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Our Perspective on the US Auto Industry & Car Wars 2021-2024

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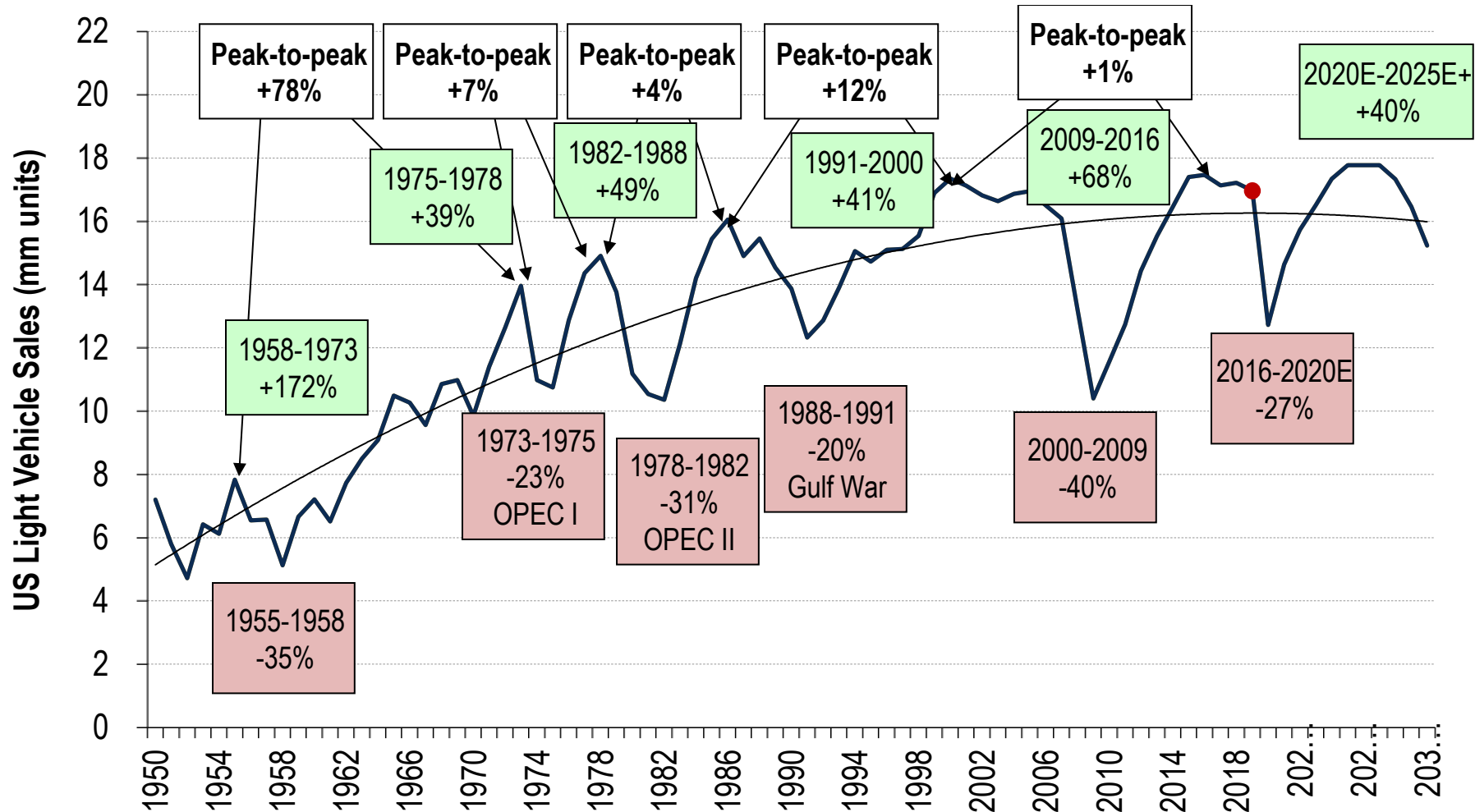
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US/Global Auto Industry Dynamics



US Auto industry dynamics – BofA expects downturn/trough in 2020E

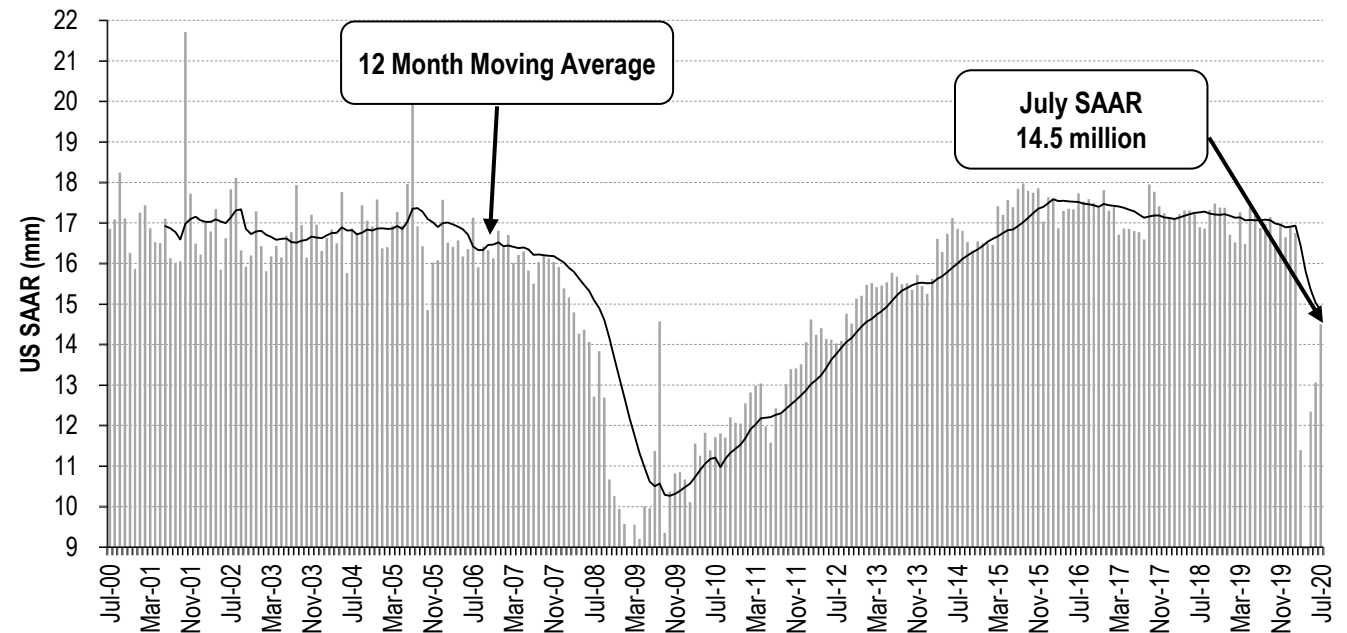


We pulled forward our trough US sales/NA production forecast to 2020, based on the expectation for a significant deterioration in demand due to the coronavirus (COVID-19) pandemic. Even before this, we had long anticipated a downturn in the US/NA market, driven by affordability dynamics that had start to work against the consumer.

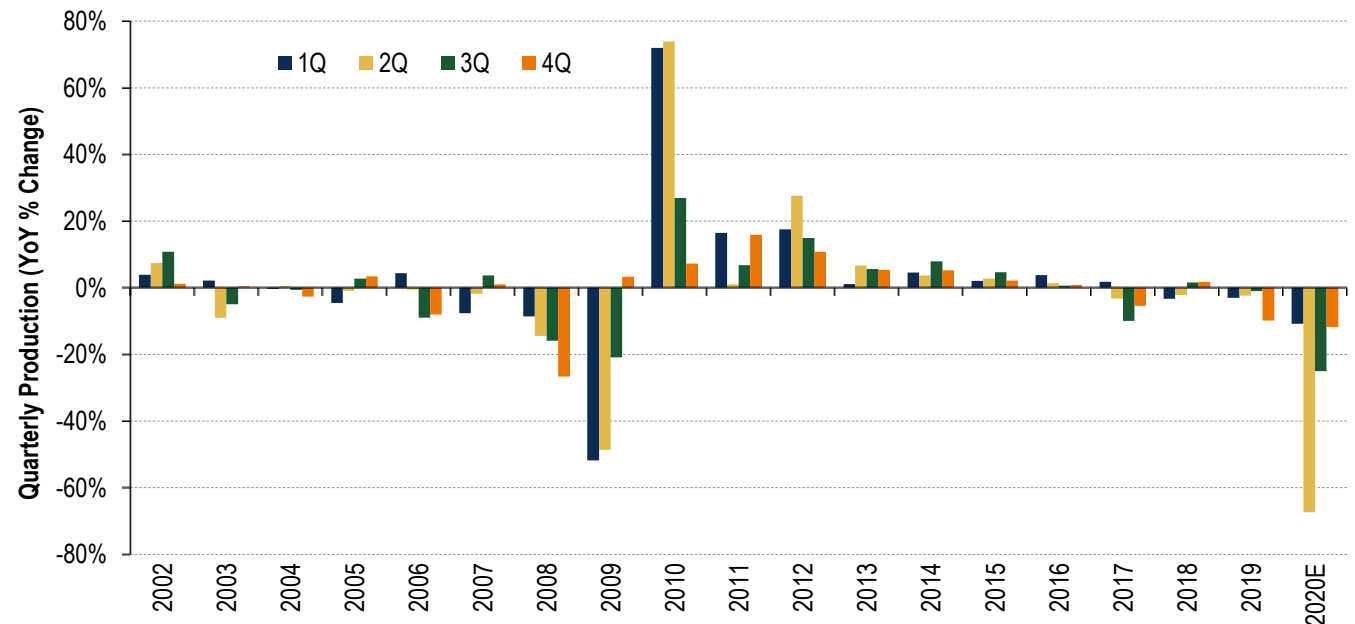
US Auto industry dynamics – 2Q:20 toughest in modern history



