

## State of the Auto Industry

NAMAD Webinar

### US Autos – Equity

**Ryan Brinkman** <sup>AC</sup>

212-622-6581

ryan.j.brinkman@jpmorgan.com

J.P. Morgan Securities LLC

**Bloomberg JPMA BRINKMAN <GO>**

### US Autos – Equity

**Ryan Brinkman** <sup>AC</sup>

212-622-6382

rajat.gupta@jpmorgan.com

J.P. Morgan Securities LLC

**Bloomberg JPMA GUPTA <GO>**

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## Macro Update

# Global Light Vehicle SAAR

	SAAR (MM units)				SAAR (MM units)					Sales (000s units)	
	U.S.	W. Europe	Japan	Developed Market	China	Brazil	Russia	India	BRIC Market	Canada	Mexico
<b>2018</b>											
Jan	17.1	15.3	5.1	37.5	28.5	2.2	1.7	3.9	36.3	117	109
Feb	16.9	14.9	5.0	36.9	28.2	2.3	1.9	3.8	36.2	125	109
Mar	17.2	14.1	5.0	36.3	28.9	2.4	1.9	3.9	37.1	187	118
Apr	17.2	14.4	5.6	37.2	30.7	2.7	1.8	4.2	39.4	191	109
May	17.2	14.8	5.4	37.5	30.0	2.4	1.9	4.4	38.6	215	114
Jun	17.2	14.6	5.2	37.0	28.9	2.4	1.8	4.2	37.3	200	120
Jul	16.7	14.7	5.2	36.6	28.3	2.4	1.6	4.2	36.5	177	114
Aug	16.6	18.4	5.4	40.4	28.2	2.7	1.5	4.1	36.5	181	119
Sep	17.4	11.3	5.0	33.7	26.6	2.5	1.8	3.9	34.8	173	114
Oct	17.5	12.6	5.5	35.6	26.2	2.9	1.7	3.7	34.5	161	117
Nov	17.4	13.3	5.5	36.3	25.3	2.5	2.0	3.8	33.6	144	134
Dec	17.6	12.8	5.0	35.4	25.8	2.2	1.9	3.6	33.6	115	142
<b>2018 Average</b>	17.2	14.3	5.3	36.7	28.0	2.5	1.8	4.0	36.2	1,986	1,420
<b>2019</b>											
Jan	16.6	14.4	5.6	36.6	25.3	2.6	1.9	3.8	33.6	109	111
Feb	16.5	14.9	5.1	36.5	23.0	2.9	2.0	3.8	31.6	122	104
Mar	17.5	14.1	4.7	36.2	26.6	2.5	1.9	3.7	34.7	183	117
April	16.4	14.2	5.8	36.5	23.6	2.6	1.6	3.6	31.4	181	98
May	17.3	14.4	5.5	37.3	23.9	2.8	1.8	3.5	32.0	203	102
June	17.2	14.2	5.0	36.4	27.2	2.7	1.8	3.5	35.2	187	106
July	16.8	14.3	5.2	36.4	27.1	2.6	1.5	3.0	34.2	174	106
Aug	17.0	16.9	5.3	39.1	27.2	2.5	1.6	2.9	34.2	182	108
Sept	17.2	13.1	5.5	35.9	26.6	2.7	1.8	3.1	34.2	167	101
Oct	16.5	13.6	4.2	34.3	26.0	2.8	1.6	3.9	34.2	160	107
Nov	17.1	14.0	4.7	35.8	26.0	2.7	1.9	3.9	34.5	144	134
Dec	16.7	15.3	4.7	36.7	26.5	2.7	1.9	3.7	34.8	111	130
<b>2019 Average</b>	17.0	14.5	5.1	36.5	25.8	2.7	1.8	3.5	33.7	1922	1322
<b>2020</b>											
Jan	16.9	13.4	5.2	35.5	24.5	2.8	1.9	3.6	32.9	113	105
Feb	16.7	13.4	4.4	34.5	3.3	2.8	1.8	3.3	11.2	124	104
Mar	11.4	6.6	4.4	22.4	14.8	1.8	1.9	1.5	20.1	98	87
Apr	8.6	2.8									
<b>2020 Average</b>	13.4	9.0	4.7	30.8	14.2	2.5	1.9	2.8	21.4	112	99

Source: Bureau of Economic Analysis, Ward's Auto, LMC Automotive; and J.P. Morgan estimates. Italicized numbers are estimates.

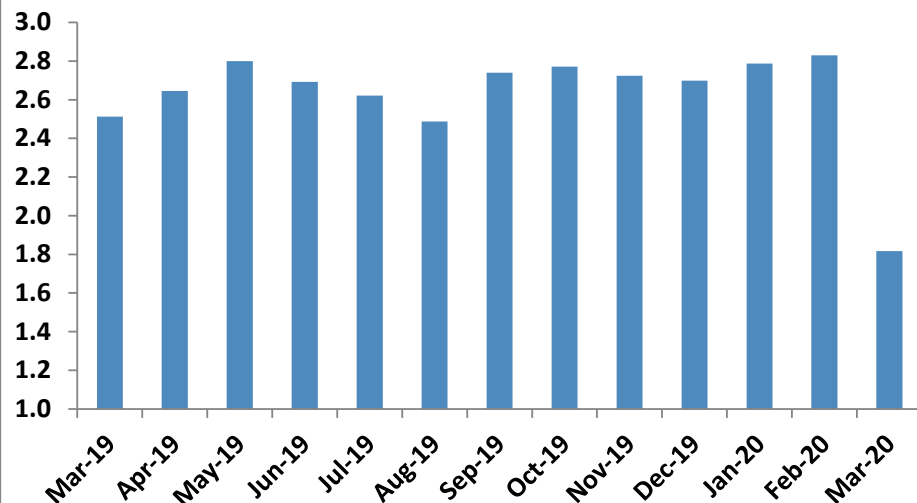
# Global Light Vehicle SAAR (Y/Y % Change)

	SAAR				SAAR					Sales	
	U.S.	W. Europe	Japan	Developed Market	China	Brazil	Russia	India	BRIC Market	Canada	Mexico
<b>2018</b>											
Jan	-1%	5%	1%	<b>1%</b>	2%	22%	26%	15%	<b>5%</b>	6%	-11%
Feb	-2%	3%	-1%	<b>0%</b>	-2%	13%	25%	13%	<b>1%</b>	2%	-7%
Mar	2%	-4%	-3%	<b>-1%</b>	8%	4%	19%	11%	<b>9%</b>	0%	-13%
Apr	2%	8%	2%	<b>4%</b>	21%	46%	13%	10%	<b>20%</b>	-3%	-5%
May	2%	2%	-1%	<b>2%</b>	15%	0%	22%	21%	<b>15%</b>	-1%	-7%
Jun	2%	2%	-7%	<b>1%</b>	3%	1%	8%	39%	<b>6%</b>	-2%	-6%
Jul	0%	9%	5%	<b>4%</b>	-5%	17%	11%	-3%	<b>-3%</b>	-3%	-6%
Aug	1%	27%	1%	<b>11%</b>	-2%	11%	5%	-5%	<b>-2%</b>	-1%	-5%
Sep	-4%	-20%	-3%	<b>-10%</b>	-14%	7%	5%	-4%	<b>-11%</b>	-7%	-2%
Oct	-2%	-10%	12%	<b>-3%</b>	-14%	26%	-2%	6%	<b>-9%</b>	-2%	-5%
Nov	-1%	-8%	9%	<b>-2%</b>	-15%	12%	19%	2%	<b>-10%</b>	-9%	-5%
Dec	1%	-10%	-4%	<b>-4%</b>	-13%	14%	19%	3%	<b>-9%</b>	-7%	-11%
<b>FY2018</b>	0%	0%	1%	<b>-16%</b>	-2%	14%	14%	8%	<b>1%</b>	-2%	-7%
<b>2019</b>											
Jan	-3%	-6%	9%	<b>-3%</b>	-11%	15%	13%	-3%	<b>-8%</b>	-7%	2%
Feb	-2%	0%	2%	<b>-1%</b>	-18%	26%	5%	-2%	<b>-13%</b>	-3%	-5%
Mar	1%	0%	-6%	<b>0%</b>	-8%	5%	-1%	-5%	<b>-6%</b>	-2%	-1%
Apr	-5%	-1%	4%	<b>-2%</b>	-23%	-3%	-11%	-15%	<b>-20%</b>	-5%	-10%
May	1%	-3%	2%	<b>-1%</b>	-20%	19%	-5%	-21%	<b>-17%</b>	-6%	-11%
June	0%	-3%	-3%	<b>-2%</b>	-6%	13%	0%	-17%	<b>-6%</b>	-6%	-11%
July	1%	-3%	1%	<b>-1%</b>	-4%	10%	-7%	-28%	<b>-6%</b>	-1%	-8%
Aug	2%	-8%	-3%	<b>-3%</b>	-3%	-9%	4%	-29%	<b>-6%</b>	1%	-9%
Sept	-1%	16%	9%	<b>6%</b>	0%	11%	1%	-22%	<b>-2%</b>	-3%	-12%
Oct	-6%	8%	-24%	<b>-4%</b>	-1%	-4%	-7%	3%	<b>-1%</b>	-1%	-9%
Nov	-2%	5%	-15%	<b>-1%</b>	3%	8%	-6%	1%	<b>2%</b>	0%	0%
Dec	-5%	19%	-7%	<b>4%</b>	2%	22.0%	-1.4%	3%	<b>3%</b>	-4%	-8%
<b>FY2019</b>	-1%	1%	-3%	<b>-16%</b>	-8%	9%	-1%	-12%	<b>-7%</b>	-3%	-7%
<b>2020</b>											
Jan	2%	-7%	-7%	<b>-3%</b>	-3%	9%	2%	-5%	<b>-2%</b>	4%	-6%
Feb	1%	-10%	-14%	<b>-6%</b>	-86%	-2%	-9%	-13%	<b>-65%</b>	2%	1%
Mar	-35%	-53%	-5%	<b>-38%</b>	-44%	-28%	1%	-58%	<b>-42%</b>	-46%	-25%
Apr	-48%	-80%									
<b>FY2020</b>	-21%	-37%	-9%	<b>-16%</b>	-45%	-7%	7%	-20%	<b>-37%</b>	0%	0%

Source: Bureau of Economic Analysis, Ward's Auto, LMC Automotive; and J.P. Morgan estimates. Italicized numbers are estimates.

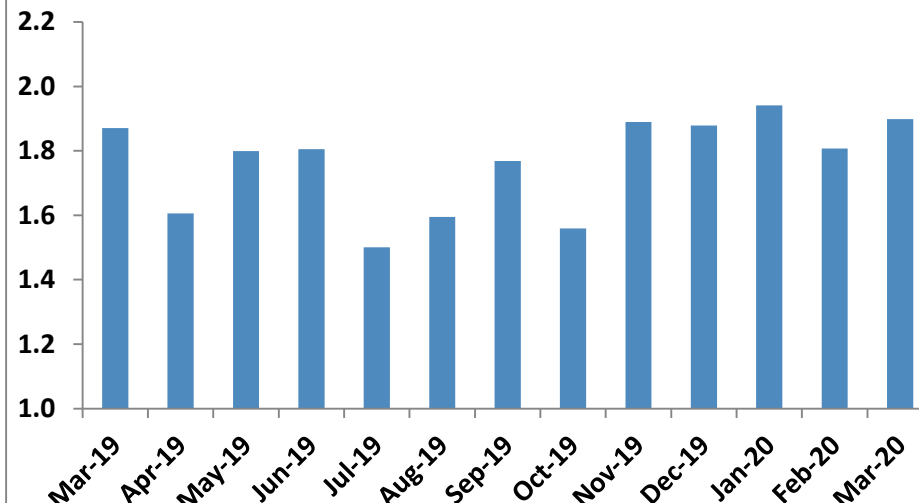
# BRIC Market SAAR Trend

## Brazil LV SAAR



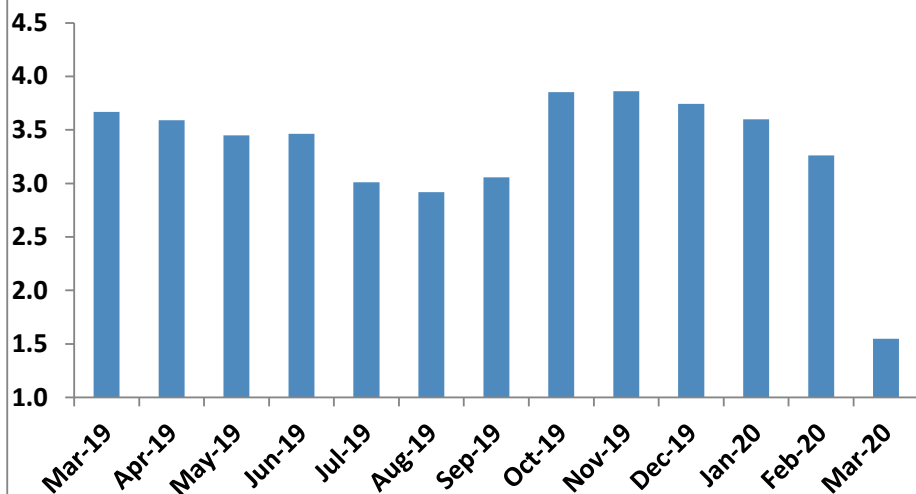
Source: LMC Automotive, ANFAVEA.

## Russia LV SAAR



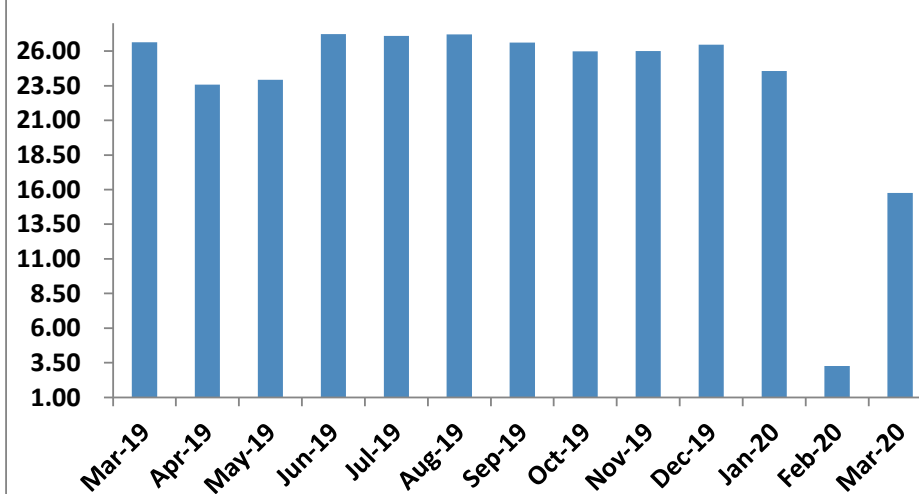
Source: LMC Automotive, AEB.

## India LV SAAR



Source: LMC Automotive, SIAM.

## China LV SAAR

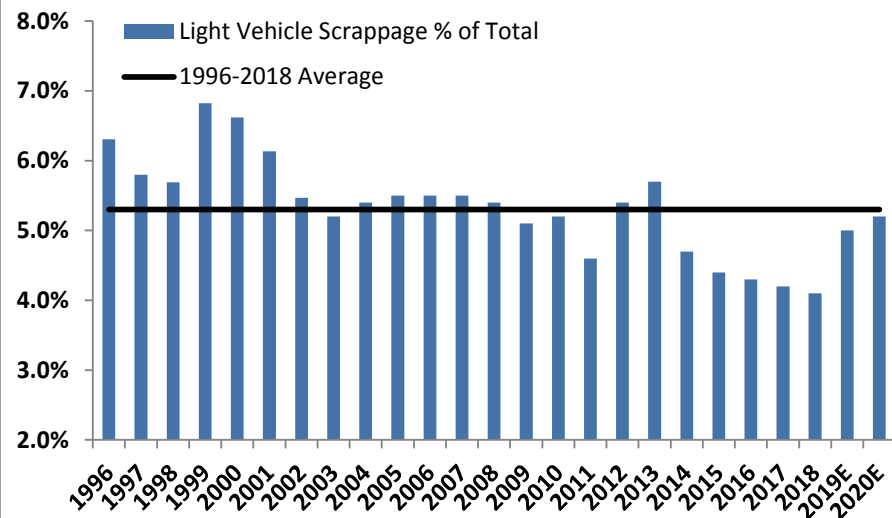


Source: LMC Automotive.

