



CFRA

Industry Surveys

Global Automobile Manufacturers

OCTOBER 2019

Garrett Nelson
Adrian Ng
Equity Analysts

Xiong Jun Goon
Industry Analyst

CONTENTS

5	Industry Snapshot
6	Financial Metrics
7	Key Industry Drivers
8	Industry Trends
10	Porter's Five Forces
20	How the Industry Operates
25	How to Analyze a Company in this Industry
30	Glossary
31	Industry References
33	Comparative Company Analysis

Contacts

Sales Inquires & Client Support

800.220.0502
cservices@cfraresearch.com

Media Inquiries

press@cfraresearch.com

CFRA

One New York Plaza
New York, NY 10004

Contributors

Sam Stovall

Chief Investment Strategist

Beth Piskora

Vice President, Editorial

Marc Bastow

Senior Editor

Raymond Jarvis

Associate Editor

Copyright © 2019 CFRA, One
New York Plaza, New York,
NY 10004. All rights reserved.

CHARTS & FIGURES

- 6 Industry Revenue Growth
Industry EBIT Margin
Industry Global Automobile Sales
- 7 Global GDP Growth
Real GDP Growth
Consumer Confidence Index
- 8 Revenue Share Map of the Global
Automobile Manufacturers
- 9 Major Automakers by Region
- 11 Total Vehicle Sales by Global Region
- 12 Vehicle Sales in China
- 13 Global Passenger Electric Vehicle Sales
- 14 SAE International Vehicle Autonomy
Levels
Global Sales of Level 5 Autonomous
Vehicles
- 17 Annual Automobile Production by Country
- 19 Key Announced Transactions in 2018

NEW THEMES



What's Changed: For starters, the Global Automobile Manufacturers survey is new! It's a global world, and our new survey builds on the Automobiles U.S. and Automobiles Europe surveys.



What's Changed: Our Profit Share Map on Page 8 provides a graphic overview of the profitability and share of revenue across the Global Automobile Manufacturers industry.



What's Changed: The new Porter's Five Forces analysis starts on Page 10, detailing the competitive positioning across the industry.

EXECUTIVE SUMMARY

From China to Mexico, South Carolina to Italy, automobile manufacturers churn out passenger cars, light and heavy-duty trucks and everything in between to consumers around the world. Global supply chains help distribute the workload, and while newer entrants attempt to gain a foothold, the more established names remain the same, while working feverishly to adapt. With this globalization in mind, CFRA is merging two Industry Surveys (Automobiles and Automobiles Europe) into one broader survey that better tracks the industry. CFRA has a neutral outlook on the Global Automobile Manufacturers industry. Here are the key themes we have highlighted and our outlook for the remainder of 2019 and 2020.

China New Vehicle Sales Slump Likely to Continue, Driving Global Auto Sales Lower

In 2018, China's auto sales growth declined for the first time since 1990. We see auto sales declining for a second and third straight years in 2019 and 2020, respectively. According to the China Association of Automobile Manufacturers (CAAM), China's full-year auto sales fell by 2.8% to 28.1 million units in 2018 and were down a staggering 11.0% the first eight months of 2019. China is both the world's largest auto consumer and producer, accounting for over 29% of global sales in 2018. The country has been the industry's primary growth driver for the past three decades. We believe China's auto sales will remain under pressure in 2019 and 2020 given slowing economic growth and consumer spending, which have been exacerbated by U.S. tariffs, in our view. We see China's auto sales declining by 10.0% in 2019 and another 3.2% in 2020, making it the primary driver of CFRA's forecasted declines in global vehicle sales.

Auto Sales Also Expected to Decline in North America and Europe as Economic Growth Slows

Looking at the two other major auto markets of North America and Europe, each of which accounted for approximately 22% of global auto sales in 2018, we see declines in new light vehicle sales in both 2019 and 2020. We see U.S. new light vehicle sales declining by 2.4% from the 2018 total of 17.2 million units (which marked a record fourth consecutive year above 17 million) to 16.8 million in 2019 and by another 1.8% to 16.5 million in 2020. In Europe, we see auto sales falling 4.0% in 2019 and another 3.5% in 2020 (following a 0.4% drop in 2018) driven by declines in Spain, Italy, the U.K. and several smaller countries. While falling interest rates should help support sales volume, the combination of rising new vehicle prices and slowing economic growth should weigh on fundamentals. In the U.S., monthly payments on new vehicle loans hit a record high of \$554 in Q1 2019, according to Experian, and auto loan delinquencies recently hit a 19-year high, although overall credit quality remains solid. While U.S. auto loan interest rates hit their highest level in a decade at 6.27% in Q2 2019, we expect rates to moderate, which should help offset rising average vehicle prices due to the cost of new technologies and mix, as automakers continue to produce more higher-value trucks and SUVs and fewer sedans.

Trade Disputes Pressuring Global Supply Chains

Assuming it is ratified, we think the USMCA trade deal announced in October 2018 will strengthen the North American bloc, giving the continent greater leverage in the global auto market. Between 1994 and 2017 (since NAFTA took effect), North America's share of global auto production fell from 31.2% to 15.9% due to massive declines in the U.S. and Canada (and a jump in Mexico) amid the rise of China as the world's largest automaker. As of this writing, the U.S. and China had not resolved their trade dispute and were engaged in a tariff tit-for-tat. In August 2019, China announced plans to implement tariffs of 25% on finished automobiles and 5% on auto parts imports from the U.S. starting December 15, 2019. We think the negative impact of the tariffs is likely to be limited, as the U.S. exported only 171,504 new and used autos worth roughly \$6.8 billion to China in 2018 (amounting to only 0.6% of China's total auto sales), down from 271,786 worth \$10.2 billion in 2017. In fact, six of the top ten models exported from the U.S. to China were SUVs made by German firms BMW or Mercedes. Auto parts exports from the U.S. to China also comprise a small percentage of the overall market.

GLOBAL AUTOMOBILE MANUFACTURERS

*Outlook: Neutral***KEY TAKEAWAYS:**

We expect global new light vehicle sales to slow substantially in 2019 and 2020 driven by significantly weaker demand in China, slowing global economic growth, rising new vehicle prices and weaker consumer confidence, partially offset by lower interest rates. Global trade disputes are also creating a high degree of uncertainty. Several automakers have also announced restructuring plans in an effort to lower costs and boost margins, which we expect to help provide support from an earnings perspective.

MARKET SHARE BREAKDOWN*(vehicles sold by company; 2018)*

RANK NO.	COMPANY NAME	MARKET SHARE
1	Volkswagen	11.6%
2	Toyota	11.2%
3	Renault-Nissan	11.1%
4	GM	9.2%
5	Hyundai-Kia	7.9%
6	Ford	6.0%
7	Honda	5.6%
8	FCA	5.2%
9	PSA	4.4%
10	Suzuki	3.5%

Source: Focus2move.com

2019/2020 PREVIEW

Revenue Growth:	-0.7% for 2019; 4.1% for 2020
Operating Margin Growth:	+43 bps for 2019; +62 bps for 2020
Net Income Growth:	-16.4% for 2019; 10.1% for 2020
Global Auto Sales Growth:	-5.5% for 2019; -2.5% for 2020

2018 REVIEW

Revenue Growth:	-0.3%
Operating Margin Growth:	-188 bps
Net Income Growth:	-8.1%
Global Auto Sales Growth:	-0.3%

Note: Financial metrics are estimated/calculated based on 56 of the world's largest listed automakers, of which the top 20 were included in the "Comparative Company Analysis" section.

NEAR-TERM THEMES**▼ China Auto Sales Plummet**

China's auto sales had fallen for thirteen straight months while sales volume was down 11% YTD July 2019. Given China's importance to the global auto market as the world's largest producer and consumer, we view this trend as a major headwind.

▼ U.S. & E.U. Demand Also Weaker

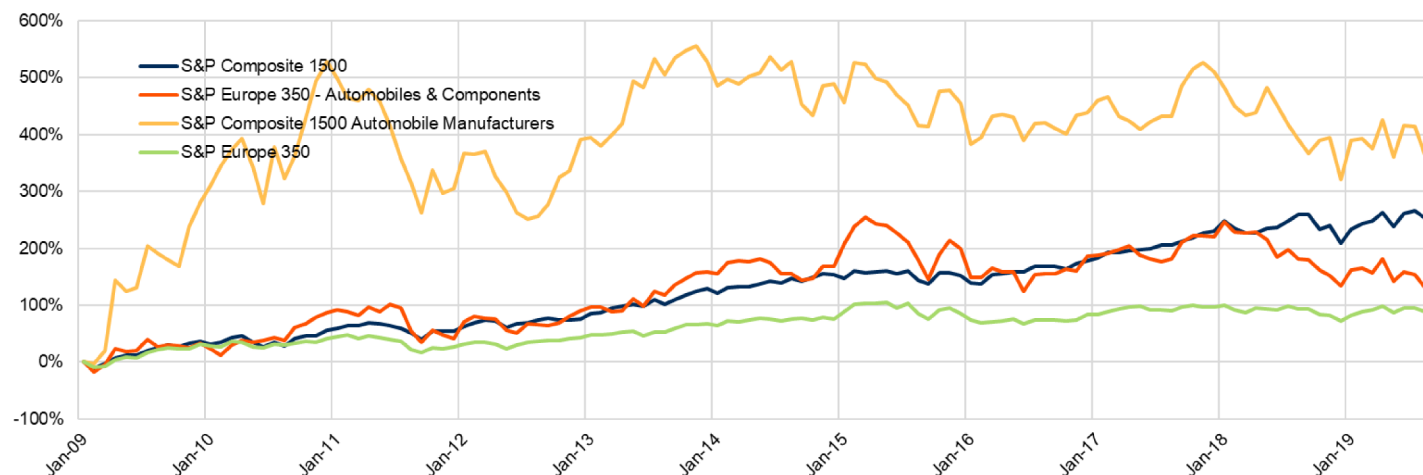
U.S. and European new vehicle sales are also down, driven by slowing economic growth, record-high average vehicle prices, and shifting consumer preferences in favor of used vehicle purchases.

▲ Restructuring Programs

Companies are implementing multi-year cost saving plans in an effort to improve margins. Companies are focusing on optimizing supply chain processes and organizational structures.

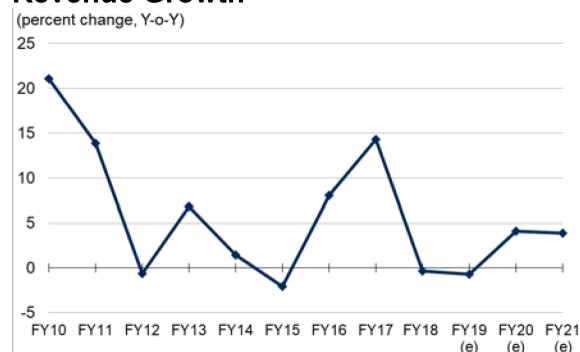
▼ Margin Pressure

Margins are under pressure from trade tariffs, slowing global economic growth, falling global auto demand and significant R&D investments in electric vehicles and automated driving technologies.

10-YEAR INDEX PERFORMANCE

FINANCIAL METRICS

Revenue Growth



e-Estimated.

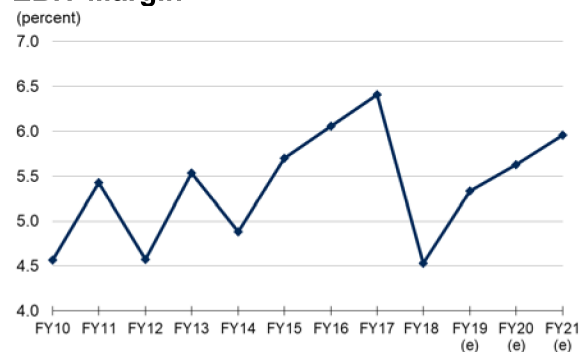
Source: CFRA; S&P Global Market Intelligence.

Note: Financial metrics are estimated/calculated based on 56 of the world's largest listed automakers.

◆ We project revenues for the industry to experience slight deterioration in 2019, due to lower vehicle sales and uncertainties arising from the ongoing trade disputes, partially offset by higher prices.

◆ Looking forward, we project revenues to increase by 5.0% in 2020 and 4.0% in 2021.

EBIT Margin



e-Estimated.

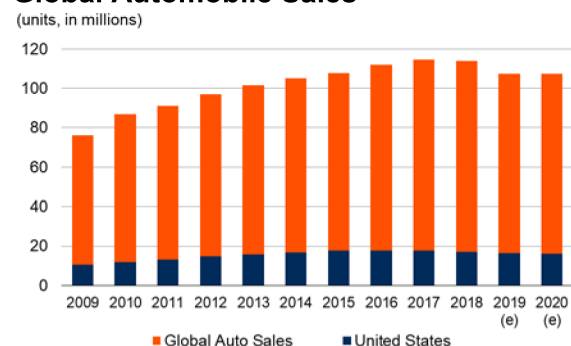
Source: CFRA; S&P Global Market Intelligence.

Note: Financial metrics are estimated/calculated based on 56 of the world's largest listed automakers.

◆ Margin compression was a major challenge for the industry in 2018 due to a stronger U.S. dollar (which reduced net revenue) and higher commodity and transportation costs.

◆ Industry median gross margin is estimated to expand by 53 bps in FY 19, 58 bps in FY 20, and 46 bps in FY 21 due to higher price realizations from vehicle mix and cost benefits from restructuring actions.

Global Automobile Sales



e-Estimated.

Source: International Organization of Motor Vehicle Manufacturers (OICA).

◆ We project Global Automobile Sales will decline by 5.5% in 2019 and another 2.5% in 2020, driven by lower sales in China, and to a lesser extent, Europe. Together, China and the E.U. account for over 51% of global auto sales.

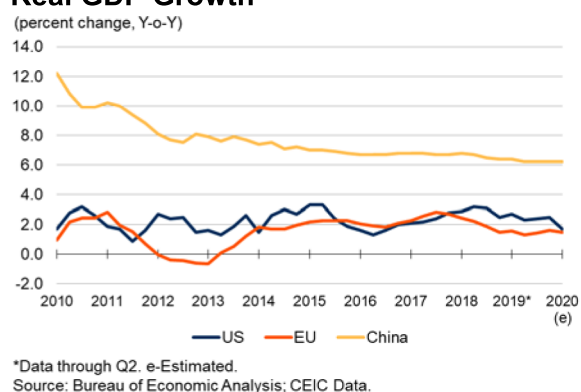
KEY INDUSTRY DRIVERS

Global GDP Growth



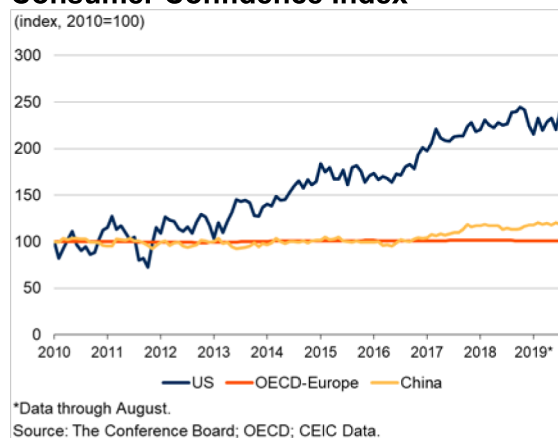
- ◆ The World Bank currently forecasts global GDP growth to slow from 3.0% in 2018 to 2.9% in 2019, and 2.8% in 2020 and 2021 amid softened international trade and investments, elevated trade tensions and financial market pressures in the emerging markets.

Real GDP Growth



- ◆ Looking at the world's three largest auto markets, the World Bank currently projects that GDP growth will slow from 6.5% in 2018 to 6.2% in 2019 and 2020 in China, from 2.9% in 2018 to 2.5% in 2019 and 1.7% in 2020 in the U.S., and from 1.9% in 2018 to 1.6% in 2019 and 1.5% in 2020 in the E.U.