US sales declined materially YoY in recent months due to the COVID-19 pandemic, with April down 47% YoY, May down 29%, June down 24%, and July down 14%



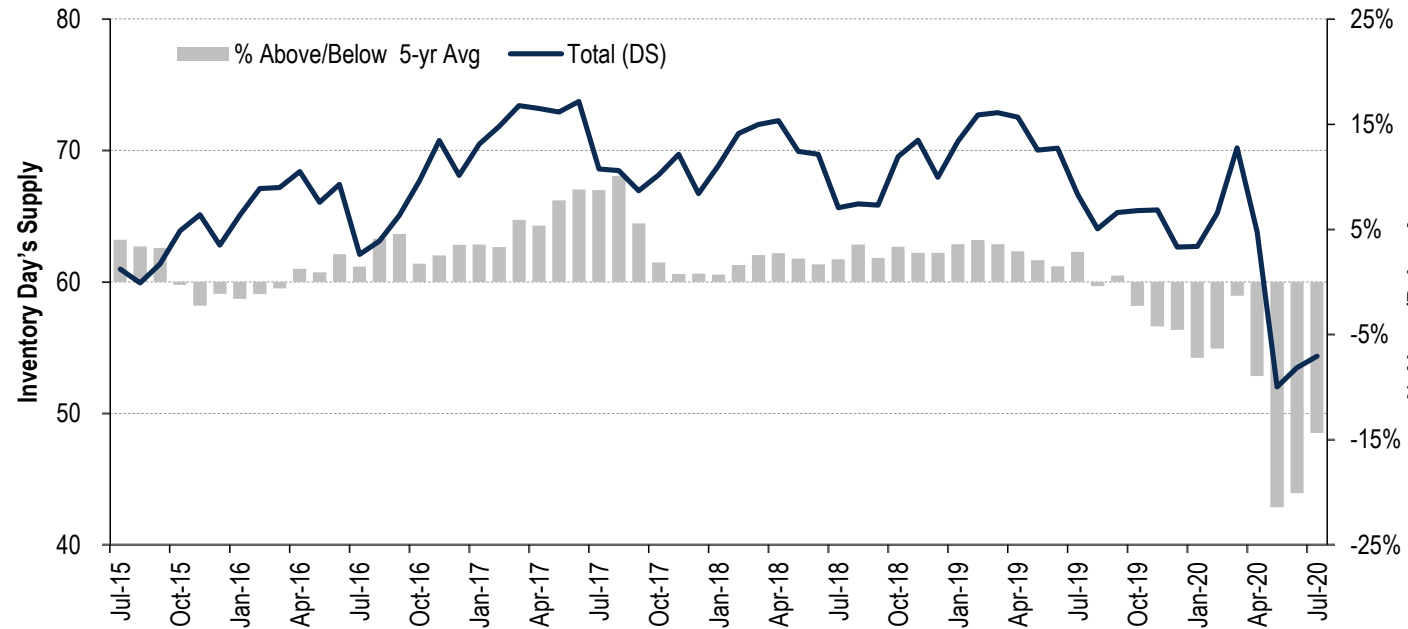
NA production declined more substantially with production stoppages and slow restarts/ramps, leading to 67% YoY decline in 2Q:20, and velocity of recovery is still questionable



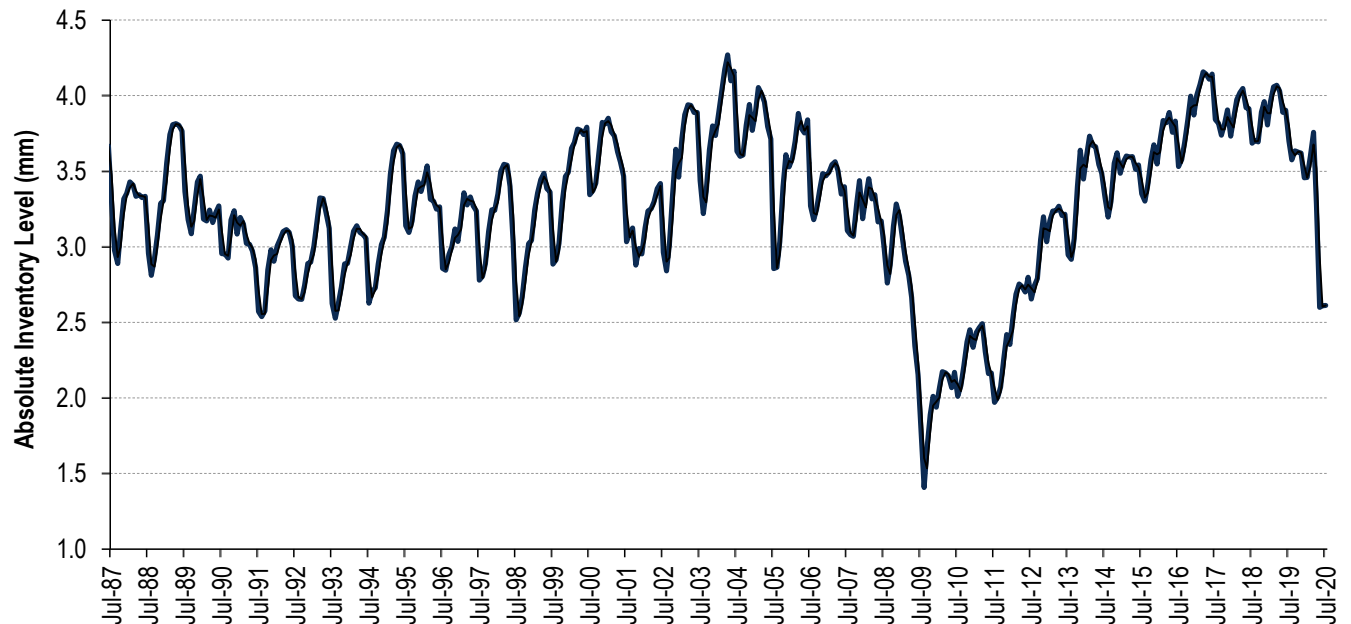
US Auto industry dynamics – Inventory becoming a pressure point



With production that was effectively 0 in April-May, but sales that have surprisingly hung in, a notable inventory shortage has emerged, which is just starting to be corrected



Inventory levels on an absolute and days' supply basis only just inflected in May-June and will take a few months to return to more normal levels



Global Auto industry dynamics – Synchronized downturn with COVID

	2016	2017	2018	2019	2020E	2021E	2022E	2023E	2024E	2025E
EU 28	17,213,806	17,793,591	17,866,958	18,095,241	13,321,786	15,316,910	16,363,673	16,650,952	16,958,599	16,639,344
YoY %	7.1%	3.4%	0.4%	1.3%	-26.4%	15.0%	6.8%	1.8%	1.8%	-1.9%
East Europe	2,611,540	2,785,282	2,688,588	2,515,640	1,804,621	2,080,680	2,480,040	2,935,527	3,133,768	3,245,037
YoY %	-7.6%	6.7%	-3.5%	-6.4%	-28.3%	15.3%	19.2%	18.4%	6.8%	3.6%
North America	21,088,657	20,804,733	20,723,019	20,312,378	15,234,284	17,519,426	18,833,383	19,775,052	20,269,428	20,269,428
YoY %	1.8%	-1.3%	-0.4%	-2.0%	-25.0%	15.0%	7.5%	5.0%	2.5%	0.0%
Asia ex-China	13,283,840	14,016,053	14,597,953	13,952,269	11,763,527	12,781,195	13,404,592	13,924,901	14,272,245	14,645,655
YoY %	1.5%	5.2%	4.2%	-4.4%	-15.7%	8.7%	4.9%	3.9%	2.5%	2.6%
China	28,037,401	28,422,188	27,533,511	25,276,923	22,471,185	23,954,283	24,385,460	25,657,821	26,626,375	27,657,467
YoY %	12.5%	1.4%	-3.1%	-8.2%	-11.1%	6.6%	1.8%	1.5%	1.5%	1.4%
South America	3,909,479	4,390,212	4,698,024	4,503,848	3,119,825	3,703,451	4,135,392	4,495,106	4,811,854	5,038,729
YoY %	-11.0%	12.3%	7.0%	-4.1%	-30.7%	18.7%	11.7%	8.7%	7.0%	4.7%
Middle East/Africa	4,785,385	4,755,305	4,280,236	3,849,419	2,770,702	3,178,929	3,582,678	3,923,746	4,204,839	4,463,126
YoY %	-4.2%	-0.6%	-10.0%	-10.1%	-28.0%	14.7%	12.7%	9.5%	7.2%	6.1%
Oceania	1,304,413	1,326,363	1,290,598	1,196,445	907,331	1,024,957	1,037,881	1,130,080	1,196,266	1,175,907
YoY %	2.8%	1.7%	-2.7%	-7.3%	-24.2%	13.0%	1.3%	8.9%	5.9%	-1.7%
Global LV Sales	92,234,521	94,293,727	93,678,887	89,702,163	71,393,260	79,559,831	84,223,099	88,493,185	91,473,375	93,134,693
YoY %	4.5%	2.2%	-0.7%	-4.2%	-20.4%	11.4%	5.9%	5.1%	3.4%	1.8%