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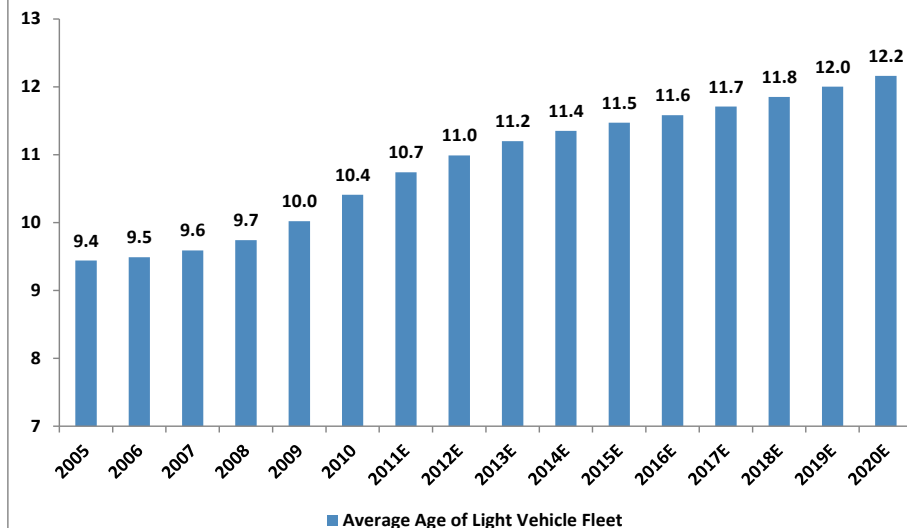
# North America Industry Outlook

## US Light Vehicle Scrappage Rate



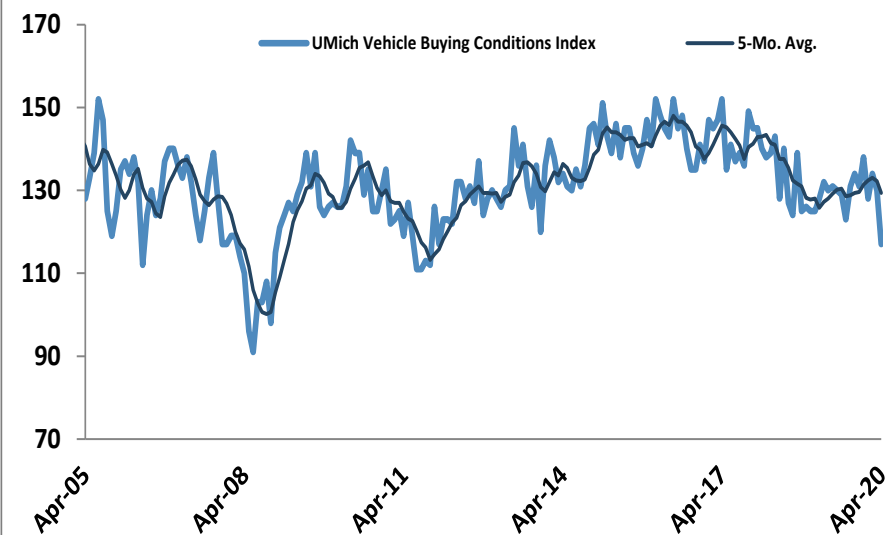
Source: IHS.

## US Average Light Vehicle Age



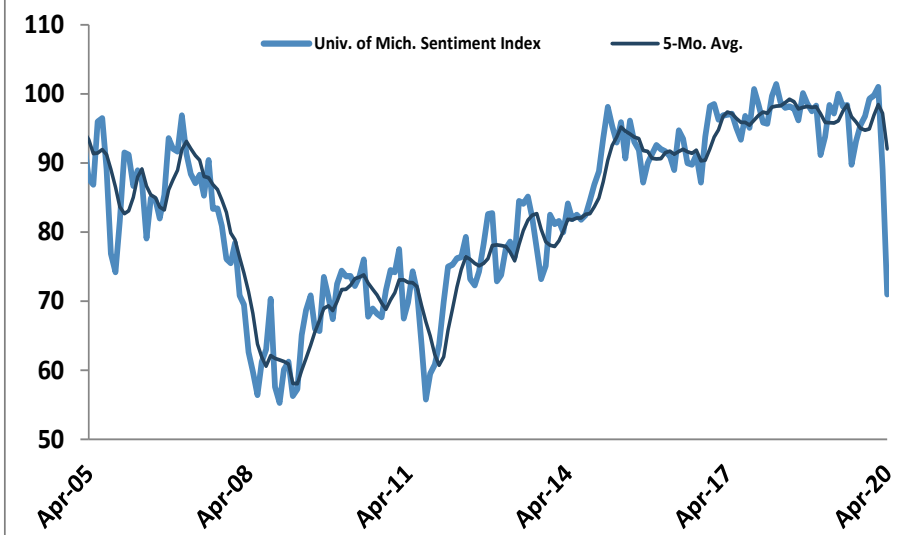
Source: IHS.

## UMich Vehicle Buying Conditions Index



Source: University of Michigan, Bloomberg and J.P. Morgan analysis.

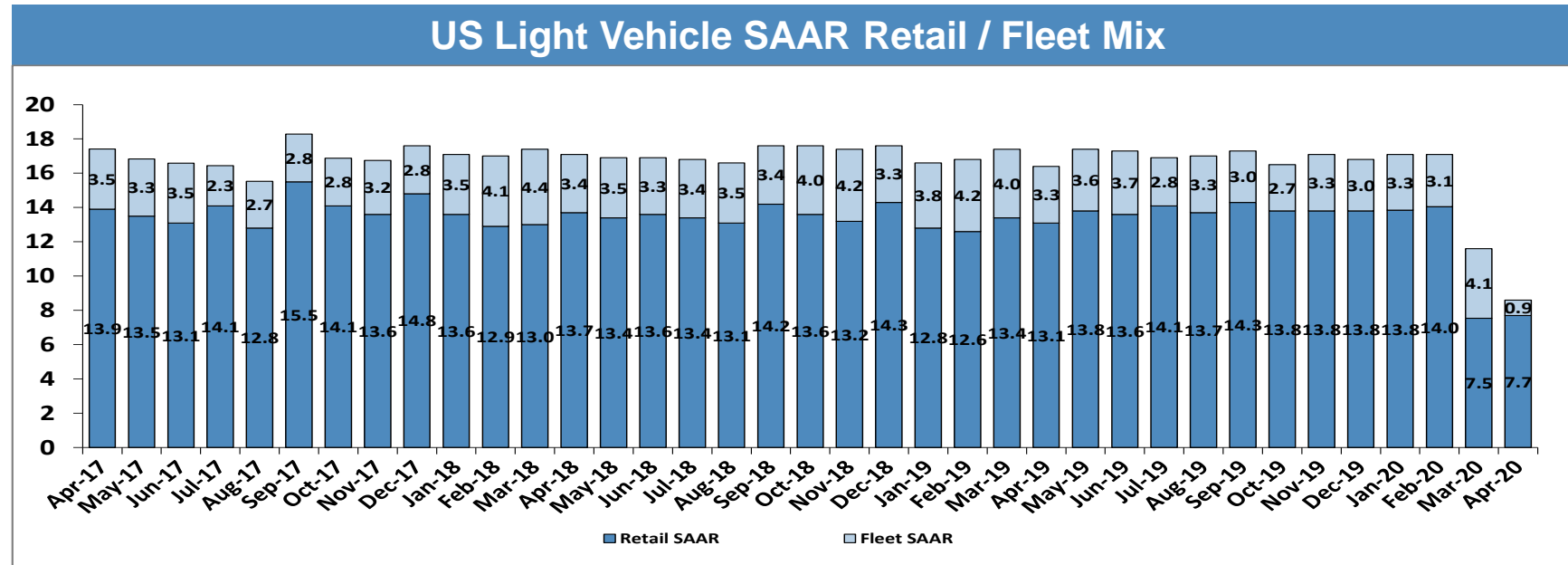
## UMich Consumer Confidence Index



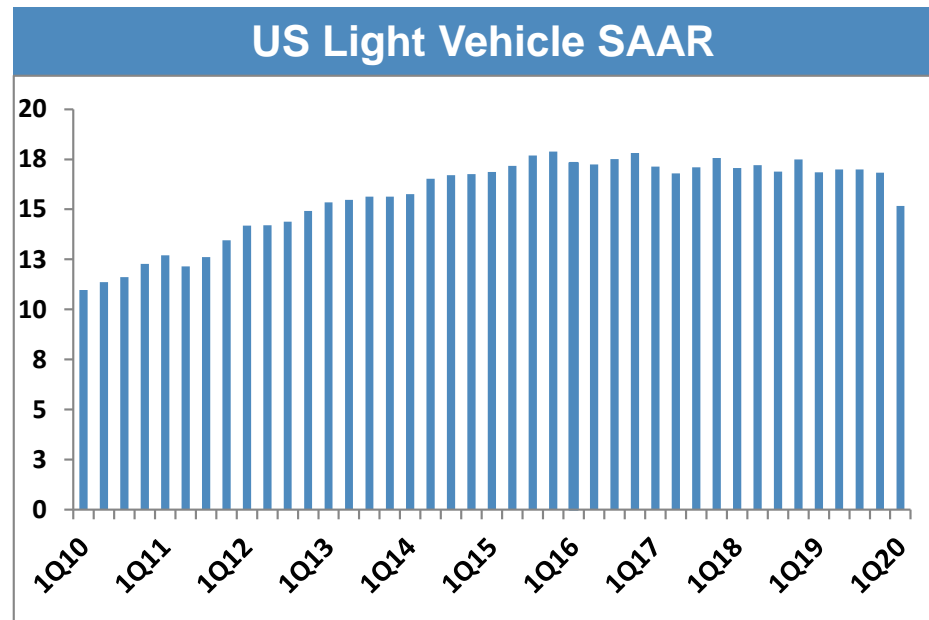
Source: University of Michigan, Bloomberg and J.P. Morgan analysis.

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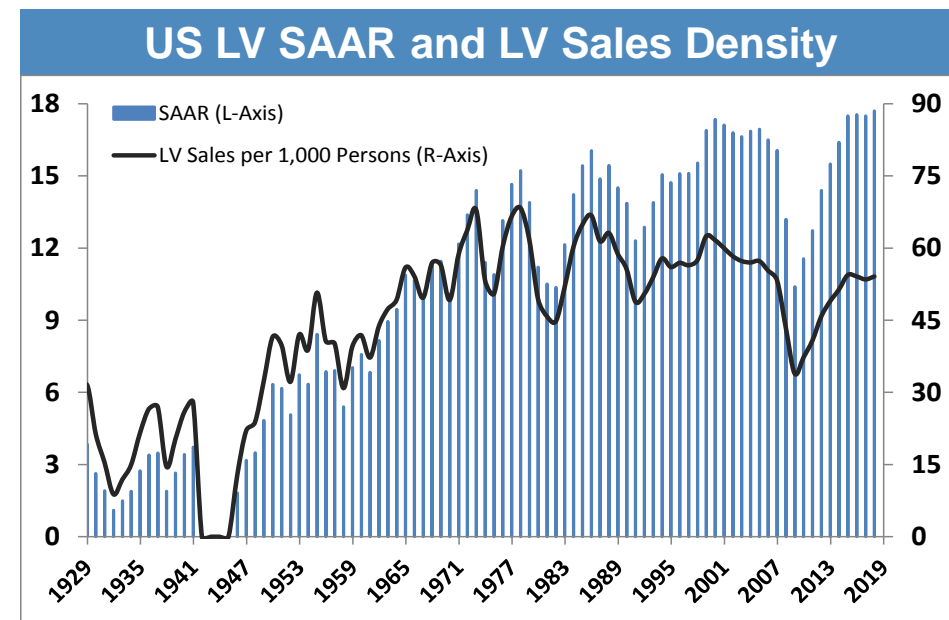
# US Light Vehicle SAAR Retail / Fleet Mix



Source: JPM estimates based on Ford's company reports.



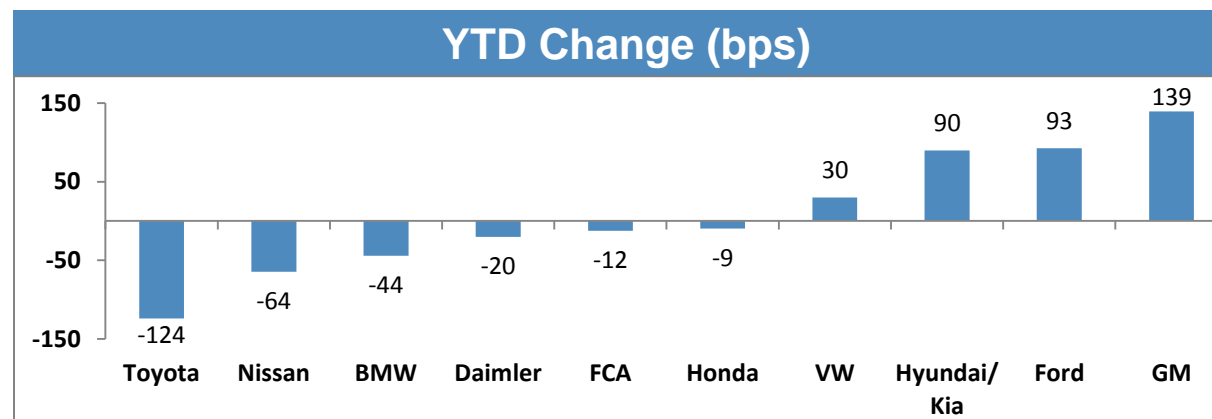
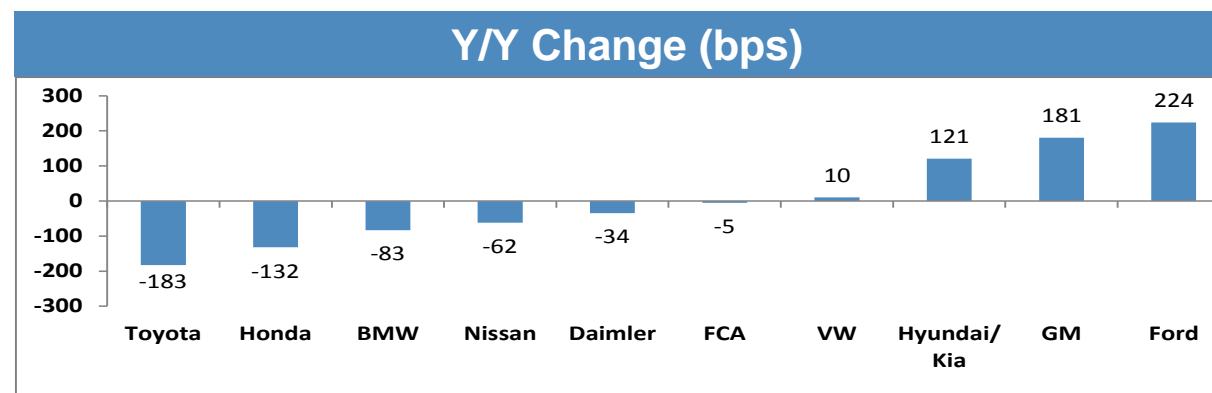
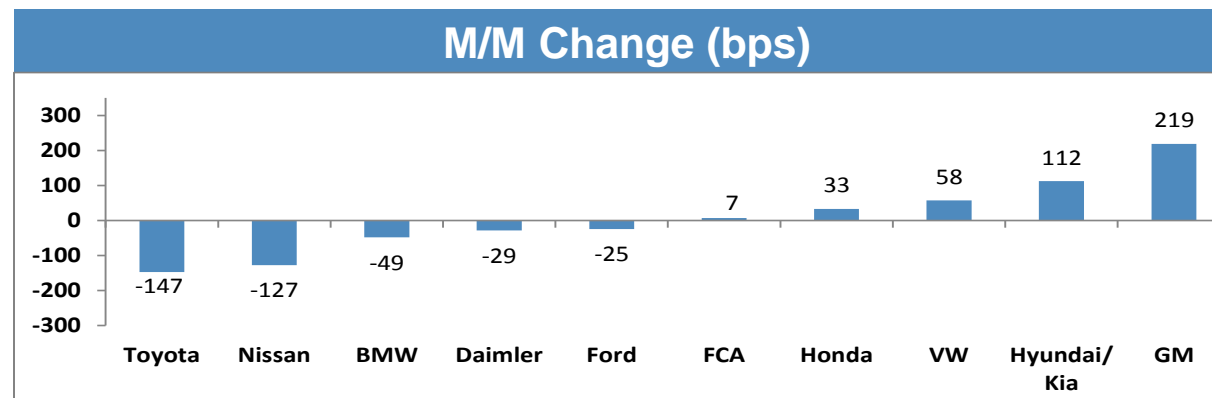
Source: Bureau of Economic Analysis, Ward's Auto, LMC Automotive, J.P. Morgan Estimates. 4Q18 SAAR includes only October.



Source: University of Michigan, Bloomberg and J.P. Morgan analysis.



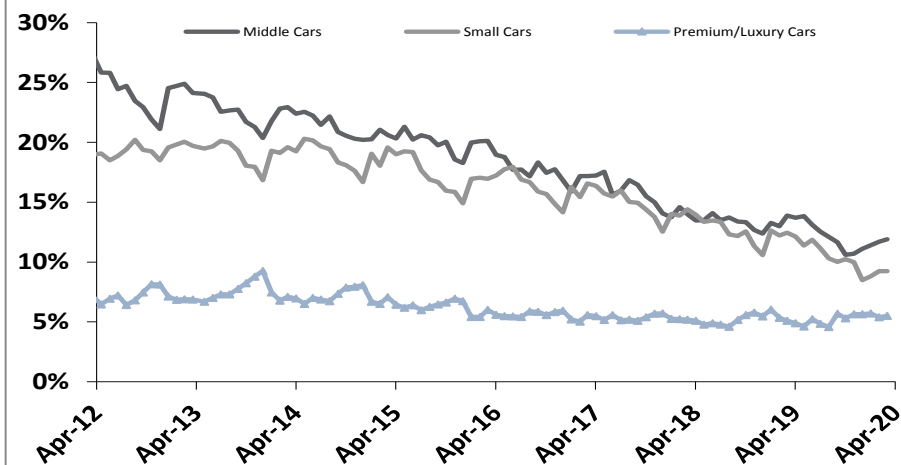
# April and YTD Market Share Trends



Source: Autodata.