Consumer Confidence Index



- ◆ The Consumer Confidence Index for all three economic regions has been on the rise since the Global Financial Crisis.
- ◆ We forecast these indices to taper in 2019 and 2020 as several global economic factors dampen consumer sentiment, including interest rate hikes and signs of a global economic slowdown.

INDUSTRY TRENDS

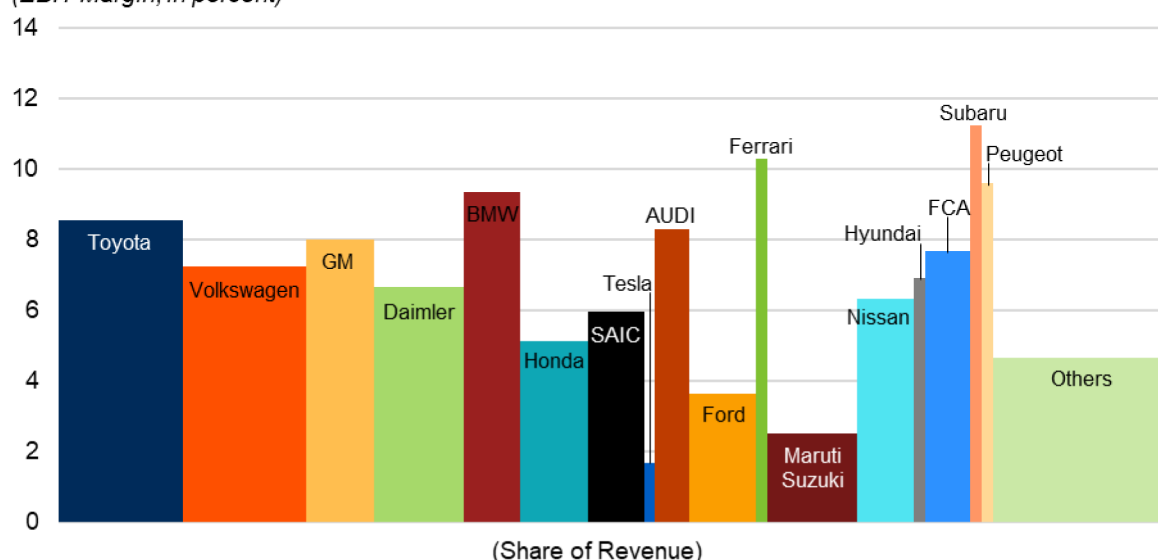
Industry Outlook and Profitability Overview

We have a neutral fundamental outlook for the automobile manufacturers sub-industry for the next 12 months. Our outlook reflects concerns regarding new vehicle sales in a global GDP growth environment, the impact of tariffs on raw material costs (particularly for metal), as well as shifting consumer preferences in favor of used vehicles, offset by a generally positive domestic and global economic backdrop. We see U.S. automotive demand trending slightly lower year-over-year in 2019, after increasing slightly in 2018, but with a favorable mix of trucks and utility vehicles. These concerns are balanced by global economic conditions and auto demand which remains healthy relative to historic standards.

These are innovative times for the industry; increasing vehicle electrification combined with the rise of ride-sharing and ride-hailing services are dramatically changing how the industry and consumers operate, and how they will operate in the future. Both traditional and non-traditional automobile makers have announced plans to bring fully autonomous vehicles to market in the next decade.

REVENUE SHARE MAP OF THE GLOBAL AUTOMOBILE MANUFACTURERS*

(EBIT Margin, in percent)



*As of year-end 2018

Source: CFRA; S&P Global Market Intelligence

Despite having one of the lowest profit margins, automobile manufacturers contributed a fairly large amount of revenue – a combined \$2.3 trillion in 2018 for the 56 largest automakers covered in this *Survey* – to their respective nation's GDP.

The Major Players

The automotive industry is a major contributor to the world's economy and is highly dominated by companies in the U.S., E.U. and various parts of Asia such as Japan and China. Following is a summary of the major original equipment manufacturers (OEMs) in the world.

MAJOR AUTOMAKERS BY REGION

COMPANY	2018 SALES (in million units)	BUSINESS DESCRIPTION
<u>United States</u>		
1) General Motors	8.6	General Motors Company (GM) was founded in 1908 and is headquartered in Detroit, Michigan. The company designs, builds, and sells cars, trucks, crossovers, and automobile parts worldwide. GM also sells trucks, crossovers, and cars to dealers for consumer retail sales, as well as to fleet customers, including daily rental car companies, commercial fleet customers, leasing companies, and governments. In addition, it offers connected safety, security, and mobility solutions for retail and fleet customers.
2) Ford	5.6	Ford Motor Company was founded in 1903 and is based in Dearborn, Michigan. The company designs, manufactures, markets, and services a range of Ford cars, trucks, sport utility vehicles, and electrified vehicles worldwide. The Automotive segment sells Ford and Lincoln vehicles, service parts, and accessories. The Mobility segment designs and builds mobility services; and provides self-driving systems development and vehicle integration, autonomous vehicle research and engineering, and autonomous vehicle transportation-as-a-service network development services.
<u>European Union</u>		
1) Volkswagen	10.4	Volkswagen AG (VW) was founded in 1937 and is headquartered in Wolfsburg, Germany. It operates as a subsidiary of Porsche Automobil Holding SE. VW's passenger cars segment develops vehicles and engines; and produces and sells passenger cars and related parts. Its commercial vehicles segment develops, produces, and sells light commercial vehicles, trucks, and buses; and offers parts and related services; while its power engineering segment develops, produces, and sells large-bore diesel engines, turbo compressors, industrial turbines, and chemical reactor systems, as well as gear units, propulsion components, and testing systems.
2) Renault-Nissan Alliance	10.3	Renault was founded in 1898 and is based in Boulogne-Billancourt, France. The company designs, manufactures, sells, and distributes vehicles. The company offers passenger and light commercial, and electric vehicles primarily under the Renault, Dacia, Renault Samsung Motors, Alpine, and LADA, as well as under the Nissan, Datsun, and Infiniti brands. The company also sells powertrains and used vehicles, as well as spare parts; and provides various services.
3) Fiat Chrysler Automobiles	4.8	Fiat Chrysler Automobiles N.V. (FCA) was founded in 1899 and is based in London, the United Kingdom. The company designs, engineers, manufactures, distributes, and sells vehicles, components, and production systems. FCA provides passenger cars, SUV vehicles, trucks, light commercial vehicles, and luxury vehicles under the Maserati brand, as well as related service parts and accessories, and service contracts under the Mopar brand. It also provides cast iron components for vehicles under the Teksid brand; and designs and produces industrial automation systems and related products for the automotive industry under the Comau brand name.
4) PSA Group	4.1	The Rueil-Malmaison, France-based company engages in automotive, automotive equipment, and finance businesses. The company's Automotive segment designs, manufactures, and sells passenger cars and light commercial vehicles under the Peugeot, Citroën, Opel Vauxhall, and DS brands. Its Automotive Equipment segment offers interior systems, automotive seating products, and clean mobility products. PSA also offers electric vehicles.
<u>Asia</u>		
1) Toyota (Japan)	10.5	Toyota Motor Corporation was founded in 1933 and is headquartered in Toyota, Japan. It designs, manufactures, assembles, and sells passenger vehicles, minivans and commercial vehicles, and related parts and accessories. The company offers hybrid cars, fuel cell vehicles, and conventional engine vehicles. Further, the company engages in the information technology related businesses comprising operation of a Web portal for automobile information known as GAZOO.com.
2) Hyundai (S. Korea)	7.4	Hyundai Motor Company was founded in 1967 and is headquartered in Seoul, South Korea. It manufactures and distributes motor vehicles and parts worldwide. In addition, the company offers trucks, buses, vans, special-CVs, and engines; vehicle financing, credit card processing, marketing, engineering, and insurance services; manufactures trains; and operates a football club. Further, it is involved in real estate development; research and development; and investment activities. Hyundai Motor Company has a strategic partnership with Rimac Automobili to develop electric vehicles.
3) Honda (Japan)	5.3	Honda Motor Co., Ltd. was founded in 1946 and is headquartered in Tokyo, Japan. It develops, manufactures, and distributes motorcycles, automobiles, power products, and other products worldwide. The company's automobile business segment offers passenger cars, light trucks, and mini vehicles, as well as vehicles powered with alternative fuel, such as ethanol, battery electric, and fuel cell vehicles. Its power product and other businesses segment manufactures and sells power products for various purposes which also includes the HondaJet aircraft.
4) Suzuki (Japan)	3.3	Suzuki Motor Corporation was founded in 1909 and is headquartered in Hamamatsu, Japan. It manufactures and sells automobiles, motorcycles, and marine products in Japan, rest of Asia, Europe, and internationally. It offers mini-vehicles, sub-compact vehicles, standard-sized vehicles, all-terrain vehicles, outboard motors, motorized wheelchairs, electro senior vehicles, and houses.

Source: CFRA; S&P Global Market Intelligence; International Organization of Motor Vehicle Manufacturers; Focus2move.com.

Competitive Environment

Below, we used the Porter's Five Forces framework as a tool to analyze the competitive environment of the automobile industry.



1) Threat of New Entrants or New Entry (Low)

The high initial capital, high cost of doing business and high brand development cost may deter most competitors from entering the industry. Large automakers had also long associated their brands to patriotism and that would be something hard for new entrants to replicate.

2) Threat of Substitutes (Moderate)

The industry experiences increasing effects from substitutes that may include public transportation or other modes of transportation. The proliferation of e-hailing services, increasing environmental awareness and increasing connectivity of public transportation may also pose threats to car ownership. Switching costs, however, may be high for most people as owning a car is still the easiest way to travel; buyers are also less inclined to use other modes of transportation while still paying down their car loans.

3) Bargaining Power of Buyers (Moderate)

The moderate bargaining power of buyers stems mainly from a few factors. First, they face low switching costs to another automaker. Next, the moderate size of individual purchases means that a small change in purchasing trends would have a significant effect on revenue. Lastly, the moderate availability of substitutes means that rapid development of other modes of transportation and proliferation of IoT could disrupt firms' profitability.

4) Bargaining Power of Suppliers (Moderate)

Suppliers support this industry with the availability of raw materials and assembled parts needed for business operations. Given the moderate overall supply and population of suppliers, they do have considerable but limited bargaining power over big automakers. However, a low degree of vertical integration means many suppliers do not have control of sales of their product to automakers.

5) Degree of Rivalry/Competition (Very High)

The degree of rivalry and competition has been known to be especially high. Industry players tend to offer products that are very similar. Furthermore, switching costs are low to none for the buyers as they

can easily switch from one automaker to another. Players would have to constantly innovate to ensure they have products with the latest technologies to offer. The industry's high exit barriers mean firms would rather compete than shutting their businesses.

Operating Environment

Growth Potential in Developing Markets

The global automobiles industry is increasingly shifting its focus toward emerging markets with Asia-Pacific leading the pack in the share of world vehicle sales. According to the International Organization of Motor Vehicle Manufacturers (OICA), Asia, Oceania and the Middle East had a combined 49.9% share of global vehicle sales in 2018, up from 45.3% in 2011 but down slightly from a peak of 50.5% in 2017. The decline was driven by lower sales in China, which in 2018 posted their first decline in vehicle sales since 1990.

In developing countries, social changes, such as urbanization and the change in lifestyles, are crucial to the industry because they can lead to an increase in per-capita consumption of automobiles. GDP, disposable income and population in various developing regions are outpacing those of the U.S. and Western Europe.

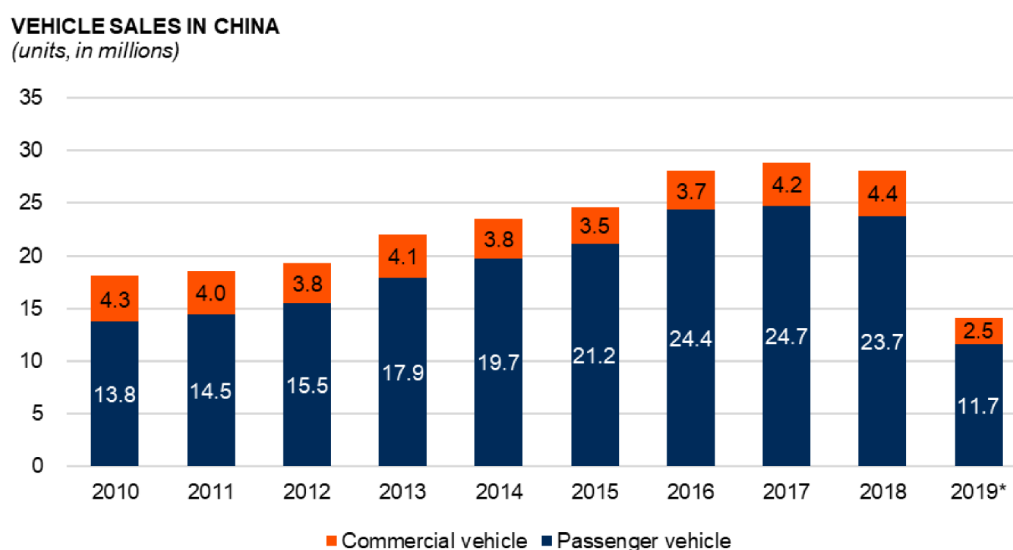
TOTAL VEHICLE SALES BY REGION (for the year ended, in millions of vehicles)											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<u>U.S.</u>	<u>11.772</u>	<u>13.041</u>	<u>14.786</u>	<u>15.883</u>	<u>16.843</u>	<u>17.846</u>	<u>17.866</u>	<u>17.551</u>	<u>17.701</u>	<u>17.277</u>	<u>16.966</u>
North America	12.859	14.204	15.598	17.527	18.765	19.910	21.175	21.497	21.120	20.613	20.242
South America	5.516	5.980	6.144	6.265	5.565	4.514	4.052	4.334	4.604	4.655	4.525
Europe	18.809	19.740	18.663	18.343	18.588	19.036	20.135	20.755	20.698	19.870	19.175
China	18.062	18.505	19.306	21.984	23.499	24.662	28.028	28.879	28.081	25.273	24.464
<u>Japan</u>	<u>4.956</u>	<u>4.210</u>	<u>5.370</u>	<u>5.376</u>	<u>5.563</u>	<u>5.047</u>	<u>4.970</u>	<u>5.234</u>	<u>5.272</u>	<u>5.193</u>	<u>5.141</u>
Asia, Oceania & Middle East	35.192	35.405	38.226	40.579	42.557	43.411	46.858	48.315	47.410	43.523	42.522
<u>Africa</u>	<u>1.251</u>	<u>1.447</u>	<u>1.569</u>	<u>1.654</u>	<u>1.718</u>	<u>1.550</u>	<u>1.314</u>	<u>1.137</u>	<u>1.236</u>	<u>1.211</u>	<u>1.189</u>
Total	74.972	78.170	82.129	85.606	88.338	89.685	93.856	95.661	95.056	89.871	87.652
<u>% Change</u>											
<u>U.S.</u>		<u>10.8%</u>	<u>13.4%</u>	<u>7.4%</u>	<u>6.0%</u>	<u>5.9%</u>	<u>0.1%</u>	<u>-1.8%</u>	<u>0.9%</u>	<u>-2.4%</u>	<u>-1.8%</u>
North America		10.5%	9.8%	12.4%	7.1%	6.1%	6.4%	1.5%	-0.4%	-2.4%	-1.8%
South America		8.4%	2.7%	2.0%	-11.2%	-18.9%	-10.2%	6.9%	7.7%	1.1%	-2.8%
Europe		5.0%	-5.5%	-1.7%	1.3%	2.4%	5.8%	3.1%	-0.4%	-4.0%	-3.5%
China		2.5%	4.3%	13.9%	6.9%	4.9%	13.7%	3.0%	-2.8%	-10.0%	-3.2%
<u>Japan</u>		<u>-15.1%</u>	<u>27.5%</u>	<u>0.1%</u>	<u>3.5%</u>	<u>-9.3%</u>	<u>-1.5%</u>	<u>5.3%</u>	<u>0.7%</u>	<u>-1.5%</u>	<u>-1.0%</u>
Asia, Oceania & Middle East		0.6%	8.0%	6.2%	4.9%	2.0%	7.9%	3.1%	-0.9%	-8.2%	-2.3%
<u>Africa</u>		<u>15.6%</u>	<u>8.5%</u>	<u>5.4%</u>	<u>3.9%</u>	<u>-9.8%</u>	<u>-15.2%</u>	<u>-13.5%</u>	<u>-2.4%</u>	<u>-2.0%</u>	<u>-1.8%</u>
Total		4.3%	5.1%	4.2%	3.2%	1.5%	4.7%	1.9%	-0.6%	-5.5%	-2.5%
<u>Global Market Share %</u>											
<u>U.S.</u>	<u>15.7%</u>	<u>16.7%</u>	<u>18.0%</u>	<u>18.6%</u>	<u>19.1%</u>	<u>19.9%</u>	<u>19.0%</u>	<u>18.3%</u>	<u>18.6%</u>	<u>19.2%</u>	<u>19.4%</u>
North America	17.2%	18.2%	19.0%	20.5%	21.2%	22.2%	22.6%	22.5%	22.2%	22.9%	23.1%
South America	7.4%	7.7%	7.5%	7.3%	6.3%	5.0%	4.3%	4.5%	4.8%	5.2%	5.2%
Europe	25.1%	25.3%	22.7%	21.4%	21.0%	21.2%	21.5%	21.7%	21.8%	22.1%	21.9%
China	24.1%	23.7%	23.5%	25.7%	26.6%	27.5%	29.9%	30.2%	29.5%	28.1%	27.9%
<u>Japan</u>	<u>6.6%</u>	<u>5.4%</u>	<u>6.5%</u>	<u>6.3%</u>	<u>6.3%</u>	<u>5.6%</u>	<u>5.3%</u>	<u>5.5%</u>	<u>5.5%</u>	<u>5.8%</u>	<u>5.9%</u>
Asia, Oceania & Middle East	46.9%	45.3%	46.5%	47.4%	48.2%	48.4%	49.9%	50.5%	49.9%	48.4%	48.5%
<u>Africa</u>	<u>1.7%</u>	<u>1.9%</u>	<u>1.9%</u>	<u>1.9%</u>	<u>1.9%</u>	<u>1.7%</u>	<u>1.4%</u>	<u>1.2%</u>	<u>1.3%</u>	<u>1.3%</u>	<u>1.4%</u>
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: OICA; CFRA estimates for 2019-2020.

