0.9%	1.1%	1.0%	1.5%	1.4%	1.5%	1.2%	0.9%
Geely	2.5%	2.2%	2.4%	2.8%	2.5%	2.0%	2.4%	2.8%	2.4%	2.6%	2.5%	2.4%	2.5%

Source: BofA Global Research, ACEA, Autodata, CPCA, Anfavea, IHS, local car authorities. Note: Market share is calculated as total sales of each OEM in tracked regions divide by total sales of all the tracked regions. These include EU, US, China, Korea, Japan, Russia, India, Turkiye, Singapore

Global auto sales by country

Exhibit 8: Monthly Sales by Country (PV)

Weak Jan-23 sales (-11.8% YoY) was followed by strong Feb-23 print (+9.4%) with positive m/m growth across regions (ex-Russia); volumes remain well below Dec-22.

Sales	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23
Europe	804,570	1,127,077	830,447	948,149	1,066,137	874,947	748,961	1,049,926	910,753	1,014,630	1,091,119	911,064	902,775
Germany	200,512	241,330	180,264	207,199	224,558	205,911	199,183	224,816	208,642	260,512	314,318	179,247	206,210
Italy	110,869	119,497	97,339	121,299	127,209	109,580	71,190	110,976	115,827	119,853	104,915	128,301	130,365
France	115,386	147,079	108,723	126,813	171,089	107,547	91,406	141,142	124,982	133,961	158,027	111,940	126,237
Spain	62,103	59,920	69,111	84,977	89,252	73,378	51,907	67,240	65,966	73,221	73,927	64,147	74,001
UK	58,994	243,479	119,167	124,394	140,958	112,162	68,858	225,269	134,344	142,889	128,462	131,994	74,441
USA	1,058,866	1,265,454	1,255,913	1,115,723	1,147,312	1,147,748	1,151,239	1,123,939	1,185,280	1,138,169	1,286,589	1,065,938	1,160,895
Korea	103,274	111,124	119,628	119,807	121,153	122,134	105,091	113,656	120,026	127,157	131,526	100,448	125,151
Japan	354,668	512,862	299,620	261,433	327,896	349,335	290,042	395,163	359,159	377,079	344,365	382,338	426,726
Brazil	97,606	108,272	109,707	139,483	133,781	135,431	154,753	143,166	136,892	158,720	164,191	103,894	95,867
Russia	114,349	55,129	32,706	24,268	27,761	32,412	41,698	46,698	45,228	46,403	64,072	32,499	41,851
India	354,378	383,237	339,759	351,332	377,698	395,574	383,294	409,866	384,196	376,615	343,645	401,933	381,554
China	1,272,333	1,623,802	1,061,955	1,374,087	1,964,578	1,848,697	1,891,965	1,953,589	1,870,613	1,675,925	2,202,759	1,304,489	1,415,756
Total	4,160,044	5,186,957	4,049,735	4,334,282	5,166,316	4,906,278	4,767,043	5,236,003	5,012,147	4,914,698	5,628,266	4,302,603	4,550,575
YoY (%)	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23
Europe	-5.4%	-18.8%	-20.2%	-12.5%	-16.8%	-10.6%	3.3%	7.9%	14.0%	17.4%	14.8%	10.8%	12.2%
Germany	3.2%	-17.5%	-21.5%	-10.2%	-18.1%	-12.9%	3.0%	14.1%	16.8%	31.4%	38.1%	-2.6%	2.8%
Italy	-22.5%	-29.6%	-32.9%	-15.0%	-14.9%	-0.6%	10.0%	5.5%	14.7%	14.7%	21.0%	19.0%	17.6%
France	-13.0%	-19.5%	-22.6%	-10.1%	-14.2%	-7.1%	3.8%	5.5%	5.5%	9.8%	-0.1%	8.8%	9.4%
Spain	6.6%	-30.2%	-12.1%	-10.9%	-7.8%	-12.5%	9.1%	12.7%	11.7%	10.3%	-14.1%	51.4%	19.2%
UK	15.0%	-14.3%	-15.8%	-20.6%	-24.3%	-9.0%	1.2%	4.6%	26.4%	23.5%	18.3%	14.7%	26.2%
USA	-11.2%	-21.3%	-18.0%	-29.9%	-11.5%	-11.2%	5.1%	11.6%	11.5%	11.2%	5.4%	6.3%	9.6%
Korea	1.9%	-21.2%	-11.8%	-3.5%	-10.1%	-1.1%	-1.1%	23.8%	12.8%	3.3%	1.6%	7.0%	21.2%
Japan	-18.0%	-16.3%	-14.4%	-18.1%	-10.3%	-7.4%	-9.3%	24.1%	28.6%	7.0%	2.4%	16.0%	20.3%
Brazil	-23.8%	-23.7%	-13.9%	-2.3%	0.3%	9.6%	29.1%	31.2%	14.7%	25.9%	5.1%	12.6%	-1.8%
Russia	-4.8%	-62.9%	-78.5%	-83.5%	-82.4%	-75.6%	-63.5%	-60.9%	-64.2%	-63.0%	-52.0%	-64.5%	-63.4%
India	3.0%	6.2%	3.3%	160.0%	22.3%	14.0%	23.0%	71.1%	28.0%	29.9%	11.0%	19.9%	7.7%
China	6.4%	-9.2%	-35.5%	-17.4%	22.1%	20.2%	26.9%	21.7%	7.0%	-9.7%	2.6%	-38.1%	11.3%
YoY (%)	-4.7%	-16.2%	-23.8%	-16.8%	-2.3%	-0.1%	11.3%	17.3%	10.4%	3.2%	4.6%	-11.8%	9.4%
YTD (%)	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23
Europe	-3.9%	-10.6%	-13.0%	-12.9%	-13.7%	-13.3%	-11.8%	-9.7%	-7.8%	-5.8%	-4.1%	10.8%	11.5%
Germany	5.6%	-4.6%	-9.0%	-9.3%	-11.0%	-11.3%	-9.8%	-7.4%	-5.5%	-2.4%	1.1%	-2.6%	0.2%
Italy	-21.1%	-24.3%	-26.4%	-24.2%	-22.6%	-20.2%	-18.3%	-16.2%	-13.7%	-11.5%	-9.6%	19.0%	18.3%
France	-15.7%	-17.3%	-18.6%	-16.9%	-16.3%	-15.3%	-13.8%	-11.8%	-10.3%	-8.7%	-7.8%	8.8%	9.1%
Spain	4.2%	-11.6%	-11.8%	-11.5%	-10.7%	-11.0%	-9.4%	-7.4%	-5.8%	-4.4%	-5.4%	51.4%	32.2%
UK	23.0%	-1.9%	-5.4%	-8.7%	-11.9%	-11.5%	-10.7%	-8.2%	-5.6%	-3.4%	-2.0%	14.7%	18.6%
USA	-10.3%	-14.8%	-15.7%	-18.9%	-17.8%	-16.9%	-14.6%	-12.4%	-10.4%	-8.8%	-7.6%	6.3%	8.0%
Korea	-9.4%	-14.0%	-13.4%	-11.4%	-11.2%	-9.8%	-8.8%	-6.0%	-4.3%	-3.6%	-3.1%	7.0%	14.4%
Japan	-16.2%	-16.3%	-15.9%	-16.2%	-15.4%	-14.3%	-13.8%	-10.3%	-7.4%	-6.2%	-5.6%	16.0%	18.2%
Brazil	-26.7%	-25.6%	-22.8%	-18.4%	-15.3%	-12.0%	-7.3%	-3.7%	-1.9%	0.6%	1.0%	12.6%	5.2%
Russia	-4.3%	-28.3%	-43.0%	-52.0%	-57.9%	-60.3%	-60.7%	-60.7%	-61.0%	-61.2%	-60.4%	-64.5%	-63.9%
India	0.7%	2.6%	2.8%	16.8%	17.8%	17.2%	17.9%	22.6%	23.1%	23.7%	22.6%	19.9%	13.6%
China	0.2%	-3.0%	-10.9%	-12.2%	-6.7%	-3.1%	0.3%	2.6%	3.1%	1.8%	1.9%	-38.1%	-19.5%
YTD (%)	-5.5%	-9.7%	-13.2%	-13.9%	-12.0%	-10.4%	-8.1%	-5.6%	-4.1%	-3.5%	-2.8%	-11.8%	-2.0%

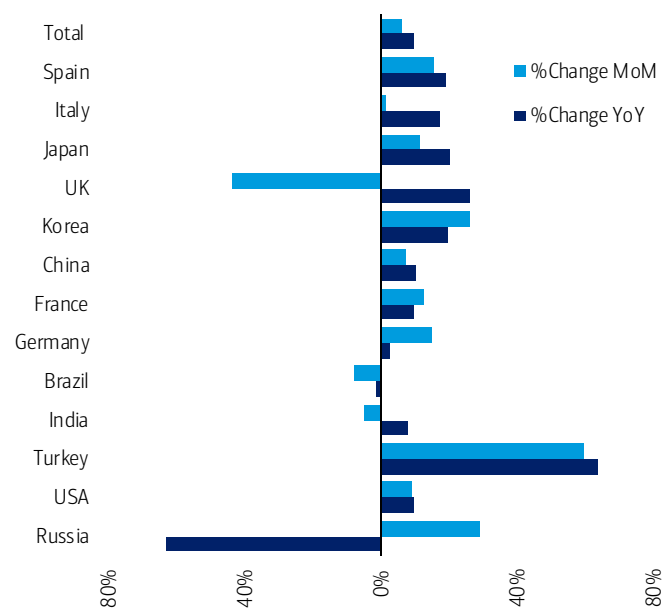
Source: BofA Global Research, ACEA, Autodata, CPCA, Anfavea, IHS, local car authorities

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Global sales summary by country

Exhibit 9: Sales % Change YoY & MoM in Feb-23

Most regions reported positive YoY growth, except for Brazil and Russia

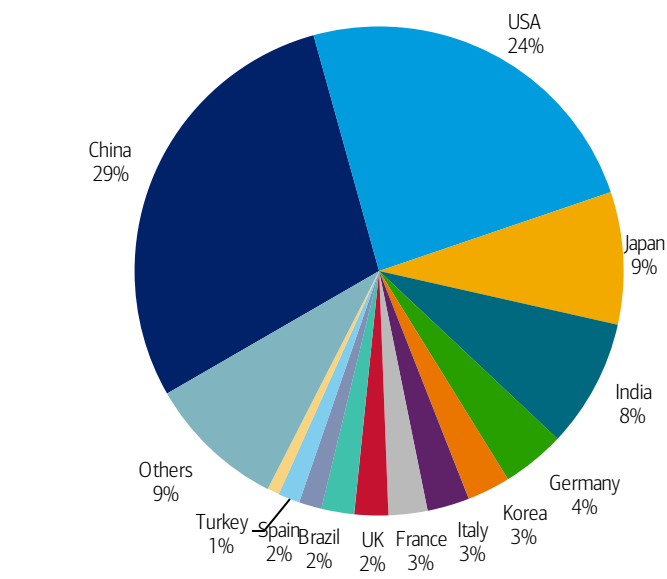


Source: BofA Global Research

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Exhibit 10: 2023 YTD sales volume split

US and China accounts for c53% of volumes in 2023 – China share down from 38% in FY22 to 29% in 2023 YTD



Source: BofA Global Research

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Exhibit 11: Global markets monthly sales (in units)

Most countries posted MoM growth in Feb-23 after a weak Jan-23; unlike peers, the UK had a very strong Jan-23

Country	Feb-23	Feb-22	Jan-23	% YoY	% MoM
Russia	41,851	114,349	32,499	-63.4%	28.8%
USA	1,160,895	1,058,866	1,065,938	9.6%	8.9%
Türkiye	81,148	49,652	50,894	63.4%	59.4%
India	381,554	354,378	401,933	7.7%	-5.1%
Brazil	95,867	97,606	103,894	-1.8%	-7.7%
Germany	206,210	200,512	179,247	2.8%	15.0%
France	126,236	115,383	111,939	9.4%	12.8%
China	1,388,818	1,257,634	1,293,138	10.4%	7.4%
Korea	146,773	122,728	116,670	19.6%	25.8%
UK	74,441	58,994	131,994	26.2%	-43.6%
Japan	426,726	354,668	382,338	20.3%	11.6%
Italy	130,287	110,869	128,437	17.5%	1.4%
Spain	74,001	62,103	64,147	19.2%	15.4%
Total	4,760,072	4,341,470	4,483,025	9.6%	6.2%