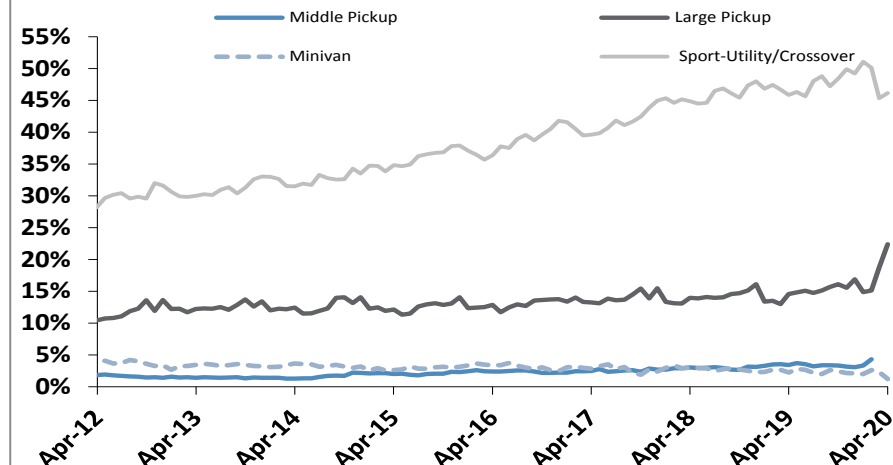
# US Sales by Segment

## Pass. Cars Mix (% of US Light Vehicles)



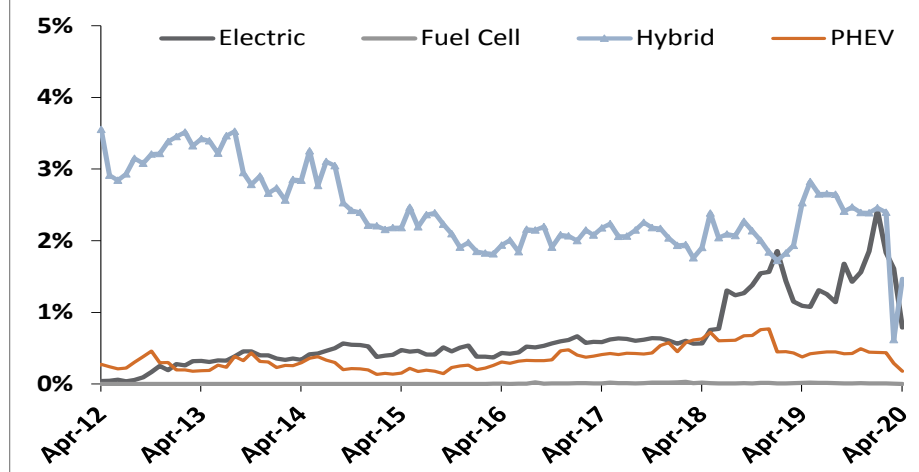
Source: Autodata.

## Light Trucks Mix (% of US Light Vehicles)



Source: Autodata.

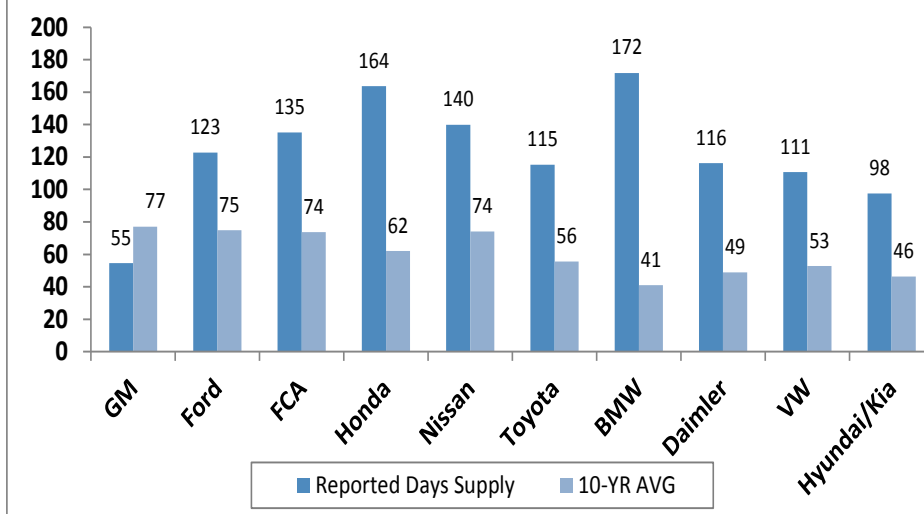
## EV Mix (% of US Lght Vehicles)



Source: Autodata.

# US Dealer Inventories

## Days Supply by OEM vs. 10 Year Average



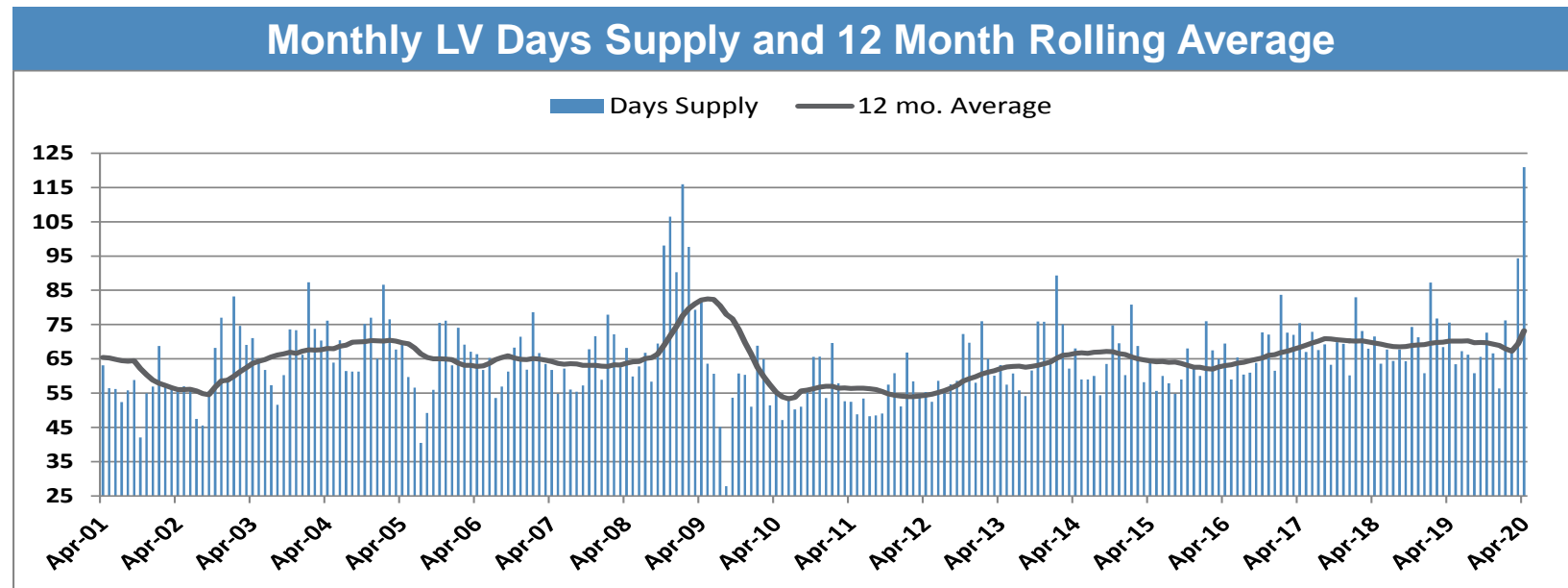
Source: Autodata and J.P Morgan.

## Inventories and Days Supply by OEM

	Apr-19	Jan-20	Feb-20	Mar-20	Apr-20	Variance ('20 vs. '19)
<b>Inventory ('000s)</b>						
GM	807	605	634	658	542	-33%
Ford	695	669	695	672	565	-19%
FCA	635	523	529	556	480	-24%
<b>Total D3</b>	<b>2,137</b>	<b>1,797</b>	<b>1,858</b>	<b>1,885</b>	<b>1,586</b>	<b>-26%</b>
Honda	434	356	381	413	364	-16%
Nissan	305	253	249	259	251	-18%
Toyota	486	364	406	414	377	-22%
<b>Total J3</b>	<b>1,225</b>	<b>973</b>	<b>1,036</b>	<b>1,086</b>	<b>992</b>	<b>-19%</b>
BMW	53	55	56	57	55	3%
Daimler	52	48	49	55	50	-3%
VW	117	121	115	131	121	3%
<b>European</b>	<b>222</b>	<b>224</b>	<b>219</b>	<b>244</b>	<b>226</b>	<b>2%</b>
Hyundai/Kia	227	239	254	268	249	10%
<b>Total Industry</b>	<b>4,025</b>	<b>3,484</b>	<b>3,579</b>	<b>3,736</b>	<b>3,307</b>	<b>-18%</b>
<b>Days Supply</b>						
GM	86	73	69	97	102	19%
Ford	89	107	95	99	123	37%
FCA	91	96	75	108	135	48%
<b>Total D3</b>	<b>89</b>	<b>90</b>	<b>79</b>	<b>101</b>	<b>118</b>	<b>33%</b>
Honda	86	88	83	134	164	90%
Nissan	80	78	65	83	140	76%
Toyota	66	54	54	78	115	74%
<b>Total J3</b>	<b>76</b>	<b>70</b>	<b>65</b>	<b>94</b>	<b>136</b>	<b>80%</b>
BMW	50	65	53	88	172	243%
Daimler	51	50	49	74	116	130%
VW	56	67	59	97	111	96%
<b>European</b>	<b>53</b>	<b>62</b>	<b>55</b>	<b>89</b>	<b>123</b>	<b>130%</b>
Hyundai/Kia	52	71	62	82	98	87%
<b>Total Industry</b>	<b>76</b>	<b>76</b>	<b>68</b>	<b>94</b>	<b>121</b>	<b>60%</b>

Source: Autodata and J.P Morgan.

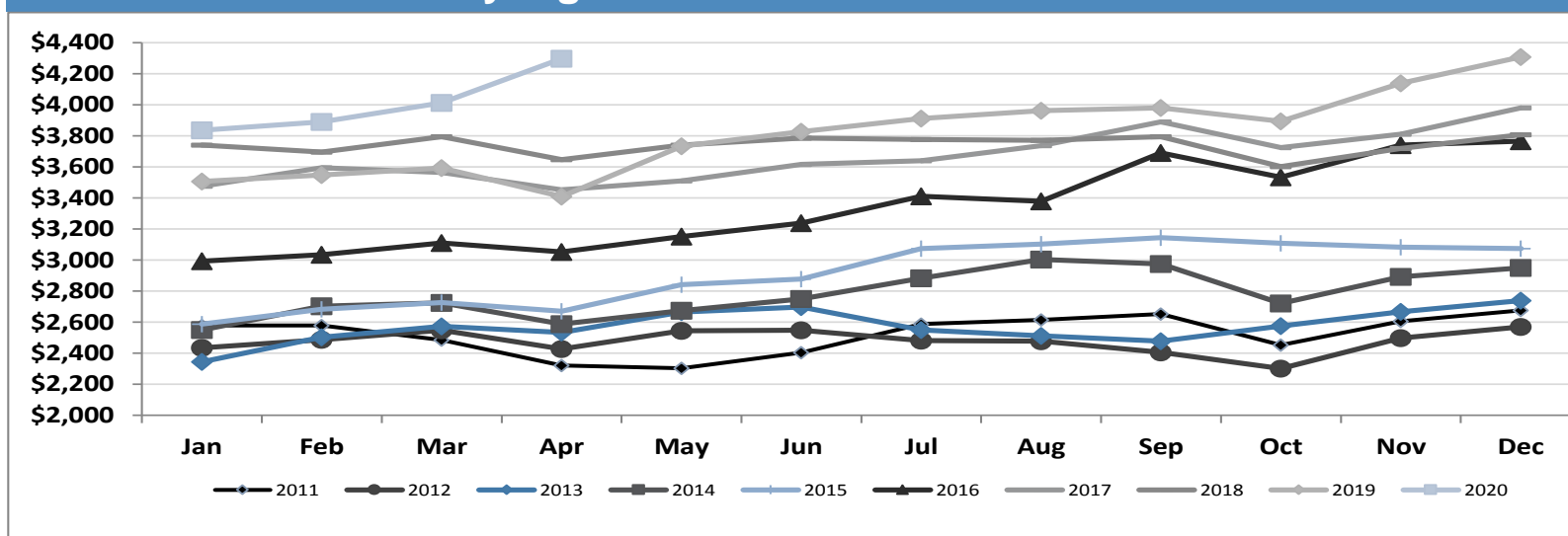
# US Dealer Inventories



Source: Autodata.

# US Retail Incentives

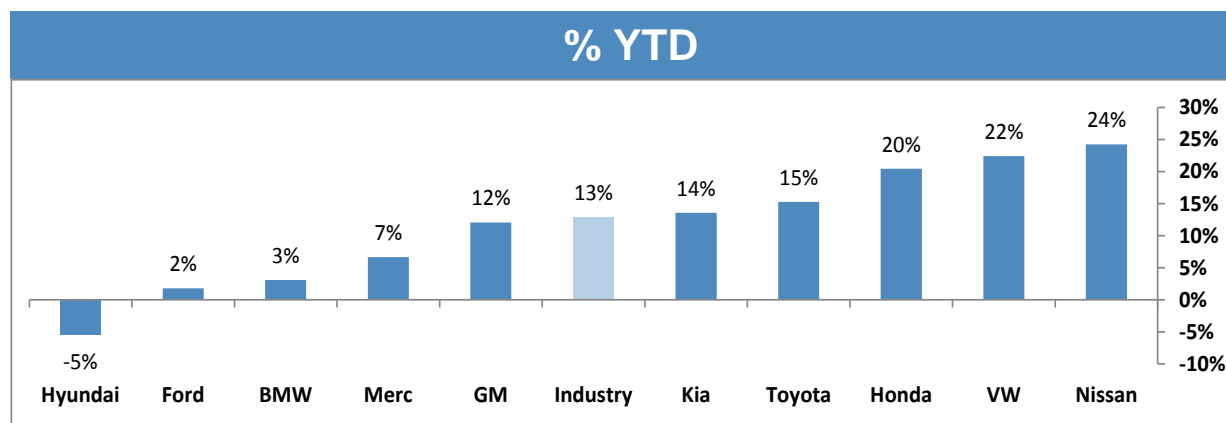
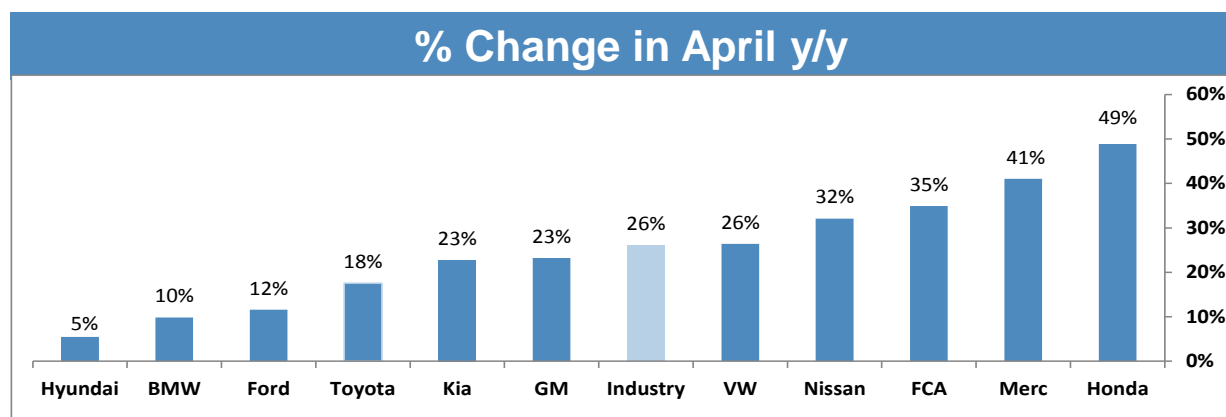
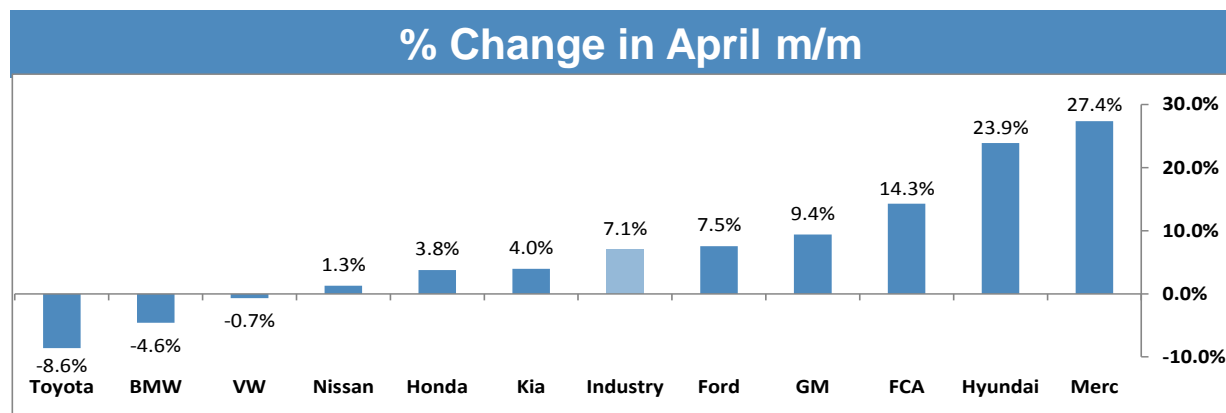
## Monthly Light Vehicle Retail Promotion Costs