Brookings Institute, a non-profit research firm, stated in a 2018 report that just over 50% of the world's population, or about 3.8 billion people, now have enough discretionary spending to be considered "middle class". The report goes on to state that the rapid expansion of the middle class is driven in Asia, with India and China accounting for about 730 million of the next billion entrants to the global middle

class. With the growth of the middle class predominately in Asia, we expect real GDP in emerging markets to grow at a faster rate than real GDP in advanced economies.

There is, however, one dampener in the developing countries. According to the China Association of Automobile Manufacturers (CAAM), China, one of the developing countries and the world's largest vehicle market, sold only 28.1 million units in 2018, a decline of 2.8% from the prior-year period. The drop was mainly due to the restoration of auto purchase tax from 5% to 10% in 2018, coupled with the trade war with U.S. and other microeconomic factors. Vehicle sales for the first eight months of 2019 plunged another 11.4% from the prior-year period to 14.13 million units, extending the decline streak to thirteen months. CAAM expects vehicle sales in China to drop in 2019 as opposed to the earlier expectation for zero growth.



*Data through July

Source: China Association of Automobile Manufacturers.

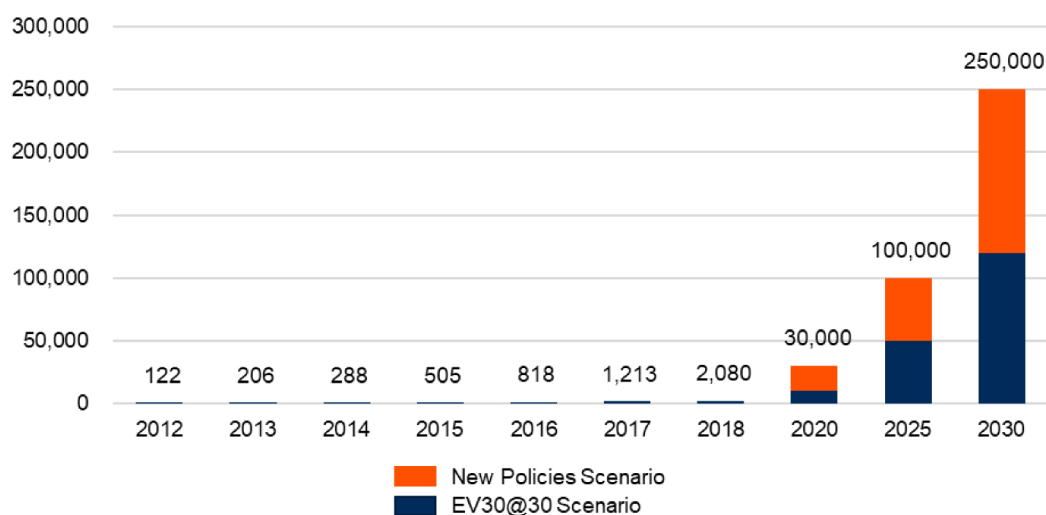
CFRA projects global vehicle sales to decline by 5.5% to 89.87 million units in 2019, followed by a 2.5% drop to 87.65 million units in 2020. The slower growth can primarily be attributed to a sharp slowdown in Chinese auto sales. While we expect a drop in global auto sales, we expect sales to remain strong relative to historic levels, and expect automakers to continue to benefit from improved mix, cost cuts, as well as widely available access to consumer credit, a strong stock market and lower gas prices.

Electric Vehicles

The advancement in technology has allowed automakers to add more features to vehicles. Current technological endeavors in the automobiles industry include electric vehicles (EVs), which encompass electric/plug-in vehicles (including hybrids) and autonomous vehicles (AVs). CFRA thinks that despite their relatively miniscule market share, EVs and autonomous vehicle sales should rise steadily and rapidly. Accelerated mass market EV growth is generally expected whereas fully autonomous vehicles are in the testing stage and adoption may be years away.

In the next five years, CFRA expects a multifold increase in EV sales volumes. Automobile manufacturers have noted this trend and have responded with plans to bring more electric vehicles to market. Industry researcher LMC Automotive forecasts that in 2030, 18.2 million units of EVs will be sold, an increase of 1,800% from the estimated 995,000 vehicles sold in 2018.

GLOBAL PASSENGER ELECTRIC VEHICLE SALES (units, in thousands)



Source: EV-volumes.com; forecasts from International Energy Agency.

Electric cars are just about 1% of worldwide auto sales volume, and even less in the U.S., according to LMC Automotive, which forecasts that by 2025, electric cars will represent less than 10% of the 100 million plus global market and 2.4% in the U.S. Although relatively small today, EVs and AVs sales will likely rise steadily and rapidly, in CFRA's view. Despite successful participation in the transitioning to EV/AV, some suppliers may still face pressure on their legacy businesses as demands dwindle, especially if and when some countries ultimately ban the production of internal combustion engine (ICE) vehicles. CFRA does not expect any bans to take effect prior to the 2030s.

Autonomous Vehicles

The list of car makers hopping on the autonomous-driving bandwagon had increased substantially. While most automakers normally outsource their component production to suppliers, they prefer to control autonomous vehicle (AV) technology through in-house expertise. Companies like Daimler, Renault-Nissan, VW, BMW, Toyota, just to name a few, are also directly or indirectly engaging in the integration and implementation of autonomous driving into their vehicles.

While we one day envision a world of fully autonomous vehicles, that remains many years away, in our view. The projected trend of Level 5 autonomous vehicle unit sales by LMC Automotive is not seen gaining ground until the 2030s. While Level 5 capabilities remain elusive and likely years away, Level 4 vehicles are already being tested in the market and will likely be rolled out (without the need for safety drivers) over the next three to five years, albeit across very limited geographic regions. The roll-out of robotaxis, beginning at Level 4, is likely to start in certain geographic regions in 2020, by CFRA analysis. Cities across the states of Arizona and California will be among the first to roll out fleets with driverless cars, according to CFRA forecasts. However, our base case is for autonomous vehicles to be deployed gradually over the next two to three decades within the ridesharing ecosystem while human drivers continue to serve most consumer demand.

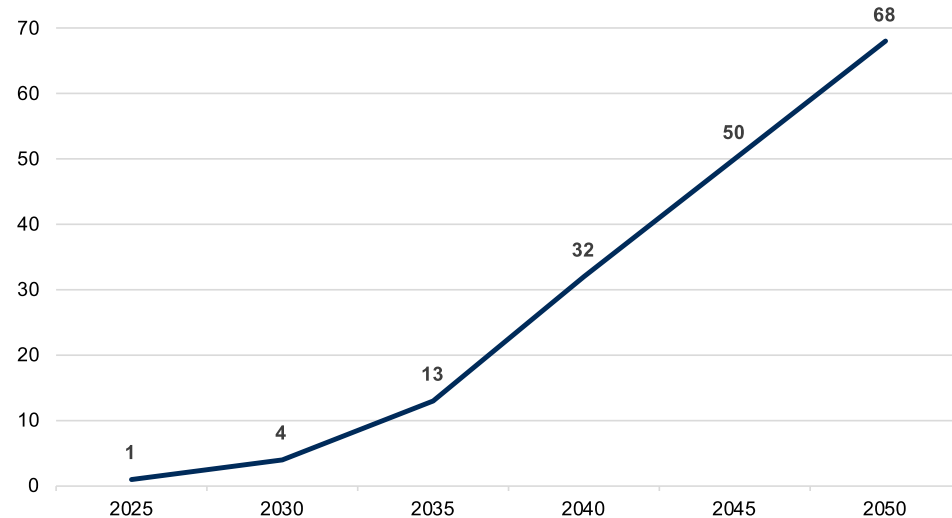
SAE INTERNATIONAL VEHICLE AUTONOMY LEVELS

Level	Description	Human Role	Vehicle Role
0	None	All driver control	No autonomous functions
1	Limited + Safety	Almost all driver control	ABS, traction control
2	Limited, Active Safety, Convenience	Mostly driver control	Lane keeping, emergency braking, adaptive cruise control, parking assist
3	Significant Autonomy	Driver can disengage completely at times	Advanced controls in simple conditions (highway, slow-moving congestion, good weather)
4	High Autonomy	Driver not needed in some locations/conditions	Full conditional autonomous capabilities, more difficult conditions/locations not autonomous
5	High/Complete Autonomy	No driver needed	Autonomous driving in all locations/conditions possible, driver controls (brakes, steering wheel) not necessary

Source: LMC Automotive

While well-established ridesharing providers are spending aggressively on developing autonomous technology internally, these providers have also opened up their networks to external developers for assistance. We believe doing this will help accelerate the adoption of autonomous vehicles. While we expect Alphabet's Waymo, among others, to help lead initiatives on autonomous technology, shared mobility service providers like Uber and Lyft appear the best way to invest in this technology at the moment on a pure play basis, in our view.

GLOBAL SALES OF LEVEL 5 AUTONOMOUS VEHICLES (units, in millions)



Source: LMC Automotive.

Companies developing autonomous vehicle technology that may compete in the future include Alphabet (Waymo), Amazon, Apple and Baidu, as well as many other technology companies and automobile manufacturers and suppliers. CFRA, however, cautions that despite the great initiatives and competitive pressures that exist, the shift to autonomous vehicle ridesharing services will likely take place very slowly, with some of the most ambitious targets likely needing to be ratcheted down/postponed.

An uncertain regulatory environment stands in the way of autonomous vehicles being on the road and could delay the path to long-term profitability. While more states in the U.S. appear to be getting more comfortable with the idea of supporting advancement of autonomous vehicles, companies themselves are likely to be very slow with rolling out Level 4 self-driving vehicles given the backlash that is faced when public casualties occur. Although we believe guidance at the state level is better than nothing,

many in the field believe federal legislation is crucial to avoid varied regulation from state to state. As technology grows and improves, different sets of rules could become a major inconvenience and burden for car manufacturers as well as ride sharing providers.

Along with vehicle manufacturers, auto part suppliers will also benefit from the proliferation of self-driving vehicles, in CFRA's view. A number of tech companies such as Intel, Samsung and Qualcomm are acquiring or joining ventures with auto part suppliers in a bid to catch up in the autonomous parts market. With wireless technology proliferating in cars, cybersecurity in vehicles is becoming an area of increased focus and opportunity, mostly since the hacking experiment with FCA. Hackers have demonstrated how they can control the brakes, transmission and other safety-critical systems in the internal network of Jeep Cherokees using a wireless communication system. Safety concerns are also becoming an issue and are raising questions as to how automakers plan to ensure that their autonomous or semi-autonomous cars meet safety procedures.

Proliferation of E-Commerce

The growing use of the Internet has changed the way consumers make their buying decisions. There is no dearth of research material and reviews available on the Internet, which helps consumers select the best option that matches their need at the best possible price from a wide range of alternatives. The Internet also best serves those consumers who find the overall buying experience, such as dealing with a car salesperson, tedious, and who are willing to opt for an alternative that can expedite the process.

Despite the increased use of social media sites such as YouTube, DealerRater and Facebook sites as online source for automotive information, third-party websites including Consumer Reports, Edmunds.com, Kelley Blue Book and True Car are still preferred and more frequently visited for research on car-buying decisions, according to the J.D. Power study. These sites provide pricing information, vehicle inventory availability, comparison tools, discounts and other information for new and used cars.

In response to this emerging trend, some dealerships have given their salespeople handheld devices containing information ranging from the details of each vehicle model to comparison information. Other interactive features on such devices include video demos of the features, which are primarily used to enhance the customer's engagement level in the buying process. In this way, sales personnel have all the information readily available for consumers, and can help reduce the waiting time at dealers' stores.

Mobility Startups Could Disrupt the Industry

Many new options for passenger transportation, collectively called innovative mobility services (IMS), have emerged in the past two decades and some have seen significant growth, driven by advancement in technologies and changing consumer preferences around vehicle ownership, according to a May 2018 featured story by the Center for Automotive Research (CAR). IMS include car-sharing, ride-hailing, bike-sharing, ride-sharing, microtransit, and scooter sharing programs, and together these are aggressively expanding in cities worldwide. Ride-hailing services provided by companies such as Uber and Lyft have grown rapidly.

In the short to medium-term, CAR thinks the growth of IMS will likely cause only a small decrease in vehicle sales, associated with falling vehicle ownership. Nevertheless, the researcher believes that IMS will have a profound effect on how people think about mobility, on the way people relate to vehicles, and how transportation services are organized and paid for. Globally, mobility providers have captured the interest of consumers and venture capital alike. These start-ups are disrupting automakers and threatening vehicle manufacturers' share of auto industry profits. Beyond presenting a challenge to the vehicle ownership model, CAR thinks the expansion of IMS could influence other aspects of the automotive industry and related sectors such as the automotive value chain, supply chain, logistics, automotive insurance, and vehicle maintenance and repair.

Investors see innovative mobility and driving automation as the future of transportation, and for that reason, some automakers have multiplied their efforts in the mobility space as a way to signal the

markets that they are forward-looking and ultimately to increase their share value. Automakers had started investing in, partnering with, and acquiring mobility and tech companies, as well as creating mobility subsidiaries. Mobility services are also attractive for automakers because they seem to be a non-recessionary business not affected by vehicle sales cycles. CAR thinks that providing in-house mobility services could make automakers less vulnerable to sales cycles and, for that reason, also boost their standing in financial markets.