Even after a weak 2018-2019, we expect a synchronized downturn in regional sales/production volumes in 2020E with the COVID-19 pandemic, and specifically forecast Europe - 27% YoY, North America -25%, Asia Pacific -13%, for a total Global decline of 20% YoY.

Global Auto industry dynamics – Tail risks abound and skew negative

Global macroeconomic
volatility

Technology and other disruptive forces

Currency rate volatility

Coronavirus

US elections

Inflation/deflation

Geopolitical events

Uncertainty in emerging markets

Trade

agreements/disagreements and
potential reform/friction

Central bank activity vs. fiscal
stimulus

Global interest rate bifurcation

Despite the already very challenging start to 2020, tail risks for the global automotive industry still have a definitively negative bias, in our view. Among these, the most significant is a possible pushout in the anticipated inflection in global sales/production to 2021+, driven by ongoing macroeconomic volatility/uncertainty with the COVID-19 pandemic.

Car Wars

Automotive Product & Pipeline Analysis



Car Wars background & thesis



- An annual proprietary study
 - Based on numerous primary and secondary sources
- Quantifies industry product trends
 - Counts number of new, all new, or next generation models
 - Forecasts annual unit volume of new models
- Measures the competitiveness of OEM product plans in several ways
 - Replacement rate (% of OEM's volume replaced annually)
 - Average showroom age (years on the market)
 - Mix of new model volume by segment
 - Key is to measure performance relative to competitors, industry average
- Provides historical perspective
 - First published in 1991
 - Datasets extend back to 1987
 - Time series for replacement rate, showroom age, and model mix

Car Wars background & thesis



Replacement rate



Showroom age



Market share



Profitability

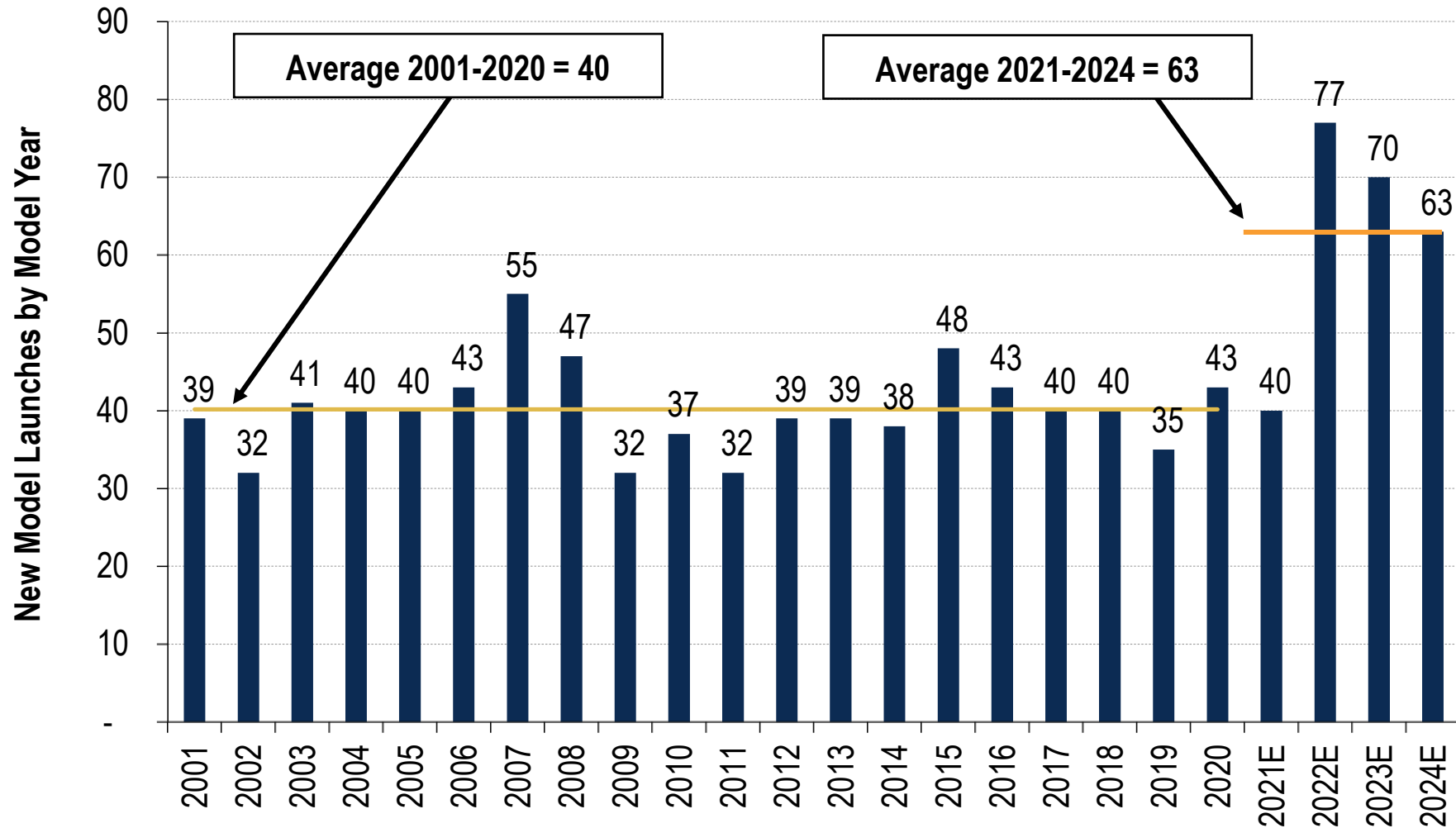


Stock Price

Replacement Rate, Showroom Age (Vol Weighted), Market Share (2001-2020)