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg.	% Y/Y
2009	\$2,691	\$2,993	\$3,116	\$2,928	\$2,873	\$2,828	\$2,737	\$2,548	\$2,743	\$2,658	\$2,694	\$2,633	\$2,776	-0.6%
2010	\$2,545	\$2,723	\$2,804	\$2,702	\$2,829	\$2,873	\$2,852	\$2,778	\$2,743	\$2,556	\$2,551	\$2,645	\$2,718	-2.1%
2011	\$2,579	\$2,578	\$2,484	\$2,320	\$2,303	\$2,403	\$2,587	\$2,615	\$2,653	\$2,452	\$2,605	\$2,675	\$2,520	-7.3%
2012	\$2,435	\$2,487	\$2,547	\$2,428	\$2,545	\$2,548	\$2,482	\$2,478	\$2,405	\$2,301	\$2,497	\$2,570	\$2,484	-1.4%
2013	\$2,345	\$2,502	\$2,573	\$2,533	\$2,664	\$2,697	\$2,550	\$2,511	\$2,478	\$2,574	\$2,667	\$2,739	\$2,576	3.7%
2014	\$2,550	\$2,702	\$2,725	\$2,587	\$2,673	\$2,749	\$2,883	\$3,004	\$2,974	\$2,721	\$2,892	\$2,950	\$2,791	8.4%
2015	\$2,588	\$2,682	\$2,726	\$2,671	\$2,842	\$2,877	\$3,073	\$3,102	\$3,144	\$3,108	\$3,083	\$3,073	\$2,923	4.7%
2016	\$2,992	\$3,035	\$3,110	\$3,052	\$3,151	\$3,237	\$3,410	\$3,378	\$3,690	\$3,533	\$3,741	\$3,766	\$3,348	14.5%
2017	\$3,475	\$3,594	\$3,563	\$3,452	\$3,509	\$3,616	\$3,640	\$3,736	\$3,889	\$3,724	\$3,811	\$3,980	\$3,672	9.7%
2018	\$3,740	\$3,695	\$3,794	\$3,646	\$3,740	\$3,785	\$3,776	\$3,771	\$3,794	\$3,602	\$3,718	\$3,807	\$3,739	1.8%
2019	\$3,506	\$3,548	\$3,641	\$3,402	\$3,733	\$3,826	\$3,911	\$3,962	\$3,980	\$3,893	\$4,138	\$4,307	\$3,821	2.2%
2020	\$3,835	\$3,890	\$4,013	\$4,296										
vs. prior mo.	-11.0%	1.4%	3.2%	7.1%										
vs. prior yr.	9.4%	9.6%	10.2%	26.3%										

Source: Autodata.

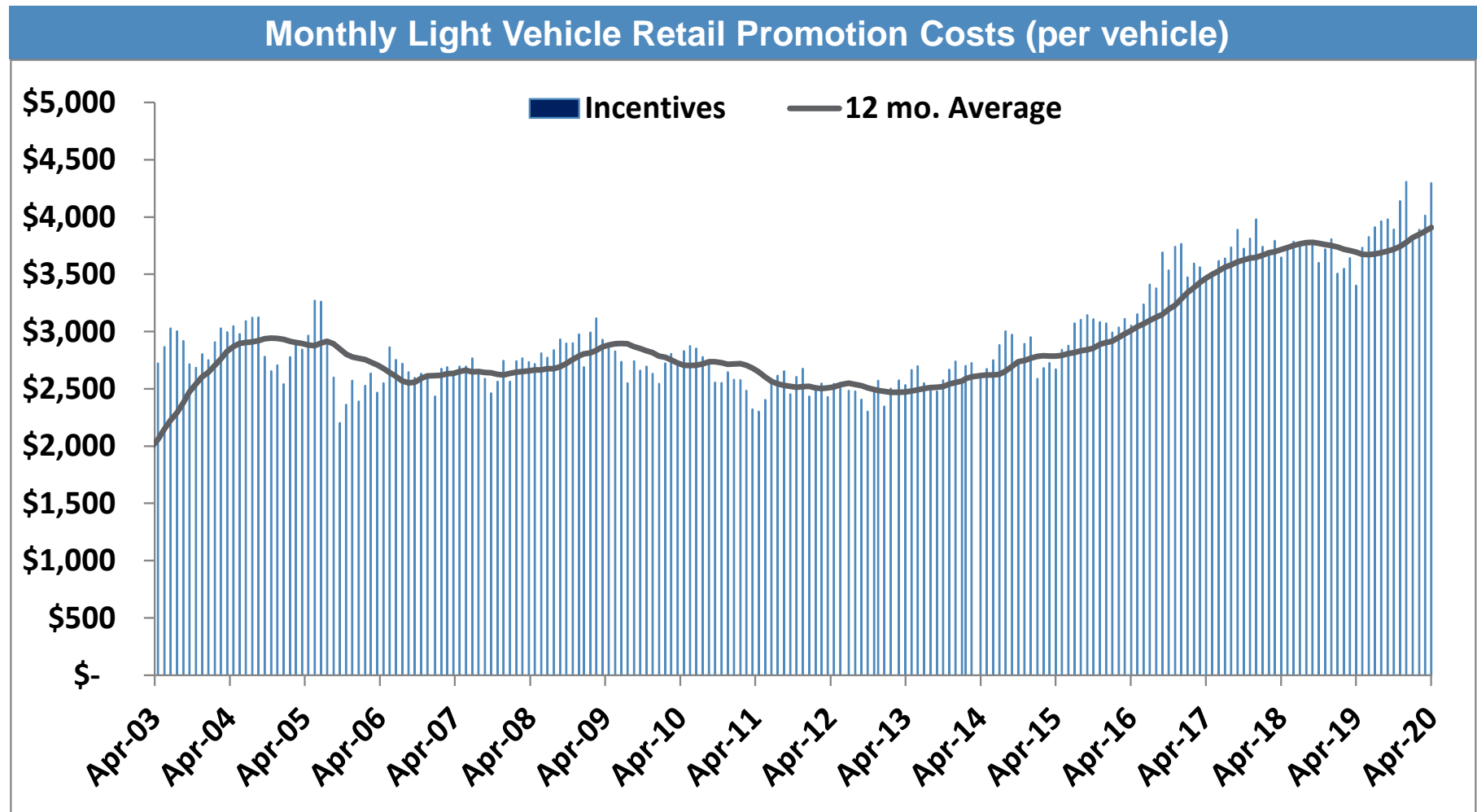
# US Retail Incentives



Source: Autodata.

## US Retail Incentives — (+26.3% in April vs. +10.2% in March)

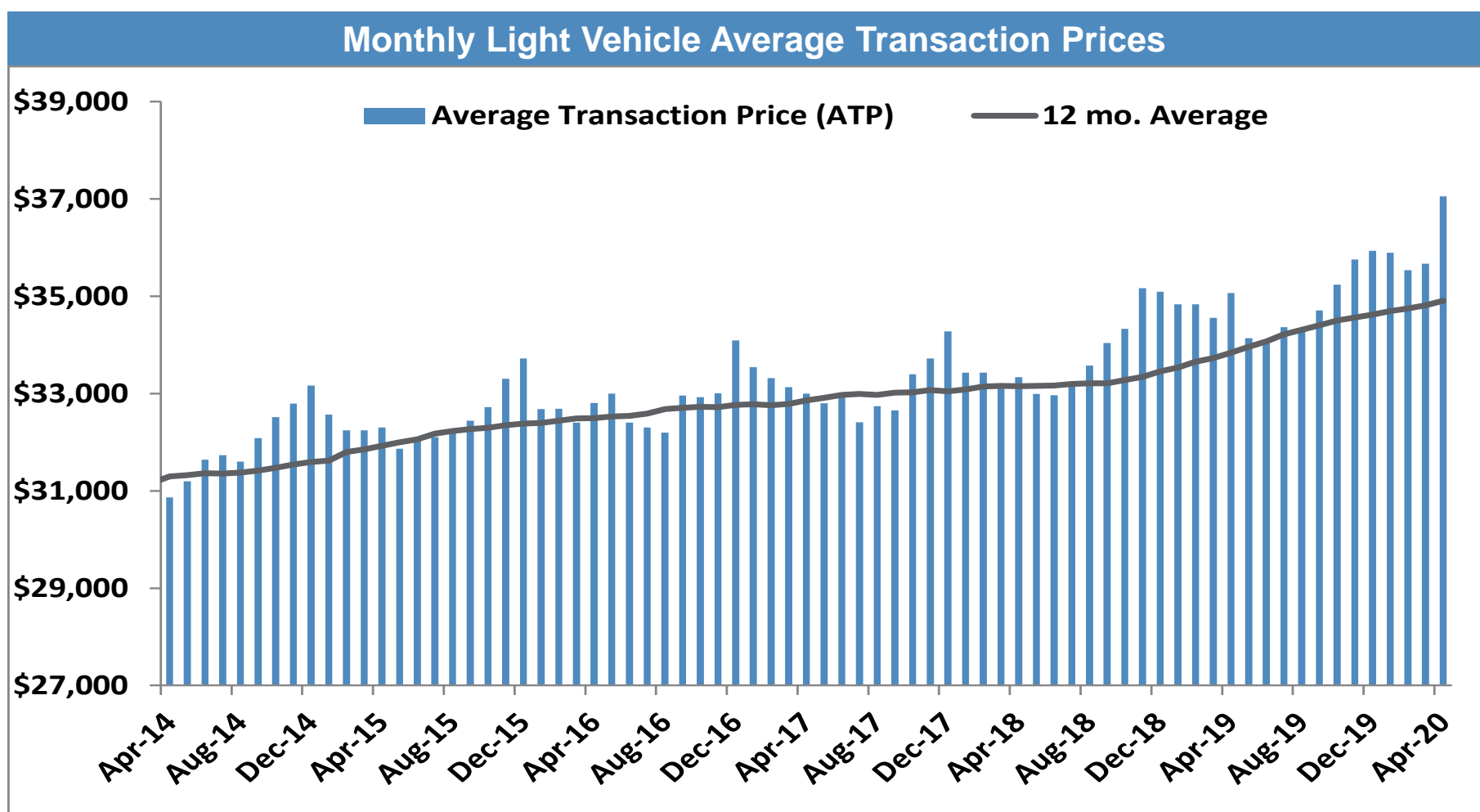
- It is true that retail incentives have tracked notably higher over the past three years, with an inflection in 2015 and 2016.
- Incentives averaged +3.7% y/y in 2013, +8.4% in 2014, +4.7% in 2015, +14.5% in 2016, +9.7% y/y in 2017, +2.0% y/y in 2018, and +2.0% y/y in 2019



Source: Autodata.

## US Retail Average Transaction Prices — (+5.4% in April vs. +3.1% in March vs. +2.0% in February vs. +3.0% in January)

- **An examination of “price/mix” rather than “price at a given mix” paints a different picture.**
  - Stronger “inter-series” mix (higher ASP CUVs, SUVs, and pickup trucks), and stronger “intra-series” mix, is proving more powerful than softer price for particular models.
  - It is hard for us to describe pricing as anything other than strong when ATPs stand at record highs.



Source: TrueCar.



# Key Commodities in a Vehicle

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	Avg
<b>Hot Rolled Steel <sup>1</sup> ( US dollars/ short ton)</b>														
2018	690	750	861	896	915	916	930	908	878	857	835	768	850	34%
2019	709	720	733	722	636	566	570	611	575	518	533	574	622	-27%
2020	615	615	618	540										
vs. prior mo.	7%	0%	0%	-13%										
<b>Cold Rolled Steel <sup>1</sup> (US dollars/ short ton)</b>														
2018	881	923	965	1,017	1,015	1,015	1,015	1,004	983	977	955	889	970	16%
2019	819	830	843	840	765	763	742	789	786	728	738	778	785	-19%
2020	816	820	827	749										
vs. prior mo.	5%	0%	1%	-9%										
<b>Aluminum <sup>2</sup> (US dollars/ Metric ton)</b>														
2018	1,870	1,861	1,805	1,920	1,850	1,724	1,770	1,595	1,404	1,344	1,380	1,383	1,659	-4%
2019	1,455	1,462	1,431	1,350	1,310	1,216	1,305	1,147	1,175	1,365	1,344	1,320	1,323	-20%
2020	1,375	1,356	1,155	1,196										
vs. prior mo.	4%	-1%	-15%	4%										
<b>Stainless Steel <sup>3</sup> (US dollars/short ton)</b>														
2018	2,702	2,675	2,815	2,754	2,551	2,472	2,572	2,528	2,363	2,198	2,064	2,038	2,477	8%
2019	2,030	2,238	2,260	2,269	2,123	2,107	2,049	2,201	2,335	2,252	2,114	2,140	2,177	-12%
2020	1,959	1,910	1,932	1,893										
vs. prior mo.	-8%	-3%	1%	-2%										
<b>Natural Rubber Price <sup>4</sup> (US cents/pound)</b>														
2018	68	68	63	65	68	62	60	62	61	56	56	59	62	-17%
2019	61	69	65	68	67	66	62	60	59	61	63	70	64	3%
2020	64	61	51	54										
vs. prior mo.	-9%	-5%	-16%	5%										
<b>Synthetic Rubber Price <sup>5</sup> (US dollars/Metric ton)</b>														
2018	1,210	1,256	1,409	1,455	1,502	1,563	1,532	1,532	1,547	1,532	1,533	1,256	1,444	2%
2019	1,241	1,226	1,226	1,226	1,226	1,180	1,149	1,118	1,118	1,103	1,087	1,042	1,162	-20%
2020	1,057	1,087	1,042	827										
vs. prior mo.	1%	3%	-4%	-21%										
<b>Polypropylene <sup>6</sup> (Cents/Pound)</b>														
2018	77	73	75	76	81	76	75	76	75	73	66	58	73	13%
2019	56	54	52	52	55	52	53	53	53	51	49	46	52	-29%
2020	45	43	40	40										
vs. prior mo.	-3%	-4%	-7%	0%										
<b>Copper <sup>2</sup> (US dollars/ Metric ton)</b>														
2018	7,079	6,895	6,679	6,770	6,845	6,625	6,279	5,968	6,264	6,037	6,227	5,949	6,468	3%
2019	6,151	6,556	6,487	6,403	5,806	5,982	5,902	5,656	5,695	5,770	5,926	6,149	6,040	-7%
2020	5,551	5,617	4,939	5,160										
vs. prior mo.	-10%	1%	-12%	4%										
<b>Lead <sup>2</sup> (US dollars/ Metric ton)</b>														
2018	2,621	2,496	2,395	2,321	2,446	2,405	2,141	2,058	2,023	1,902	1,961	2,007	2,231	-5%
2019	2,100	2,145	2,002	1,959	1,795	1,917	1,999	2,013	2,127	2,171	1,927	1,914	2,006	-10%
2020	1,898	1,887	1,734	1,610										
vs. prior mo.	-1%	-1%	-8%	-7%										

Source: Bloomberg, Datastream, Wardsauto.com and J.P. Morgan estimates.

\*Commodities we track represent approximately 87% of the total raw material by weight in a light vehicle.