Regulatory Environment

Trump Effect on the Automobiles Industry

Since the U.S. presidential campaign, President Trump has been critical about U.S. manufacturing companies outsourcing production overseas. In a bid to boost the U.S. economy by encouraging automotive companies to use domestic materials and labor, President Trump promised incentives such as the reduction of taxes, hence the passing of The Tax Cuts and Jobs Act of 2017 and easing of “unnecessary” regulations such as fuel efficiency requirements imposed during the Obama-era.

According to a February article by CNBC, while the President has been considering slapping tariffs on imported vehicles and parts, industry players and experts are advising against as this would increase vehicle costs drastically and possibly upset the U.S. economy by slashing jobs. Trump’s decision on such tariffs will hinge on the soon-to-be-released investigative report by the U.S. Commerce Department on potential national security risks posed by imported automobiles and parts.

Tariffs on Chinese Goods

In May, the Trump administration raised tariffs from 10% to 25% on \$250 billion worth of Chinese imports which China quickly retaliate with a 25% duty on \$113 billion worth of U.S. imports. Seeing the lack of progress on the trade talks, U.S. then again imposed a 10% tariff on an additional \$300 billion worth of Chinese imports in August which China responded by halting all purchases on U.S. agricultural products, effectively escalating trade tensions between the two countries. Despite a brief sigh of relief when the U.S. held off the additional tariff while China suspends tariffs on some major U.S. agricultural imports, a general uneasiness looms across global businesses as negotiations continues.

Auto production in both countries would be greatly affected, according to Reuters, if the trade war persists. U.S. automakers, however, will be at a more disadvantaged position because the the U.S. exported 171,504 new and used passenger cars worth approximately \$6.8 billion to China in 2018, according to U.S. government import/export data, and imported relatively few vehicles from China.

While the global trade war was focused largely between China and the U.S., the European automakers were singled out by President Trump as he threatened a 25% tariff on every car import from the E.U. If all the tariff threats come to pass, European automakers stand to become the biggest losers as they are hit from 3 fronts: (i) tariffs on American imports from China would significantly increase raw material prices for vehicles the European automakers manufacture in the U.S. (ii) tariffs on American exports to China would impact the sales of vehicles the European automakers manufacture in the U.S. for sale in China; (iii) tariffs on American imports from the E.U. would impact parts shipped from the E.U. to the American manufacturing centers and finished vehicles from the E.U.

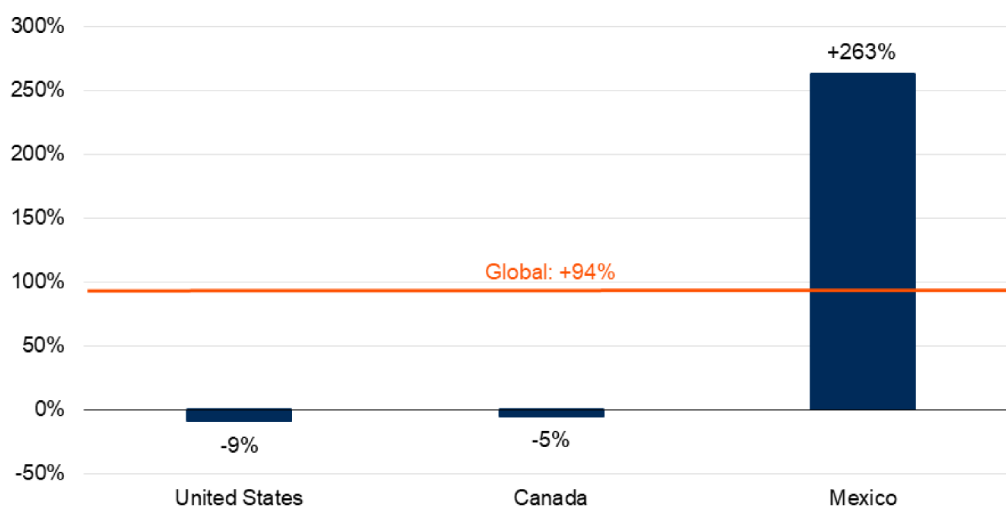
USMCA

After more than a year of talks to review and to modernize the North American Free Trade Agreement (NAFTA), Mexico, Canada and the U.S. had finally on November 2018 signed a new trade accord, termed the United States-Mexico-Canada Agreement (USMCA). Subject to the approval of the U.S. Congress, which at this point in time is still uncertain, the USMCA is expected to go into effect on the first day of 2020.

CFRA thinks that USMCA has positive implications for U.S. and Canadian auto-related manufacturing jobs, while costs for North American auto manufacturers and parts & equipment suppliers are likely to increase, much of which will likely be passed on to consumers. We think the wage requirement of the new deal (requiring 40-45% of auto content be produced by workers making a minimum of \$16/hour, or roughly triple the average wage of an autoworker in Mexico) should help level the playing field with regard to labor costs between the three countries. The portion of an automobile that must be made in North America in order to avoid tariffs increases from 62.5% to 75% under the new deal, which we think will likely equate to less sourcing from overseas countries such as China.

That said, we think the net impact is higher costs, much of which companies will likely pass-through to consumers, and also the creation of a more regionalized auto market (as opposed to globalized). We think companies are currently evaluating the economics of the new trade deal and expect that there could be some changes to their long-term business decisions and strategic planning as a result, assuming USMCA is approved by Congress in its current form. We also think the deal strengthens the North American trading bloc as a whole, and gives them greater leverage in future trade negotiations with China.

ANNUAL AUTOMOBILE PRODUCTION BY COUNTRY
(percent change, 2017 vs 1994)



Source: Ward's Automotive Group.

Emissions Controls and Fuel Efficiency Requirements

Emission standards define the acceptable limits for exhaust emissions of new vehicles sold in the region. Following are developments on emission control and fuel efficiency in the U.S. and E.U.

UNITED STATES

On August 2, 2018, President Trump, with support from some of the largest automakers in the country, put forth plans to freeze the mile-per-gallon standards through 2026 set previously by the Obama administration to combat global warming. The relaxation to achieve 54.5 mpg by 2025 would likely send a ripple effect across the world as a number of countries modeled their emission control rules on the U.S.'s, according to *The New York Times*. Trump's proposed rules would also directly challenge the rights of states to set their own, more stringent, standards.

In June 2019, however, according to a separate article from *The New York Times*, 17 of the world's largest automakers including Ford, GM, Volvo and Toyota signed a letter asking Trump to renegotiate a

“midway” rule between that of Trump’s rollback and of Obama’s. This comes after automakers concluded that such rollback would create a bifurcated market and thereby cut their profits and destabilize the manufacturing sector.

In September, the Trump administration announced an initiative to revoke the State of California’s authority to set its own auto emissions standards, which are higher than that of the U.S. federal standards. As of this publication, the matter is not settled, and we would expect a long-term fight through the U.S. court system.

EUROPEAN UNION

Starting September 1, all new passenger cars sold in the Europe will have to comply with the Worldwide Harmonised Light Vehicle Test Procedure (WLTP) and Real Driving Emission (RDE) which replaces the New European Driving Cycle test used since the 1980s.

The two tests complement each other; the WLTP measures the car model’s pollutant emissions and the RDE confirms WLTP results in real-life driving or on-the-road performance. However, the ACEA said that the WLTP standard would affect vehicle taxation, because this more rigorous test would likely result in higher CO₂ values. Nineteen E.U. members currently apply car taxes based on CO₂ values in emission tests; therefore, the ACEA urges national governments to ensure that taxations will remain fair, to prevent an increase in the financial burden on customers.

After a steady drop in CO₂/km from 2010-2016, the European Environment Agency reported that average passenger car fleet emissions in the E.U. for 2017 and 2018 increased by 0.4g CO₂/km and 2.0g CO₂/km, respectively. Despite having met its 130 g CO₂/km target two years ahead the intended schedule of 2015, manufacturers will have to reduce fleet emissions meaningfully to meet the upcoming 2021 target of 95g CO₂/km. The industry has spent billions of dollars to reach its carbon emission targets and CFRA foresees further investment to meet the requirements of E.U.

M&A Environment

Global Auto Deals

In 2018, global automotive merger and acquisition (M&A) deal value was a record \$97.5 billion, doubling the previous year’s value of \$48.4 billion; the number of transactions had also increased by 1% to 903 deals, according to market research firm PricewaterhouseCoopers (PwC). The increase was largely driven by five mega deals involving the acquisition of Johnson Controls International PLC-Power Solutions Business by an investor group for \$13.2 billion, and Magneti Marelli SpA’s sale to CK Holdings Co. Ltd. for \$7.1 billion., collectively accounting for transaction value of \$42 billion. 42% of the total transaction value in 2018 originated from Asia and Oceania, followed by North America with 29% share. Despite headwinds such as slowing growth, rising interest rates, cross-border trade concerns, and volatile financial markets, PwC expects for M&A activity to remain strong in 2019, driven by significant shifts in technologies, consolidation as a strategy to drive economies of scale, and the availability of capital.

Automotive M&A activity in 2018 was spurred by component suppliers continuing to invest in key technologies of the future and further consolidating for scale, according to PwC. Consolidation was also very strong in the parts and components manufacturing segment, with half of the top ten transactions accounted total transaction value of \$42 billion.

KEY ANNOUNCED TRANSACTIONS IN 2018

(in millions, \$)

ANNOUNCED	TARGET NAME	TARGET NATION	ACQUIRER NAME	ACQUIRER NATION	STATUS	DEAL VALUE	CATEGORY
11/13/18	Johnson Controls International PLC- Power Solutions Business	United States	Investor Group	Canada	Pending	13,244	Parts and Components Manufacturing Parts and Components
01/12/18	GKN PLC	United Kingdom	Melrose Industries PLC	United Kingdom	Completed	11,016	Manufacturing Parts and Components
10/22/18	Magneti Marelli spA	Italy	CK Holdings Co. Ltd.	Japan	Pending	7,138	Manufacturing Parts and Components
04/10/18	Federal-Mogul Holdings Corp.	United States	Tenneco Inc.	United States	Completed	5,400	Manufacturing Parts and Components
03/07/18	Bhushan Steel Ltd.	India	Bamnipal Steel Ltd.	India	Completed	5,216	Manufacturing Vehicle
01/22/18	Beijing Electric Vehicle Co. Ltd.	China	Chengdu Qianfeng Electronics Co. Ltd	China	Completed	4,508	Manufacturing Vehicle
10/11/18	BMW Brilliance Automotive Ltd.	China	BMW Holdings BV	Netherlands	Pending	4,189	Manufacturing Vehicle
07/26/18	Aleris Corporation	United States	Novelis Inc.	United States	Pending	2,600	Manufacturing Vehicle
09/18/18	Erwin Hymer Group SE	Germany	Thor Industries Inc.	United States	Pending	2,561	Manufacturing Vehicle
05/31/18	GM Cruise Holdings LLC	United States	Softbank Vision Fund LP Japan	Japan	Pending	2,250	Manufacturing

Source: Thomson Reuters, PwC, Company press releases.

HOW THE INDUSTRY OPERATES

The automobiles industry is engaged in the design, production, marketing, sale, provision of spares, and service of motor vehicles. The largest market for these products is the individual consumer. Success of the industry relies heavily on various macro- and microeconomic factors in the global scale as well as regulations in areas where they operate. The industry is characterized with long development and production cycles.

Replacement demand for automobiles is driven by product wear and tear, as well as changes in consumer preferences, technological advancements, and changes to regulatory requirements related to environmental factors and vehicle safety. Model lifecycles also affect sales: during the end of a model lifecycle, sales tend to decline, prices are cut, and larger incentives are offered. Consumers often will hold off on purchasing a model if they are aware that an updated version will soon become available.

AUTOMAKER REVENUE

Automakers generate revenues from sales of vehicles to dealers and through financing operations. Revenues from vehicle sales depend on the automakers' market share, product mix, and pricing. In addition to the general macro-situation and consumer confidence, which drives overall volume, this volatile and cyclical business can be vulnerable to shifting consumer tastes and gyrating fuel prices. Given the industry's high fixed costs, volume is necessary to ensure profitability. This leaves the industry prone to bouts of price competition, exacerbated by significant industry overcapacity. This, in CFRA's view, has been the case in Europe with external players, such as Japanese and Korean original equipment manufacturers (OEMs), targeting rising sales in Europe at the same time as incumbents sought to cut. Market share movements tend to follow country and segment exposure as well as new model activity.

The growth of financial services businesses over the past decade and the age of cheap credit also improved sales and mix in the industry. The possible longer-term reversal of the era of cheap credit could be a risk to mature market volume and mix growth in the future, in CFRA's view.

Automotive pricing

Several factors can force retail auto prices to rise. Over time, consumers come to value, as standard equipment, features once offered as optional. New safety or emissions-control items may be required to comply with government regulations. Prices may also rise as new models are launched that are perceived as higher value-added or improved quality, or consumer demand for a model increases.

Competitive pressures can result in lower prices. Lower automobile prices, however, can be supported through higher unit production volume, cost savings on parts and labor, and manufacturing efficiencies. When costs are reduced through innovation, savings can be shared between manufacturer, supplier, and consumer; therefore, profits can still rise. However, when prices are reduced solely to stimulate demand and there are no offsetting cost savings, profitability often declines.

Demand factors

The economic environment naturally affects demand for automobiles. Principal end purchasers include private individuals, corporations, and short-term rental companies. Cars are a major purchase for most families, and consumers need to feel comfortable before they spend so much of their hard-earned money. During periods of sustained economic growth and plentiful employment, sales typically rise as customers feel flush and confident enough to buy new vehicles. Conversely, when the economy weakens and jobs are hard to come by, consumers are more likely to delay the purchase of new vehicles.

Other factors affecting new-car sales include cost of ownership, changes in style, engineering, safety, and quality (which hasten the obsolescence of existing models), and the cost and availability of fuel and insurance. Safety has captured vehicle buyers' attention in recent years and has become a pervasive theme in automakers' ad campaigns. In response to consumer demand for safer vehicles, automakers have made wide use of components such as airbags and antilock brake systems (ABS). ABS has now been superseded by electronic stability control (ESC) systems in many countries. Other new driving aids include automated parking assist and the current introduction of advanced driver assistance systems, which may eventually lead to fully automated driving.

Automaker costs

Auto parts, materials, and labor are the chief components of automaker operating costs. These costs are determined by the location of automaker plants, fluctuations in the price of key materials, and the terms of contracts between the automaker and parts/materials providers. Research and development (R&D) is another significant expense.

Operating leverage is generally very high in the industry given generally low operating margins and high fixed investment in plant, machinery, and capitalized development costs. Operating leverage remains lower at the premium makers (given superior operating margins) than the mass makers, which are more heavily geared into volume, with lower revenue per unit and already thin margins. Pricing and mix also affect automaker profitability to a large extent.

◆ **Auto parts.** Auto parts and components, along with raw materials, constitute purchased materials, the biggest cost category for automakers. Auto parts prices may include indirect costs, if suppliers are called upon to subsidize the automaker through R&D expenditures and investment in capital equipment.

◆ **Raw materials.** The key raw materials used in automobiles are steel, plastics and composites, iron, and aluminum, with metals comprising over 75% of a vehicle's total content. Spot prices for steel are easily accessible, but automakers typically sign undisclosed long-term contracts with steel suppliers to lock in prices, often on a volume-based level, which adds a higher degree of fixed costs to their structure, in our view. In contrast, parts suppliers and tire makers often buy on shorter contracts, and are thus more exposed to the risks of rapid price changes, with typically a six-month delay between the changes in spot prices and the impact on the profit and loss statement. CFRA thinks that mechanisms to pass on variations in raw materials have increasingly become a feature in component supply contracts.