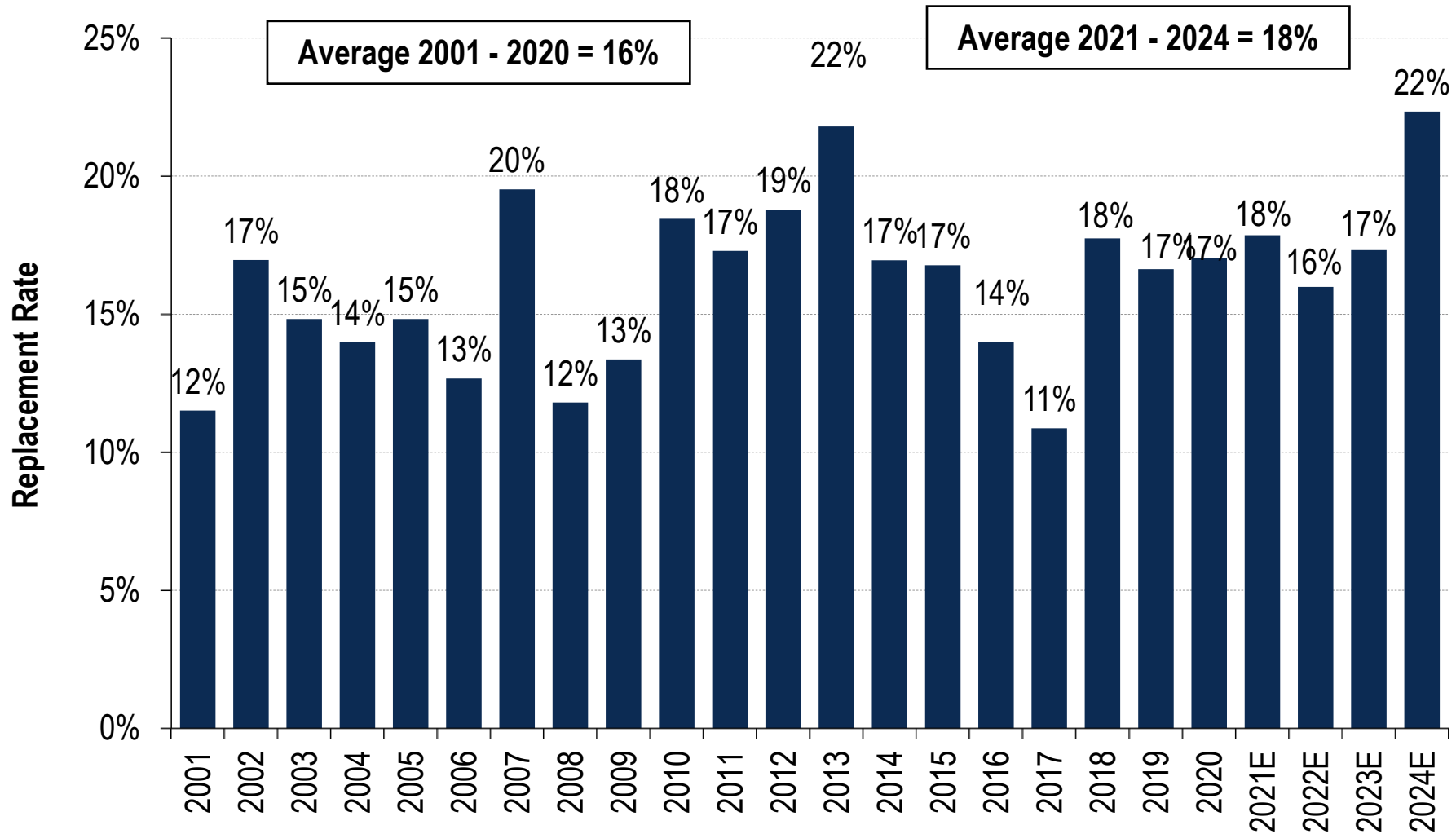
	Avg. Replacement Rate ^[1]	Avg. Showroom Age O/(U)	US Market Share Δ ^[2]
Ford	13.6%	0.8	-9.7%
FCA	13.0%	0.4	-2.7%
GM	14.0%	0.1	-12.4%
Industry Avg.	15.8%	0.0	0.0%
Toyota	18.0%	(0.1)	5.3%
Nissan	16.9%	(0.1)	3.9%
European	17.1%	(0.2)	3.6%
Honda	19.7%	(0.2)	3.1%
Korean	22.4%	(0.9)	6.0%

Car Wars industry trends – New model launches



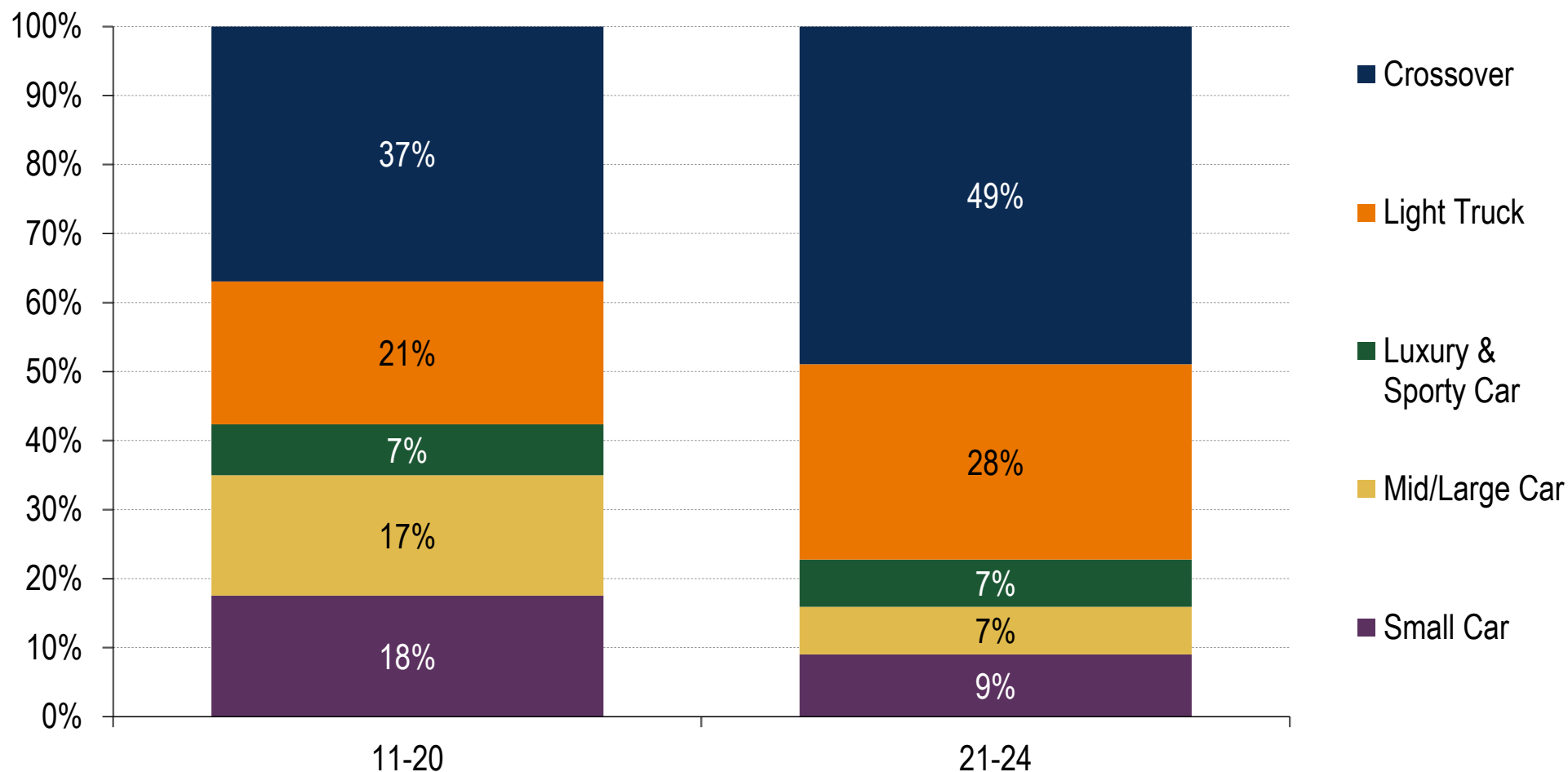
We expect OEMs to launch 250 new models during our forecast period (MY2021-24), or an average of 63 per year. Typically, this level of new model introductions would be a positive sign for the industry. However, in the near-term this robust product activity in a soft crisis derailed market creates some risk for profits. This could reverse in 2021+ to a net positive.

Car Wars industry trends – Annual replacement rate



Between model years 2001 and 2020, the industry replaced about 16% of its volume each year with new models. Over the next four model years, we expect the annual replacement rate of industry volume will trend at about 18%, above the historical average level.

Car Wars industry trends – New models by segment

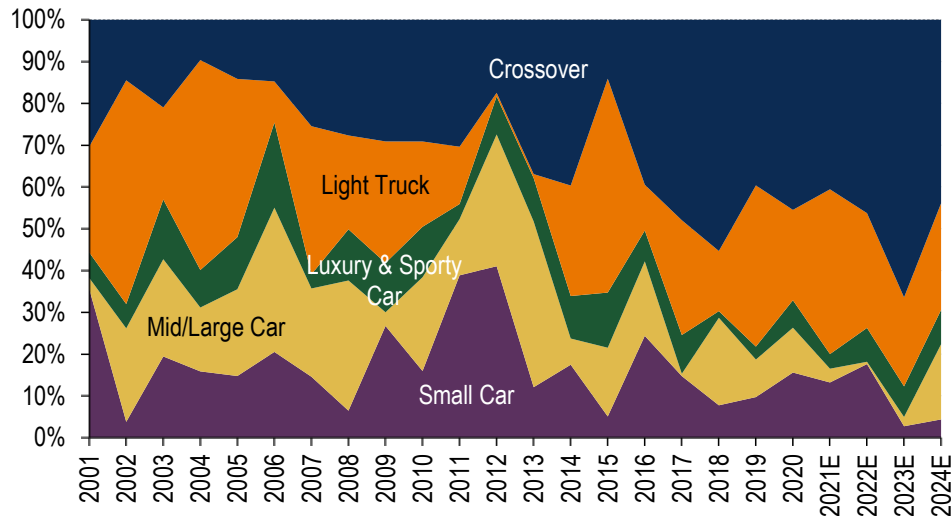


New model emphasis is on CUVs and Light Trucks, with launches accounting for 49% and 28% of new volume in MY2021-24, respectively, which should continue to support industry mix. However, the proliferation of CUV models (113 launches) will likely pressure OEMs' profitability in the segment as the market gets crowded and price competition emerges.