Source: BofA Global Research

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Exhibit 12: Global markets YTD sales (in units)

YTD 23 global sales dragged by weak China sales

Country	Feb-23	Feb-22	% YoY	Feb-21	% YoY
Russia	74,350	206,011	-63.9%	215,294	-4.3%
USA	2,226,833	2,061,799	8.0%	2,299,000	-10.3%
Türkiye	132,042	87,783	50.4%	102,232	-14.1%
Brazil	199,761	189,844	5.2%	258,915	-26.7%
Germany	385,457	384,624	0.2%	339,508	13.3%
France	238,175	218,282	9.1%	252,760	-13.6%
China	2,681,956	3,336,071	-19.6%	3,340,089	-0.1%
India	783,487	689,633	13.6%	684,915	0.7%
Korea	263,443	238,949	10.3%	262,237	-8.9%
UK	206,435	174,081	18.6%	180,498	-3.6%
Japan	809,064	684,367	18.2%	816,740	-16.2%
Italy	258,724	218,683	18.3%	268,396	-18.5%
Spain	138,148	104,480	32.2%	83,922	24.5%
Total	9,243,097	9,373,388	-1.4%	9,949,100	-5.8%

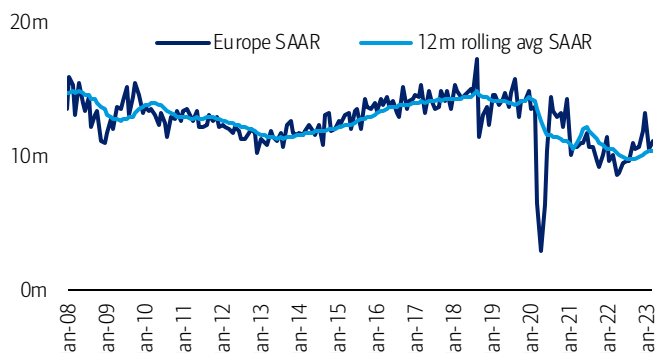
Source: BofA Global Research

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Regional Auto SAARs

Exhibit 13: Europe SAAR trend

EU SAAR up 6% MoM and 11% YoY in Feb-23

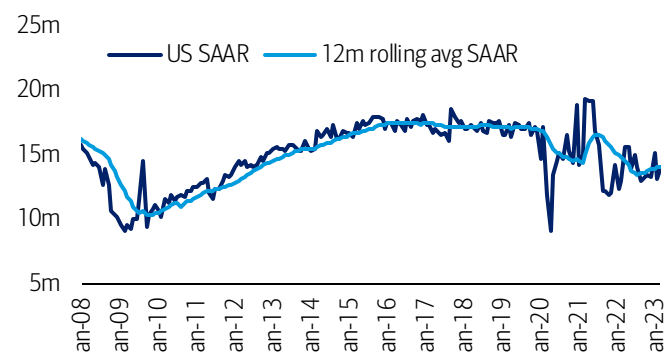


Source: BofA Global Research *Passenger car only

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Exhibit 14: US SAAR trend

US SAAR spiked 8% on MoM 7% YoY in Feb-23

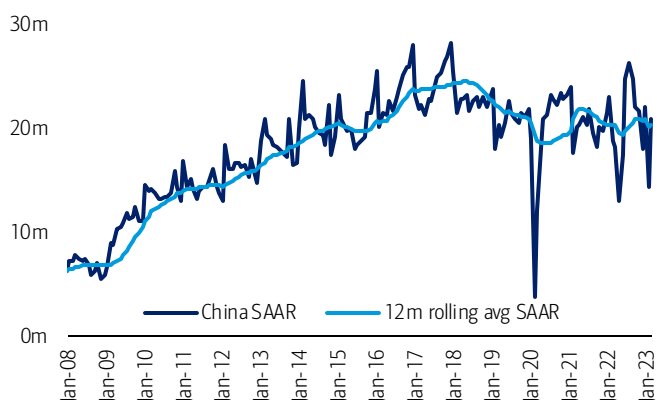


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Exhibit 15: China SAAR trend

China SAAR soars MoM by 46% in Feb-23 and up 11% YoY

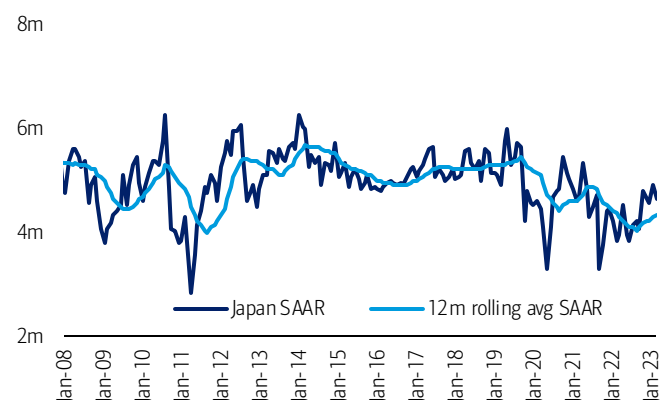


Source: BofA Global Research

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Exhibit 16: Japan SAAR trend

Japan SAAR down -6% MoM while up 21% YoY in Feb-23

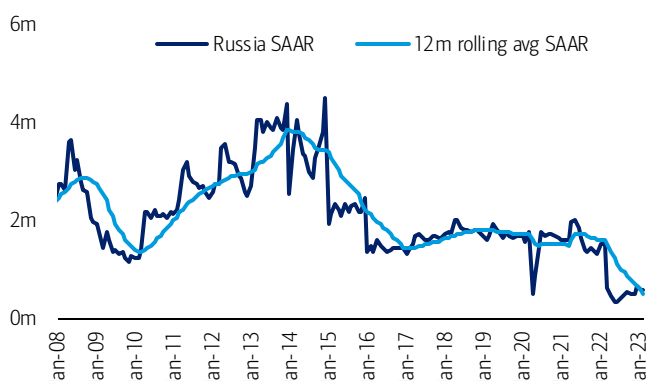


Source: BofA Global Research

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Exhibit 17: Russia SAAR trend

Russia SAAR jumps 2% MoM but remains 63% below Feb-22 sales

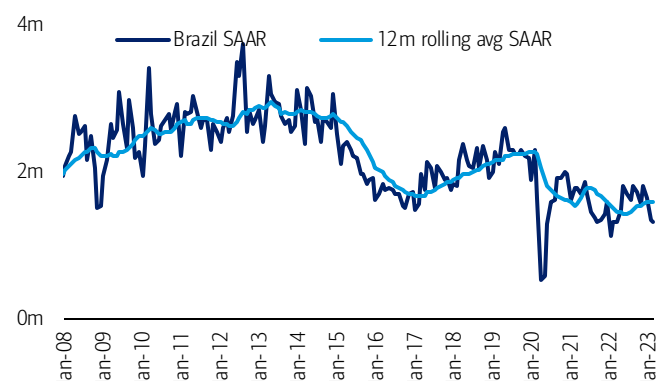


Source: BofA Global Research

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Exhibit 18: Brazil SAAR trend

Brazil SAAR weakens MoM by 2% in Feb-23 and flat YoY



Source: BofA Global Research

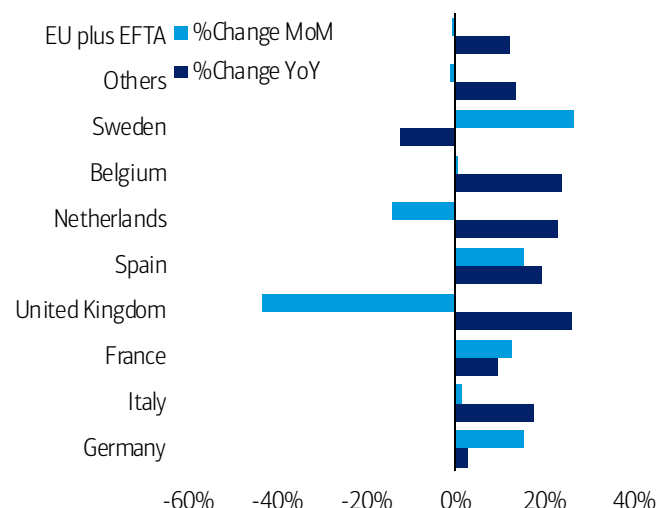
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Sales: Major geographies

Europe by Country: New passenger car registrations

Exhibit 19: Europe monthly sales % Change YoY & MoM in Feb-23

Sales up YoY in all countries except in Sweden

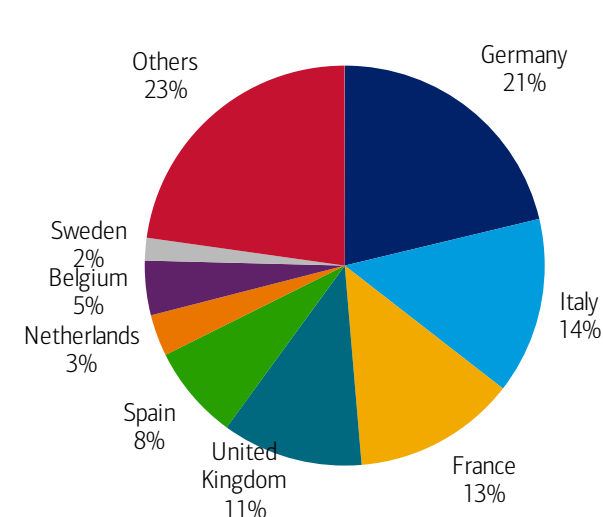


Source: www.acea.be, BofA Global Research.

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Exhibit 20: YTD sales volume split

Top 5 countries account for c77% of European sales



Source: BofA Global Research, ACEA, LMC

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Exhibit 21: European countries monthly new passenger car registration (in units)

European countries show strength overall YoY in Feb-23

Country	Feb-23	Feb-22	Jan-23	% YoY	% MoM
Germany	206,210	200,512	179,247	2.8%	15.0%
Italy	130,287	110,869	128,437	17.5%	1.4%
France	126,236	115,383	111,939	9.4%	12.8%
United Kingdom	74,441	58,994	131,994	26.2%	-43.6%
Spain	74,001	62,103	64,147	19.2%	15.4%
Netherlands	28,128	22,860	32,845	23.0%	-14.4%
Belgium	39,883	32,201	39,847	23.9%	0.1%
Sweden	18,442	21,136	14,601	-12.7%	26.3%
Others	205,147	180,512	208,007	13.6%	-1.4%
EU plus EFTA	902,775	804,570	911,064	12.2%	-0.9%

Source: BofA Global Research, www.acea.be.

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Exhibit 22: European countries YTD new passenger car registration (in units)

EU performance is also improving YTD, except for Sweden and Germany

Country	Feb-23	Feb-22	% YoY	Feb-21	% YoY
Germany	385,457	384,624	0.2%	339,508	13.3%
Italy	258,724	218,683	18.3%	268,396	-18.5%
France	238,175	218,282	9.1%	252,760	-13.6%
United Kingdom	206,435	174,081	18.6%	180,498	-3.6%
Spain	138,148	104,480	32.2%	83,922	24.5%
Netherlands	60,973	53,844	13.2%	69,858	-22.9%
Belgium	79,730	66,148	20.5%	75,470	-12.4%
Sweden	33,043	41,029	-19.5%	41,146	-0.3%
Others	413,154	365,822	12.9%	373,782	-2.1%
EU plus EFTA	1,813,839	1,626,993	11.5%	1,685,340	-3.5%

Source: BofA Global Research, www.acea.be.