◆ **Labor.** Labor is one of automakers' key operating costs. Factors weighing on labor expenses include hourly wages; the skill and productivity levels of the workforce; flexibility to learn new production techniques; and the presence of strong labor unions. Employee costs may be fixed or variable, depending on labor contracts that affect the employer's ability to adjust staffing levels and schedules according to demand. In Europe, labor costs have become increasingly variable through the implementation of time bank agreements, increased reliance on temporary labor, and government-backed, short-time working schemes.

◆ **Research and development.** The research and development (R&D) demands on the automobiles industry are unrelenting given the highly competitive structure and increased consumer and government-led demands for improved fuel efficiency, safety, performance, and comfort. Increasingly stringent emissions controls and safety regulations have meant that European companies have had to increase spending on R&D.

In the process of automotive manufacturing, fewer parts mean lower production costs and a reduced likelihood of assembly errors. Manufacturers are also lowering costs by minimizing industrial waste and pollution, as well as reducing the number of labor hours. The increase in subassemblies, a unit

assembled separately, but designed to fit with other units within a manufactured product, may also reduce the number of individual parts.

Reducing the number of labor hours required for the final assembly stage has been a high priority for automakers. Greater proportions of components are being made at parts facilities and delivered to the assembly plants on a just-in-time basis. Automakers send daily or even hourly orders for specific seats, which are then produced and delivered.

In recent years, there has been a trend toward the formation of alliances (e.g., Renault/Nissan/AvtoVAZ or Peugeot/GM), which allow economies of scale through the joint development of new platforms/models/engines and joint purchasing. This has the effect of spreading costs over a significantly larger number of cars. It is not unusual to see one company assembling a vehicle that will be badged, marketed, and sold under its partner's brand. Contract manufacturers may be used to outsource capacity for successful models or for smaller manufacturing runs.

Currency risk/reward another factor

With auto OEMs as one of the world's largest exporters, foreign exchange (forex) can be a significant challenge as European OEMs have relatively high naturally unhedged positions. U.S. dollar weakness can seriously hurt profitability, most notably for the German OEMs.

Currency affects in three ways: translation, transaction, and competitiveness:

◆ **Translation:** The translation of revenue and profits into a reported currency.

◆ **Transaction:** Vehicles produced in Europe and sold in non-euro countries suffer from revenue deterioration, while the euro-based cost structure remains intact, causing a structural margin impact.

◆ **Competitiveness:** Manufacturers from regions with relative currency weakness have increased flexibility in terms of pricing in export regions. Historically, this has particularly supported the Japanese OEMs in the U.S. and in Europe to a much lesser degree.

Currency risks can be mitigated by hedging strategies, mainly futures and options, which can essentially lock in set exchange rates, but this remains a relatively short-term strategy. Going forward, OEMs are seeking to increase their natural hedging through greater local production and local content. Given the duration of the investment cycle, however, this will not be a quick solution to currency volatility impacts on profitability.

Financial services operations: an important source of earnings

Over the past decade, automakers' financial services operations have offered growing support to volume and earnings developments. Given the longer-term nature of financing contracts (typically three years), these divisions have also offered a relatively stable source of earnings versus the more cyclical industrial business.

Financial services profitability is basically derived from the interest rate spread on receivables, with other influences being credit losses as well as general administrative costs. Leasing is predominantly U.S.-based, as VAT issues make leasing in Europe a much more expensive option; the U.K. has the highest leasing exposure in Europe. The prospects for a financial services division can be affected by the following:

◆ **Higher cost of capital:** This squeezes interest rate and thus financial services margins, although it depends on the ability to pass the higher cost on to the end consumer.

◆ **Higher delinquencies and defaults:** Difficulty in meeting payments pushes up credit losses. Cyclical highs of credit losses have historically been more than 2%.

◆ **Lower residual values:** For a vehicle coming off lease, a lower value versus expectations affects profits. Write-downs may also be taken to adjust for overly optimistic assumptions on financial services assets. In Europe, this affects the premium names—BMW and Mercedes-Benz—both of which took substantial residual value charges through 2008 on lower U.S. and U.K. used-vehicle prices.

◆ **Credit availability:** Access to financing markets has been a concern for the automakers' financial services arms needing to roll over debt to fund their businesses during the credit crunch. However, national and central bank schemes supported funding through 2008–2009 and conditions have greatly improved, with the average return on equity (ROE) on the assets across the European OEMs back well more than 10% again.

SUPPLIERS

The automotive supply component comprises manufacturers of factory-installed automotive components, replacement (aftermarket) parts manufacturers, rubber fabricators, and distributors. The aftermarket segment of the industry includes manufacturers that sell replacement parts to repair facilities, individual consumers, service providers, and distributors. The automobiles industry is the primary source of revenues for parts suppliers.

Mature, capital-intensive business

The auto parts segment is a mature and capital-intensive business, with high operating leverage amid volatility in end-market demand and raw material price inputs. Auto suppliers have a highly concentrated OEM customer base. Price pressure is intense given the challenges facing the OEM themselves, and real annual price deterioration is the norm, with flexibility, quality, and innovation expectations high. This follows down through the entire supply chain.

Added value, growth product segments key

Growth rates generally follow automotive production levels, which in mature markets can mean only 1%–2% annual growth. Above-average growth rates can result from market share gains, but more often from increased content per vehicle. This is particularly the case in the specialized areas of safety, comfort, electronics, fuel efficiency, and emissions-related technology. This can be prompted by tighter government legislation or proactively by the OEMs themselves as a competitive advantage, which increasingly becomes an industry standard. Parts suppliers with solid market shares in these growth areas typically have greater pricing resilience versus the more commoditized companies within the industry.

It is important to an OEM that its auto supplier base adds value to its product by investing heavily in research to provide innovative products, while improving manufacturing flexibility and good reliability, and allowing productivity improvement opportunities. The stronger European suppliers generally enjoy premium operating margins, returns, and free cash flow versus U.S. suppliers and even versus the OEMs themselves.

Focus on emerging markets offers revenue and cost benefits

As the OEMs increase their production footprint in new emerging markets, auto suppliers follow suit. This shift to low-cost countries can generate higher revenue streams and accelerate growth and can help reduce suppliers' production costs. Emerging economies tend to have lower levels of unionized plants than Western markets do, and suppliers do not face the same type of political pressure as OEMs regarding lowering labor costs.

Auto suppliers may also gain access to markedly lower-priced component sources when using overseas production bases, such as Russia. The rise in raw materials prices can be a major challenge for the entire supply chain as well as the OEMs, with little opportunity to pass on any price increases to end customers. An obvious exception would be the tire segment, which has greater potential for price rises given the high degree of replacement sales making up their total demand, the oligopoly structure of the industry, and the increasingly disciplined nature of this segment. Some suppliers have agreements that allow changes in raw material prices (up and down) to be passed on to OEMs, usually with a lag of three to six months.

Other means for suppliers to reduce their cost structure include consolidation and attaining economies of scale, although leading European players already enjoy relatively high market shares, in our view. Consolidation in the industry is sometimes driven by OEMs reducing their number of suppliers by awarding larger contracts in exchange for lower pricing. Improved efficiency gains remain ongoing targets for the industry and areas include increased use of automation and reduction in parts complexity. The outsourcing of non-critical activities and higher collaboration down the supply chain can also reduce the capital intensity of the suppliers' business profile.

Tough pricing environment, but close OEM relationship

Supplier contracts are frequently written for the life of a vehicle model (currently as few as three to five years, from the previous norm of eight); contract terms typically include goals for cost, quality, performance, timing, and product features. The relationship between an auto supplier and an OEM is increasingly close. While price reductions remain part of the business, it makes no sense for OEMs to threaten the financial viability of their supply base by demanding excessive pricing cuts, given the greater disruption to production (and thus earnings) that a financial collapse could cause, and the ongoing need for suppliers to invest heavily in R&D, innovation, and quality.

Some OEMs and Tier 1 suppliers were forced to absorb costs to prop up their supply base after the sharp and pronounced nature of the production cuts from late 2008 (output fell by as much as 40%–50% in one quarter, year on year). This hurt suppliers, given the pressure on working capital.

In CFRA's view, European automotive suppliers typically have a more stable risk profile than U.S. suppliers. This relates to a more diversified customer base, platform and segment coverage, and geographical spread. U.S. suppliers that historically had close relationships with the U.S. OEMs offering significant North America-based volume had suffered disproportionately from the decline of the U.S. Big Three's U.S. volumes over an extended period, the rise of the Japanese transplants, and the relatively limited geographic expansion of the U.S. players versus the European names.

HOW TO ANALYZE A COMPANY IN THIS INDUSTRY

QUALITATIVE MEASURES

At CFRA, we recommend a top-down approach to valuation. An examination of the industry drivers outlined on page 7—economic growth and consumer confidence—is a good starting point.

Industry Drivers

◆ **Economic growth.** The automobiles industry is highly cyclical, so changes in volume tend to correlate with economic conditions. Even if pricing is used to support volume, automakers' earnings and share prices will follow the macro picture. There is typically a close correlation between automotive share-price performances and the key lead indicators such as the German IFO Business Climate Index, the U.S. ISM Manufacturing Index, and consumer confidence data, giving an indication of the possible future direction of the macro environment. In terms of the share-price performance, the industry tends to be early cycle.

◆ **Currency exchange rates.** The industry remains one of the most currency-sensitive industries. Despite increasing local production outside Europe (in the U.S., China, and Brazil) and apparent rising local content ratios, much of the value-added componentry may still be sourced in Europe and, as such, the German automakers remain large net exporters from Europe, with large U.S. dollar and U.K. sterling exposures.

◆ **Commodity prices.** Raw materials have a significant impact on automakers' earnings, both directly through input costs, but can also affect volume and mix through cost of ownership. Manufacturers typically cannot pass higher input costs on to consumers.

Company Analysis

A number of qualitative and quantitative factors should be considered when evaluating an auto company. A plethora of statistics is available to help track the state of the industry and its participants.

Seasons and cycles

The automobiles industry is a highly cyclical and seasonal one, with the second and fourth quarters typically the strongest volume periods of the year. The industry's profitability also typically follows pronounced macro-related cycles.

Geographic diversity

A company's current geographic spread, as well as its plans for global expansion to emerging markets, is important. On a short-term basis, each country typically produces monthly sales statistics (including data down to the manufacturer level) that can help gauge country sales performance. In Europe, the European Automobile Manufacturers Association (ACEA), a trade group, produces a monthly pan-European summary. Data are also available on most other key global markets, including the U.S., Brazil, and China.

Obviously, an OEM's relative exposure to certain markets is an indication of overall sales prospects. The relative contribution from emerging and mature markets is a key indication of longer-term future growth prospects. However, pricing, and thus, margins, tend to be better in home markets, particularly at the early stages of development.

Market share evolution and product mix

Market share evolution is important when analyzing an automaker and can typically be highly correlated with model cycles. However, pricing also remains key, as automakers can "buy" share in various ways—by high sales to low-value rental fleets, for example, or by highly incentivized sales, both of which hurt earnings. Model line data can also provide valuable insight when analyzing product mix developments.

Pricing and margins tend to be better in the larger segments, with content in general increasing across all segments, but the ability to “price” that in is much more restricted in more compact segments.

A number of factors influence product mix, including changes in regulations, customer preferences, commodity prices, and demographics. Product mix can also be influenced by government-backed scrappage incentives, as was witnessed in 2009, when monetary incentives encouraged a temporary sales shift to small cars, which favoured the small carmakers.

Model changeovers

There has typically been a tight inverse correlation between the average age of an automakers’ product range and its earnings before interest and tax (EBIT) margin. This effectively means that when an automaker has a young, fresh product range, it is often rewarded with higher production volume, with the obvious operating leverage benefits, as well as improving market share. New models also help improve pricing, as older models increasingly need higher incentives, and increase showroom traffic in general. Production costs also typically fall from one generation model to the next, with greater commonality, lower complexity, and use of modular designs, all helping to reduce costs.

Pricing: new and used

Pricing is a key earnings contributor for autos companies, but is much more difficult to track on an ongoing monthly basis given the lack of consistent data, not least because of variations in the levels of standard equipment. In North America, incentives per vehicle can be monitored using monthly estimates from Autodata; in Europe, however, data are less consistent, so qualitative manufacturer offers/discounts (which are often not specification-adjusted) can be viewed as a gauge. Pricing is highly linked to branding and customer perceptions of quality; customer loyalty offers higher profitability. Typically, higher specification vehicles fitted with more optional extras offer higher profitability than entry-level vehicles.

Used-vehicle pricing is highly important, not just for the implications that it has on the general health of the new-car market and pricing, but more directly for the impact it has on the leasing business and the potential residual value impact. Typically, consumers may require higher discounts on cars that see their value fall away the quickest. When an automaker offers a lease, it includes a value it believes the vehicle will be worth at the end of that lease. Should used-vehicle pricing fall notably, the automaker will have to take a provision for that change in asset value. Monthly data in the U.S. is provided by the Manheim Index, which tracks used prices, and by ADESA—North America’s premier vehicle auction operator, which provides segment detail.

Management

CFRA looks favorably on seasoned management teams that have performed well, compared with their peers, in both good times and bad. However, some executives may be particularly good at containing costs, while others are better at creating new products or managing expansion. In evaluating a company, it is a good idea to look at top management’s track record—either at that company or at other firms—and to assess whether the skills demonstrated in the past match up well with the company’s current needs or goals. It is worth highlighting, however, that due to the ownership structure of European autos companies—many have high family or government ownership—the ability to carry out what is believed to be the necessary restructuring can often be limited, even for managers with strong track records.

QUANTITATIVE MEASURES

When assessing any company, it is important to analyze income statement, cash flow, and balance sheet data. The measures of particular importance to autos companies are described below.

Analyzing the financial statements

Looking at financial statements is important. Sources of information include quarterly and annual reports to shareholders, filings with relevant bodies and reports put out by advisory firms (such as CFRA and ValueLine), and brokerage companies. Investors are increasingly able to hear corporate managements talk about their businesses, via conference calls or company-provided webcasts, often around the time

that they release their quarterly earnings. Discussed later in this section are various significant financial considerations one should be aware of when analyzing an automobile company.

Sustainability of revenues and earnings

When looking at both revenues and profits, one must determine whether contributions to the current results are likely to recur in future periods. If one-time factors have either inflated or depressed results in a prior period, these should be examined as well. Furthermore, some ongoing costs of doing business can change significantly due to macroeconomic and industry factors, or world events.

Accounting items to review

There are various corporate accounting issues to consider. For example, an analyst should consider if the company has significant pension or employee benefit plans, and if it is accounting for them in a realistic and conservative manner.

The Income Statement

Among the major items to examine on an automaker's income statement are revenues, gross margins and marketing costs. Automakers typically include them in two different statements. In accordance with financial accounting standards, automakers since 1988 have presented consolidated statements of income. These statements separate and detail the income from, and expenses for, automotive manufacturing and financial services. Automakers can present a second set of financial statements, in which their finance subsidiaries' results are reported on an equity basis. This means that the company's income statement gives only the net operating income for financial services, rather than a detailed breakdown of income and expenses.

Revenues

Automakers derive the bulk of their revenues from the sale and financing of light vehicles, which are defined as cars and light trucks weighing less than 10,000 pounds. The key revenue drivers for the automobiles industry are vehicle production and sales volume. For manufacturers, revenues are recognized when vehicles are shipped to dealers. In the short term, they may not match sales; however, over time, sales should act as a leading indicator of production needs. Revenue is based on volume, mix, and pricing. The automobiles industry is highly concentrated and global in nature.

◆ **Sales revenues.** Automobile companies listed on U.S. stock exchanges report their revenues on a quarterly basis. Most revenues are derived from wholesale (or factory) vehicle shipments; these are recorded when automakers ship vehicles to dealerships.

Monthly vehicle sales reports record the retail volume of motor vehicle sales by dealerships. These numbers are disclosed to the public and followed closely by economists, analysts and the media. In the long term, factory shipments and retail sales should balance out. As a practical matter, however, differences usually arise due to the timing of shipments and retail sales, and the impact of imports and exports.