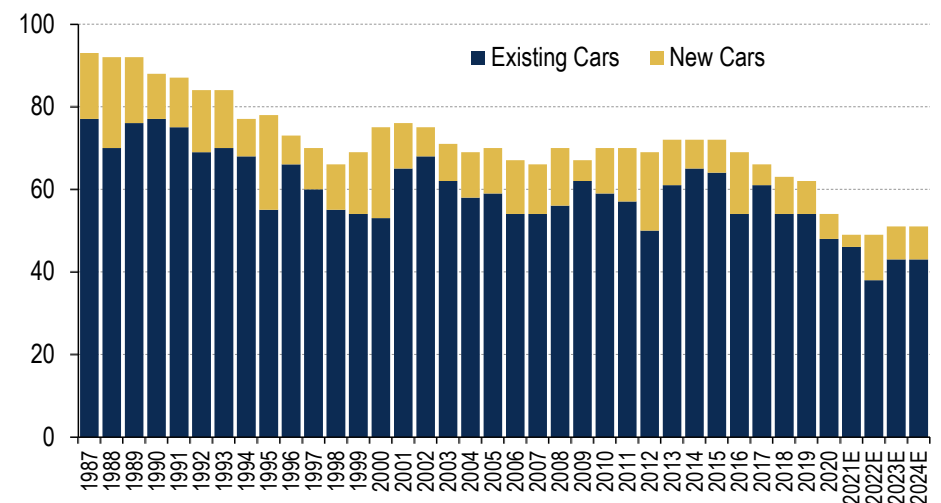
Car Wars industry trends – Crossover surge intensifies



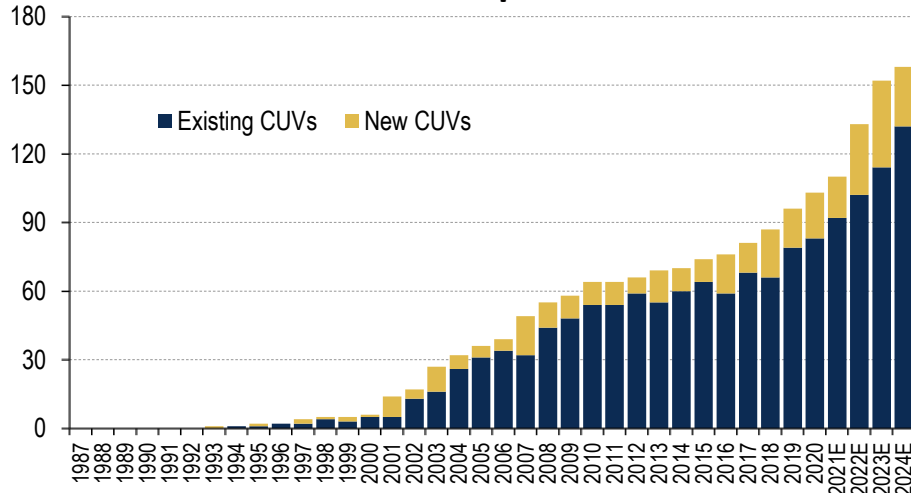
New models by segment



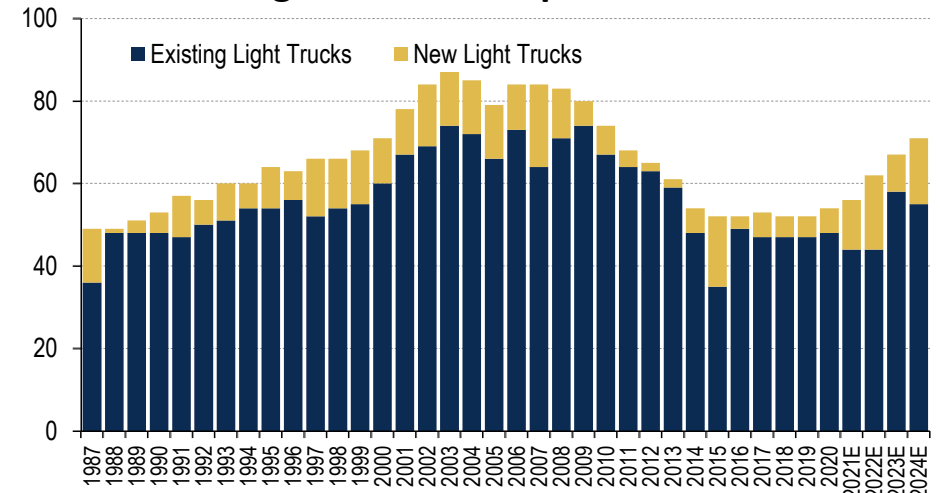
Number of passenger car nameplates



Number of crossover nameplates

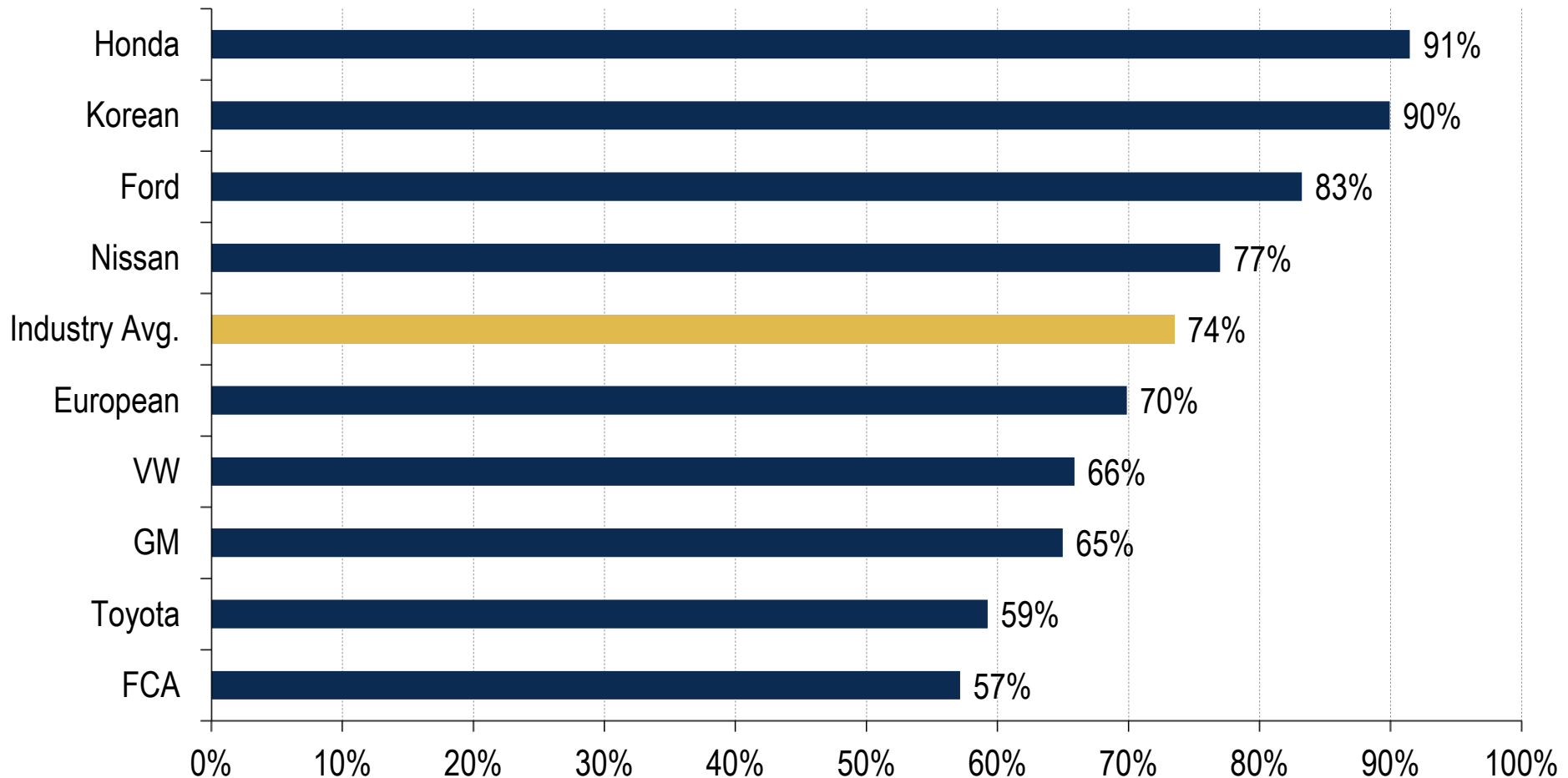


Number of light truck nameplates



Automakers are aggressively pursuing the Crossover segment, particularly at the premium price point. This industry overweight will likely pressure the segments profitability to passenger car levels in the next few years.

Car Wars manufacturer trends – Replacement rate dispersion widens



The dispersion in product replacement rates opens wide over the next four years. The delta in the spread of cumulative replacement rates among OEMs is 34% from high (Honda) to low (FCA). This is about 2x what it has been in recent years.