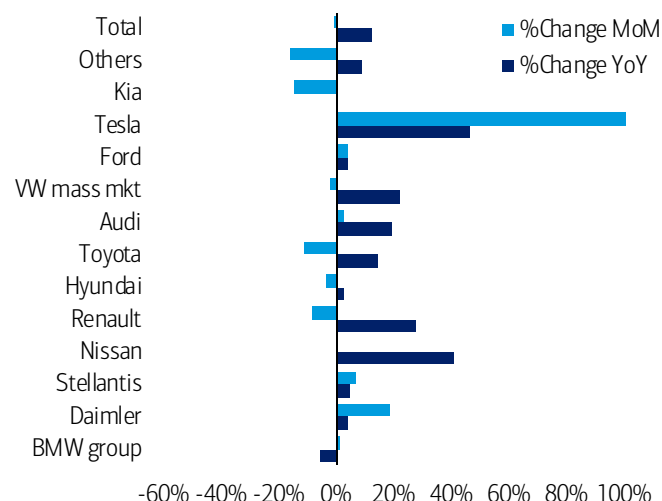
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Europe

Passenger car registrations by company

Exhibit 23: Monthly sales % change YoY & MoM – Dec-22

Most OEMs witnessed YoY increase in sales in Europe, except BMW

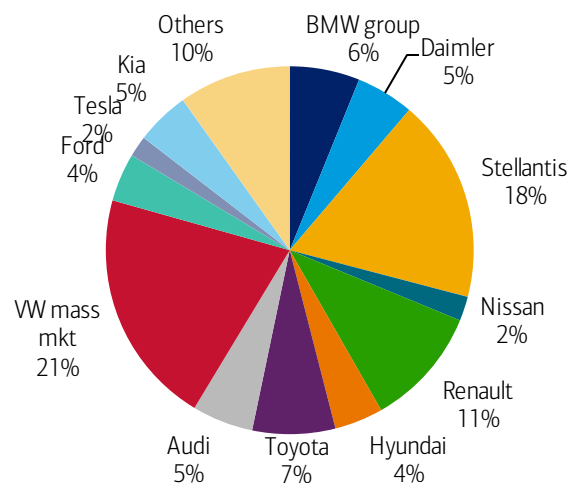


Source: BofA Global Research, ACEA

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Exhibit 24: YTD sales volume split

Stellantis, VW Group, & RNO accounts for >50% of sales in Europe



Source: BofA Global Research, ACEA

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Exhibit 25: Europe OEM monthly passenger car registrations

Nissan and Tesla post biggest YoY growth in Feb-23

OEM	Feb-23	Feb-22	Jan-23	% YoY	% MoM
BMW group	56,092	59,334	55,447	-5.5%	1.2%
Daimler	50,017	47,998	42,258	4.2%	18.4%
Stellantis	167,097	159,728	156,553	4.6%	6.7%
Nissan	19,377	13,776	19,343	40.7%	0.2%
Renault	91,242	71,262	99,579	28.0%	-8.4%
Hyundai	37,951	37,032	39,350	2.5%	-3.6%
Toyota	62,067	54,060	69,978	14.8%	-11.3%
Audi	49,456	41,467	48,241	19.3%	2.5%
VW mass mkt	185,948	152,092	189,759	22.3%	-2.0%
Ford	39,209	37,747	37,609	3.9%	4.3%
Tesla	23,449	15,985	9,854	46.7%	138.0%
Kia	39,424	39,149	46,094	0.7%	-14.5%
Others	81,446	74,940	96,999	8.7%	-16.0%
Total	902,775	804,570	911,064	12.2%	-0.9%

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 26: Europe OEM YTD passenger car registrations (in units)

Tesla sales growth still stand out on YTD basis, Nissan and RNO are also performing well

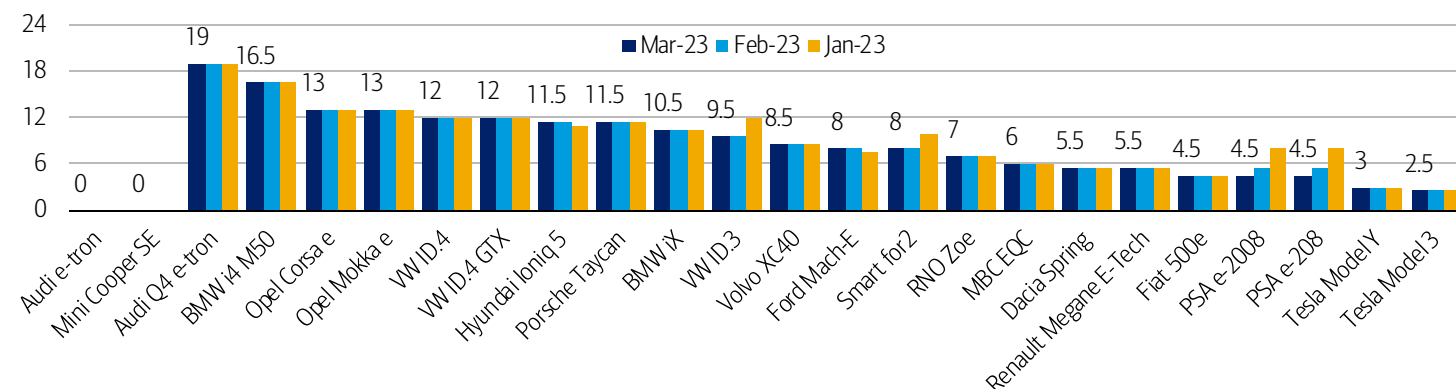
OEM	Feb-23	Feb-22	% YoY	Feb-21	% YoY
BMW group	111,539	121,268	-8.0%	122,781	-1.2%
Daimler	92,275	95,278	-3.2%	100,456	-5.2%
Stellantis	323,650	316,401	2.3%	377,814	-16.3%
Nissan	38,720	29,655	30.6%	37,832	-21.6%
Renault	190,821	148,657	28.4%	151,010	-1.6%
Hyundai	77,301	74,684	3.5%	57,935	28.9%
Toyota	132,045	121,734	8.5%	110,498	10.2%
Audi	97,697	85,105	14.8%	83,173	2.3%
VW mass mkt	375,707	314,472	19.5%	349,666	-10.1%
Ford	76,818	75,927	1.2%	88,854	-14.5%
Tesla	33,303	16,847	97.7%	7,315	130.3%
Kia	85,518	86,286	-0.9%	65,344	32.0%
Others	178,445	140,679	26.8%	140,162	0.4%
Total	1,813,839	1,626,993	11.5%	1,692,840	-3.9%

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 27: Germany: Waiting periods for new EV (months)

Waiting periods for new EVs are slowly coming down; mainly driven by improving supply of the PSA e-2008 and e-208

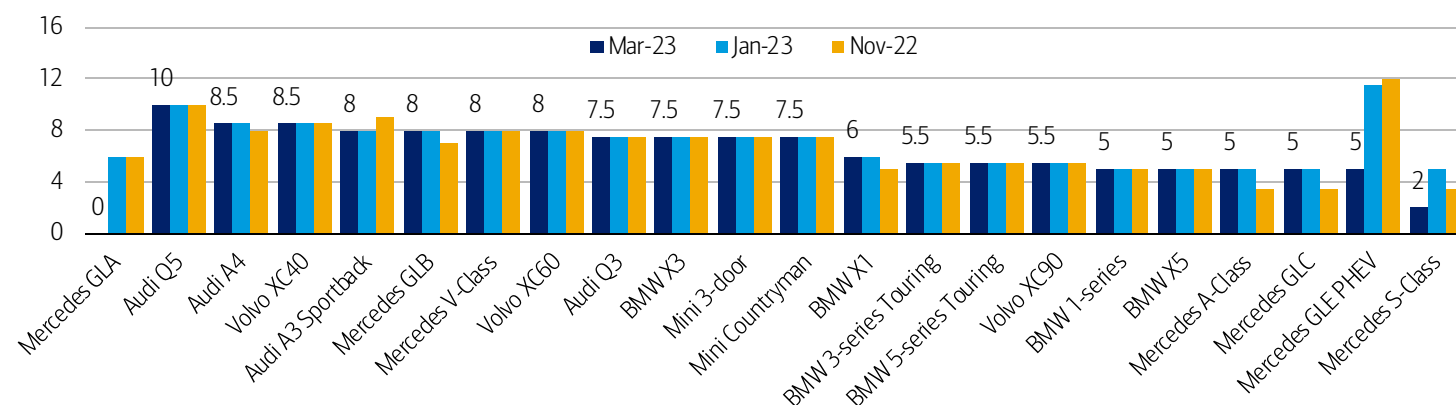


Source: BofA Global Research, carwow.de, *0 = Not available

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Exhibit 28: Germany: How many months you need to wait until you get your ICE premium car ...

Waiting times are down in Mar-23 for premium cars as availability of the Mercedes GLE (PHEV) and S-Class improves substantially; while the GLA is not available anymore at some German dealerships

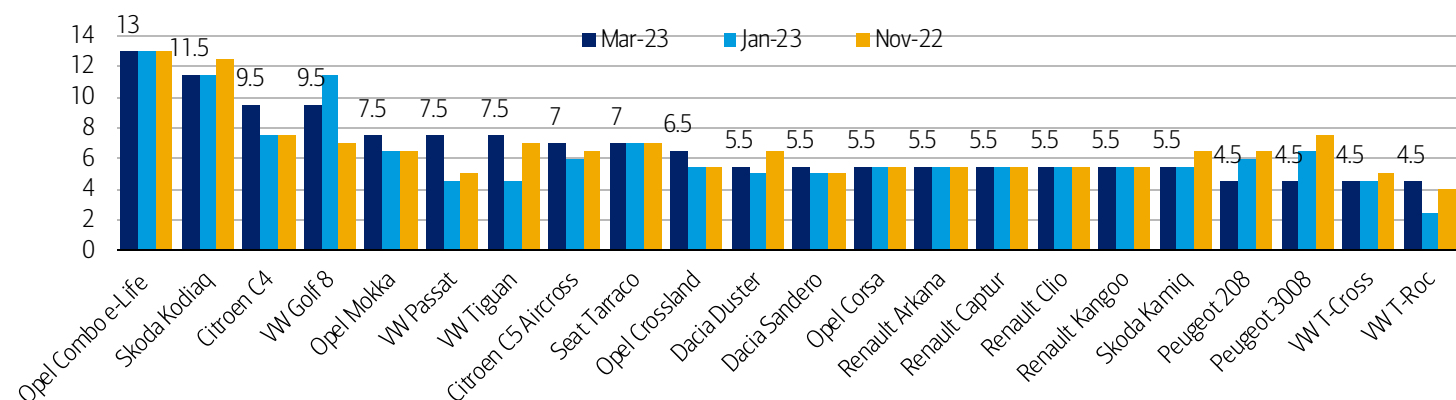


Source: BofA Global Research, carwow.de, *0 = Not available

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Exhibit 29: Germany: How many months you need to wait until you get your ICE mass market car ...

Waiting times are volatile but generally trending up for mass market cars since Nov-22. Notable increases include the Citroen C4, Opel Mokka, VW Passat/Tiguan and Dacia Sandero. Waiting times are improving for Peugeot cars.



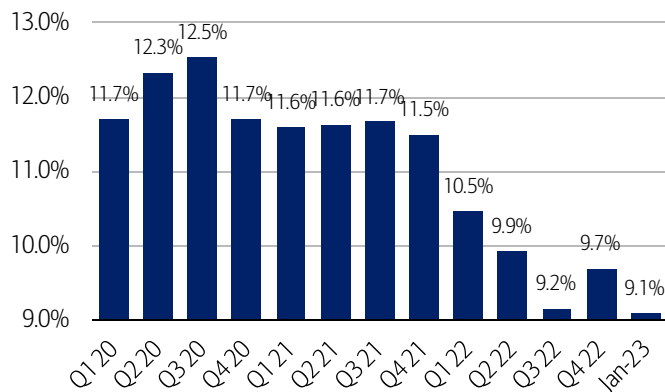
Source: BofA Global Research, carwow.de, *0 = Not available

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Germany – car pricing at a glance

Exhibit 30: Average price rebate on list price – Germany

Price rebates jumped reached all-time lows in Jan-23!