<sup>1</sup> Hot rolled steel and Cold rolled steel prices from Bloomberg

<sup>2</sup> Aluminium, Lead and Copper Cash (Spot) market prices from LME

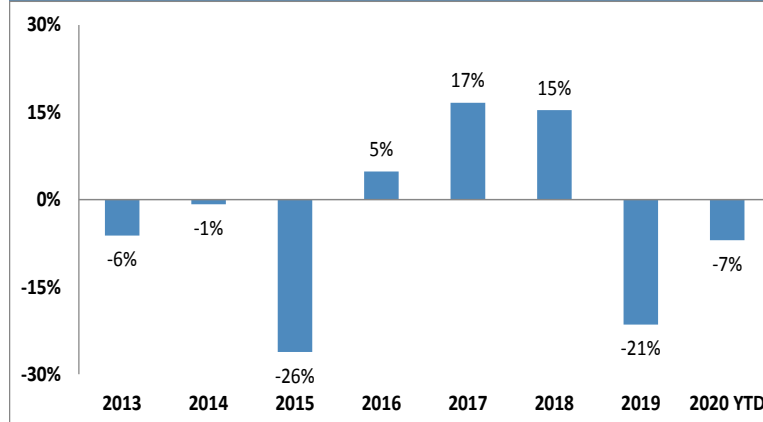
<sup>3</sup> Stainless Steel Asia 2mm CR Coil from MBSTCHSC Index

<sup>4</sup> Natural Rubber RSS3 (Pre Jan-09); TSR20, Singapore Commodity Exchange (Jan 09- Dec 2011), Bloomberg (Jan 2011-Present)

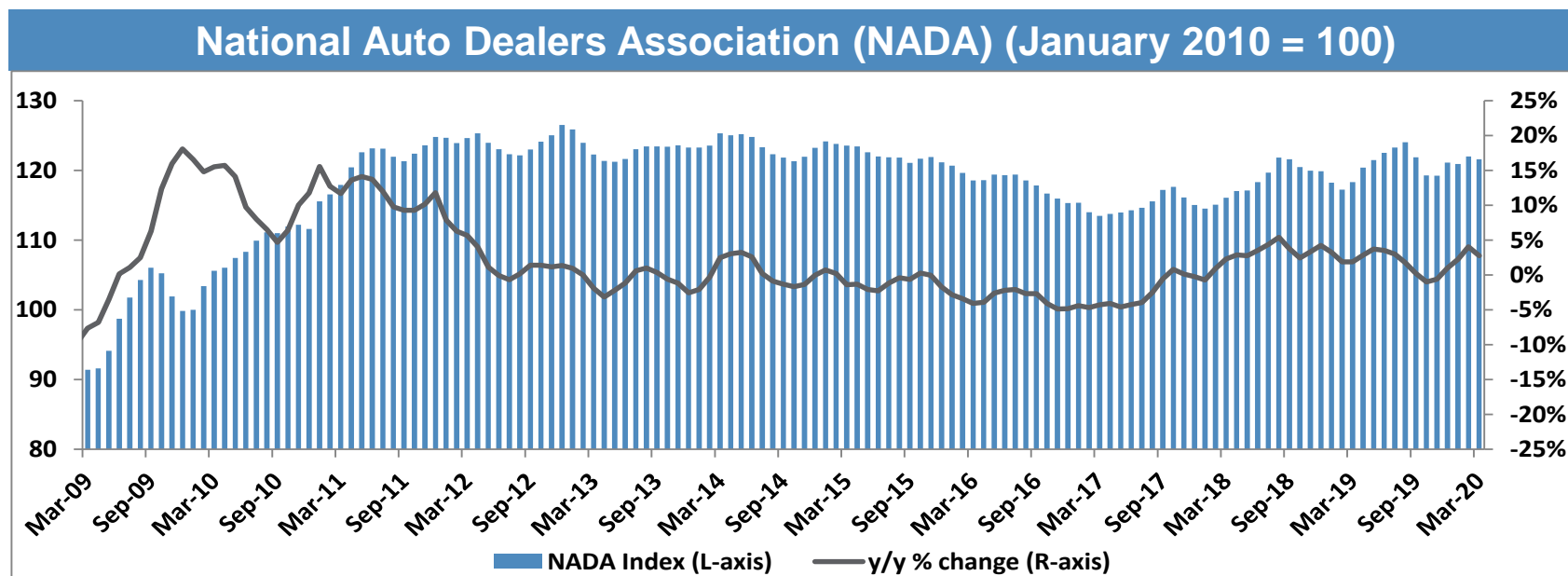
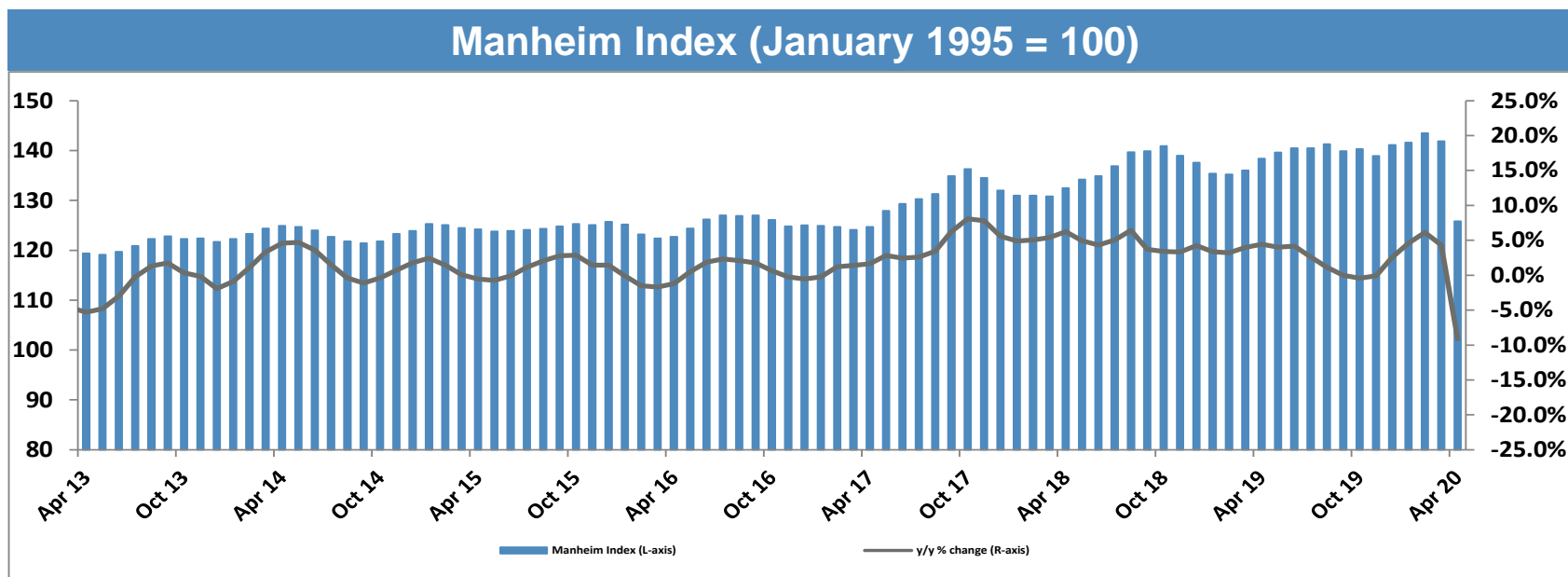
<sup>5</sup> Synthetic rubber price from CMAI ( SBR 1500)

<sup>6</sup> Polypropylene NA Domestic Market (Contract) GP- Homopolymer from CMAI

## Weighted Commodity Index Y/Y Change



# US Used Car Prices



# Western Europe SAAR

	Western Europe	Germany	France	UK	Italy	Spain	Other Western Europe
<b>2017</b>							
Jan	14.7	3.6	2.2	2.7	1.9	1.2	3.0
Feb	14.6	3.5	2.1	2.8	2.1	1.1	3.1
Mar	14.7	3.5	2.2	2.8	2.1	1.1	3.0
Apr	13.4	3.2	2.0	2.2	1.8	1.3	2.9
May	14.5	3.6	2.2	2.3	2.0	1.3	3.1
Jun	14.4	3.5	2.1	2.5	2.0	1.2	3.1
Jul	13.5	3.4	1.9	2.4	1.8	1.1	2.9
Aug	14.5	3.5	2.2	2.5	2.0	1.2	3.0
Sep	14.2	3.4	2.1	2.4	2.0	1.3	3.0
Oct	14.0	3.4	2.1	2.4	1.9	1.3	3.0
Nov	14.6	3.5	2.4	2.3	2.0	1.3	3.0
Dec	14.3	3.6	2.1	2.4	1.9	1.4	2.8
<b>2017 Average</b>	14.3	3.5	2.1	2.5	2.0	1.2	3.0
<b>2018</b>							
Jan	15.3	4.0	2.2	2.5	2.0	1.5	3.1
Feb	14.9	3.7	2.1	2.7	2.1	1.2	3.1
Mar	14.1	3.3	2.2	2.5	2.0	1.1	3.0
Apr	14.4	3.5	2.2	2.4	1.9	1.4	3.1
May	14.8	3.5	2.3	2.4	2.0	1.3	3.2
Jun	14.6	3.4	2.2	2.4	1.9	1.3	3.4
Jul	14.7	3.8	2.3	2.4	1.9	1.4	3.0
Aug	18.4	4.4	3.1	3.1	2.3	1.9	3.6
Sep	11.3	2.5	1.9	2.0	1.6	1.1	2.2
Oct	12.6	3.0	2.0	2.2	1.8	1.1	2.5
Nov	13.3	3.2	2.1	2.3	1.9	1.2	2.7
Dec	12.8	3.3	1.8	2.2	1.9	1.3	2.2
<b>2018 Average</b>	14.3	3.5	2.2	2.4	1.9	1.3	2.9
<b>2019</b>							
Jan	14.4	3.8	2.2	2.4	1.8	1.3	3.0
Feb	14.9	3.8	2.2	2.7	2.0	1.2	3.0
March	14.1	3.4	2.2	2.3	1.8	1.2	3.1
April	14.2	3.5	2.1	2.3	1.9	1.4	3.0
May	14.4	3.7	2.2	2.3	1.9	1.3	3.0
June	14.2	3.5	2.2	2.4	1.8	1.3	3.0
July	14.3	3.8	2.2	2.3	1.9	1.2	3.0
August	16.9	4.3	2.6	3.1	2.2	1.4	3.3
Sept	13.1	3.0	2.2	2.0	1.8	1.3	2.8
Oct	13.6	3.3	2.2	2.1	1.9	1.2	2.8
Nov	14.0	3.5	2.2	2.3	1.9	1.2	2.9
Dec	15.3	4.0	2.4	2.3	2.2	1.4	3.1
<b>2019 Average</b>	14.5	3.6	2.2	2.4	1.9	1.3	3.0
<b>2020</b>							
Jan	13.4	3.6	1.9	2.3	1.8	1.2	2.7
Feb	13.4	3.3	2.0	2.5	1.7	1.1	2.7
Mar	6.6	2.1	0.6	1.3	0.3	0.4	1.9
Apr	2.8	1.4	0.2	0.1	0.0	0.0	1.0
<b>2020 Average</b>	9.0	2.6	1.2	1.5	0.9	0.7	2.4

Source: LMC Automotive, ACEA and J.P. Morgan estimates.

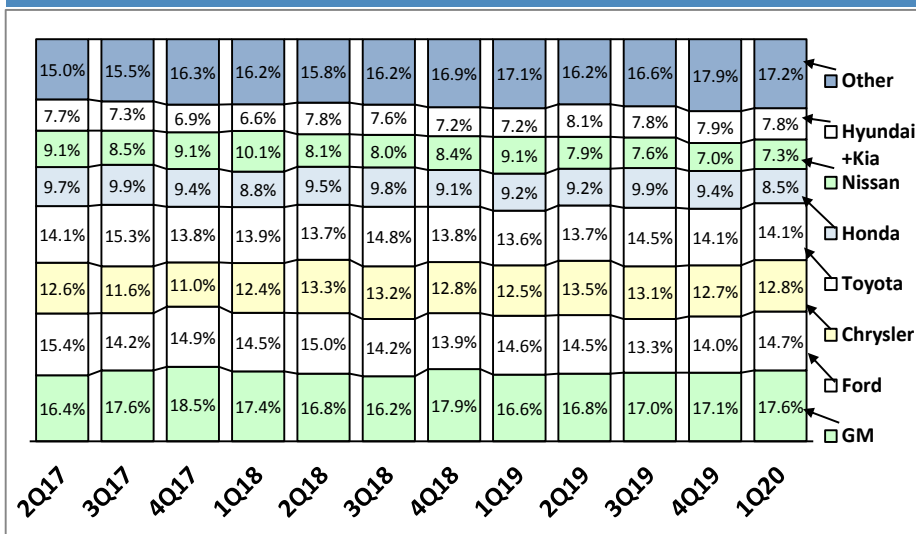
# Western Europe SAAR (Y/Y % Change)

	Western Europe	Germany	France	UK	Italy	Spain	Other Western Europe
<b>2017</b>							
Jan	5%	4%	8%	2%	4%	10%	8%
Feb	3%	-2%	1%	3%	8%	5%	7%
Mar	3%	3%	2%	-2%	11%	6%	1%
Apr	1%	0%	2%	-8%	4%	12%	5%
May	3%	9%	7%	-13%	7%	7%	4%
Jun	3%	1%	4%	-5%	13%	6%	5%
Jul	1%	-1%	12%	-9%	6%	2%	3%
Aug	4%	4%	8%	-8%	17%	14%	1%
Sep	-2%	-4%	-1%	-10%	9%	3%	-4%
Oct	5%	7%	14%	-12%	8%	13%	6%
Nov	4%	9%	9%	-12%	6%	7%	5%
Dec	-2%	5%	2%	-13%	6%	18%	-12%
<b>2017 Average</b>	2%	3%	6%	-7%	8%	8%	2%
<b>2018</b>							
Jan	5%	12%	1%	-10%	4%	22%	5%
Feb	3%	8%	3%	-2%	-1%	8%	1%
Mar	-4%	-3%	2%	-12%	-5%	-4%	0%
Apr	8%	8%	8%	6%	7%	9%	8%
May	2%	-2%	4%	4%	-2%	7%	5%
Jun	1%	-3%	5%	-3%	-7%	8%	9%
Jul	9%	13%	19%	2%	5%	20%	1%
Aug	27%	27%	42%	22%	13%	55%	20%
Sep	-20%	-27%	-10%	-17%	-21%	-16%	-25%
Oct	-10%	-12%	-3%	-4%	-9%	-12%	-18%
Nov	-8%	-8%	-11%	-2%	-5%	-11%	-13%
Dec	-10%	-7%	-14%	-8%	1%	-9%	-21%
<b>2018 Average</b>	0%	0%	4%	-2%	-2%	6%	-2%
<b>2019</b>							
Jan	-6%	-5%	-2%	-2%	-11%	-16%	-6%
Feb	0%	2%	2%	1%	-4%	-4%	-2%
March	0%	3%	0%	-6%	-9%	8%	4%
April	-1%	0%	-3%	-2%	0%	-1%	-2%
May	-3%	4%	-4%	-4%	-1%	-7%	-8%
June	-3%	3%	-1%	0%	-2%	-4%	-11%
July	-3%	0%	-4%	-6%	0%	-12%	0%
August	-8%	-2%	-15%	-1%	-3%	-29%	-9%
Sept	17%	22%	17%	1%	15%	19%	25%
Oct	8%	12%	9%	-7%	8%	7%	15%
Nov	5%	9%	5%	-1%	3%	3%	8%
Dec	19%	19%	28%	3%	14%	7%	39%
<b>2019 Average</b>	1%	5%	1%	-2%	0%	-4%	3%
<b>2020</b>							
Jan	-7%	-5%	-12%	-7%	-2%	-4%	-10%
Feb	-10%	-14%	-7%	-6%	-12%	-10%	-10%
Mar	-53%	-38%	-72%	-44%	-85%	-69%	-39%
Apr	-80%	-61%	-89%	-97%	-98%	-96%	-66%
<b>2020 Average</b>	-37%	-29%	-47%	-35%	-51%	-47%	-19%

Source: LMC Automotive, ACEA and J.P. Morgan estimates.

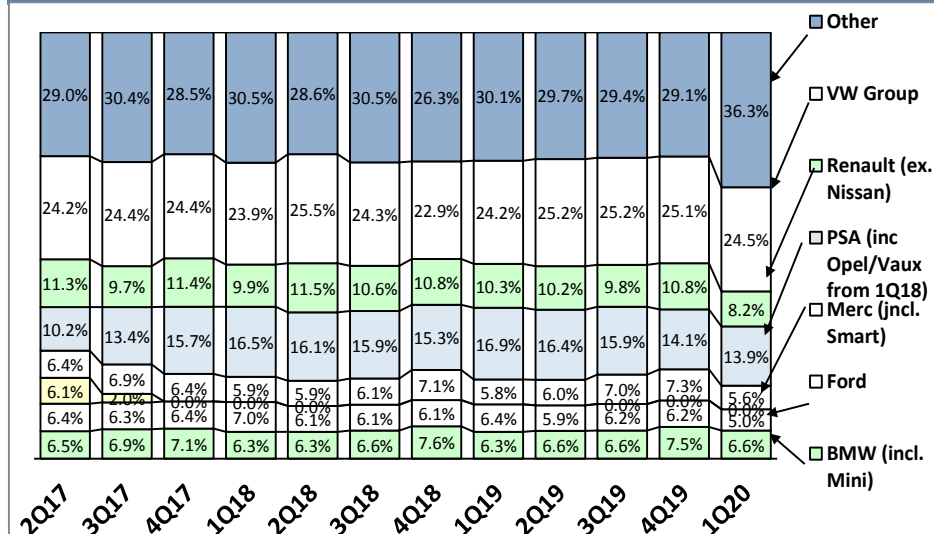
# OEM Market Share in US, Pan-Europe, and Japan

## US Market Share by OEM



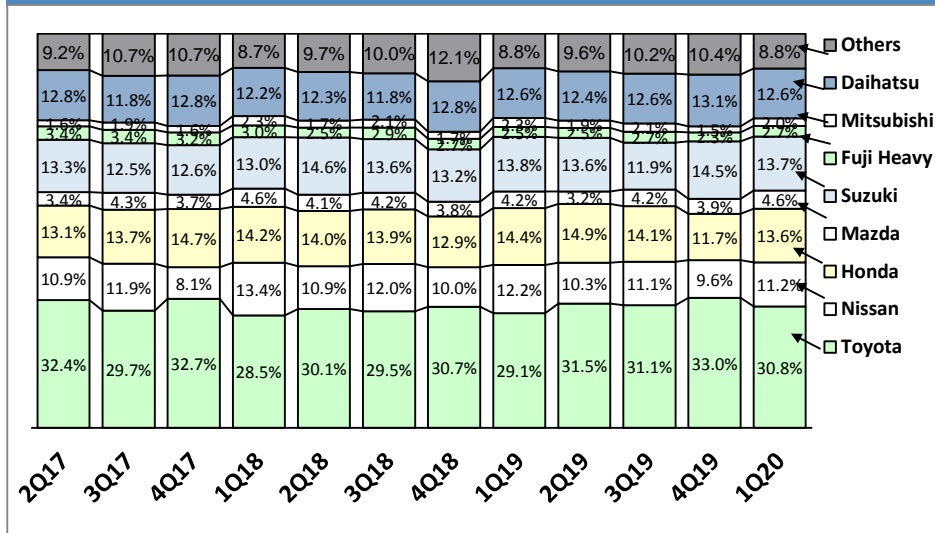
Source: Autodata.