Average revenue per vehicle sold can be tracked by dividing an automaker's revenues from vehicle sales by the number of vehicles shipped during the same period. Generally, the trend should be upward; if an automaker has flat or declining revenues per vehicle, it may have discounted heavily to sustain unit shipments, or it may be selling more of its cheaper models. A sharp rise in revenues per vehicle could indicate that an automaker has seen a shift in production volume to models that are more expensive.

◆ **Financing revenues.** Automakers receive revenues from the dealer inventories and retail customer sales that they finance. In addition to generating revenues, financing is an important sales tool: automakers use their financing divisions to support various marketing initiatives. These include encouraging dealers to keep larger inventories on hand (by offering a favorable interest rate on inventory

purchases) and subsidizing customers' vehicle purchases (via rebates, below-market interest rates and the like). U.S. automakers also generate revenues by offering a variety of services, including insurance and extended service contracts.

An automaker's financing revenues may rise or fall with the general level of interest rates without dramatically affecting income from financing operations. This is because the automaker earns a markup on the interest it pays to borrow funds. Auto loans are usually made for a period of 24 to 60 months. Automakers attempt to match their borrowings with loan maturities to minimize their exposure to interest rate fluctuations.



Watch Out! Companies rely upon estimates to calculate the appropriate provision and allowance related to potentially uncollectible receivables. The estimates are generally based on factors such as an aging of receivables and the financial condition of customers. Because credit loss provisions for financing and trade receivables are based on estimates and because there is not a quantifiable "correct" level for the allowance, such provisions can easily be manipulated to benefit earnings.

Gross Margins

Gross margins in the automobiles industry fluctuate greatly with production volume because many of the costs related to vehicle production are fixed. Even labor costs had become largely fixed because of union contracts, which restricted layoffs or required automakers to pay certain laid-off workers benefits worth up to 95% of their take-home pay. This policy has changed, largely due to the industry's latest financial crisis and government intervention.

Therefore, automakers must sustain relatively high production levels to break even. Once the break-even point has been passed and fixed costs are spread over more units, however, the automaker can earn substantial profits. For each additional unit of production beyond the break-even point, variable profit for high-end vehicles can exceed \$10,000 per unit.

Even so, it is rare for an automaker's gross margin to exceed 25% of its revenues. By the time the company has deducted marketing, selling, general and administrative (SG&A) costs, its average return on sales (i.e., net income from operations as a percentage of revenues) may be as little as 5% over the automotive cycle, which may run more than four years. Over the past two decades, U.S. automakers' return on sales has often been even lower due to strenuous competition.



Watch Out! Companies in the Automobiles industry are fixed asset intensive, making depreciation a significant expense for most of these companies. Since depreciation is based on estimates of asset lives, management can manipulate these estimates to manage earnings. Specifically, extending the depreciable life of an asset will boost a company's earnings while shortening depreciable lives will decrease earnings.



Watch Out! Automobile companies generally incur substantial costs related to R&D. Under U.S. GAAP, R&D costs must be expensed as incurred. A sharp decline in R&D costs relative to sales raises concern that a company may be delaying or cutting back on R&D costs in the current period to boost earnings.

Marketing Costs

Marketing costs tend to rise and fall with the underlying level of demand for motor vehicles. Normally, automakers devote about 10% of sales revenue to marketing costs (which may include financial incentives). When attempting to stimulate demand, however, they may spend 14% or more. Nevertheless, when it is clear that demand is declining severely due to recession, automakers may have to face reality and curtail advertising and marketing expenditures.

The Balance Sheets

As with their income statements, automakers produce two sets of balance sheets. One set uses the full consolidation method, and one accounts for financial operations on an equity basis. An equity balance sheet separates the automaker's financial services operation (which customarily operates with high debt leverage ratios) from its manufacturing operation. Auto investors usually focus on the equity-method balance sheets because these make it easier to determine the financial strength of a company's manufacturing operations.

When studying an automaker's balance sheets, it is easy to be impressed with the strong cash position the company may have accumulated during a favorable economic period. However, when business slows, an automaker's cash position can quickly erode for several reasons. First, the company receives less revenue. Second, the float created by timing differences between the purchase of supplies and materials and payment of accounts payable diminishes, as fewer materials are purchased and more bills are paid. Third, the automaker must continue to pay its fixed costs even as its business volume decreases. Thus, an automaker can see wide swings in liquidity in a short time.



Watch Out! Inventory represents one of the most substantial assets on the balance sheets of Automobiles companies and can be a leading indicator of financial condition. Therefore, a company's choices with respect to inventory accounting can have a significant impact on a company's results. Rising inventories are a sign of a business slowdown.

Valuation Measures

Valuation measures are used to determine how much a company or its stock is worth. A common measurement is a multiple of projected earnings. Keep in mind that valuations depend on various factors, including overall investor sentiment, industry conditions, the level of interest rates and the extent to which future earnings seem predictable. As is the case with other measures, valuations of a particular company should be compared with those of similar companies in the same industry.

◆ **P/E ratio.** When valuing a company's stock, a good place to start is the basic investment ratio of stock price-to-earnings (P/E) per share, or P/E ratio. This ratio (or multiple) is useful in judging a company's performance relative to firms in the same industry, as well as in other industries.

Historically, automotive P/E expanded during recessions or times of economic weakness that lead to lower profits. During flusher times, P/E ratios will often contract. The reason for this counterintuitive action reflects the cyclical nature of the industry: when profits rise, the multiple contracts in anticipation of the inevitable decrease in profits; when profits fall, the multiple increases.

◆ **P/S ratio.** At times, companies may not have forward earnings to apply P/E multiples to. In such cases, other metrics might come into play, such as price-to-cash flow or enterprise value-to-earnings before interest, taxes, depreciation and amortization (EV/EBITDA) ratios. However, in extreme circumstances (as seen in 2009, for example), these numbers may not be meaningful, and the investor has to rely on price-to-sales (P/S) ratios or discounting to future years' expected profits.

GLOSSARY

Aftermarket—Replacement or add-on purchases for a product after its original sale. The automotive aftermarket includes replacement parts, accessories, lubricants, fuel, appearance products and repairs.

Autonomous vehicles (AVs)—Self-driving cars capable of fully operating without input.

Diesel engine—An internal combustion engine that uses diesel oil for fuel. Rather than using a traditional ignition system, it functions by injecting diesel oil into the cylinders when the piston has compressed the air to make it hot enough to ignite the diesel fuel without a spark.

Electric vehicles (EVs)—Electric/plug-in vehicles (including hybrids), which use one or more electric motors for propulsion.

Hybrid—A vehicle utilizing two distinct but interdependent forms of propulsion, usually a gasoline engine coupled with an electric motor.

Internal combustion engine (ICE)—An engine which generates motive power by the burning of petrol, oil, or other fuel with air inside the engine, the hot gases produced being used to drive a piston or do other work as they expand.

Platform—Mechanical underpinnings of a vehicle.

Tier 1 (T1) suppliers—Automotive parts manufacturers that supply final equipment directly to automakers (OEMs or original equipment manufacturers). Increasingly, Tier 1 suppliers are becoming “systems integrators” or producers of major subassemblies and modular components that can be installed into a vehicle as a unit, such as a complete chassis.

Tier 2 (T2) suppliers—Manufacturers that produce components for Tier 1 suppliers.

Tier 3 (T3) suppliers—Manufacturers that supply raw materials used in the production of components.

Transplant—A production facility operated by an automaker outside its native country. The term often refers to cars or trucks with a foreign nameplate made within a country where it will be distributed.

Original equipment manufacturer (OEM)—A company whose goods are used as components in the products of another company, which then sells the finished item to users..

INDUSTRY REFERENCES

PERIODICALS

Automotive Industries

<http://www.ai-online.com>

Covers the auto industry, targeting those in automotive engineering, design, manufacturing and purchasing.

Automotive News

<http://www.autonews.com>

Covers the automobiles industry.

Car and Driver

<http://www.caranddriver.com>

Covers the auto industry from an enthusiast/consumer angle.

Motor Trend

<http://www.motortrend.com>

Covers the auto industry from a consumer angle.

GOVERNMENT/INTERNATIONAL AGENCIES

Bureau of Economic Analysis (BEA)

<http://www.bea.gov>

BEA produces and disseminates statistics that provide a comprehensive, up-to-date picture of U.S. economic activity.

International Energy Agency

<https://www.iea.org>

The IEA is an autonomous organization which works to ensure reliable, affordable and clean energy for its 30 member countries and beyond.

The World Bank

<https://www.worldbank.org/>

The World Bank is a vital source of financial and technical assistance to developing countries around the world. It comprises five institutions managed by their member countries.

TRADE ORGANIZATIONS

Alliance of Automobile Manufacturers (Auto Alliance)

<http://www.autoalliance.org>

Trade association comprising 12 car and light truck manufacturers; advocates for the auto industry on public policy matters.

Associação Nacional dos Fabricantes de Veículos Automotores (ANFAVEA)

<http://www.anfavea.com.br>

Trade group representing Brazilian automotive industry.

Associazione Nazionale Filiera Industria Automobilistica (ANFIA)

<http://www.anfia.it>

Trade group representing Italian automotive manufacturers and suppliers.

Automotive Component Manufacturers Association of India (ACMA)

<http://acmainfo.com>

Provides statistics on parts production and investment in the industry.

China Association of Automobile Manufacturers (CAAM)

www.caam.org.cn/

CAAM is a non-profit social organization that represents firms engaged in production and management of automobiles, auto parts and vehicle-related industries within China.

Comité de Liaison Européen des Fabricants d'Équipements et de Pièces Automobiles (CLEPA)

<http://www.clepa.eu>

Trade association representing Europe's auto parts suppliers.

Comité des Constructeurs Français d'Automobiles (CCFA)

<http://www.ccfa.fr>

Trade group representing French automobile manufacturers.

European Automobile Manufacturers Association (ACEA)

<http://www.acea.be>

Represents 13 of Europe's biggest auto, bus, and truck manufacturers. Issues monthly and annual registration figures for Western Europe.

National Automobile Dealers Association (NADA)

<http://www.nada.org>

A national association representing national franchised new car and truck dealers in legal and legislative affairs; provides services and training programs to help members improve their operations.

International Organization of Motor Vehicle Manufacturers (OICA)

<http://www.oica.net/>

OICA is an international trade association founded 1919 in Paris whose members are 39 national automotive industry trade associations.

CONSULTING AND RESEARCH FIRMS

ALG

<https://www.alg.com/>

An automotive industry consulting firm.

Brookings Institute

<https://www.brookings.edu/>

A non-profit firm that conducts research and education in the social sciences, primarily in economics, metropolitan policy, governance, foreign policy, and global economy and development.

CEIC Data

<https://www.ceicdata.com/en>

Provider of data and insights into both developed and developing economies around the world.

The Conference Board, Inc.

<http://www.conference-board.org>

Publishes the monthly consumer confidence survey, which measures consumer sentiment.

EV-volumes.com

<http://www.ev-volumes.com>

Publishes reports and data on the electric vehicle (EV) market.

Experian

<https://www.experian.com/>

Experian plc is a consumer credit reporting company. Experian collects and aggregates information on over one billion people and businesses around the world.

IHS Markit

<http://www.ihc.com/industry/automotive.html>

Formerly Polk. Provides automotive information and marketing solutions to the automobiles industry.

InsideEVs.com

<https://insideevs.com/>

Publishes reports and data on the electric vehicle (EV) market.

J.D. Power

<http://www.jdpower.com>

International marketing and information firm that studies consumer opinion and customer satisfaction; supplies statistics and survey information on the auto industry. (J.D. Power is a unit of McGraw Hill Financial.)

LMC Automotive Ltd.

<http://www.lmc-auto.com>

Provides global and national automotive production, sales, and powertrain forecasts, and automotive market intelligence.

Ward's Automotive Group

<http://wardsauto.com>

Market research company for the automotive industry that provides automotive insights and intelligence.

PricewaterhouseCoopers (PwC)

<http://www.pwc.com>

Consulting firm that provides industry information, trends, and forecasts.

COMPARATIVE COMPANY ANALYSIS

Operating Revenues																		
			Million \$							CAGR(%)			Index Basis (2011=100)					
Company	Yr. End	#	2018	2017	2016	2015	2014	2013	2012	10-Yr.	5-Yr.	1-Yr.	2018	2017	2016	2015	2014	2013
TOYOTA MOTOR CORPORATION	MAR	#	272,770.3	276,630.2	247,508.5	252,786.7	226,973.3	249,557.2	234,239.5	1.1	5.9	6.5	116	118	106	108	97	107
	DEC		270,035.5	275,636.4	229,354.0	231,650.3	245,062.0	271,303.4	254,039.2	7.6	3.7	2.7	106	109	90	91	96	107
	DEC		147,049.0	145,588.0	149,184.0	135,725.0	155,929.0	155,427.0	152,256.0	(0.1)	(1.1)	1.0	97	96	98	89	102	102
	DEC		191,621.3	197,111.0	161,787.2	162,331.8	157,201.5	162,476.1	150,698.1	5.4	7.2	2.0	127	131	107	108	104	108
BAYERISCHE MOTORENWERKE AKTIENGESELLSCHAFT	DEC		111,609.8	111,609.8	99,401.5	100,108.6	97,320.1	104,742.8	101,322.4	6.2	5.1	(0.8)	110	110	98	99	96	103
	MAR	#	143,386.1	144,636.8	125,553.4	129,949.7	111,076.8	121,477.3	104,867.0	2.5	9.2	9.7	137	138	120	124	106	116
SAIC MOTOR CORPORATION LIMITED	DEC		129,346.6	132,091.5	107,626.8	101,987.4	101,065.2	93,069.5	76,762.5	23.8	9.6	3.5	169	172	140	133	132	121
	DEC		21,461.3	11,758.8	7,000.1	4,046.0	3,198.4	2,013.5	413.3	107.2	60.5	82.5	5193	2845	1694	979	774	487
TESLA, INC.	DEC		67,836.0	71,792.7	62,616.9	63,448.3	65,105.6	68,691.0	64,303.5	5.7	3.5	(0.9)	105	112	97	99	101	107
	DEC		160,338.0	156,776.0	151,800.0	149,558.0	144,077.0	146,917.0	133,559.0	1.1	1.8	2.3	120	117	114	112	108	110
FORD MOTOR COMPANY	DEC		3,916.1	4,102.9	3,277.8	3,100.0	3,343.7	3,216.0	2,933.9	NA	7.9	0.1	133	140	112	106	114	110
	MAR	#	12,422.4	12,264.2	10,507.8	8,689.4	7,982.9	7,309.9	8,060.3	16.0	12.8	17.2	154	152	130	108	99	91
NISSAN MOTOR CO., LTD.	MAR	#	104,451.3	112,529.3	105,112.5	108,486.3	94,801.3	101,821.5	92,757.8	1.0	6.5	2.0	113	121	113	117	102	110
	DEC		86,964.0	90,217.8	77,788.7	78,146.3	81,774.0	82,701.2	79,420.5	2.0	2.1	0.5	109	114	98	98	103	104
HYUNDAI MOTOR COMPANY	DEC		126,188.5	126,761.5	111,519.1	119,909.9	119,909.9	116,131.7	110,442.3	6.3	5.5	4.4	114	115	101	109	109	105
	DEC		28,521.9	32,062.7	29,829.5	28,767.0	23,984.6	23,391.2	20,308.6	8.0	12.2	2.4	140	158	147	142	118	115
SUBARU CORPORATION	MAR	#	84,757.3	74,755.0	57,035.8	59,382.0	62,448.7	73,096.5	73,104.4	3.1	6.9	18.9	116	102	78	81	85	100
	DEC		117.9	40.8	1.1	0.0	0.0	0.0	0.0	(34.8)	NA	202.9	NA	NA	NA	NA	NA	NA
PORSCHE AUTOMOBIL HOLDING SE	DEC		16,585.0	15,200.4	13,439.5	13,346.7	16,285.9	15,937.5	19,513.7	9.4	4.3	16.1	85	78	69	68	83	82
PT ASTRA INTERNATIONAL TBK	DEC		34,938.1	35,377.0	28,426.4	28,307.8	25,130.9	28,541.2	27,372.1	0.7	7.8	18.5	128	129	104	103	92	104
SUZUKI MOTOR CORPORATION	MAR	#																

Note: Data as originally reported. CAGR-Compound annual growth rate. #Of the following calendar year.
Source: S&P Capital IQ.