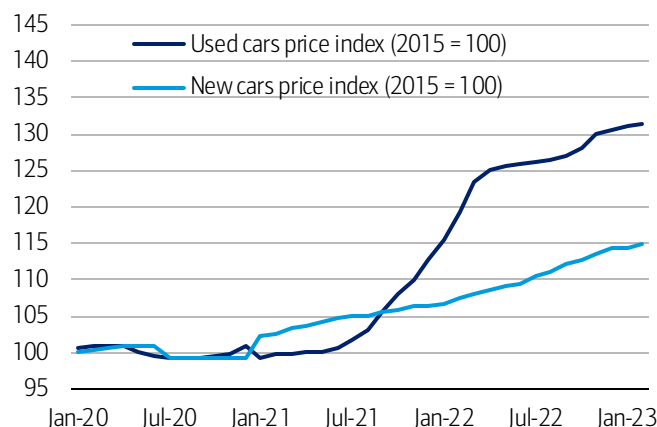


Source: BofA Global Research, Autohaus Pulsschlag

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Exhibit 31: New vs used car prices

Used and new car prices continue to increase in Germany

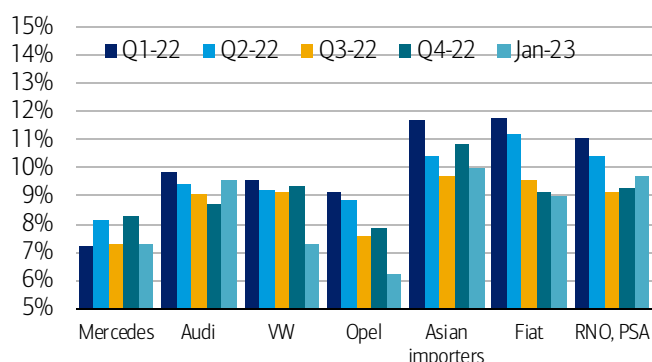


Source: Destatis

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Exhibit 32: Incentives for car sales in Germany

Incentives continue to decline in Jan-23 for MBC, VW, Opel and Fiat

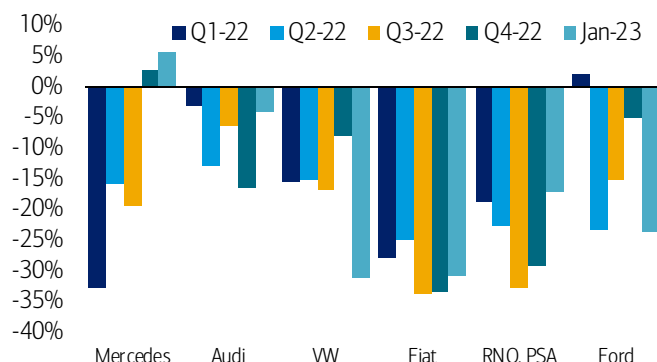


Source: BofA Global Research, Autohaus Pulsschlag. Note: Q4 22 includes Oct-22 and Nov-22

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Exhibit 33: Change in incentives

Drop in incentives continue in January 23 across OEMs

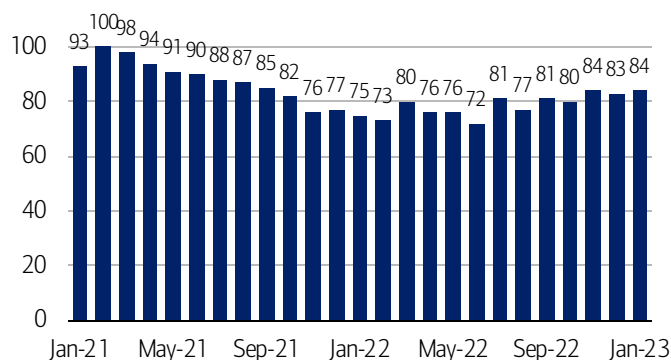


Source: BofA Global Research, Autohaus Pulsschlag. Note: Q4 22 includes Oct-22 and Nov-22.

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Exhibit 34: How many days used cars remain on dealer lots?

Number of days has increased since Jun-22 lows, but remains low vs historical

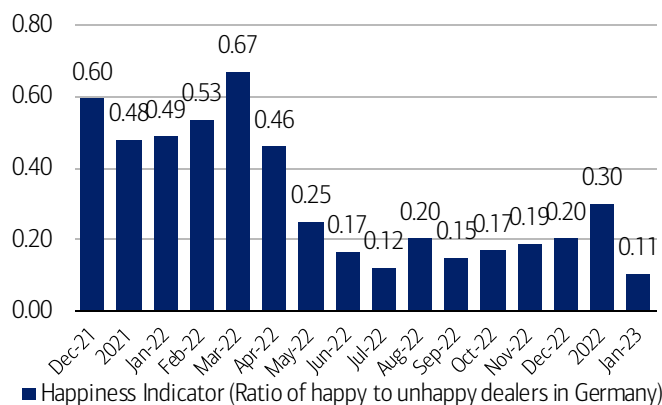


Source: Autohaus Pulsschlag. Sample size : 1,000 BofA Global Research Note: Q4 22 includes Oct-22 and Nov-22

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Exhibit 35: Dealers happiness indicator in Germany (Monthly)

Dealers happiness remains depressed – new all-time low reached...



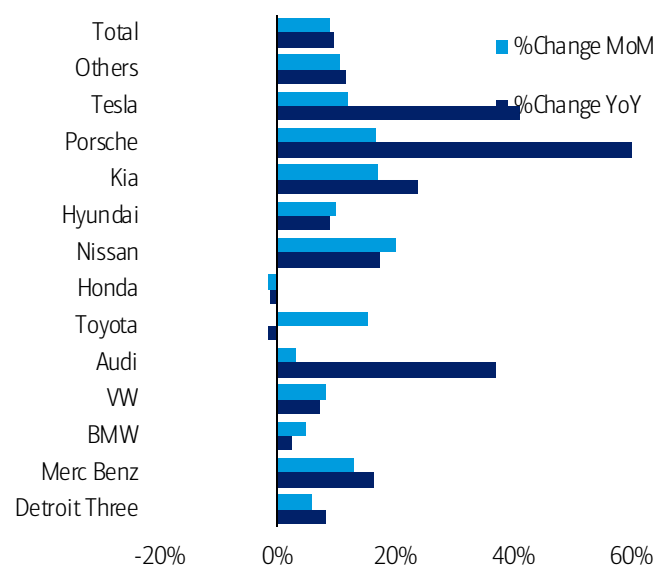
Source: Autohaus Pulsschlag. Sample size: 1,000. BofA Global Research

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US

Exhibit 36: US monthly sales % Change YoY & MoM in Feb-23

Sales up YoY for most OEMs in the US except for Honda and Toyota

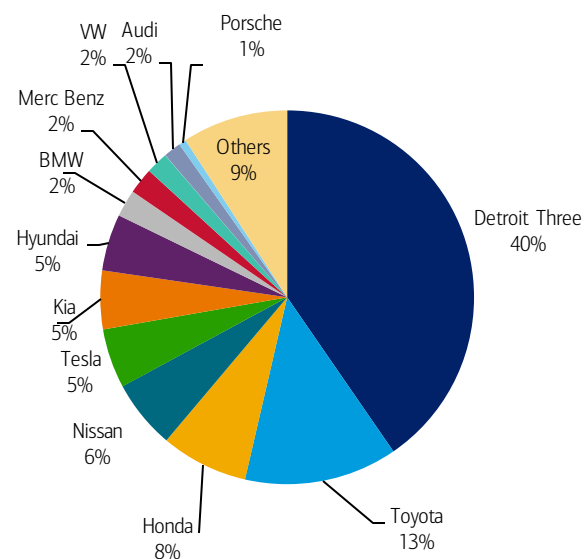


Source: AutoWards

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Exhibit 37: YTD sales volume split

Detroit 3 and Toyota accounts for >50% of US volumes



Source: AutoWards

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Exhibit 38: US monthly registrations by OEM in Feb-23

MoM growth is positive across all OEMs in the US, except for Toyota; Porsche is expanding rapidly in the US

OEM	Feb-23	Feb-22	Jan-23	% YoY	% MoM
Detroit Three	462,259	427,119	437,328	8.2%	5.7%
Merc Benz	26,624	22,927	23,560	16.1%	13.0%
BMW	26,691	26,074	25,459	2.4%	4.8%
VW	22,106	20,655	20,465	7.0%	8.0%
Audi	17,068	12,472	16,538	36.9%	3.2%
Toyota	157,697	160,645	136,759	-1.8%	15.3%
Honda	83,247	84,394	84,514	-1.4%	-1.5%
Nissan	72,393	61,674	60,251	17.4%	20.2%
Hyundai	57,044	52,424	52,001	8.8%	9.7%
Kia	60,859	49,182	51,983	23.7%	17.1%
Porsche	7,686	2,854	6,585	169.3%	16.7%
Tesla	60,325	42,742	53,875	41.1%	12.0%
Others	106,896	95,704	96,620	11.7%	10.6%
Total	1,160,895	1,058,866	1,065,938	9.6%	8.9%

Source: AutoWards

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Exhibit 39: US OEM YTD registrations (in units)

Audi and Porsche are performing well in the US, while VW is stagnating

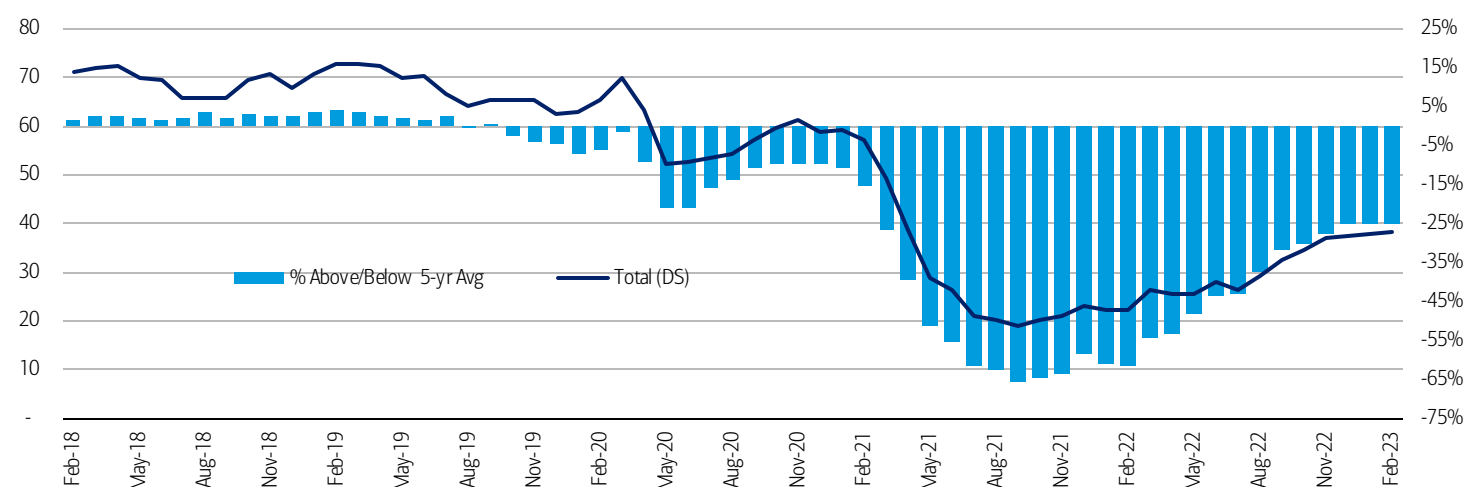
OEM	Feb-23	Feb-22	% YoY	Feb-21	% YoY
Detroit Three	899,587	838,034	7.3%	985,531	-15.0%
Merc Benz	50,184	45,854	9.4%	45,585	0.6%
BMW	52,150	50,029	4.2%	45,957	8.9%
VW	42,571	42,747	-0.4%	49,934	-14.4%
Audi	33,606	23,899	40.6%	32,236	-25.9%
Toyota	294,456	319,321	-7.8%	352,185	-9.3%
Honda	167,761	158,343	5.9%	198,553	-20.3%
Nissan	132,644	121,416	9.2%	178,363	-31.9%
Hyundai	109,045	100,296	8.7%	91,727	9.3%
Kia	112,842	91,670	23.1%	93,027	-1.5%
Porsche	14,271	6,931	105.9%	8,924	-22.3%
Tesla	114,200	82,907	37.7%	46,250	79.3%
Others	203,516	180,352	12.8%	170,728	5.6%
Total	2,226,833	2,061,799	8.0%	2,299,000	-10.3%

Source: AutoWards

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Exhibit 40: US inventory – total (DS)

February days' supply of 38DS came in ~25% below the 5-year average



Source: WardsAuto InfoBank

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Exhibit 41: February 2023 inventory summary