## Pan-Europe Market Share by OEM



Source: ACEA.

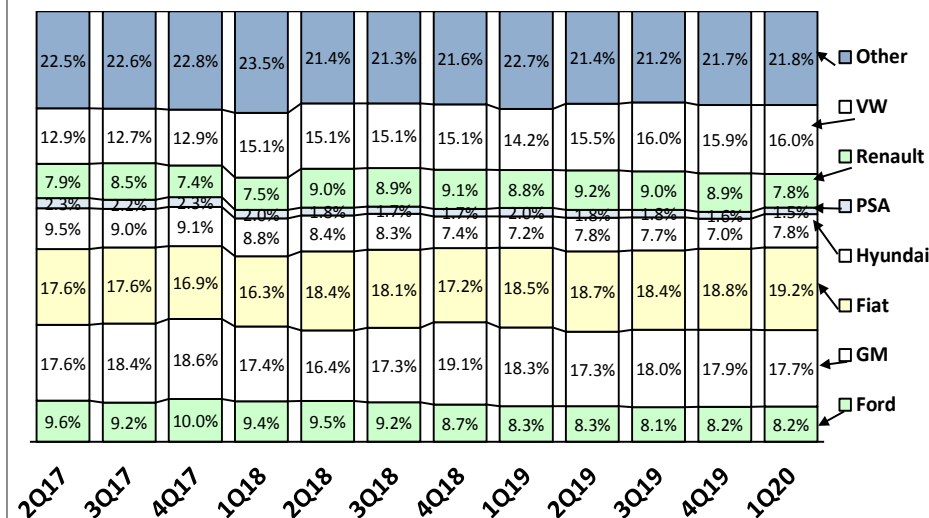
## Japan Market Share by OEM



Source: JADA.

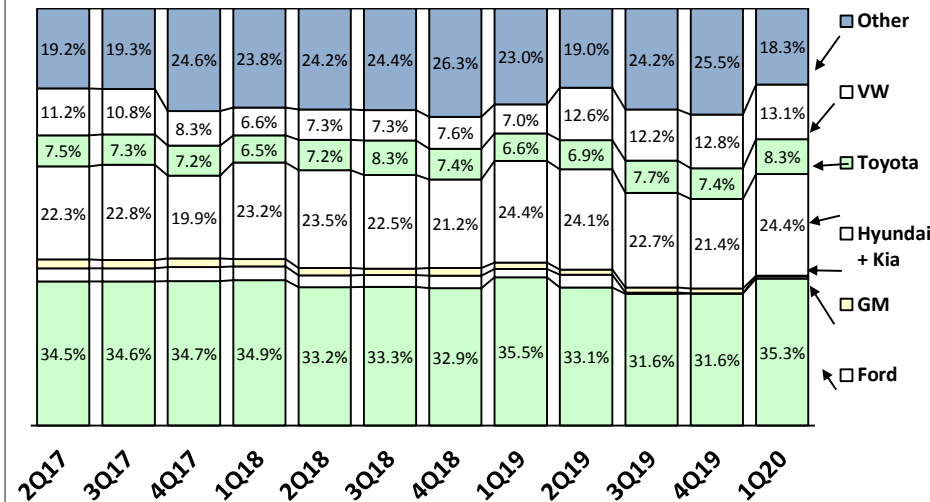
# OEM Market Share in Emerging Markets

## Brazil Market Share by OEM



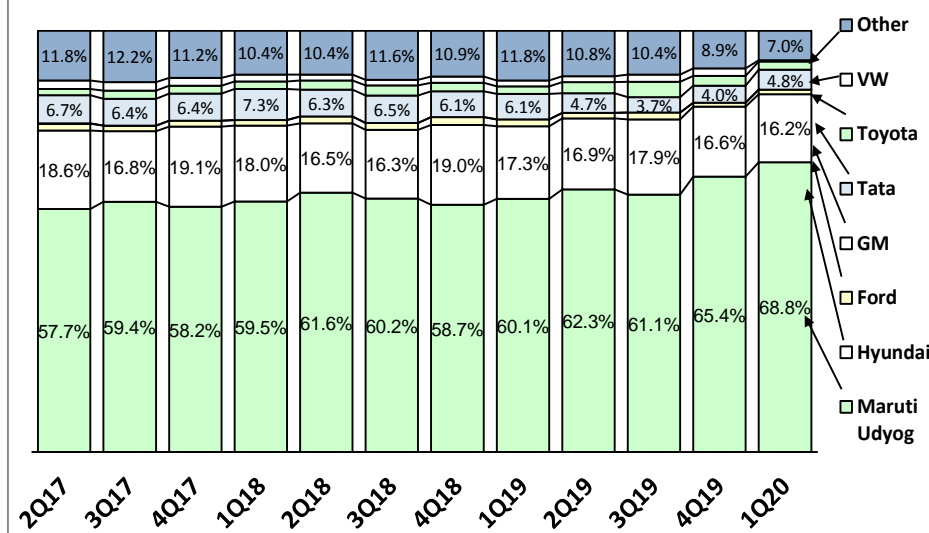
Source: ANFAVEA.

## Russia Market Share by OEM



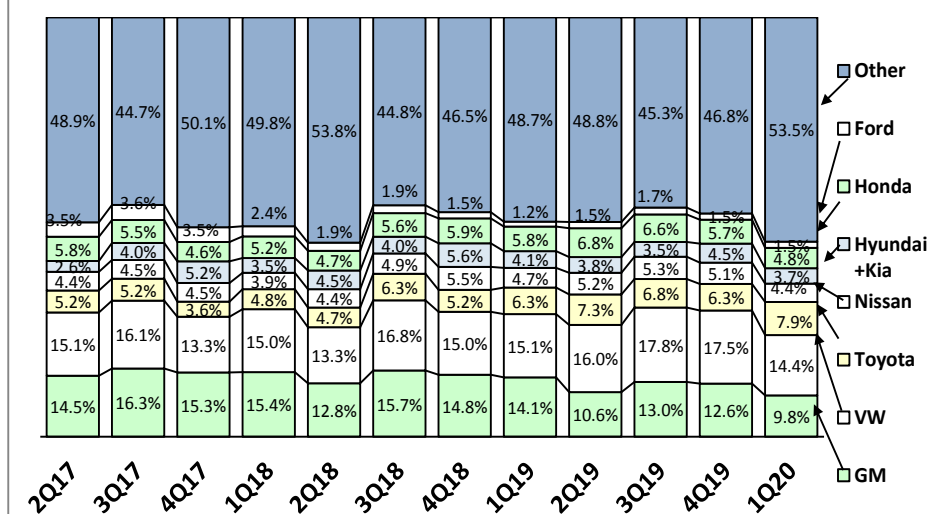
Source: AEB.

## India Market Share by OEM



Source: SIAM.

## China Market Share by OEM



Source: LMC Automotive.

# Global Light Vehicle Production Forecast

	2015	2016	2017	2018	2019	1Q	2QE	3QE	4QE	2020E	1QE	2QE	3QE	4QE	2021E
<b><u>Y/Y % CHANGE</u></b>															
NAFTA	3%	2%	-4%	-1%	-4%	-10%	-70%	-5%	-9%	-24%	-2%	200%	-9%	3%	18%
Europe	4%	3%	3%	-1%	-4%	-18%	-65%	-10%	-8%	-26%	-1%	140%	0%	-1%	17%
Western World	3%	2%	0%	-1%	-4%	-15%	-68%	-8%	-8%	-25%	-1%	163%	-4%	1%	17%
China	5%	14%	2%	-4%	-8%	-46%	-2%	-4%	-9%	-15%	62%	4%	-2%	-1%	10%
Latin America	-20%	-11%	20%	4%	-4%	-17%	-84%	-17%	-3%	-31%	0%	445%	14%	-6%	31%
Emerging World	1%	11%	4%	-3%	-8%	-42%	-13%	-5%	-9%	-17%	52%	15%	0%	-2%	12%
Japan/Korea	-3%	-3%	3%	0%	-1%	-9%	-40%	-19%	-14%	-21%	-4%	39%	8%	5%	10%
Other	2%	8%	5%	4%	-11%	-18%	-70%	-30%	-15%	-33%	-13%	170%	28%	13%	25%
Global	2%	5%	2%	-1%	-6%	-23%	-48%	-11%	-10%	-23%	9%	71%	2%	2%	15.1%
<b><u>Q/Q % CHANGE</u></b>															
NAFTA	3%	2%	-4%	-1%	-4%	-1%	-67%	202%	-7%	-24%	7%	1%	-9%	5%	18%
Europe	4%	3%	3%	-1%	-4%	-10%	-58%	117%	14%	-26%	-3%	1%	-9%	12%	17%
Western World	3%	2%	0%	-1%	-4%	-6%	-62%	150%	4%	-25%	1%	1%	-9%	9%	17%
China	5%	14%	2%	-4%	-8%	-56%	66%	3%	20%	-15%	-21%	6%	-3%	21%	10%
Latin America	-20%	-11%	20%	4%	-4%	-14%	-78%	400%	4%	-31%	-11%	18%	4%	-14%	31%
Emerging World	1%	11%	4%	-3%	-8%	-52%	42%	13%	18%	-17%	-20%	7%	-2%	16%	12%
Japan/Korea	-3%	-3%	3%	0%	-1%	-5%	-35%	28%	8%	-21%	6%	-5%	0%	4%	10%
Other	2%	8%	5%	4%	-11%	-6%	-68%	137%	17%	-33%	-3%	0%	13%	3%	25%
Global	2%	5%	2%	-1%	-6%	-22%	-35%	62%	10%	-23%	-6%	2%	-3%	10%	15%

Source: IHS Automotive.

# NA and Europe Production Forecast Snapshot (Y/Y % Change)

## May IHS Forecast

	2018	2019	1Q	2QE	3QE	4QE	2020E	1QE	2QE	3QE	4QE	2021E
<b>Y/Y % CHANGE</b>												
<b>NAFTA</b>	<b>-1%</b>	<b>-4%</b>	<b>-10%</b>	<b>-70%</b>	<b>-5%</b>	<b>-9%</b>	<b>-24%</b>	<b>-2%</b>	<b>200%</b>	<b>-9%</b>	<b>3%</b>	<b>18%</b>
GM	-3%	-9%	-10%	-72%	-4%	6%	-22%	-7%	206%	-14%	1%	14%
F	-5%	-6%	-19%	-73%	-8%	-14%	-29%	10%	269%	3%	22%	36%
FCA	12%	-6%	-15%	-71%	-16%	-22%	-31%	3%	186%	-9%	-2%	18%
<b>Memo: Total D3</b>	<b>0%</b>	<b>-7%</b>	<b>-15%</b>	<b>-72%</b>	<b>-9%</b>	<b>-10%</b>	<b>-27%</b>	<b>1%</b>	<b>220%</b>	<b>-7%</b>	<b>7%</b>	<b>22%</b>
Honda	-2%	0%	-17%	-72%	-10%	-28%	-32%	-22%	148%	-18%	17%	7%
Nissan	-8%	-11%	-24%	-69%	-15%	-6%	-29%	10%	208%	4%	2%	27%
Toyota	-3%	-4%	-7%	-74%	4%	4%	-20%	2%	219%	-20%	-13%	9%
<b>Total J3</b>	<b>-4%</b>	<b>-5%</b>	<b>-16%</b>	<b>-72%</b>	<b>-6%</b>	<b>-10%</b>	<b>-27%</b>	<b>-5%</b>	<b>190%</b>	<b>-13%</b>	<b>0%</b>	<b>13%</b>
Others	4%	8%	11%	-64%	6%	-4%	-13%	-4%	172%	-8%	-2%	14%
<b>EUROPE</b>	<b>-1%</b>	<b>-4%</b>	<b>-18%</b>	<b>-65%</b>	<b>-10%</b>	<b>-8%</b>	<b>-26%</b>	<b>-1%</b>	<b>140%</b>	<b>0%</b>	<b>-1%</b>	<b>17%</b>
F	-2%	-7%	-24%	-72%	-12%	-5%	-29%	3%	194%	4%	-9%	19%
VW excl Audi, Porsche	3%	-1%	-17%	-62%	-3%	-7%	-24%	6%	128%	1%	4%	20%
PSA	0%	-3%	-22%	-77%	-6%	-8%	-30%	-1%	250%	-8%	-8%	17%
FCA	-11%	-13%	-17%	-69%	-8%	4%	-25%	7%	137%	-7%	-10%	14%
Renault/Nissan excl Lada	-4%	-7%	-22%	-62%	-8%	-8%	-27%	5%	121%	1%	-6%	16%
Merc excl Smart	0%	-2%	-15%	-63%	-26%	-3%	-27%	0%	148%	16%	7%	25%
BMW excl Mini	-2%	-7%	-17%	-69%	-12%	0%	-26%	0%	170%	6%	1%	21%
Audi	-9%	-6%	-11%	-59%	20%	-6%	-18%	4%	115%	-3%	13%	20%
Porsche	2%	2%	-4%	-54%	21%	-11%	-14%	11%	103%	-10%	11%	18%
All Other	0%	-3%	-17%	-63%	-16%	-13%	-28%	-11%	114%	0%	2%	13%
<b>European Lux.</b>	<b>-4%</b>	<b>-6%</b>	<b>-15%</b>	<b>-63%</b>	<b>-11%</b>	<b>-3%</b>	<b>-24%</b>	<b>1%</b>	<b>141%</b>	<b>7%</b>	<b>9%</b>	<b>23%</b>
<b>German Lux. - NA, Eur</b>	<b>-3%</b>	<b>-2%</b>	<b>-8%</b>	<b>-62%</b>	<b>-9%</b>	<b>-3%</b>	<b>-21%</b>	<b>1%</b>	<b>144%</b>	<b>3%</b>	<b>4%</b>	<b>20%</b>

Source: IHS Automotive.



# NA Key Truck Platform Production Forecast (Y/Y % Change)

## May IHS Forecast

	2018	2019	1Q	2QE	3QE	4QE	2020E	1QE	2QE	3QE	4QE	2021E
<b>% Y/Y</b>												
<b>GM</b>												
Total Full-Size Pickups	-3%	-2%	1%	-71%	1%	29%	-13%	2%	248%	-7%	-3%	20%
GM Full-Size Light Duty Pick-ups	-1%	2%	2%	-74%	-5%	31%	-16%	0%	234%	-6%	-2%	19%
GM Full-Size Medium Duty Pick-ups	-8%	-15%	-3%	-58%	18%	23%	-2%	8%	292%	-10%	-5%	21%
Total GM Full-Size SUVs	1%	-20%	28%	-83%	-11%	27%	-18%	-6%	389%	-9%	2%	21%
Total GM Full-Size Pickups and SUVs	-2%	-7%	6%	-74%	-2%	28%	-14%	0%	272%	-8%	-2%	20%
<b>Ford</b>												
F-Series Total	1%	0%	-15%	-77%	-1%	-24%	-30%	10%	303%	-10%	27%	33%
F Series Light Duty	1%	0%	-17%	-76%	-6%	-38%	-35%	16%	293%	-4%	54%	45%
F Series Medium Duty	1%	1%	-10%	-80%	8%	6%	-21%	0%	327%	-20%	-8%	14%
<b>FCA</b>												
Total Ram Pickup	10%	5%	2%	-69%	-20%	-17%	-27%	26%	230%	13%	11%	40%
Ram Pickup Light Duty	19%	4%	-6%	-73%	-26%	-23%	-33%	15%	268%	28%	13%	44%
Ram Pickup Heavy Duty	-9%	8%	31%	-59%	-7%	0%	-13%	54%	170%	-11%	9%	33%
MiniVans	3%	-28%	-33%	-74%	-46%	-74%	-57%	-65%	-18%	-43%	25%	-39%
<b>Total D3 Medium Duty</b>	<b>-5%</b>	<b>-2%</b>	<b>-1%</b>	<b>-69%</b>	<b>6%</b>	<b>9%</b>	<b>-14%</b>	<b>14%</b>	<b>257%</b>	<b>-15%</b>	<b>-2%</b>	<b>21%</b>

Source: IHS Automotive.