Net Income

Company	Yr. End	#	Million \$								CAGR(%)		Index Basis (2011=100)					
			2018	2017	2016	2015	2014	2013	2012	10-Yr.	5-Yr.	1-Yr.	2018	2017	2016	2015	2014	
TOYOTA MOTOR CORPORATION	MAR	#	16,991.9	2,493,983.0	1,831,109.0	2,312,694.0	2,173,338.0	1,823,119.0	962,163.0	3.8	21.0	36.2	2	259	190	240	226	189
VOLKSWAGEN AG	DEC		12,136.0	11,453.0	5,369.0	(1,370.0)	10,985.0	9,093.0	21,712.0	9.8	5.9	6.0	56	53	25	(6)	51	42
GENERAL MOTORS COMPANY	DEC		8,014.0	(3,864.0)	9,427.0	9,687.0	3,949.0	5,346.0	6,188.0	NA	8.4	NM	130	(62)	152	157	64	86
DAIMLER AG	DEC		7,249.0	10,278.0	8,526.0	8,424.0	6,962.0	6,842.0	6,428.0	18.3	1.2	(29.5)	113	160	133	131	108	106
BAYERSCHE MOTORENWERKE AKTIENGESELLSCHAFT	DEC		7,117.0	7,117.0	6,863.0	6,369.0	5,798.0	5,303.0	5,085.0	36.2	6.1	(17.1)	140	140	135	125	114	104
HONDA MOTOR CO., LTD.	MAR	#	610,316.0	1,059,337.0	616,569.0	344,531.0	509,435.0	624,703.0	367,149.0	5.8	23.6	71.8	166	289	168	94	139	170
SAIC MOTOR CORPORATION LIMITED	DEC		36,009.2	34,410.3	32,005.7	29,793.8	27,973.4	24,803.6	20,751.8	49.3	7.7	4.6	174	166	154	144	135	120
TESLA, INC.	DEC		(976.1)	(1,961.4)	(674.9)	(888.7)	(294.0)	(74.0)	(396.2)	28.0	67.5	(50.2)	246	495	170	224	74	19
AUDI AG	DEC		3,382.0	3,509.0	1,985.0	4,204.0	4,367.0	3,961.0	4,280.0	4.5	(3.1)	(3.6)	79	82	46	98	102	93
FORD MOTOR COMPANY	DEC		3,677.0	7,731.0	4,589.0	7,373.0	1,231.0	11,953.0	5,613.0	NA	(21.0)	(52.4)	66	138	82	131	22	213
FERRARI N.V.	DEC		784.7	535.4	398.8	287.8	261.4	240.8	225.4	NA	26.7	46.6	348	238	177	128	116	107
MARUTI SUZUKI INDIA LIMITED	MAR	#	76,491.0	78,800.0	75,099.0	54,961.0	38,074.0	28,529.0	24,692.0	16.0	26.1	4.9	310	319	304	223	154	116
NISSAN MOTOR CO., LTD.	MAR	#	319,138.0	746,892.0	663,499.0	523,841.0	457,574.0	389,034.0	341,117.0	4.5	17.0	12.6	94	219	195	154	134	114
HYUNDAI MOTOR COMPANY	DEC		1,508,084.0	4,032,824.0	5,406,435.0	6,417,303.0	7,346,807.0	8,541,834.0	8,566,568.0	5.8	(29.3)	(62.6)	18	47	63	75	86	100
FIAT CHRYSLER AUTOMOBILES N.V.	DEC		3,608.0	3,491.0	1,803.0	334.0	334.0	904.0	44.0	8.4	31.9	3.4	8,200	7,934	4,098	759	759	2,055
SUBARU CORPORATION	MAR	#	147,812.0	220,354.0	282,354.0	436,654.0	261,873.0	206,616.0	119,588.0	28.1	13.0	(22.0)	124	184	236	365	219	173
PEUGEOT S.A.	DEC		2,827.0	1,924.0	1,730.0	899.0	(706.0)	(2,327.0)	(5,008.0)	NA	NM	46.9	(56)	(38)	(35)	(18)	14	46
PORSCHE AUTOMOBIL HOLDING SE	DEC		3,473.0	3,278.0	1,374.0	(308.0)	3,035.0	2,408.0	7,932.0	(5.8)	7.6	5.9	44	41	17	(4)	38	30
PT ASTRA INTERNATIONAL TBK	DEC		21,673,000.0	18,847,000.0	15,156,000.0	14,464,000.0	19,191,000.0	19,417,000.0	19,421,000.0	9.0	2.2	15.0	112	97	78	74	99	100
SUZUKI MOTOR CORPORATION	MAR	#	178,759.0	215,730.0	159,956.0	116,660.0	96,862.0	107,484.0	80,389.0	10.4	21.8	34.9	222	268	199	145	120	134

Note: Data as originally reported. CAGR-Compound annual growth rate. #Of the following calendar year.
Source: S&P Capital IQ.

Company	Yr. End	Return on Revenues (%)					Return on Assets (%)					Return on Equity(%)				
		2018	2017	2016	2015	2014	2018	2017	2016	2015	2014	2018	2017	2016	2015	2014
TOYOTA MOTOR CORPORATION	#	6.2	8.5	6.6	8.1	8.0	7.1	3.6	5.0	3.8	4.9	4.6	4.4	10.1	13.8	10.8
VOLKSWAGEN AG	DEC	5.1	5.0	2.5	NM	5.4	4.6	2.6	2.7	1.3	NM	3.1	2.8	10.7	11.4	5.9
GENERAL MOTORS COMPANY	DEC	5.4	NM	6.3	7.1	2.5	3.4	3.5	NM	4.3	5.0	2.2	3.2	20.4	0.8	22.0
DAIMLER AG	DEC	4.3	6.3	5.6	5.6	5.4	5.8	2.6	4.0	3.5	3.9	3.7	4.1	11.6	17.1	15.4
BAYERISCHE MOTOREN WERKE AKTIENGESSELL	DEC	7.3	8.7	7.3	6.9	7.2	7.0	3.4	4.4	3.6	3.7	3.7	3.8	12.9	17.1	15.3
HONDA MOTOR CO., LTD.	#	3.8	6.9	4.4	2.4	3.8	5.0	3.0	5.5	3.3	1.9	2.8	3.9	8.1	14.3	9.3
SAIC MOTOR CORPORATION LIMITED	DEC	4.0	4.0	4.3	4.5	4.5	4.4	4.6	4.8	5.4	5.8	6.7	6.6	17.4	18.6	19.7
TESLA, INC.	DEC	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
AUDI AG	DEC	5.7	5.9	3.3	7.2	8.1	7.9	5.2	5.5	3.2	7.4	8.6	8.8	12.0	12.8	8.8
FORD MOTOR COMPANY	DEC	2.3	4.9	3.0	4.9	0.9	8.1	1.4	3.0	1.9	3.3	0.6	5.9	10.3	23.9	15.9
FERRARI N.V.	DEC	22.9	15.7	12.8	10.1	9.5	10.3	16.2	12.9	10.4	7.4	5.6	6.2	73.6	96.5	257.5
MARUTI SUZUKI INDIA LIMITED	#	8.9	9.9	11.0	9.5	7.6	6.5	12.0	13.1	14.5	12.9	11.0	9.1	17.1	19.8	22.2
NISSAN MOTOR CO., LTD.	#	2.8	6.2	5.7	4.3	4.0	3.7	1.7	4.0	3.6	3.0	2.7	2.6	6.0	14.1	13.6
HYUNDAI MOTOR COMPANY	DEC	1.6	4.2	5.8	7.0	8.2	9.8	0.8	2.3	3.0	3.9	5.0	6.4	2.2	6.2	8.2
FIAT CHRYSLER AUTOMOBILES N.V.	DEC	3.3	3.3	1.7	0.3	0.6	1.1	3.7	3.6	1.7	0.3	0.6	1.0	14.5	16.3	9.4
SUBARU CORPORATION	#	4.7	6.5	8.5	13.5	9.1	8.6	5.0	7.6	10.2	16.8	11.9	10.9	9.3	14.7	20.2
PEUGEOT S.A.	DEC	3.8	3.1	3.2	1.6	NM	NM	4.6	3.3	3.8	1.8	NM	NM	18.2	15.0	16.0
PORSCHE AUTOMOBIL HOLDING SE	DEC	3371.8	9641.2	137400.0	0.0	0.0	0.0	10.3	10.4	4.8	NM	10.1	7.7	10.7	11.1	5.0
PT ASTRA INTERNATIONAL TBK	DEC	9.1	9.1	8.4	7.9	9.5	10.0	6.3	6.4	5.8	5.9	8.1	9.1	16.5	15.6	13.7
SUZUKI MOTOR CORPORATION	#	4.6	5.7	5.0	3.7	3.2	3.7	5.3	6.5	5.1	4.3	3.0	3.7	14.3	18.5	15.4

Note: Data as originally reported. CAGR-Compound annual growth rate. #Of the following calendar year.
Source: S&P Capital IQ.

Company	Yr. End	Current Ratio						Debt/Capital Ratio(%)						Debt as a % of Net Working Capital					
		2018	2017	2016	2015	2014	2013	2018	2017	2016	2015	2014	2013	2018	2017	2016	2015	2014	2013
# TOYOTA MOTOR CORPORATION VOLKSWAGEN AG GENERAL MOTORS COMPANY DAIMLER AG BAYERISCHE MOTOREN WERKE AKTIENGESELLSCHAFT	MAR	1.0	1.0	1.0	1.1	1.1	1.1	4.8	4.1	4.9	4.9	5.1	5.2	152.8	229.5	180.0	42.6	62.4	78.6
	DEC	1.1	1.0	0.9	1.0	1.0	1.0	10.8	5.8	5.9	9.8	10.6	15.0	91.1	NM	(27.0)	NM	2687.6	446.1
	DEC	0.9	0.9	0.9	1.0	1.3	1.3	24.2	28.6	19.7	18.2	20.8	14.3	NM	NM	NM	NM	52.0	37.4
	DEC	1.2	1.2	1.2	1.2	1.2	1.2	28.1	24.4	24.3	25.6	18.8	23.8	108.9	109.1	108.2	127.4	101.5	119.5
	DEC	1.2	1.0	1.0	0.9	1.0	1.0	53.0	51.9	55.4	56.6	58.1	58.8	496.7	3100.5	NM	NM	NM	3991.7
# HONDA MOTOR CO., LTD. SAIC MOTOR CORPORATION LIMITED TESLA, INC. AUDI AG FORD MOTOR COMPANY	MAR	1.2	1.2	1.2	1.1	1.2	1.2	32.6	32.0	34.7	34.7	34.7	33.0	303.2	298.3	357.0	484.5	394.6	404.4
	DEC	1.1	1.0	1.1	1.0	1.2	1.3	32.0	22.7	21.5	17.2	5.4	6.9	259.9	NM	162.3	309.4	27.6	24.3
	DEC	0.8	0.9	1.1	1.0	1.5	1.9	57.3	62.7	50.6	65.1	66.6	46.8	NM	NM	1427.8	NM	179.2	99.2
	DEC	1.6	1.6	1.6	1.4	1.5	1.5	0.1	0.3	0.3	6.8	7.3	6.3	0.3	0.7	0.6	16.0	14.7	13.2
	DEC	1.2	1.2	1.2	1.2	1.7	1.8	26.0	29.8	34.2	29.8	32.4	36.6	65.2	65.6	80.0	58.7	20.7	25.2
# FERRARI N.V. MARUTI SUZUKI INDIA LIMITED NISSAN MOTOR CO., LTD. HYUNDAI MOTOR COMPANY FIAT CHRYSLER AUTOMOBILES N.V.	DEC	1.9	1.7	1.4	1.1	1.9	2.1	53.8	65.6	81.5	150.0	18.4	11.2	132.2	171.6	263.5	1354.5	34.6	22.4
	MAR	0.9	0.5	0.7	0.7	1.0	1.8	0.5	0.4	1.6	0.4	1.6	8.7	(13.8)	(2.3)	(13.0)	(4.4)	NM	30.6
	MAR	1.5	1.7	1.6	1.6	1.6	1.7	2.9	3.0	5.8	5.2	6.3	11.9	4.2	3.7	7.3	7.0	9.0	18.4
	DEC	1.5	1.7	1.1	1.6	1.8	1.8	49.0	47.6	48.0	48.5	44.4	43.4	251.1	191.1	1485.5	205.7	149.4	145.8
	DEC	0.8	0.8	0.8	0.9	1.0	1.2	27.2	34.9	46.6	55.2	64.4	69.2	NM	NM	NM	NM	3301.3	461.9
# SUBARU CORPORATION PEUGEOT S.A. PORSCHE AUTOMOBIL HOLDING SE PT ASTRA INTERNATIONAL TBK SUZUKI MOTOR CORPORATION	MAR	1.8	1.8	1.8	1.9	1.7	1.5	5.5	2.7	6.8	8.8	14.4	23.9	11.4	5.1	12.5	15.3	27.8	50.6
	DEC	0.9	0.9	1.0	1.0	1.0	1.0	25.9	28.3	28.2	25.3	37.7	49.7	NM	NM	678.1	2502.4	435.2	1068.4
	DEC	6.9	7.6	4.1	13.0	4.6	6.8	0.0	0.0	0.0	1.1	1.0	1.0	1.5	1.4	0.0	16.1	13.9	11.5
	DEC	1.1	1.2	1.2	1.4	1.3	1.2	27.8	25.4	26.6	28.4	28.0	29.5	347.9	209.2	205.4	157.4	185.4	226.6
	MAR	1.2	1.6	1.6	1.4	1.7	1.7	16.1	24.5	28.7	32.0	22.8	23.9	110.2	69.4	67.7	95.4	52.6	55.4

Note: Data as originally reported. CAGR-Compound annual growth rate. #Of the following calendar year.
Source: S&P Capital IQ.