February inventory was at 1.74mm units, with days' supply of 38, roughly 25% below the 5-year average of 51

	Inventory	Days	5-yr	% Above	
	Units	Supply	Avg DS	/Below	Note
Detroit 3 -- Cars	58,523	42	49	-16%	Detroit 3 OEM's total inventory roughly flat MoM but increased 437k units YoY. Aggregate supply remains less constrained than the industry average, across both cars and light trucks.
Detroit 3 -- Lt Trucks	998,049	59	64	-8%	
Detroit 3 -- Total	1,056,572	57	62	-7%	
Japanese -- Cars	94,375	21	45	-53%	Supply at Japanese OEMs increased 14k units MoM and 134k units YoY. Aggregate supply remains more constrained than the industry average with cars somewhat tighter than light trucks.
Japanese -- Lt Trucks	286,877	26	43	-39%	
Japanese -- Total	381,252	25	44	-44%	
European -- Cars	38,927	33	51	-35%	European OEM's inventory decreased 5k units MoM but increased 38k units YoY. Supply of European light truck remains as tight as the industry average, but cars availability is well above.
European -- Lt Trucks	122,007	40	49	-18%	
European -- Total	160,934	38	50	-24%	
Korean -- Cars	31,042	19	43	-55%	Inventory at Korean OEMs increased 16k units MoM and increased 51k units YoY. Both car and truck inventories remain well below the 5-year average.
Korean -- Lt Trucks	71,589	22	41	-47%	
Korean -- Total	102,631	21	42	-50%	
Industry -- Cars	228,737	24	45	-45%	Total inventory increased 29k units MoM and 671k units YoY. Car supply remains tighter than light truck, as OEMs continue to prioritize production and inventory build of high ASP/margin vehicles.
Industry -- Lt Trucks	1,508,502	42	53	-21%	
Industry -- Total	1,737,239	38	51	-25%	

Source: WardsAuto InfoBank, BofA Global Research

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Exhibit 42: Most recent month US incentive and ATP trends – major automakers

Industry average incentive was down 8.1% YoY in February, while the average transaction price was up 5.2% YoY

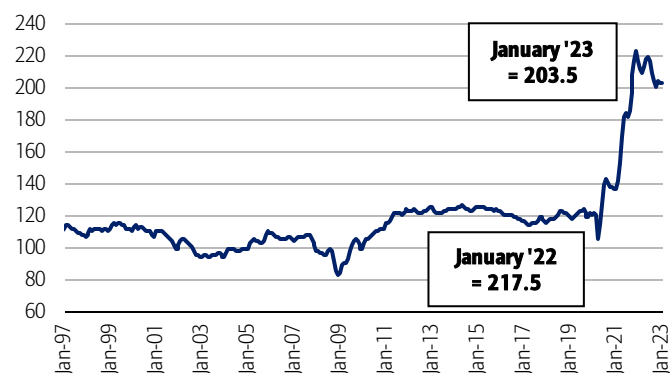
	Average Incentive					Average Transaction Price				
	Feb-23	Jan-23	MoM % Chg	Feb-22	YoY % Chg	Feb-23	Jan-23	MoM % Chg	Feb-22	YoY % Chg
GM	\$1,887	\$1,964	-3.9%	\$1,963	-3.9%	\$51,523	\$51,789	-0.5%	\$51,406	0.2%
Ford	\$1,283	\$1,121	14.5%	\$1,737	-26.1%	\$54,790	\$55,288	-0.9%	\$48,605	12.7%
Stellantis	\$2,246	\$2,046	9.8%	\$2,570	-12.6%	\$55,580	\$55,172	0.7%	\$52,848	5.2%
Toyota	\$676	\$683	-1.0%	\$1,058	-36.1%	\$42,711	\$41,895	1.9%	\$40,902	4.4%
Honda	\$1,189	\$1,335	-10.9%	\$1,159	2.6%	\$37,841	\$37,080	2.1%	\$37,270	1.5%
Nissan	\$1,994	\$1,855	7.5%	\$1,789	11.5%	\$38,779	\$37,671	2.9%	\$33,794	14.8%
Hyundai	\$875	\$856	2.2%	\$950	-7.9%	\$37,830	\$37,393	1.2%	\$37,550	0.7%
Kia	\$684	\$688	-0.6%	\$1,239	-44.8%	\$34,631	\$34,324	0.9%	\$34,475	0.5%
Volkswagen	\$1,969	\$1,843	6.8%	\$1,874	5.1%	\$48,536	\$49,193	-1.3%	\$47,916	1.3%
Industry	\$1,522	\$1,396	9.0%	\$1,657	-8.1%	\$45,645	\$45,576	0.2%	\$43,382	5.2%

Source: TrueCar

BoFA GLOBAL RESEARCH

Exhibit 43: NADA Used Vehicle Price Index

NADA Used Vehicle Price Index was down 6.4% YoY in January 2023, but was flat on a MoM basis

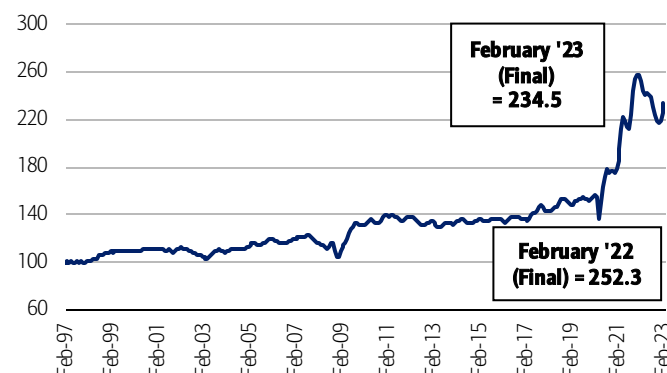


Source: NADA

BoFA GLOBAL RESEARCH

Exhibit 44: Manheim Used Vehicle Value Index

Manheim Used Vehicle Value Index was down 7.1% YoY in February 2023 (Final), but increased 4.3% on a MoM basis

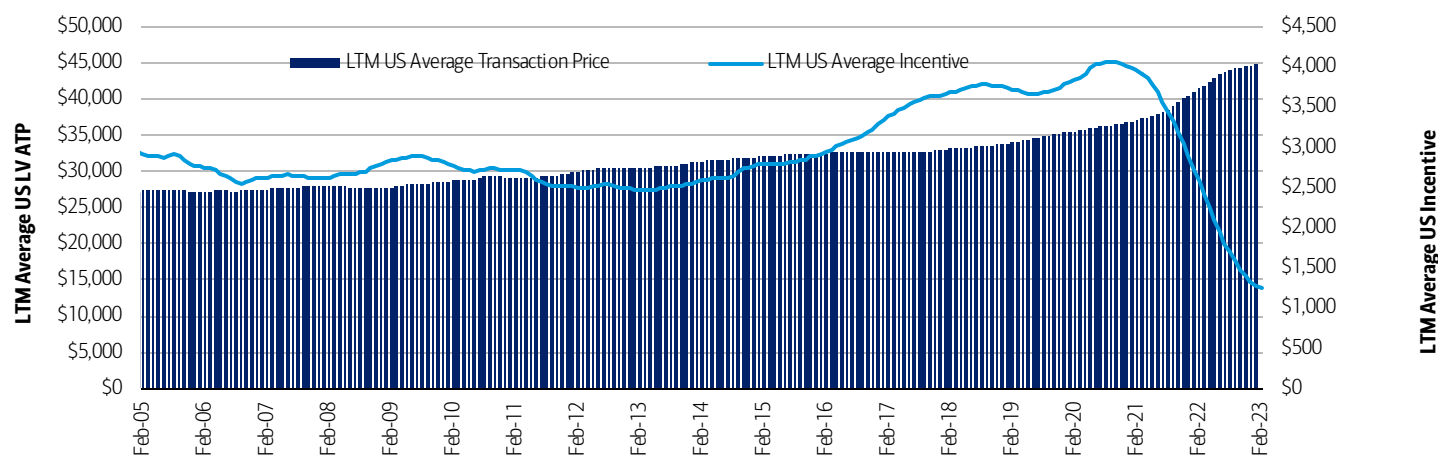


Source: Manheim

BoFA GLOBAL RESEARCH

Exhibit 45: Industry average transaction price & average incentive

US average ATPs continued to increase in February



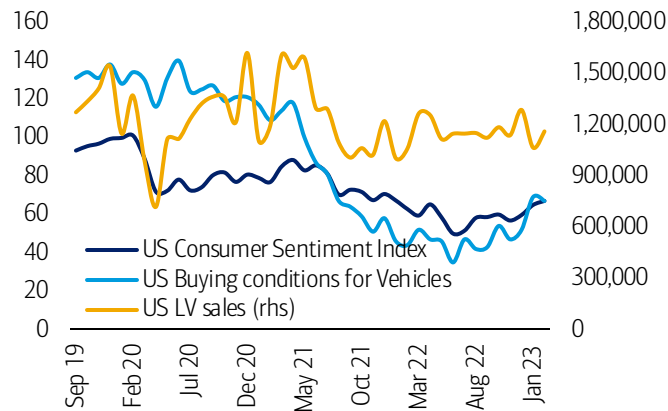
Source: TrueCar, AutoData

BoFA GLOBAL RESEARCH

US consumer confidence (University of Michigan)

Exhibit 46: US Consumer Confident Index vs LV Sales (rhs)

US Consumer confidence index remains low relative to historical levels

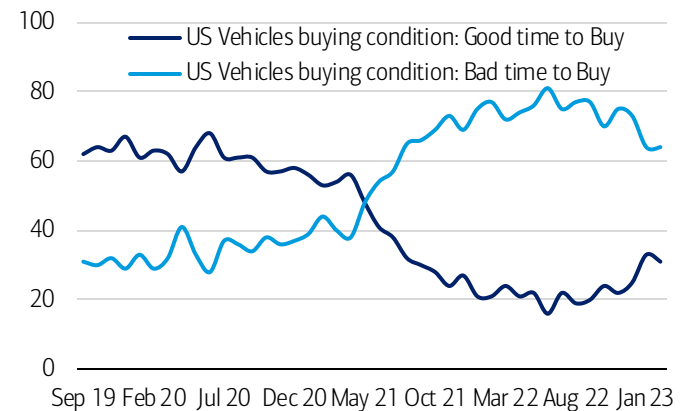


Source: Bloomberg, AutoWards, BofA Global Research

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Exhibit 47: Good time vs Bad time to buy Vehicles

General consensus is that it is a bad time to buy vehicle

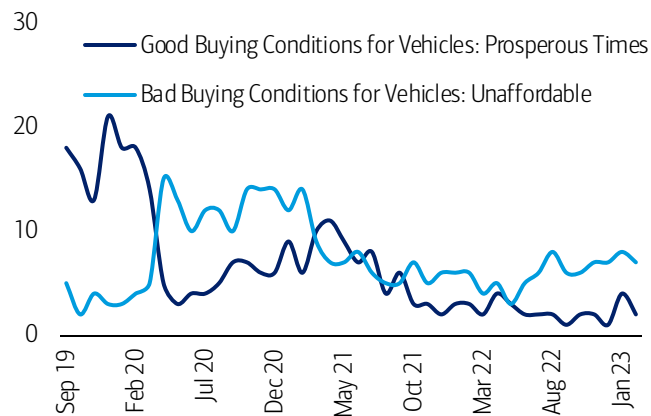


Source: Bloomberg, BofA Global Research

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Exhibit 48: Prosperous Times vs Unaffordable times

Vehicles are becoming more unaffordable for consumers

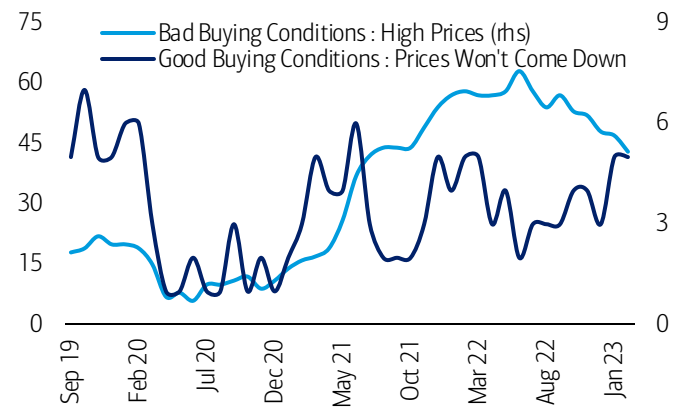


Source: Bloomberg, BofA Global Research

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Exhibit 49: Vehicle Pricing expectations