Car Wars manufacturer trends - Expected market share shifts MY2021-24



	Annual Replacement Rate ^[1]	Avg. Showroom Age O/(U)	2019 Mkt. Share	Direction of US Mkt. Share, CY23 vs. CY19
Honda	22.9%	(0.3)	9.5%	↑
Korean	22.5%	(1.0)	7.8%	↑
Ford	20.8%	(0.7)	13.8%	↑
Nissan	19.2%	(0.4)	7.9%	↔
Industry Avg.	18.4%	0.0	nm	nm
European	17.5%	0.1	8.1%	↔
GM	16.2%	0.4	17.0%	↓
Toyota	14.8%	0.6	14.0%	↓
FCA	14.3%	0.6	12.9%	↓

Over the next four models years, there is a relatively wide dispersion of OEM replacement rates. This appears to be due to differences in product investment towards traditional models vs. alternative powertrain development. There is theoretically some market share opportunity at Honda, the Korean OEMs, and Ford, as well as risk at GM, Toyota, and FCA.

Future Car Wars

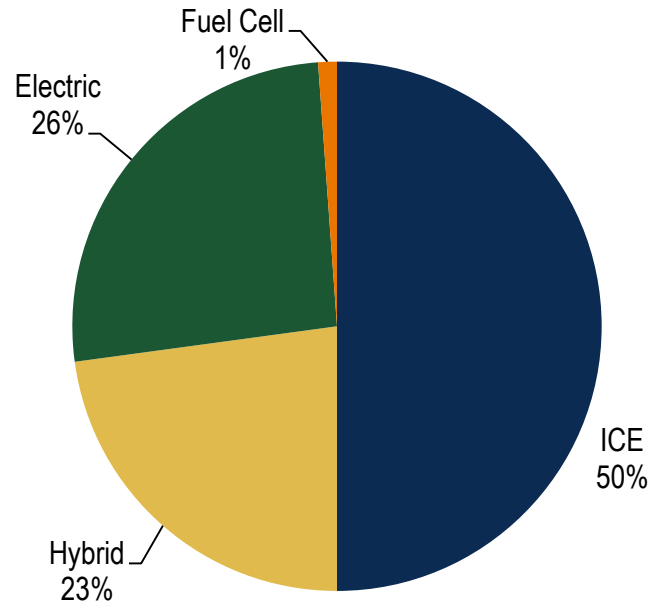
Electrification & Autonomy



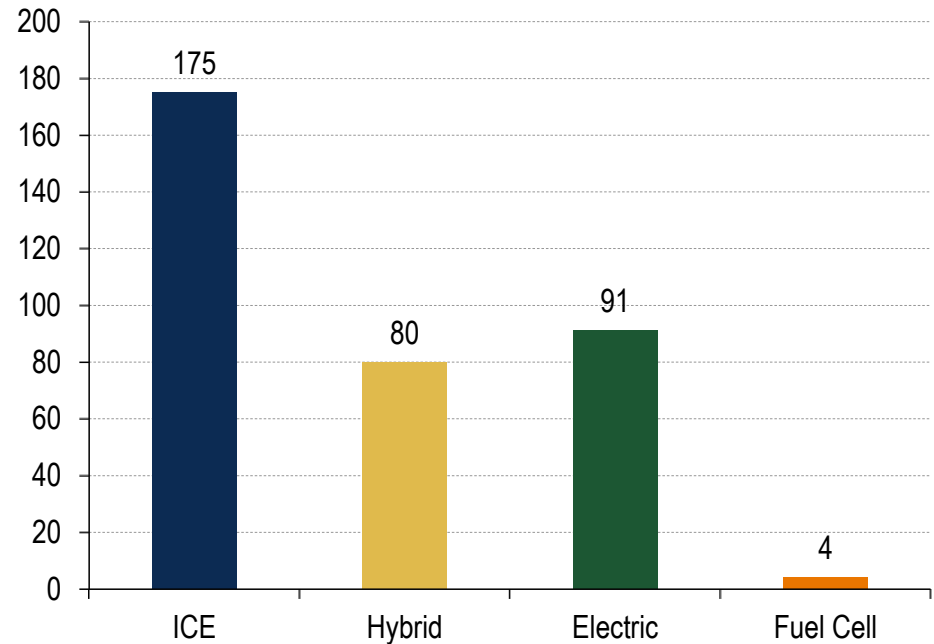
Future Car Wars – Powertrain



Nameplate offerings by powertrain type^[1]



Number of nameplate offerings by powertrain type

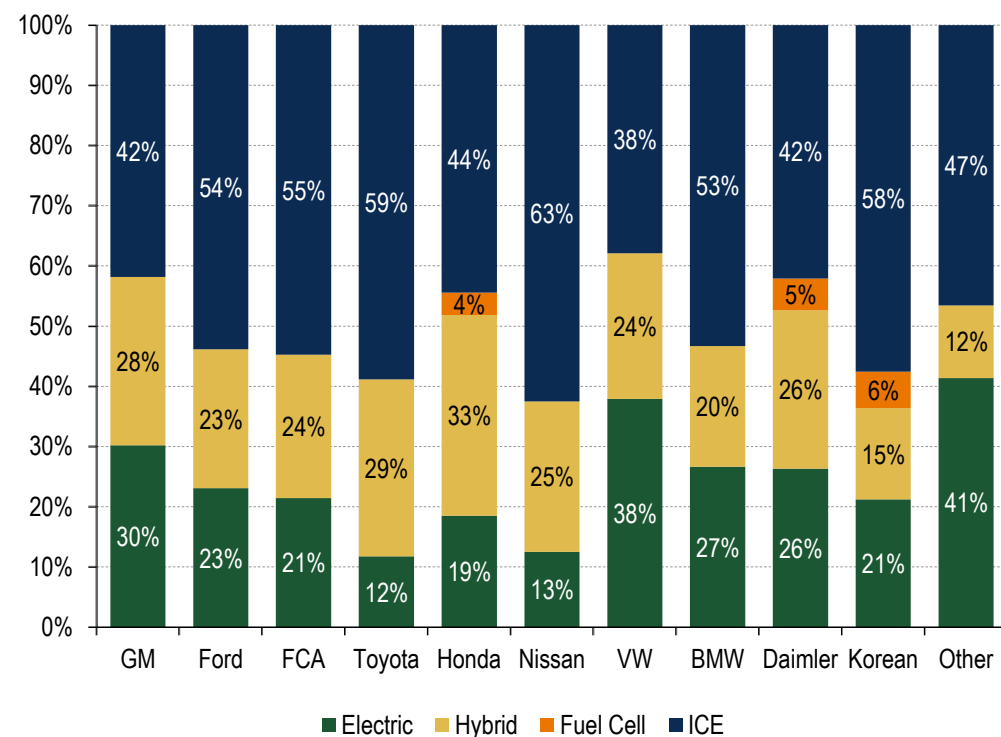


Tallying up all the powertrain offerings across all the new model nameplates MY21-24, we estimate half will be pure internal combustion (ICE), and the remainder some alternative powertrain variant (hybrid, electric, fuel cell). We expect many traditional ICE models will be offered with an alternative powertrain variant, although there will also be 63 standalone alternative powertrain vehicles, with introductions led by GM and VW.