# Outlook For Electric Vehicles (mid-February 2020 IHS Forecast)

Global Light Vehicle Production by Powertrain Type (Pure EV vs. HEV, MHEV, and ICE)																		
Propulsion System Design	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Electric	13	70	86	138	233	362	558	966	1,654	1,981	2,687	3,974	5,653	7,571	9,331	10,989	12,137	13,428
Fuel Cell	0	0	0	0	0	1	3	4	4	10	17	24	31	38	46	61	67	75
Hybrid-Full	966	985	1,691	1,768	1,923	1,811	2,227	2,547	2,847	3,292	4,534	5,920	7,282	8,452	9,660	10,925	11,792	12,600
Hybrid-Mild	67	24	125	169	134	245	452	626	985	2,072	4,563	8,161	10,967	14,973	20,089	23,801	27,300	30,261
ICE	69,825	69,161	69,332	68,673	66,915	61,752	59,437	54,304	47,667	37,809	31,844	28,421	25,145	22,607	20,701	19,377	18,818	18,000
ICE: Stop/Start	3,418	6,617	10,289	13,940	18,216	24,620	30,415	36,676	41,013	43,728	43,539	43,255	43,390	41,906	38,145	34,782	31,894	29,912
<b>Global Light Vehicle Production</b>	<b>74,289</b>	<b>76,857</b>	<b>81,523</b>	<b>84,686</b>	<b>87,422</b>	<b>88,791</b>	<b>93,091</b>	<b>95,124</b>	<b>94,170</b>	<b>88,892</b>	<b>87,184</b>	<b>89,756</b>	<b>92,467</b>	<b>95,547</b>	<b>97,972</b>	<b>99,934</b>	<b>102,007</b>	<b>104,275</b>
Penetration by Propulsion Type																		
Propulsion Type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Electric	0%	0%	0%	0%	0%	0%	1%	1%	2%	2%	3%	4%	6%	8%	10%	11%	12%	13%
Fuel Cell	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hybrid-Full	1%	1%	2%	2%	2%	2%	2%	3%	3%	4%	5%	7%	8%	9%	10%	11%	12%	12%
Hybrid-Mild	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	5%	9%	12%	16%	21%	24%	27%	29%
ICE (includes Stop/Start)	99%	99%	98%	98%	97%	97%	97%	96%	94%	92%	86%	80%	74%	68%	60%	54%	50%	46%
<b>Global Total Production (in thousands)</b>	<b>74,289</b>	<b>76,857</b>	<b>81,523</b>	<b>84,686</b>	<b>87,422</b>	<b>88,791</b>	<b>93,091</b>	<b>95,124</b>	<b>94,170</b>	<b>88,892</b>	<b>87,184</b>	<b>89,756</b>	<b>92,467</b>	<b>95,547</b>	<b>97,972</b>	<b>99,934</b>	<b>102,007</b>	<b>104,275</b>
<b>memo: Stop-start penetration</b>	<b>5%</b>	<b>9%</b>	<b>13%</b>	<b>17%</b>	<b>21%</b>	<b>29%</b>	<b>34%</b>	<b>40%</b>	<b>46%</b>	<b>54%</b>	<b>58%</b>	<b>60%</b>	<b>63%</b>	<b>65%</b>	<b>65%</b>	<b>64%</b>	<b>63%</b>	<b>62%</b>

Source: IHS Automotive.

Global Light Vehicle Production by Powertrain Type																		
Powertrain Propulsion Type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
No Internal Combustion	13	70	86	138	233	363	560	970	1,658	1,991	2,704	3,999	5,683	7,609	9,377	11,049	12,204	13,502
Internal Combustion of All Sorts (includes hybrids)	74,276	76,787	81,437	84,549	87,189	88,428	92,531	94,154	92,512	86,901	84,480	85,757	86,784	87,938	88,595	88,885	89,804	90,773
<b>Global Light Vehicle Production (in '000)</b>	<b>74,289</b>	<b>76,857</b>	<b>81,523</b>	<b>84,686</b>	<b>87,422</b>	<b>88,791</b>	<b>93,091</b>	<b>95,124</b>	<b>94,170</b>	<b>88,892</b>	<b>87,184</b>	<b>89,756</b>	<b>92,467</b>	<b>95,547</b>	<b>97,972</b>	<b>99,934</b>	<b>102,007</b>	<b>104,275</b>
Powertrain Propulsion Type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
No Internal Combustion	0%	0%	0%	0%	0%	0%	1%	1%	2%	2%	3%	4%	6%	8%	10%	11%	12%	13%
Internal Combustion of All Sorts (includes hybrids)	100%	100%	100%	100%	100%	100%	99%	99%	98%	98%	97%	96%	94%	92%	90%	89%	88%	87%
<b>Global Light Vehicle Production (in %)</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: IHS Automotive.

**In the Current Environment, We Prefer:**  
**Auctions / Aftermarket > Tires > Suppliers > Automakers > Rentals**  
(Auctions / Aftermarket is Best Positioned)  
(Rentals are Worst Positioned)

## **Auctions / Aftermarket > Tires > Suppliers > Automakers > Rentals**

- **Salvage Auction / Aftermarket Parts companies (e.g., CPRT / LKQ) have the most stable end-markets.**
  - During lockdowns, miles driven has taken a beating, likely reducing demand for LKQ parts and CPRT services.
    - Miles driven data is released on a multi-month lag, but various sources including auto insurers (some of whom are rebating monthly premiums) report unprecedented -30% to -40% y/y declines in the latter half of March.
  - But eventually (hopefully throughout May!), this unique once-in-a-hundred years public health crisis will morph into something more familiar — a garden variety economic recession (hopefully not depression).
    - When that happens, we expect miles driven to normalize and prove its historical resiliency.
      - The most miles driven has declined on an annual basis since 1980 was -3.4% in 2008;
      - The most miles driven declined on a monthly basis in 2008 / 2009 was -5.1% (in June 2008).
        - Compare to new vehicle sales likely -40% in Global Financial Crisis.
    - People will resume normal driving patterns (could there even be an eventual boost, on avoidance of public transit?), meaning stability for LKQ & CPRT end-markets (recycled/refurbished collision parts in North America, mechanical replacement parts in Europe, and salvage car auctions in North America).
- **Whole Car Auctions are modestly more cyclical but have interesting cross-currents which can help to smooth supply**
  - ~50% of whole car auction supply is variable with SAAR.

## Auctions / Aftermarket > Tires > Suppliers > Automakers > Rentals

- **Whole Car Auctions are more cyclical than salvage auctions but have interesting cross-currents which can help to smooth supply and are substantially less cyclical than most other auto end-markets.**
  - Dealer Consignment volume (~50% of whole car auction supply) is variable with SAAR;
    - We forecast US LV SAAR -20% this year, to 13.5 mn from 17.0 mn in 2019.
  - Off-Lease volume (~20% of whole car auction supply) is variable with lease originations (itself a function of SAAR + lease penetration rate) but on a 3-year lag;
    - Examination of past lease originations suggests tailwind peaked in 2019 but will not turn to material headwind until 2023 (given that while sales declined slightly 2016-2019, lease penetration rate mostly offset).
  - Repossession volume (~15% of whole car auction supply) is perhaps surprisingly long-term correlated with economic activity (because of higher vehicle sales and looser lending in good economic times) but near-term is inversely correlated;
    - We expect repossession volume to be a tailwind in 2020.
  - Off-Rental volume (~5% of whole car auction supply) has been more or less stable after undergoing substantial structural decline (used to be ~20% of supply) as rental car firms vertically integrated from 2008/2009 and, like repossessions, is positively correlated with economic activity;
    - However, this is a special moment in history, and we expect rental car companies to very aggressively de-fleet (faster than their alternative disposition channels can accommodate), providing a tailwind to whole car auction supply in 2020.
  - Fleet/Government/Other volume (~10% of whole car auction supply) tends to be more or less stable.

## **Auctions / Aftermarket > Tires > Suppliers > Automakers > Rentals**

- **Remember that KAR is disproportionately reliant upon commercial customers (i.e., the stable off-lease and near-term tailwind providing repossession and off-rental customers) and is underrepresented in the headwind-providing dealer consignment category.**
- **Interestingly, the auctions / aftermarket stocks have been crunched along with our overall automotive coverage:**
  - Since the market peak on February 19 through yesterday's close (through April 23):
    - The S&P 500 is -17%;
    - CPRT shares are -35%;
    - LKQ shares are -41%;
    - KAR shares are -48%.
  - The performance of these three aftermarket stocks (-41% on average) is more akin to much more cyclical General Motors (-39%) and Ford (-40%) than they are to the S&P.
    - Granted, KAR has a bit of leverage (less than at any point since going public) and LKQ a bit more, but CPRT does not.
- **This creates a buying opportunity in our view:**
  - We remain Overweight LKQ but today are upgrading KAR from Neutral to Overweight and CPRT from Underweight to Neutral. Our favorites here are LKQ & KAR, as CPRT while not nearly as rich as before is we think now after pull-back still only fairly valued.

## Auctions / Aftermarket > **Tires** > Suppliers > Automakers > Rentals

- **Tires benefit relative to traditional auto parts suppliers in that the large majority of their demand comes from the steadier automotive aftermarket (consumer / commercial replacement) industry.**
  - **Goodyear is roughly 80% aftermarket;**
  - **Cooper Tire enjoys a substantially higher well over 95% aftermarket exposure** (just a small amount of OE sales in China).
- **The other very substantial benefit tire manufacturers enjoy currently is that ~68% of tire raw materials (~55% of tire COGS) are linked to the price of oil;**
  - It remains to be seen the degree of pricing power tire manufacturers possess, or their ability to hold on to pricing as input costs plunge, but they have invariably complained in recent years about an earlier inability to pass higher costs on during the 2017 timeframe, which they claim has dented their P&Ls and they are “due” to recoup this lost spread between price and raw materials. Perhaps the current environment may provide them just such a chance.
- **We have a strong preference for Cooper Tire, particularly in the current environment:**
  - Goodyear’s leverage is such that we do not regard it as a lower risk play than most suppliers;
  - Goodyear also has more leverage to the commercial vehicle market;
    - Ordinarily, this is a positive, as commercial vehicle tires tend to be more lucrative, but commercial vehicle OE is the most volatile of all sub-sectors of tire demand.
  - Cooper has less financial leverage, a relatively better track record of execution in recent years, and a strong long-term commitment to its dividend.
  - LIFO accounting means CTB feels benefit of lower raw materials first.

## Auctions / Aftermarket > Tires > **Suppliers** > **Automakers** > Rentals

- **We estimate suppliers average ~15-25% decremental margins** (perhaps toward the higher end of this range early on in downturns or when production stops abruptly such as with a strike (or pandemic).
- **This compares to automakers which we estimate average ~30-40% decremental margins** (perhaps toward the higher end of this range early on in downturns or when production stops abruptly such as with a strike (or pandemic).
  - **Automaker decrementals tend to be higher, given they have a higher degree of fixed costs in comparison to suppliers, for example:**
    - More design, development, engineering, and even semi-fixed advertising expense.
- **Apart from the greater operating leverage, automakers also have pro-cyclical working capital vs. suppliers which have counter-cyclical working capital, meaning automakers are more vulnerable and suppliers less vulnerable in downturns.**
  - Automakers generally are paid in cash by dealers when the title on the vehicle transfers as the vehicle leaves the factory gate;
    - Dealers have gotten the cash from the automaker's captive finance arm, which has borrowed they money from fixed income investors;
    - Dealers repay the captive finance company after ~70 days, and the captive finance company repays the fixed income investors, closing the circle;
      - But automakers do not pay their suppliers for ~65 days, meaning automakers generate cash from working capital when production is rising, and lose cash from working capital when production is falling.



# Auctions / Aftermarket > Tires > Suppliers > Automakers > **Rentals**

- **Rentals are worst positioned in the current environment:**
  - **Firstly, the demand fall-off is unprecedented in both its scope and historically relative to other automotive sub-sectors.**
    - Air travel is literally -90%. We believe that Avis and Hertz on-airport revenue (2/3 of their total!) is likely also -90% y/y in April and May.
    - Off-airport is likely fairing better but still off -50% or so y/y.
    - This decline in demand is not only highly historically unusual in scope, but also relative to demand for other automotive sub-sectors, such as new vehicles.
      - In the Global Financial Crisis / Great Recession, while new vehicle sales were -40% (2007 to 2009), Avis Budget revenue was -14%.
      - This will normalize, but there is low visibility as to when.
  - **Secondly, the decline in used vehicle prices (Manheim -11.8% m/m through mid-April) is a big headwind.**
    - Lower prices will result in higher depreciation per vehicle, lower margin, and ultimately lower cash flows at the time of auction.
      - Comes at a bad time — just when these companies need to aggressively de-fleet.
    - Our conversations suggest fleet financings are manageable at Avis but this is less clear in the case of Hertz.

## Downgrade Hertz (HTZ) to Underweight from Neutral

- **We have long preferred Avis Budget to Hertz amongst rentals, previously citing potentially higher reward in the case of HTZ, but also higher risk, resulting in what we saw as superior risk/reward in the case of CAR, which we have found to have historically been less levered, better run (e.g., oftentimes higher margin), and to have generally generated positive free cash flow in a wider variety of macro scenarios, vs. Hertz which has not been a consistent generator of positive free cash flow.**
  - We do think a potentially large amount of cash could be made available to Hertz from the federal government, potentially solving any liquidity concerns;
    - But we are also uncertain with regard to the terms of any assistance. We assume that grants — as opposed to loans — may prove a bit more unique to in the case of airlines (where grants represent a portion of assistance) and small businesses (e.g., forgivable loans generally not available to publicly traded corporations).
  - This suggests, then, that even in the event Hertz is assured access to sufficient liquidity, it will likely emerge with still greater debt and leverage.
  - On the other side of this crisis, the cash calls associated with servicing and repaying such incremental debt, along with what we perceive as lingering “catch-up” investments required in the way of information systems and connected cars suggests a slower turnaround or longer lasting period of not being in a position to return cash to shareholders in relation to Avis.
  - We are suspending our price target, reflecting the increasingly binary and almost option-like nature of the shares, which currently trade under \$5.

# Downgrade Avis Budget (CAR) to Neutral from Overweight

- **We see +8% to our new \$13 price target, which is lowered from \$20 prior, given headwinds from lower demand, lower air travel, and lower used vehicle prices.**
- **Despite these headwinds — all three of which are blowing very strong currently — we rate Avis shares only Neutral (not Underweight), and continue to prefer it to close peer Hertz (HTZ), including:**
  - We explored in an in-depth note only in January four company-specific initiatives discussed on a CFO NDR that could grow EBITDA ~\$300 mn:
    - (~\$100 mn opportunity): Growing the number of vehicles rented to ride-hailing drivers from ~4K units currently to potentially 200K+ over time;
    - (~\$100 mn opportunity): Growing the number of vehicle dispositions into the more profitable Direct-to-Consumer (D2C) channel from ~10K currently (~7% of the 185K units Avis de-fleets annually) to 100K or more over time;
    - (~\$50 mn opportunity): Rationalization of duplicative costs in Europe that have built up over time as a result of having consummated more than 8 acquisitions in just the past 4 years; and
    - (~\$50 mn opportunity): Globalization and rationalization of various corporate functions, primarily in the areas of IT and finance, the spending on which management feels it is over-indexed vs. its closest peers.
  - Strong management team that has demonstrated the ability to execute solidly.
  - Demonstrated strong free cash generation with leverage levels historically within management's long-term target range of 3.0x-4.0x, allowing Avis to enter this period of extreme uncertainty on a more stable financial footing.

## Downgrade Avis Budget (CAR) to Neutral from Overweight

- **Pre-announcement yesterday (stock +7-10% aftermarket) suggests management is moving quickly to shore up operations and liquidity** (e.g., cutting or furloughing 70% of staff in just two weeks, already achieving \$400 mn of annualized run-rate SG&A savings, etc.).
- **But it also concerned us with regard to the pace of potential de-fleeting** (at least -20% fewer vehicles y/y by June-end) **vs. revenue / bookings / employees** (all roughly -60% to -80% y/y).
- **Management seems to be making the right moves quickly and aggressively, and could also potentially benefit from distress at competitor Hertz, but we wish to side-step this unprecedented fall-off in demand.**
  - Both companies are likely to emerge from this crisis with higher debt and higher leverage.