More consumers are believing that car prices will not come down

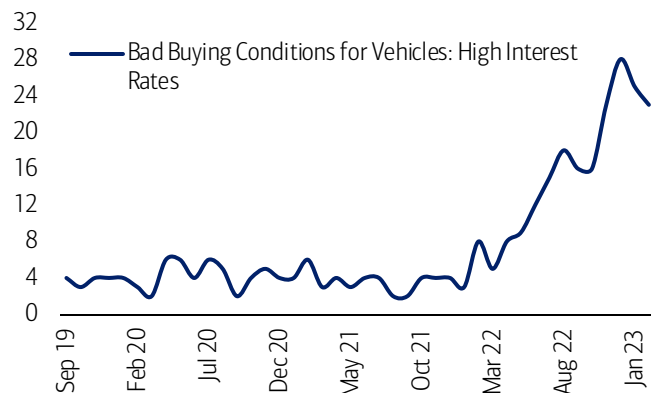


Source: Bloomberg, BofA Global Research

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Exhibit 50: Rising Interest rates further hurting buying sentiment

Rising interest rates becoming more of a problem for car sales

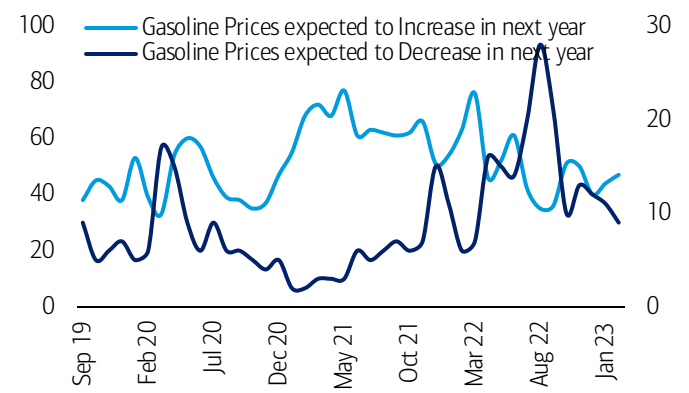


Source: Bloomberg, BofA Global Research

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Exhibit 51: Gasoline Prices

Most consumers now think gas prices could increase in 2023



Source: Bloomberg, BofA Global Research

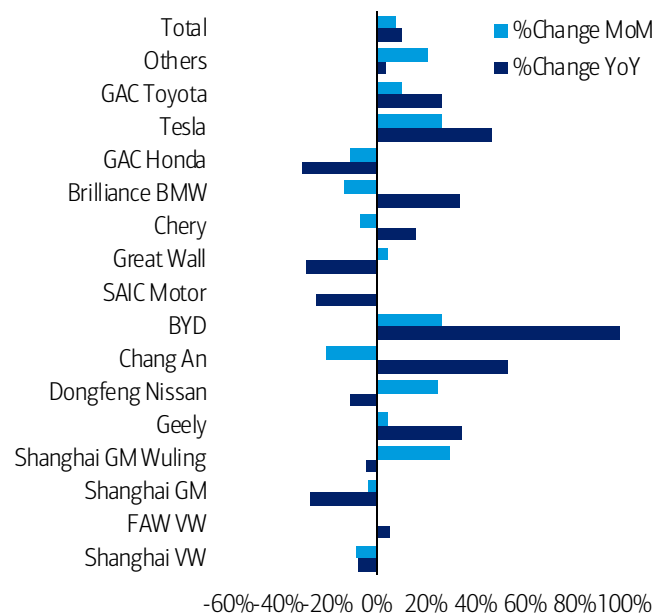
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China

Passenger Car sales including Mini bus

Exhibit 52: China monthly sales % Change YoY & MoM in Feb-23

Performances vary strongly in China, with BYD and Tesla faring the best

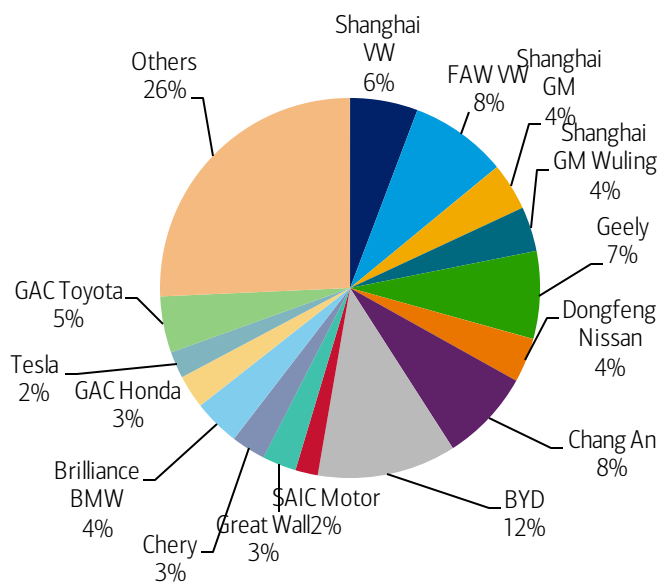


Source: BofA Global Research, Company data.

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Exhibit 53: YTD sales volume split

China market is very competitive, but BYD remains the undisputed market leader



Source: BofA Global Research, Bloomberg

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Exhibit 54: China PC monthly sales (in units)

Feb sales data improving in China – winners include BYD, Chery and Changan

OEM	Feb-23	Feb-22	Jan-23	% YoY	% MoM
Shanghai VW	74,013	80,158	80,618	-7.7%	-8.2%
FAW VW	110,511	104,940	111,435	5.3%	-0.8%
Shanghai GM	53,021	73,021	55,021	-27.4%	-3.6%
Shanghai GM Wuling	57,307	59,967	44,265	-4.4%	29.5%
Geely	102,356	76,304	98,057	34.1%	4.4%
Dongfeng Nissan	56,096	63,211	45,162	-11.3%	24.2%
Chang An	92,802	60,682	117,023	52.9%	-20.7%
BYD	176,662	89,102	139,755	98.3%	26.4%
SAIC Motor	25,484	33,658	25,700	-24.3%	-0.8%
Great Wall	39,472	55,666	37,733	-29.1%	4.6%
Chery	37,979	32,747	40,675	16.0%	-6.6%
Brilliance BMW	49,342	37,001	56,767	33.4%	-13.1%
GAC Honda	35,842	51,387	40,294	-30.3%	-11.0%
Tesla	33,923	23,200	26,843	46.2%	26.4%
GAC Toyota	67,029	53,094	61,113	26.2%	9.7%
Others	376,979	363,496	312,677	3.7%	20.6%
Total	1,388,818	1,257,634	1,293,138	10.4%	7.4%

Source: BofA Global Research, CAAM

BofA GLOBAL RESEARCH

Exhibit 55: China PC YTD sales (in units)

BYD leads Chery and Tesla in 2023 market share gain in China – YTD23 market much lower than in 2022 due to weak Jan-23 sales

OEM	Feb-23	Feb-22	% YoY	Feb-21	% YoY
Shanghai VW	154,631	217,775	-29.0%	264,300	-17.6%
FAW VW	221,946	295,711	-24.9%	348,505	-15.1%
Shanghai GM	108,042	193,042	-44.0%	229,291	-15.8%
Shanghai GM Wuling	101,572	145,738	-30.3%	169,907	-14.2%
Geely	200,413	221,058	-9.3%	241,726	-8.6%
Dongfeng Nissan	101,258	173,237	-41.5%	188,220	-8.0%
Chang An	209,825	204,238	2.7%	245,262	-16.7%
BYD	316,417	184,134	71.8%	62,146	196.3%
SAIC Motor	51,184	104,178	-50.9%	75,005	38.9%
Great Wall	77,205	145,407	-46.9%	177,453	-18.1%
Chery	78,654	108,566	-27.6%	90,229	20.3%
Brilliance BMW	106,109	126,084	-15.8%	113,382	11.2%
GAC Honda	76,136	131,678	-42.2%	103,907	26.7%
Tesla	60,766	42,546	42.8%	33,802	25.9%
GAC Toyota	128,142	140,731	-8.9%	138,300	1.8%
Others	689,656	901,948	-23.5%	858,654	5.0%
Total	2,681,956	3,336,071	-19.6%	3,340,089	-0.1%

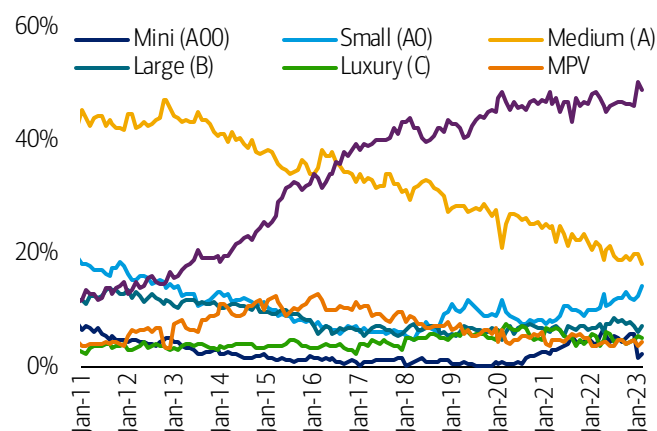
Source: BofA Global Research, CAAM

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China sales break-up by segment and price

Exhibit 56: Break-up by Segment

SUV share is the highest but is plateauing

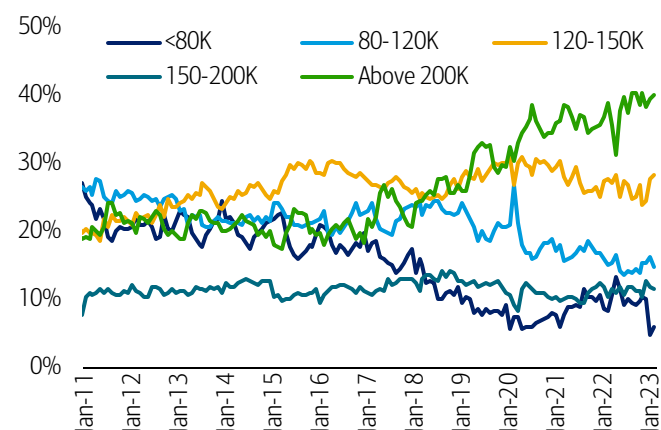


Source: BofA Global Research, Company data, China Auto Market

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Exhibit 57: Break-up by Price

Share of cars sold with price of CNY >200k remains high relative to historical levels



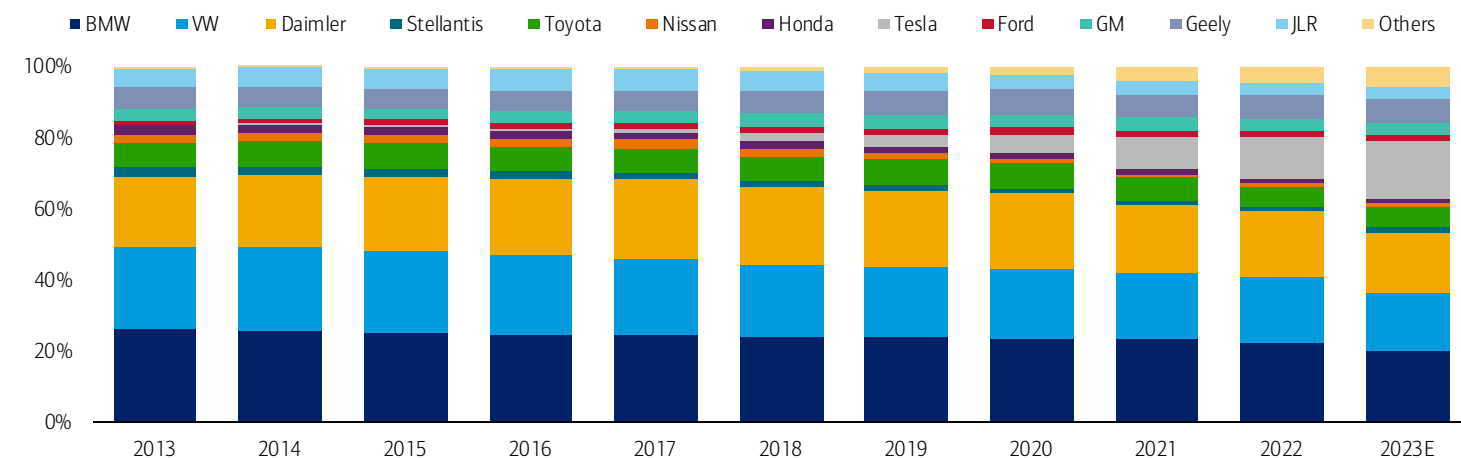
Source: BofA Global Research, Company data, China Auto Market