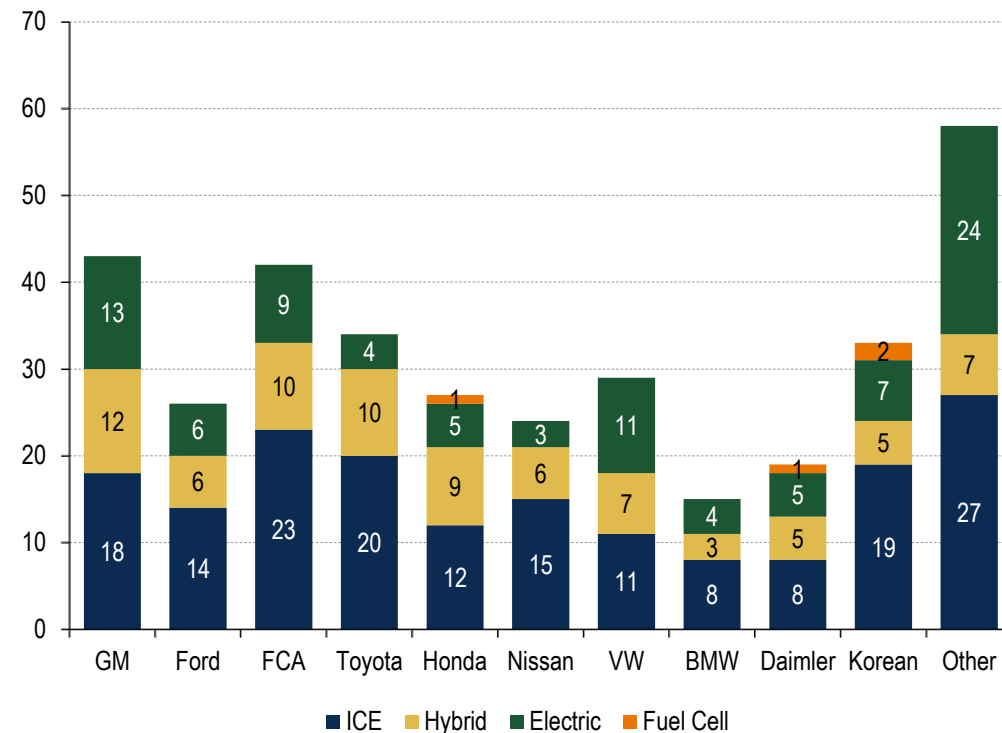
Future Car Wars – Powertrain



Powertrain offering mix by OEM - % of total

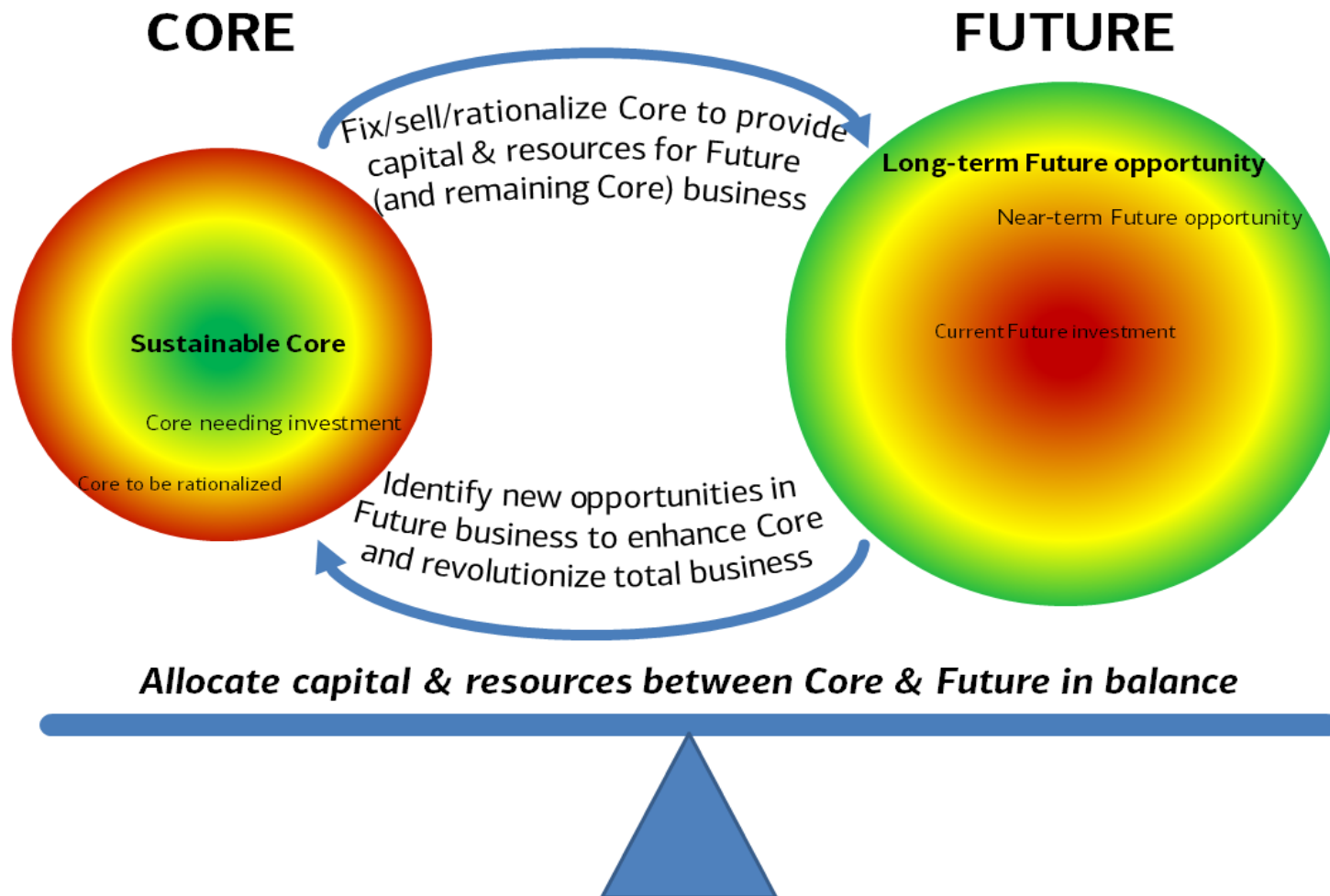


Powertrain offering by OEM - # of models



Over our forecast period, it appears that GM and VW are pushing the most aggressively into electrification, with a slew of standalone models launching MY21-24, although others are not far behind. In addition to some standalone electric models, many OEMs have focused on introducing varying levels of hybridization/electrification across existing nameplates. A number of electric vehicle startups (Rivian, Fisker, Lucid, Byton, etc.) are also expected to launch new products within our forecast period.

Future Car Wars - Core to Future transition framework



Companies' optimization of Core segments enhances the yield and output of their total Core business, which can then be used to develop Future technologies and businesses, and ultimately expand companies' market and financial opportunity.