# Upgrade KAR Global (KAR) to Overweight from Neutral

- **We see +58% upside to our \$19 December 2020 price target.**
  - KAR operates in the highly attractive market for auto auctions, characterized by high barriers to entry, oligopoly, and strong pricing and margins. It is the second-largest provider of whole car auction services.
  - Limited competition and high barriers to entry result in strong pricing and margins and strong free cash flow given low working capital requirements.
  - We had earlier downgraded shares of KAR from Overweight to Neutral in mid-2019, citing the spin-off of IAA vs. our previous Overweight thesis which had largely been Sum-of-Parts based.
  - Another concern was the continued high spending on TradeRev and eventual abatement of off-lease volumes (turned from tailwind to a push in mid-2019 and will not be a material headwind for another 2-3 years), as was (thought to be) modestly declining SAAR.
  - However, the shares are now substantially lower. Surely the company will face some headwinds from lower used vehicle prices, given reduced demand in the face of the COVID-19 pandemic, and fewer used vehicle trade-ins, but other aspects of its business (such as the aforementioned off-lease volume) should remain steady, even as others actually benefit.
  - For example, there is likely to be an uptick in repossession volumes at auctions, as unemployed consumers fall behind on payments, and there is likely to be a short-term uptick in volumes also as rental car companies look to quickly de-fleet, perhaps to a greater degree than can be handled via their vertically integrated disposition platforms.
  - We value KAR shares using a 7.5x EV/EBITDA multiple, a discount to its historical trading range. KAR shares are now more attractive on pull-back, after the shares fell -48% since the market's high on February 19, vs. the S&P 500 -17%

# Upgrade Copart (CPRT) to Neutral from Underweight

- **We see -5% downside to our new \$65 December 2020 CPRT price target** (we have over the past year seen substantial downside on what we saw as too rich valuation).
  - We are attracted to Copart's unique and entrepreneurial corporate culture and believe it is a technological leader in its field.
  - We are also long-term attracted to Copart's disproportionate exposure to the salvage car auction market, which is even more concentrated and less exposed to channel diversion than the whole car auction market.
  - Apart from near-term (likely one quarter) disruption around COVID-19, we expect the salvage auction market to continue to exhibit above-average growth for at least the next several years, driven in part by an increase in the percentage of insurance claims that result in an accident (including because of increasing cost to repair due to the growing complexity of vehicles).
  - Our previous Underweight rating was in the context of the shares trading at a then significant valuation premium to both peers and at or near the company's own all-time record multiples of EPS and EBITDA (which had reached ~40x and ~25x, respectively, vs. current NTM multiples of our new lowered estimates of 28.7x and 19.3x EPS and EBITDA, respectively). CPRT shares now trade below their recent year averages, even if still a premium to history.
  - We believe this more modest premium to history is now appropriate, given that the multiples have come in, the company does have some historically interesting opportunities (such as expansion into continental Europe), and given its end-market (while disrupted near-term from lower miles driven due to lockdowns) we expect will prove substantially more resilient than that of any other company we follow after one quarter. CPRT shares are now more attractive on pull-back, after the shares fell -35% since the market's high on February 19, vs. the S&P 500 -17%.

## Car Sharing Counterpoints

Blue Skies “Fully Autonomous Completely Car Sharing Future” Scenario May Not Come to Pass or May Be Much More Delayed than Imagined; EVEN IF It Did Come to Pass, Some Popular Conclusions About Implications Seem Off

# What Is the Blue Skies Scenario?

- **In the future, people will not own vehicles.**
- **Instead of car ownership, mobility will be provided as a service.**
- **The fully autonomous nature of vehicles in the future will allow much greater fleet utilization.**
  - Fleet utilization could improve dramatically, perhaps by as much or more than a factor of two.
- **Demand for new vehicles could fall dramatically, perhaps by a commensurate degree (as much or more than a factor of two).**
- **This is what we are referring to as the “Fully Autonomous Completely Car Sharing Future”.**
  - If you do not fully subscribe to this scenario, it is argued it may be because you are backward, myopic, or insufficiently imaginative.



# Why Might the Blue Skies Scenario Not Come to Pass?

## ➤ **Fleet utilization factors:**

- While utilization is very low during the overnight hours, it is also very high during "rush hours".
  - Opportunity to increase utilization may be overstated in some cases.

## ➤ **Convenience factors:**

- People sometimes have one, two, or three child safety seats in their cars, which can be a pain to properly install and uninstall;
  - Would represent storage and carrying issues even if they were easily installable and removable.
- Even in the instance of an autonomous car that could be summoned to your precise location, it would not be as readily available as if it were in your garage or on your driveway.
- People like to keep things of convenience to them in their cars.

## ➤ **Cultural / luxury factors:**

- Having one's own car is a luxury we have come to expect and demand.
- Shared cars are not likely to be as clean.
- Cars are status symbols.
  - While there may be a (potentially very big) place for shared cars, some people will still want their own car.

# Why A Blue Skies Scenario, EVEN IF It Did Come to Pass, Could Be Perhaps More Delayed than Imagined

## ➤ Technological / regulatory / cost factors:

- Car sharing has been with us as long as we have had automobiles.
  - What is new is connectivity (i.e., Uber) and the potential for fully autonomous driving mode.
  - Fully autonomous driving mode is forecasted to spur car-sharing adoption, allowing for far greater utilization
    - (e.g., because the car could drive you to work, then drive itself to someone else in need of it — whether it is your own car returning home to be available for the rest of your family until you need to be picked up from work, or whether it is not your car and it is just going to be of service to another random user).
- For various technological, regulatory, and cost reasons, adoption and prevalence of truly fully autonomous vehicles could be further out or more limited in scope than often imagined.
  - Recall a key takeaway from our automotive conference on the sidelines of the Consumer Electronics Show in Las Vegas (*discussed in last month's State of the Auto Industry conference call*) was that the more powerful revolution by far over the near- and medium-term is the increasingly semi-autonomous nature of vehicles.
    - It has been suggested that semi-autonomous features can provide ~80% of at least the safety benefit of fully autonomous vehicles for ~20% of the price.

# EVEN IF A “Fully Autonomous Completely Car Sharing Future” Comes to Pass, We See Less Headwind to the Auto Industry than Many Fear... (and there will also be opportunities)

- Assuming a fully autonomous completely car sharing future did come to pass, it has in various places been suggested that:
  - 1. This could necessitate having perhaps only half as many vehicles in the country.
    - We see this as potentially true.
  - 2. New car sales could fall perhaps by half or nearly half.
    - **We do not believe this is true**, because of the increased wear-and-tear placed on vehicles, which will cause them to be needed to be replaced much more frequently.
      - Wear-and-tear on vehicles caused by every day miles driven primarily determines when a vehicle will be replaced (admittedly, there would likely be fewer catastrophic accidents).
    - In a fully autonomous completely car sharing future, we will drive MORE.
      - More people will be able to “drive”:
        - Children could drive;
        - Very elderly people could drive;
        - Disabled people could drive;
        - Blind people could drive;
        - Drunk people could drive.
      - The convenience of “driving” will greatly increase for the population that already can drive, causing us to “drive” more.
      - Also: deliveries & the phenomenon of “dead lifts”.

### Auto Dealerships:

Sales Recovery Happening; 2H20 Trajectory Uncertain;  
Dealers Likely to Emerge Stronger and Efficient Post Crisis

# Sales Recovery Happening; 2H20 Trajectory Uncertain; Dealers Likely to Emerge Stronger Post Crisis

- **Sales recovery faster than expected; 2H20 trajectory uncertain – unemployment, OE production restart, and incentives (including cash for clunkers) key factors; longer-term, preference for personal transportation may provide SAAR support**
  - Sales in early May are tracking down -20% y/y vs down -55% in early April – sharp recovery driven by relaxed shelter-in-place orders, OE incentives
  - Likely to continue to into June driven by pent-up demand and incentives
  - 2H20 trajectory uncertain – stimulus paychecks roll-off, unemployment levels do not recover quickly enough as several industries may take time to recover
  - OE production restart faces issues from supply chain disruptions as different regions relax restrictions at different time periods + threat of second wave of COVID-19 infections
  - Cash for clunkers should also drive demand, and help normalize production at OEs, though this is just a temporary benefit
  - Beyond COVID-19, preference for personal transportation from lower ride-share and reduced public transport should provide downturn support for SAAR
- **Used vehicle Gross profit per unit (GPU) key unknown in 2Q as strategies vary across the space; eitherway likely to prove transitional with 2H20 converging**
  - Used vehicle demand has recovered faster than expected, now down in the teens y/y
  - Payment deferrals and CPO offers have also simulated demand
  - 2Q profitability highly uncertain as some dealers have cleared out inventory cheaply to conserve cash impacting profitability while some have waited out
  - Retail prices have held up substantially better than auction which might benefit well capitalized dealers that are able to replenish inventory at attractive prices
  - Wholesale prices now have started to recover as well – a good sign for the industry overall

# Sales Recovery Happening; 2H20 Trajectory Uncertain; Dealers Likely to Emerge Stronger Post Crisis

- **Parts & Services recovering slower than expected; key profit headwind and the difference vs 08/09; miles driven picking back up but likely to remain down y/y through remainder of 2H20**
  - Parts & Service has been a key profit driver and key priority for dealerships recently given a pressured new vehicle market in recent years
  - However, this revenue stream has not been as resilient during this crisis as in 08/09 given collapse in miles driven and shelter-in-place orders which should significantly impact near-term profitability for franchise dealerships
  - Recent data points suggest Parts & Services is tracking down -25% y/y through early May vs down -20% y/y for vehicle sales. Sonic Automotive suggested last month that demand will take longer to get back to prior forecast but will exceed those forecasts thereafter due to pent-up demand
  - Beyond 2Q, as work from home/telecommuting increase and unemployment takes time to recover, this could offset the benefits from lower gasoline prices and reduced public transportation
- **F&I remains resilient; some could see mix impacts in the near-term; digital penetration and execution could be key to differentiation**
  - Encouragingly, F&I gross profit per unit (GPU) has stayed resilient through this crisis period with penetration likely increasing for some as well
  - Our conversations suggest that penetration levels remain strong even for digital transactions
  - There could be some mix impact on overall GPU as lower GPU used units grow/recover faster than new units
  - Ease of F&I process on-line and in-store in a contactless environment will be key to differentiation among dealerships

# Sales Recovery Happening; 2H20 Trajectory Uncertain; Dealers Likely to Emerge Stronger Post Crisis

- **COVID-19 crisis accelerated transition to on-line channels; unit economics on on-line seemingly similar to in-store**
  - While the industry was slowly transitioning towards this the pace of penetration hadn't really picked up enough as one would have thought
  - The COVID-19 crisis accelerates the shift in this direction and we are likely to see an increasing mix of vehicle sales being sold online
  - Clearly, we have seen this happening in the used vehicle space, where on-line retailer Carvana actually is seeing sales up 20-30% y/y in early May
  - OEMs have also taken initiatives here to drive this shift with advertising campaigns and incentives at the same time
  - This shift in our view helps consolidate the industry to more well capitalized companies and at the same time also unit economics over time
- **Cost control key to watch: Furlough magnitude and pace of re-hiring and permanent reductions could drive long-term efficiencies**
  - The public franchise dealers have furloughed anywhere from 25-55% of workforce
  - Some of these actions will remain permanent and the re-staffing levels is likely to lag the recovery in demand
  - These actions along with the move to on-line will ultimately make the overall cost structure at these dealerships more efficient, drive higher through put with a thinner sales force
- **Floorplan a material tailwind to near to medium-term earnings**
  - With the 1-month LiBOR approaching zero, this is a material benefit to dealer floor plan expense that will support overall earnings growth over the next 12-18 months

# Sales Recovery Happening; 2H20 Trajectory Uncertain; Dealers Likely to Emerge Stronger Post Crisis

- **Balance sheet - most dealers in cash preservation mode; with sales and demand recovery, liquidity is less of a concern**
  - Liquidity bandwidth had emerged as a major concern mid-March, though once the government stimulus measures started to get announced, and we started to see a trough in sales in early April, concerns were put to rest
  - OEMs had a slew incentives out there, providing extension/relief on floorplan payments, etc.
  - That said, companies are approaching the near-term with caution, even though all the publics had positive FCF back in 08/09 - some have drawn on their revolvers, couple of them have cut their dividend (Penske Automotive more recently)
  - Coming out of the crisis, we do believe that those with a relatively better balance sheet position and lower leverage will be better positioned to take advantage of the recovery and transition to omni-channel sales.
  - We expect consolidation to pickup post the COVID-19 crisis particularly as the under capitalized dealers find it hard to compete in a more digital world that will need investments – this is likely to happen more on the independent used side vs new
- **Equity view**
  - The stocks continue to trade at recessionary levels, low end of their historical range, so the risk-reward for the space remains attractive
  - For the multiple re-rating to happen, we would need more clarity on how 2H20 economic activity shapes up, the pace of unemployment recovery, a potential cash for clunkers program, and how these dealers are able to permanently adjust the cost structure
  - Lithia Motors, even though its outperformed a fair amount, remains our top pick, given a solid balance sheet, good history of execution on M&A and also above average execution in the core business



# A Quick Word on Carvana

- **We initiated on shares of Carvana with Neutral rating last year and currently have \$65 price target, as we believe the company's attractive business model, coupled with solid near-term earnings momentum, is more than reflected in its standing premium valuation**
- **Fragmented used vehicle market provides plenty of growth opportunity**
  - Highly fragmented \$750 bn used vehicle market that has room for both consolidation and better operational efficiency - #1 player has just ~2% share currently
  - Used vehicle market has significantly lower volatility than the market for new vehicles - natural and predictable churn of US installed base of 270 mn vehicles
- **Differentiated business model driving the industry in its direction**
  - Carvana operates as an on-line only used retailer with a full captive finance business and centralized reconditioning centers – proprietary technology, quick background checks, immediate financing options
  - Business model allows quick expansion into newer markets, grow market share in existing markets, and offer attractive pricing, given ability to leverage SG&A - also allows the firm to be more productive than legacy players
  - The company has also recently made technology-oriented acquisitions, including Carlypso, Car360 and Propel AI
- **GPU growth to be gradual as scale and sourcing benefits get somewhat offset by pricing competition**
  - GPU expansion opportunities are realistic, particularly F&I and sourcing, with the key differentiation vs. peers being Carvana's more scalable and efficient IRCs - will be tough to replicate at brick & mortar retailers
  - However, competition will continue to rise, suggesting continued persistent pricing pressure (a key reason we forecast only a gradual ramp in GPU)
- **SG&A leverage should drive positive EBITDA, with initial markets already profitable**
  - The firm's 2013 cohort had become operationally profitable after 4 years, suggesting other regions are likely to follow a similar profitability curve - execution will be key to replicate the early success, particularly as it relates to common reconditioning centers, logistics, managing new hub costs, and leveraging fixed costs such as information technology and corporate functions

## Quick Word on Carvana

- **Carvana is not an “asset-light” company, although infrastructure / network could prove a relative advantage longer-term**
  - Carvana is far from an asset-light technology company - high mix of PP&E as a % of total assets and minimal software capitalization as a % of PP&E in comparison to other e-commerce players and retailers
  - Carvana needs to continue storing a substantial inventory of vehicles, build and expand its reconditioning facilities, and deploying heavy-duty trucks and trailers for vehicle transportation
  - Carvana does have a differentiated approach to reconditioning, as well as now established market hubs which are scalable, and that could provide the company with a relative advantage longer-term
- **Financing revenue is a substantial and increasing chunk of gross profit mix**
  - ~35% of Carvana's current gross profit comes from gains on financing receivables- this degree of mix is higher than for its competitors, other retailers, and industrial companies generally with a captive finance business
  - Potential risk in the event of a downturn as we are seeing now, through efforts to efficiently manage and build its captive finance arm could also provide a long-term competitive advantage
- **Downturn vulnerability likely elevated, given leverage and high dependency upon financing income**
  - Unlikely to be a significant hit to earnings in a near-term recession, with the company still likely to grow (albeit at a much more moderate pace than seen in recent quarters) given its still in early stages of growth
  - High reliance upon its financing arm for gross profit and for facilitating vehicle sales presents a risk
  - Recall that Amazon traded well below its historical average EV/sales multiple during the 2001/2002 and 2008/2009 downturns despite growing its revenue and earnings during those periods
- **CVNA shares' current premium valuation seems fair in the context of the firm's recent growth trend and opportunity**

# Not a “Winner Takes All” Used Vehicle Market

- **E-commerce vs. Omni-Channel vs. Brick & Mortar: Not a “Winner Takes All” Market but Carvana Has Ability to Scale Faster**
  - Carvana is asset-heavy like other dealers, primarily due to reconditioning requirements and heavy logistics
  - Online-only likely to be more productive longer-term; companies transitioning are seeing some near-term pressure but not significant. KMX a good example where EBITDA margin is down over the last 3 years though should likely stabilize once omni-channel initiatives start to produce returns
  - A focused brick & mortar strategy can also generate solid returns, as seen at Sonic Automotive recently
- **Competitive Landscape: Peers Taking a Less Aggressive Approach; Brick & Mortar Retailers Gradually Moving Toward Omni-channel Though Focused on Returns**
  - Shift and Vroom taking a less aggressive and less capital –intensive approach but have ample opportunity to expand – currently partnering with brick & mortar dealers for forming partnerships and utilizing reconditioning
  - Public franchise dealerships also ramping up initiatives and spending, though taking a thoughtful and return focused approach
  - CarMax ramping investment and expansion in omni-channel initiatives

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