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Premium Market segment

Exhibit 58: Global Premium market share

Traditional OEMs share in premium cars segment falling due to rise of Tesla, China OEMs – the trend should continue in 2023e



Source: BofA Global Research, IHS

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Exhibit 59: Dealer level Inventory by Key Automakers

China Inventory level are up MoM in Feb-23 and are high vs 3-month average

	Inventory Days		MoM	3 month Average	changes
Luxury brands Average	Feb-2023	Jan-2023			

Exhibit 59: Dealer level Inventory by Key Automakers

China Inventory level are up MoM in Feb-23 and are high vs 3-month average

	Inventory Days		MoM	3 month Average	changes
Brilliance BMW	-0.1	-2.0	-96.0%	-2.0	-96.0%
Beijing Benz	36.0	29.7	21.4%	31.7	13.7%
FAW Audi	87.0	77.6	12.1%	79.3	9.8%
Subtotal	37.7	33.0	14.5%	34.1	10.7%

JV brands Average

FAWVW	51.6	48.5	6.5%	48.5	6.4%
SAIC VW	50.0	46.4	7.6%	47.0	6.2%
SAIC GM	74.6	63.1	18.3%	64.7	15.4%
Changan Ford	321.3	285.6	12.5%	288.9	11.2%
FAW Toyota	49.2	41.4	18.8%	43.1	14.0%
DF PSA	639.6	593.9	7.7%	594.9	7.5%
DF Nissan	66.0	48.6	35.7%	55.6	18.7%
Beijing Hyundai	59.8	51.7	15.6%	56.4	6.0%
DF Honda	63.7	56.1	13.7%	56.4	13.0%
GAC Toyota	35.6	31.8	11.7%	30.0	18.7%
GAC Honda	56.7	47.4	19.7%	47.3	19.9%
GAC FCA	-83.3	-52.2	59.5%	-56.8	46.7%
Subtotal	64.7	56.5	14.4%	57.7	12.1%

Local brands Average

Changan	30.0	21.0	42.6%	23.3	28.9%
GAC Motor	528.9	472.2	12.0%	486.3	8.8%
BYD	88.1	81.7	7.8%	82.4	6.8%
GWM	11.0	11.7	-6.3%	13.7	-19.7%
Geely	79.0	68.8	14.7%	71.0	11.3%
SAIC PV	65.4	64.6	1.2%	68.3	-4.2%
Subtotal	86.2	76.7	12.4%	79.2	8.8%

Overall Average

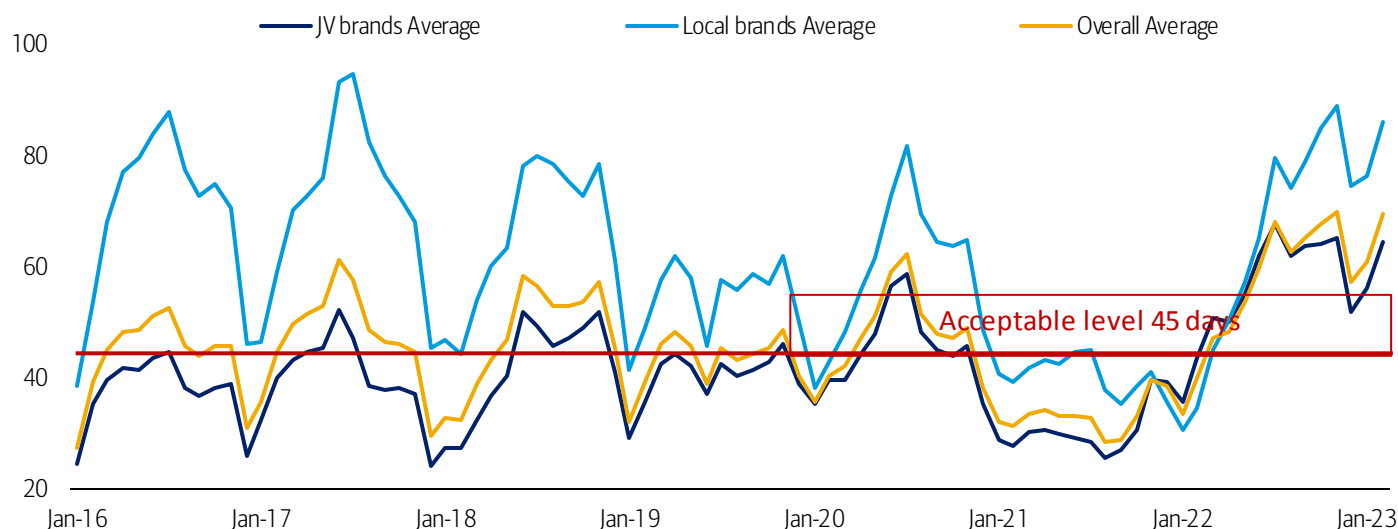
69.5 61.1 13.8% 62.8 10.8%

Source: China Auto Market

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Exhibit 60: China inventories level rising

Current inventories levels are reverting to historical highs – local brands average remains the highest



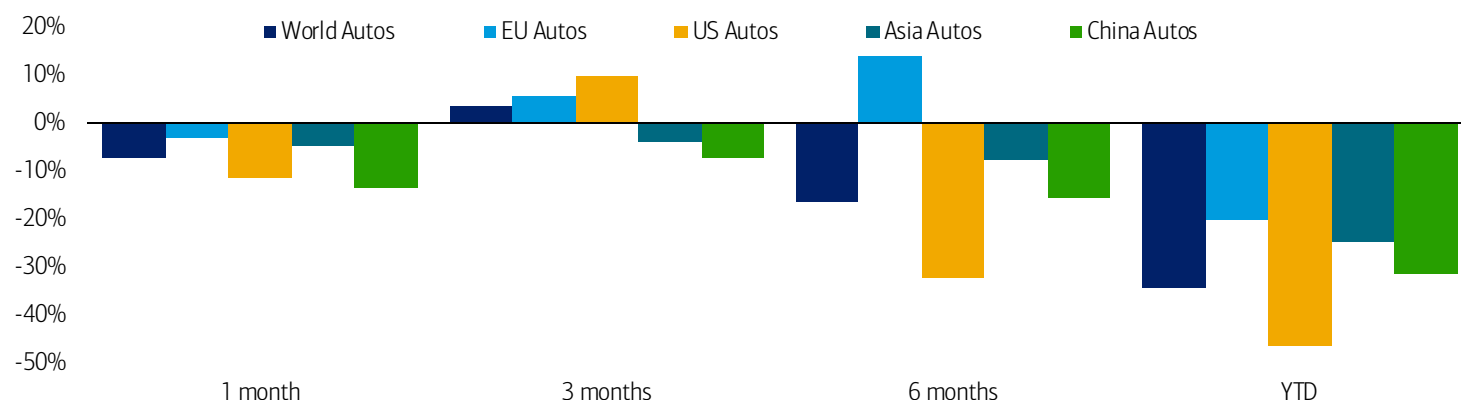
Source: China Auto Market

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Global auto share price performances

Exhibit 61: Global Auto stock performance

Auto indices were mixed in the last one month with US witnessing the most significant decline

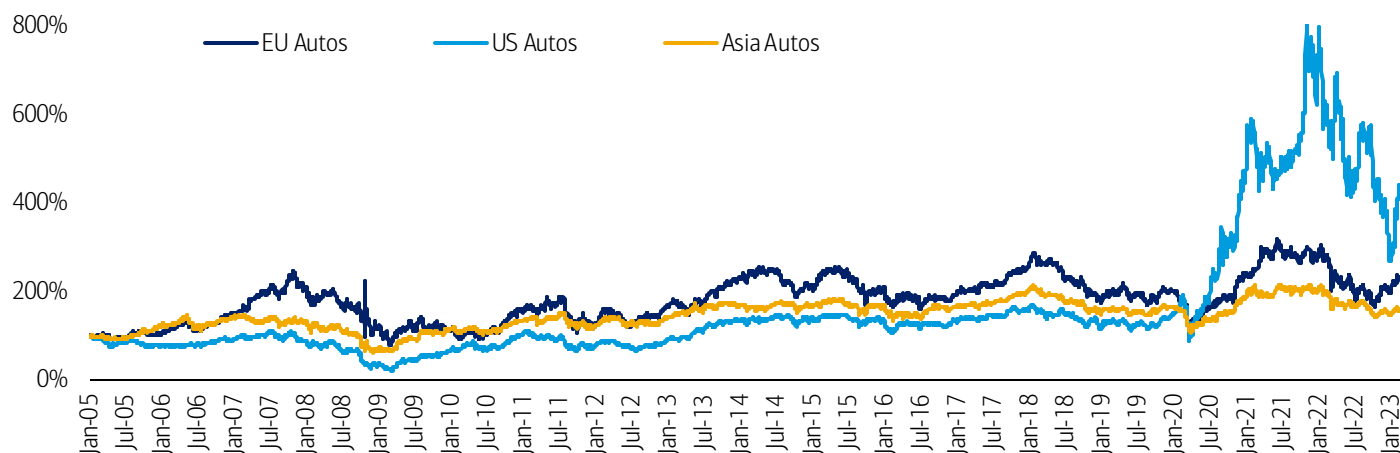


Source: BofA Global Research, Refinitiv Eikon

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Exhibit 62: EU Autos index vs US and Asia

US Auto index falling rapidly in recent months as high growth stock take a beating

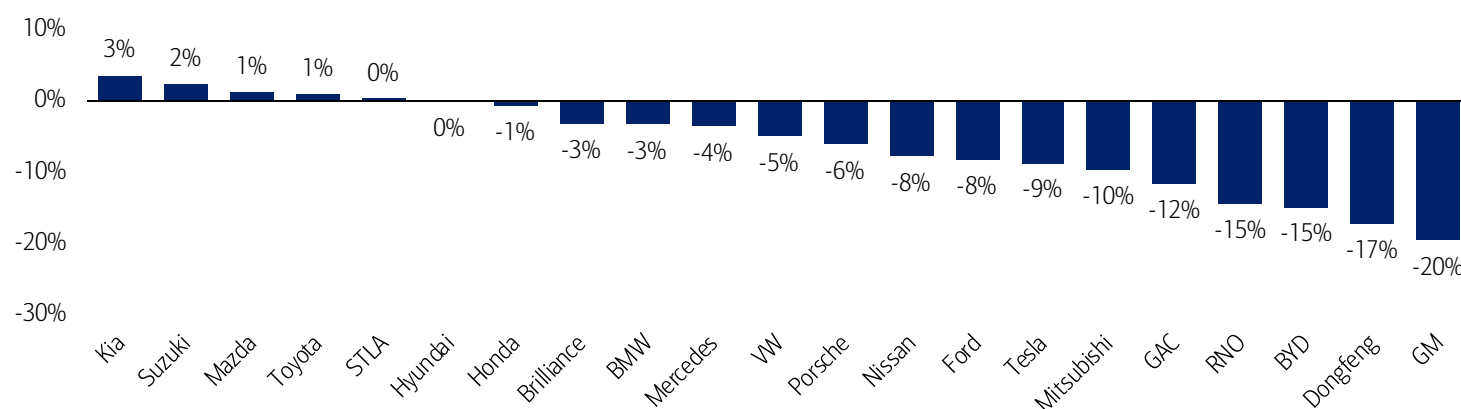


Source: BofA Global Research, Refinitiv Eikon

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Exhibit 63: Auto OEMs stock price change in the last month