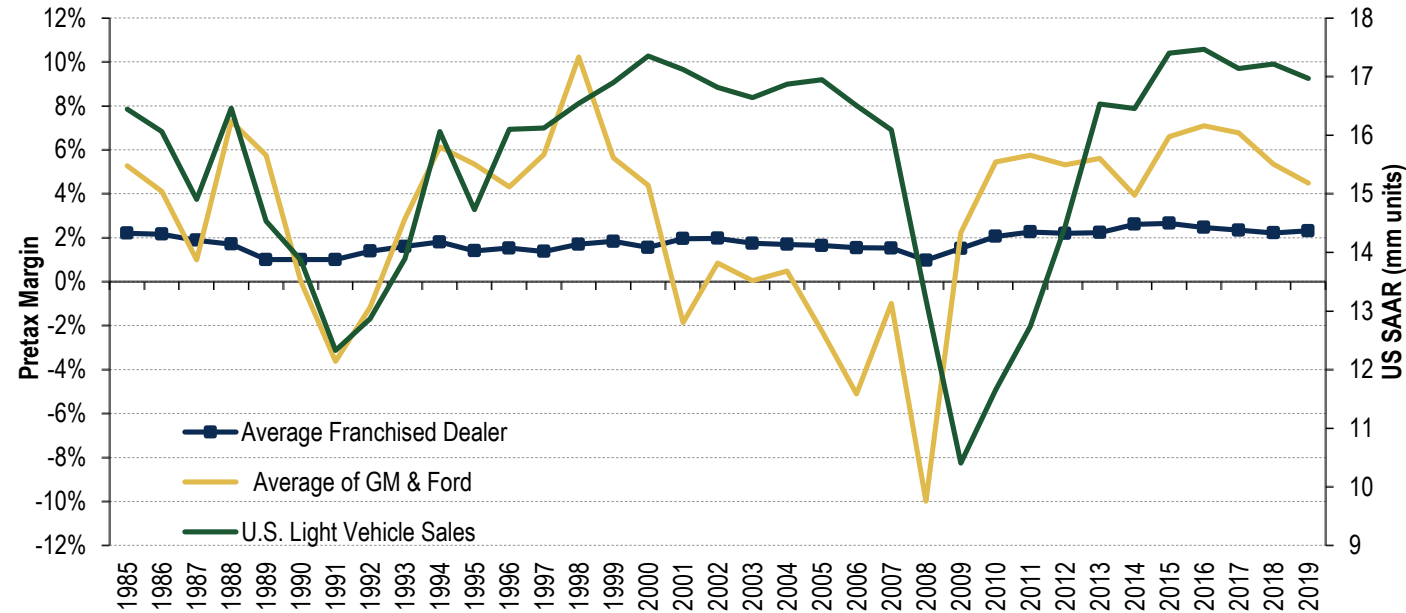
Why We Like the Dealer Business Model



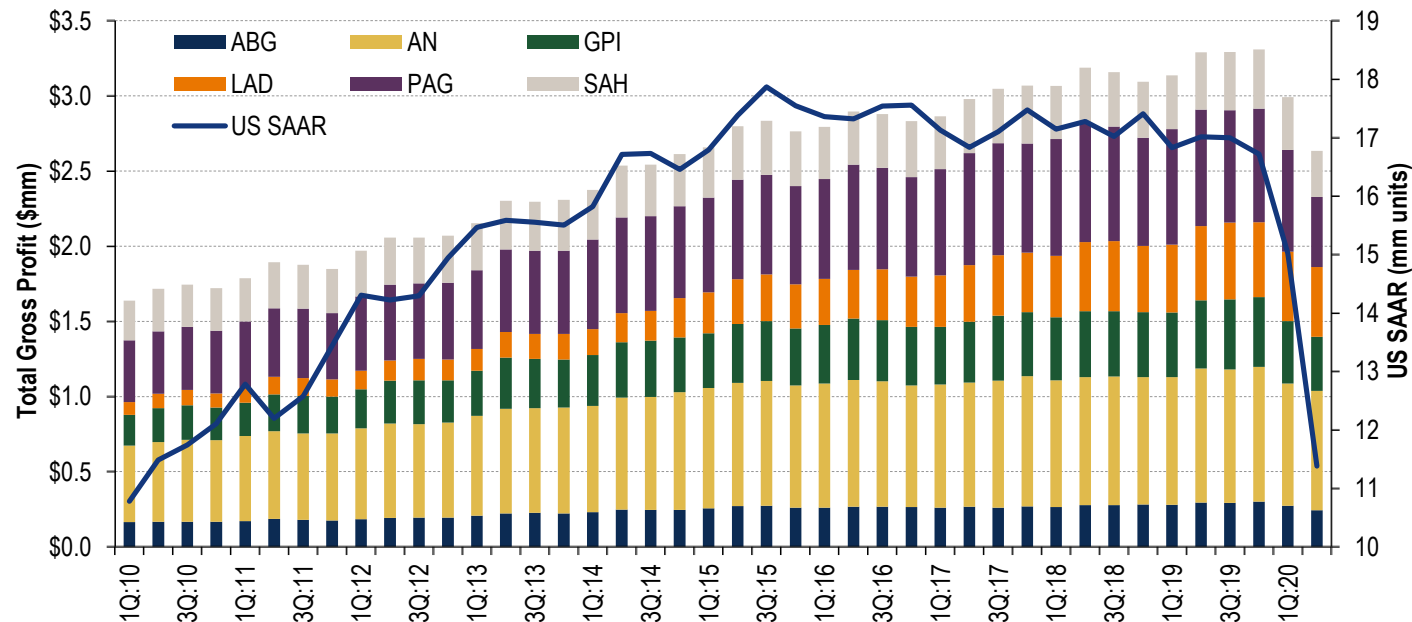
Dealers – Profitable & less cyclical link in auto value chain



Dealers have more flexible/variable cost structures, which has allowed them to maintain relatively stable pre-tax margins through-cycle

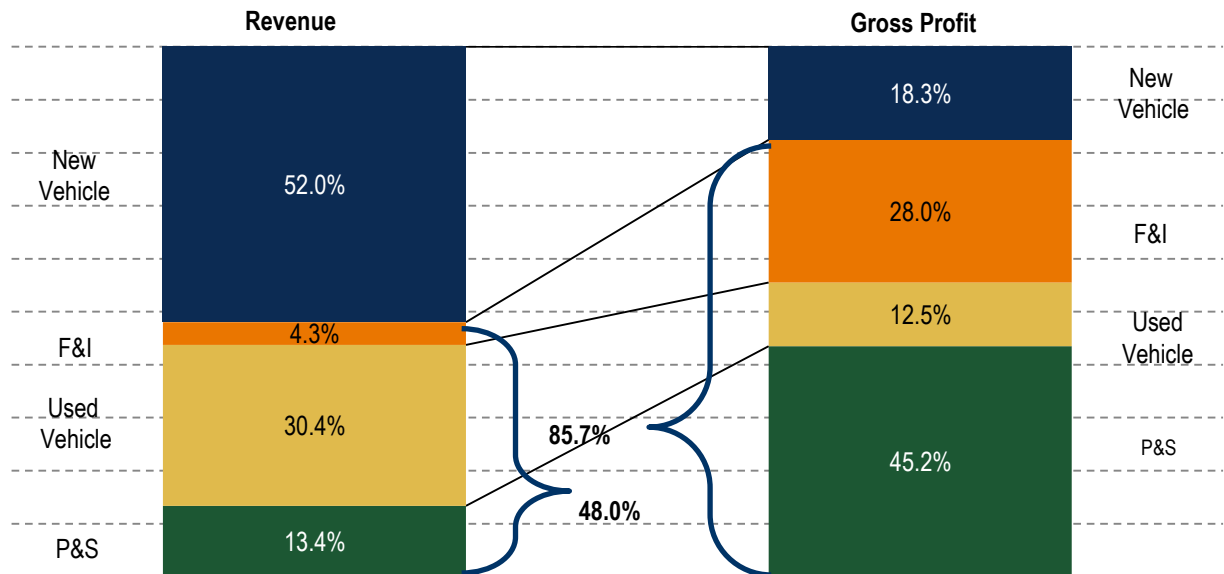


Despite a fade in new vehicle sales in recent years, dealers have largely managed to grow total gross profits, a good proof point of cycle resiliency

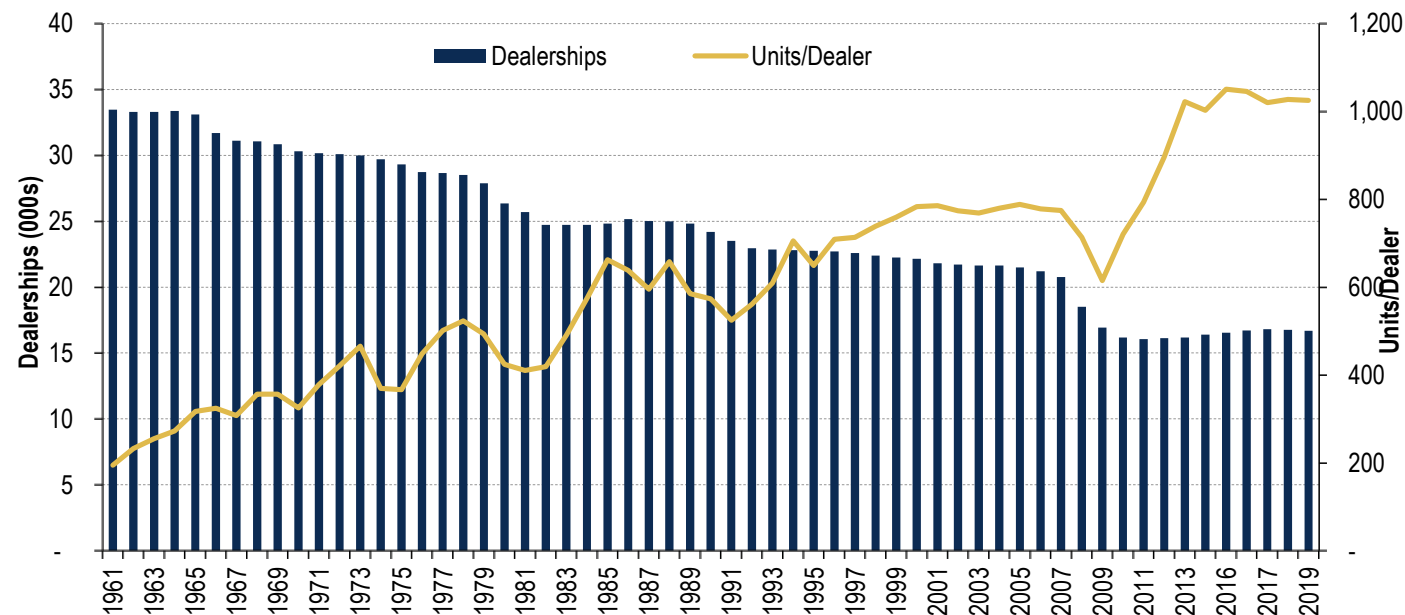


Dealers – Should benefit from back-end businesses & rationalization

For an average dealer, the Used Vehicle, P&S, and F&I business represent roughly 48% of total revenue, but nearly 86% of total gross profit



Back-end business exposure will become increasingly important, as there is a smaller channel of dealers through which these units are flowing for transactions



Source: National Automobile Dealers Association, Company filings, BofA Global Research

Conclusions – Challenges remain, but emerging stronger



- **Global automotive value chain faces a challenging macro environment**
 - In the near-term, global light vehicle sales/production are in a period of synchronized downturn across all regional markets, driven by the COVID-19 pandemic; and we pulled forward our trough estimate for the US cycle to 2020E, with recovery thereafter
 - This macroeconomic environment poses a challenge for companies of mere survival and weathering through the trough versus what had been a decade-long trend of revenue growth, steady margins, efficient capital allocation, and improved returns
- **For the industry in aggregate, product activity remains robust, although an abundance of new models into a softer market may result in overcrowding**
 - Entire industry's overweight on CUV model introductions will likely pressure the segment's profitability to the historically low levels of passenger cars in short order
 - A surge of alternative powertrain vehicles at higher price points may begin to support the development of the EV market in the US
- **However, among OEMs, product activity is varied and relative gaps are opening again**
 - Spectrum of strategies span OEMs with launch cadence focused on traditional high-volume models to OEMs focused on lower-volume niche vehicles (Luxury & EVs)
 - Disparity in replacement rates is not a function of wide differences in total product development spend, but rather allocation towards traditional model launches versus underlying alternative powertrain development
- **Industry is undergoing a significant technological evolution, which is both an issue & opportunity**
 - Companies must remain diligent now in rationalizing the optimizing their Core businesses and investing in Future businesses to fortify their longer-term industry positioning, under the Core to Future transition framework
- **Why we like the auto dealer model ... stable profits and ongoing diversification**
 - Dealers are relatively insulated from cyclical pressures given more resilient/flexible business models and exposure to late-cycle dynamics
 - Dealers are also increasingly investing in new business initiatives and further diversification of the traditional model

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster*
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

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

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