Most stocks were positive in the last one month; Tesla down 9%



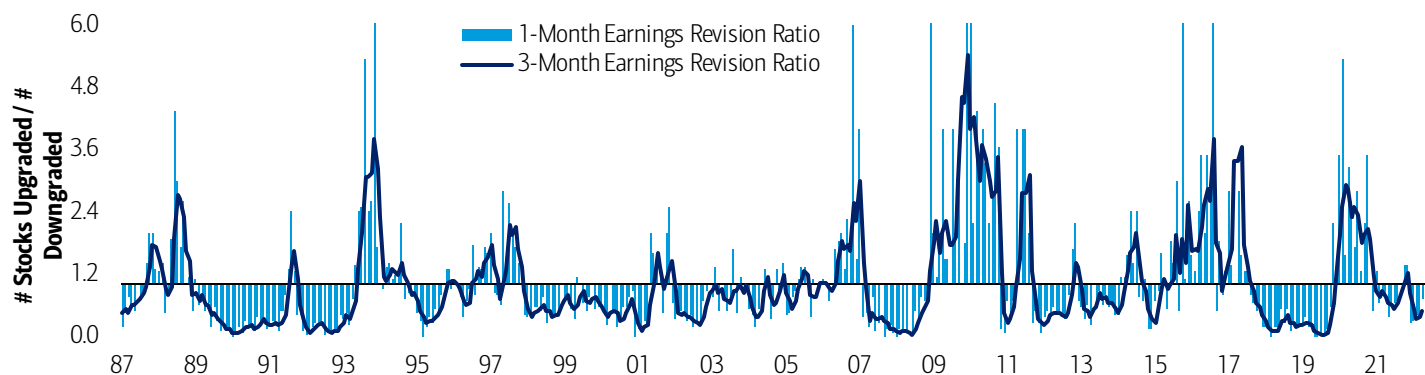
Source: BofA Global Research, Refinitiv Eikon

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EU Autos: Estimate revision trend & Investor sentiment

Exhibit 64: European Autos: 12m forward EPS revision trend

EPS revisions were negative as the economy deteriorates and OEMs experience peak margins

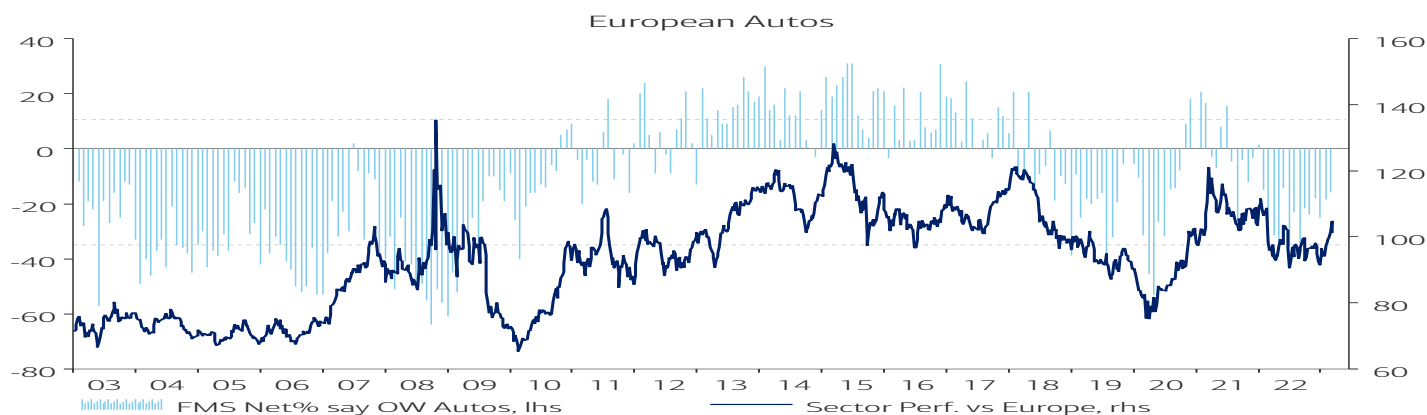


Source: BofA European Equity Quant Strategy

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Exhibit 65: Net % saying they are overweight European Autos

Net 16% of managers said they are overweight the sector and net 8% of them see it as undervalued

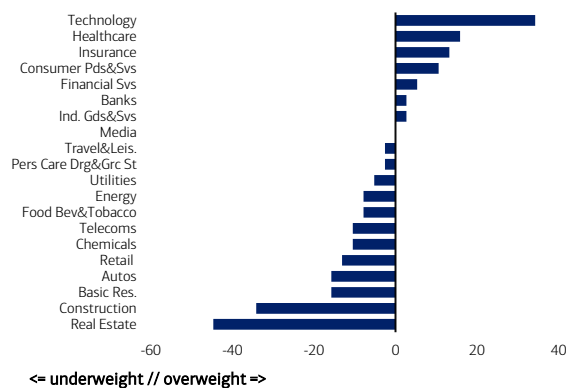


Source: BofA Regional Fund Manager Survey, DataStream

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Exhibit 66: Current European sector snapshot

% saying overweight - % saying underweight

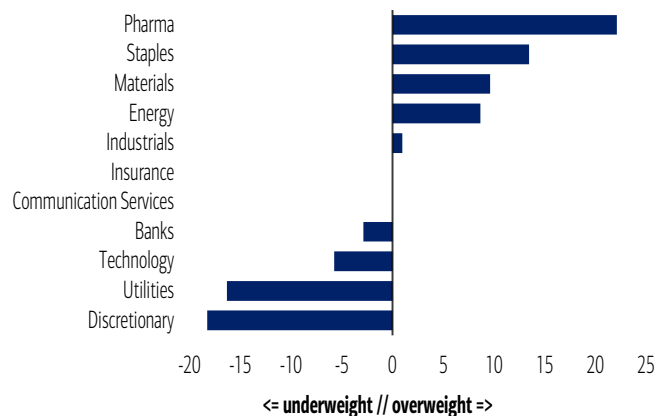


Source: BofA Regional Fund Manager Survey

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Exhibit 67: Global sector sentiment

% saying overweight - % saying underweight



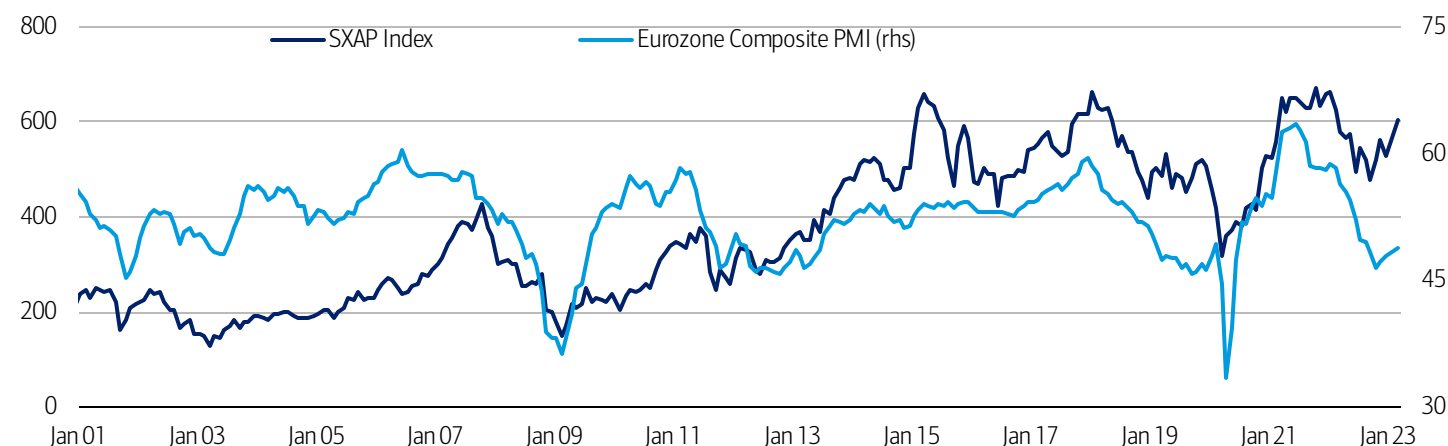
Source: BofA Global Fund Manager Survey

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EU share prices & valuation still in crisis mode

Exhibit 68: SXAP Index (=EU Autos) vs PMI

There remains a very close correlation between the EU purchasing manager index (PMI) and EU Autos share prices – even though the gap has widened

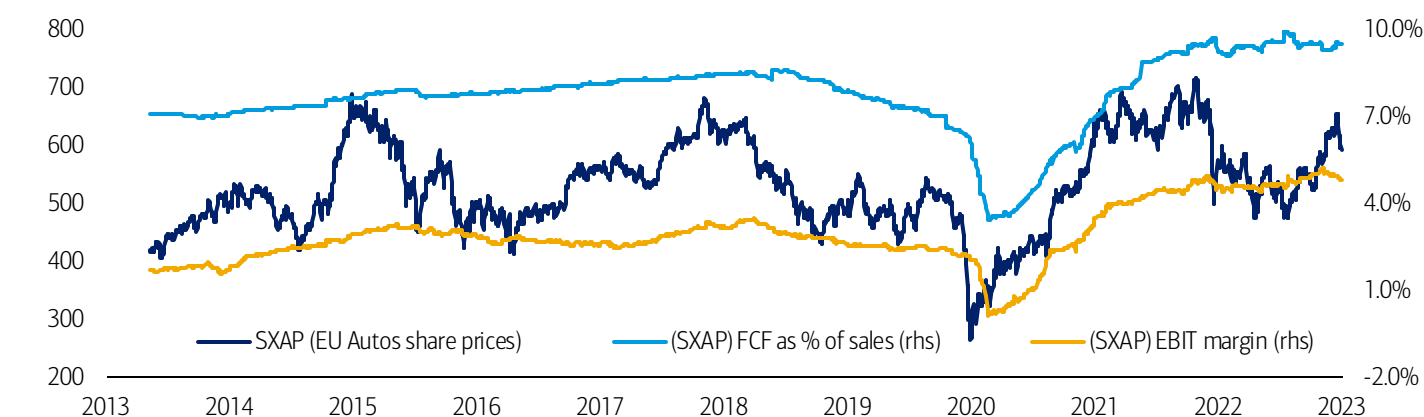


Source: Bloomberg, BofA Global Research

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Exhibit 69: EU Autos: Peak earnings view takes valuations down

12m forward EBIT margins just starting to decline

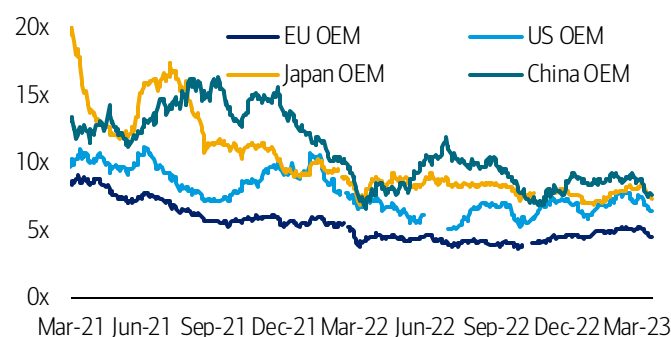


Source: BofA Global Research, FactSet

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Exhibit 70: 12m fwd PE valuation by region for car makers (OEMs)

European Autos now valued so low that they hardly can de-rate further

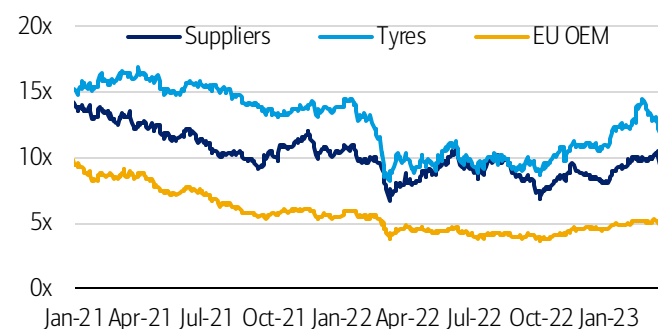


Source: FactSet, BofA Global Research

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Exhibit 71: 12m fwd PE by auto sub-segment in Europe

Car makers at trough levels, suppliers and tires are de-rating



Source: FactSet, BofA Global Research

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster ^{R1}
Buy	≥ 10%	≤ 70%
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Underperform	N/A	≥ 20%

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