Company	Price/Earnings Ratio (High-Low)					Dividend Payout Ratio(%)					Dividend Yield(High-Low, %)				
	Yr. End	2018	2017	2016	2015	2014	2013	2018	2017	2016	2015	2014	2013	2018	2013
TOYOTA MOTOR CORPORATION VOLKSWAGEN AG GENERAL MOTORS COMPANY DAIMLER AG BAYERISCHE MOTOREN WERKE AKTIENGESELLSCHAFT	#	MAR	9 - 7	12 - 8	12 - 8	13 - 8	17 - 9	34	25	35	31	26	22	3.6 - 2.8	3.7 - 2.7
		DEC	8 - 6	8 - 6	14 - 9	NM - NM	9 - 7	11 - 7	20	12	7	NM	18	3.5 - 2.6	3.0 - 1.1
		DEC	8 - 5	NM - NM	6 - 4	6 - 4	23 - 17	15 - 10	28	NM	25	23	80	4.7 - 3.7	5.0 - 3.4
		DEC	11 - 7	8 - 6	10 - 7	12 - 8	11 - 9	10 - 6	54	34	41	31	35	8.2 - 5.5	7.3 - 4.3
		DEC	9 - 6	7 - 6	9 - 6	13 - 8	11 - 9	11 - 8	37	27	31	30	31	0.0 - 0.0	0.0 - 0.0
HONDA MOTOR CO., LTD. SAIC MOTOR CORPORATION LIMITED TESLA, INC. AUDI AG FORD MOTOR COMPANY	#	MAR	7 - 5	11 - 7	23 - 14	15 - 12	13 - 10	19 - 11	32	16	26	46	31	4.1 - 2.6	3.2 - 2.3
		DEC	12 - 8	12 - 8	9 - 6	10 - 5	9 - 5	8 - 5	64	60	49	50	47	7.8 - 4.7	7.4 - 4.4
		DEC	NM - NM	NM - NM	NM - NM	NM - NM	NM - NM	NM - NM	0	0	0	0	0	0.0 - 0.0	0.0 - 0.0
		DEC	11 - 9	9 - 8	15 - 13	9 - 6	6 - 5	7 - 6	71	26	139	77	73	0.0 - 0.0	0.0 - 0.0
		DEC	14 - 8	7 - 5	12 - 10	9 - 7	57 - 43	6 - 4	74	31	52	32	159	7.9 - 5.7	8.3 - 5.5
FERRARI N.V. MARUTI SUZUKI INDIA LIMITED NISSAN MOTOR CO., LTD. HYUNDAI MOTOR COMPANY FIAT CHRYSLER AUTOMOBILES N.V.	#	MAR	38 - 23	42 - 20	28 - 15	37 - 30	NA - NA	NA - NA	17	22	22	0	0	0.9 - 0.6	0.8 - 0.6
		MAR	38 - 23	25 - 14	26 - 18	30 - 15	21 - 13	20 - 13	32	29	14	14	10	1.2 - 0.8	1.2 - 0.5
	#	MAR	6 - 5	7 - 5	11 - 7	12 - 8	13 - 9	12 - 8	67	26	28	30	29	6.8 - 4.6	5.0 - 4.1
		DEC	29 - 16	11 - 9	8 - 6	8 - 5	9 - 6	8 - 6	75	28	20	21	7	3.7 - 2.8	4.3 - 2.4
		DEC	9 - 5	7 - 4	11 - 4	71 - 43	24 - 13	9 - 5	0	0	0	0	0	5.9 - 4.4	0.0 - 0.0
SUBARU CORPORATION PEUGEOT S.A. PORSCHE AUTOMOBIL HOLDING SE PT ASTRA INTERNATIONAL TBK SUZUKI MOTOR CORPORATION	#	MAR	15 - 12	14 - 9	9 - 6	14 - 7	12 - 5	10 - 4	75	50	39	19	19	6.5 - 3.9	4.1 - 3.2
		DEC	8 - 5	10 - 7	8 - 5	17 - 9	NM - NM	NM - NM	17	22	0	0	0	4.1 - 2.3	2.8 - 2.1
		DEC	7 - 5	7 - 4	12 - 8	NM - NM	8 - 6	10 - 7	15	9	22	NM	20	0.0 - 0.0	0.0 - 0.0
		DEC	16 - 11	20 - 16	23 - 15	24 - 14	17 - 13	17 - 11	35	36	45	60	46	3.4 - 2.2	3.0 - 1.9
	#	MAR	14 - 9	13 - 7	20 - 11	23 - 15	15 - 11	17 - 9	20	12	9	14	14	1.4 - 1.0	1.0 - 0.7

Note: Data as originally reported. CAGR-Compound annual growth rate. #Of the following calendar year.

Source: S&P Capital IQ.

Company	Earnings per Share(\$)					Tangible Book Value per Share(\$)					Share Price (High-Low, Respective currencies)				
	Yr. End	2018	2017	2016	2015	2014	2018	2017	2016	2015	2014	2013	2018	2017	2016
TOYOTA MOTOR CORPORATION VOLKSWAGEN AG GENERAL MOTORS COMPANY DAIMLER AG BAYERISCHE MOTOREN WERKE AKTIENGESELLSCHAFT	JUN	5.82	7.84	5.37	6.84	5.73	5.58	61.68	60.62	52.81	49.07	44.46	44.34	7856.00	6945.00
	JUN	27.01	26.78	10.83	(3.43)	26.44	25.66	171.14	159.05	104.58	96.13	116.52	126.37	192.46	131.44
	JUN	5.53	(2.60)	6.00	5.91	1.65	2.38	23.77	20.82	25.12	22.92	18.15	21.51	45.52	30.96
	JUN	7.76	11.54	8.41	8.55	7.88	8.81	66.41	67.81	53.95	52.06	47.00	52.27	76.48	44.81
	JUN	12.39	12.39	11.03	10.54	10.69	11.13	98.41	98.41	74.17	68.64	66.70	71.88	97.04	69.17
HONDA MOTOR CO., LTD. SAIC MOTOR CORPORATION LIMITED TESLA, INC. AUDI AG FORD MOTOR COMPANY	JUN	3.12	5.56	3.07	1.70	2.36	3.37	41.72	41.25	35.51	32.53	32.08	33.36	4151.00	2733.00
	JUN	0.45	0.45	0.42	0.42	0.41	0.37	2.72	2.80	2.36	2.32	2.21	1.98	37.66	24.13
	JUN	(5.72)	(11.83)	(4.68)	(6.83)	(2.36)	(0.62)	26.49	22.60	27.09	8.15	7.25	5.42	387.46	244.59
	JUN	90.04	97.98	48.73	106.18	122.92	126.86	742.91	742.07	579.03	507.80	496.17	546.75	852.00	680.00
	JUN	0.92	1.93	1.15	1.84	0.31	2.94	9.03	8.70	7.15	7.18	6.14	6.60	13.48	7.41
FERRARI N.V. MARUTI SUZUKI INDIA LIMITED NISSAN MOTOR CO., LTD. HYUNDAI MOTOR COMPANY FIAT CHRYSLER AUTOMOBILES N.V.	JUN	4.74	3.39	2.23	1.65	1.67	1.76	3.22	(0.25)	(2.75)	(4.80)	10.66	0.00	149.85	93.85
	JUN	3.65	4.01	3.84	2.71	2.02	1.58	22.28	21.49	18.75	15.12	12.72	11.77	99.93.00	6500.00
	JUN	0.74	1.80	1.49	1.11	0.91	0.90	11.92	12.69	10.85	9.80	9.38	9.85	1197.00	635.50
	JUN	5.06	14.04	16.71	20.28	24.76	29.79	263.32	275.36	236.97	223.23	221.60	205.47	167500.00	92500.00
	JUN	2.63	2.69	1.25	0.24	0.24	1.01	6.50	4.35	1.30	0.18	0.16	(4.25)	20.20	12.36
SUBARU CORPORATION PEUGEOT S.A. PORSCHE AUTOMOBIL HOLDING SE PT ASTRA INTERNATIONAL TBK SUZUKI MOTOR CORPORATION	JUN	1.74	2.71	3.28	4.98	2.80	2.57	18.50	18.72	16.77	15.09	10.74	9.35	3857.00	2208.50
	JUN	3.45	2.45	2.04	1.04	(1.40)	(9.37)	13.92	11.85	13.09	11.95	11.59	19.70	25.40	16.46
	JUN	12.98	12.85	4.74	(1.09)	12.00	10.83	123.91	121.38	96.15	96.02	115.36	137.02	80.14	50.10
	JUN	0.04	0.03	0.03	0.03	0.04	0.04	0.20	0.20	0.19	0.17	0.17	0.16	8775.00	6100.00
	JUN	3.57	4.46	3.25	2.09	1.44	1.86	27.20	27.61	22.71	19.24	21.93	22.85	7680.00	5056.00

Note: Data as originally reported. CAGR-Compound annual growth rate. #Of the following calendar year.

Source: S&P Capital IQ.

The accuracy and completeness of information obtained from third-party sources, and the opinions based on such information, are not guaranteed.

Disclosure

S&P GLOBAL™ is used under license. The owner of this trademark is S&P Global Inc. or its affiliate, which are not affiliated with CFRA Research or the author of this content.

CFRA's Industry Surveys Reports (the "Industry Surveys") have been prepared by Accounting Research & Analytics, LLC and/or one of its affiliates. The Industry Surveys are published and distributed by Accounting Research & Analytics, LLC d/b/a CFRA with the following exceptions: In the European Union/European Economic Area, the Industry Surveys are published and distributed by CFRA UK Limited (company number 08456139 registered in England & Wales with its registered office address at PO Box 698, Titchfield House, 69–85 Tabernacle Street, London, EC2A 4RR, United Kingdom), which is regulated by the UK Financial Conduct Authority (No. 775151); in Malaysia, the Industry Surveys are published and distributed by CFRA MY Sdn Bhd (Company No. 683377-A) and regulated by Securities Commission Malaysia, No. CMSL/A0181/2007 ("CFRA Malaysia"). CFRA Malaysia is a wholly-owned subsidiary of CFRA US.

The content of this report and the opinions expressed herein are those of CFRA based upon publicly-available information that CFRA believes to be reliable and the opinions are subject to change without notice. This analysis has not been submitted to, nor received approval from, the United States Securities and Exchange Commission or any other regulatory body. While CFRA exercised due care in compiling this analysis, CFRA AND ALL RELATED ENTITIES SPECIFICALLY DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, to the full extent permitted by law, regarding the accuracy, completeness, or usefulness of this information and assumes no liability with respect to the consequences of relying on this information for investment or other purposes.

No content (including ratings, credit-related analyses and data, valuations, model, software or other application or output therefrom) or any part thereof (Content) may be modified, reverse engineered, reproduced or distributed in any form by any means, or stored in a database or retrieval system, without the prior written permission of CFRA. The Content shall not be used for any unlawful or unauthorized purposes. CFRA and any third-party providers, as well as their directors, officers, shareholders, employees or agents do not guarantee the accuracy, completeness, timeliness or availability of the Content.

Past performance is not necessarily indicative of future results. This document may contain forward-looking statements or forecasts; such forecasts are not a reliable indicator of future performance.

This report is not intended to, and does not, constitute an offer or solicitation to buy and sell securities or engage in any investment activity. This report is for informational purposes only. Recommendations in this report are not made with respect to any particular investor or type of

investor. Securities, financial instruments or strategies mentioned herein may not be suitable for all investors and this material is not intended for any specific investor and does not take into account an investor's particular investment objectives, financial situations or needs. Before acting on any recommendation in this material, you should consider whether it is suitable for your particular circumstances and, if necessary, seek professional advice.

CFRA may license certain intellectual property or provide services to, or otherwise have a business relationship with, certain issuers of securities that are the subject of CFRA research reports, including exchange-traded investments whose investment objective is to substantially replicate the returns of a proprietary index of CFRA. In cases where CFRA is paid fees that are tied to the amount of assets invested in a fund or the volume of trading activity in a fund, investment in the fund may result in CFRA receiving compensation in addition to the subscription fees or other compensation for services rendered by CFRA, however, no part of CFRA's compensation for services is tied to any recommendation or rating. Additional information on a subject company may be available upon request.

CFRA's financial data provider is S&P Global Market Intelligence. THIS DOCUMENT CONTAINS COPYRIGHTED AND TRADE SECRET MATERIAL DISTRIBUTED UNDER LICENSE FROM S&P GLOBAL MARKET INTELLIGENCE. FOR RECIPIENT'S INTERNAL USE ONLY.

The Global Industry Classification Standard (GICS®) was developed by and/or is the exclusive property of MSCI, Inc. and S&P Global Market Intelligence. GICS is a service mark of MSCI and S&P Global Market Intelligence and has been licensed for use by CFRA.

Certain information in this report is provided by S&P Global, Inc. and/or its affiliates and subsidiaries (collectively "S&P Global"). Such information is subject to the following disclaimers and notices: "Copyright © 2019, S&P Global Market Intelligence (and its affiliates as applicable). All rights reserved. Nothing contained herein is investment advice and a reference to a particular investment or security, a credit rating or any observation concerning a security or investment provided by S&P Global is not a recommendation to buy, sell or hold such investment or security or make any other investment decisions. This may contain information obtained from third parties, including ratings from credit ratings agencies. Reproduction and distribution of S&P Global's information and third-party content in any form is prohibited except with the prior written permission of S&P Global or the related third party, as applicable. Neither S&P Global nor its third-party providers guarantee the accuracy, completeness, timeliness or availability of any information, including ratings, and are not responsible for any errors or omissions (negligent or otherwise), regardless of the cause, or for the results obtained from the use of such information or content. S&P GLOBAL AND ITS THIRD-PARTY CONTENT PROVIDERS GIVE NO EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF

MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE AND ALL S&P INFORMATION IS PROVIDED ON AN AS-IS BASIS. S&P GLOBAL AND ITS THIRD-PARTY CONTENT PROVIDERS SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, EXEMPLARY, COMPENSATORY, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES, COSTS, EXPENSES, LEGAL FEES, OR LOSSES (INCLUDING LOST INCOME OR PROFITS AND OPPORTUNITY COSTS OR LOSSES CAUSED BY NEGLIGENCE) IN CONNECTION WITH ANY USE OF THEIR INFORMATION OR CONTENT, INCLUDING RATINGS. Credit ratings are statements of opinions and are not statements of fact or recommendations to purchase, hold or sell securities. They do not address the suitability of securities or the suitability of securities for investment purposes, and should not be relied on as investment advice."

Certain information in this report may be provided by Securities Evaluations, Inc. ("SE"), a wholly owned subsidiary of Intercontinental Exchange. SE is a registered investment adviser with the United States Securities and Exchange Commission (SEC). SE's advisory services include evaluated pricing and model valuation of fixed income securities, derivative valuations and Odd-Lot Pricing that consists of bid- and ask-side evaluated prices for U.S. Municipal and U.S. Corporate Securities (together called valuation services). Such information is subject to the following disclaimers and notices: "No content (including credit-related analyses and data, valuations, model, software or other application or output therefrom) or any part thereof (Content) may be modified, reverse engineered, reproduced or distributed in any form by any means, or stored in a database or retrieval system, without the prior written permission of SE. The Content shall not be used for any unlawful or unauthorized purposes. SE and any third-party providers, as well as their directors, officers, shareholders, employees or agents (collectively SE Parties) do not guarantee the accuracy, completeness, timeliness or availability of the Content. SE Parties are not responsible for any errors or omissions (negligent or otherwise), regardless of the cause, for the results obtained from the use of the Content, or for the security or maintenance of any data input by the user. The Content is provided on an "as is" basis. SE PARTIES DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION.

In no event shall SE Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs or losses caused by negligence) in connection with any use of the Content even if advised of the possibility of such damages. Credit-related and other analyses and statements in the Content are statements of opinion as of the date they are

expressed and not statements of fact or recommendations to purchase, hold, or sell any securities or to make any investment decisions. SE assumes no obligation to update the Content following publication in any form or format. The Content should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. SE's opinions and analyses do not address the suitability of any security. SE does not act as a fiduciary or an investment advisor. While SE has obtained information from sources it believes to be reliable, SE does not perform an audit and undertakes no duty of due diligence or independent verification of any information it receives. Valuations services are opinions and not statements of fact or recommendations to purchase, hold or sell any security or instrument, or to make any investment decisions. The information provided as part of valuations services should not be intended as an offer, promotion or solicitation for the purchase or sale of any security or other financial instrument nor should it be considered investment advice. Valuations services do not address the suitability of any security or instrument, and securities, financial instruments or strategies mentioned by SE may not be suitable for all investors. SE does not provide legal, accounting or tax advice, and clients and potential clients of valuation services should consult with an attorney and/or a tax or accounting professional regarding any specific legal, tax or accounting provision(s) applicable to their particular situations and in the countries and jurisdictions where they do business. SE has redistribution relationships that reflect evaluated pricing, derivative valuation and/or equity pricing services of other unaffiliated firms with which SE has contracted to distribute to its client base. Pricing and data provided by these third-party firms are the responsibilities of those firms, and not SE, and are produced under those firms' methodologies, policies and procedures. Valuations services provided by SE and products containing valuations services may not be available in all countries or jurisdictions. Copyright © 2019 by Intercontinental Exchange Inc. All rights reserved."

Any portions of the fund information contained in this report supplied by Lipper, A Thomson Reuters Company, are subject to the following: "Copyright 2019 © Thomson Reuters. All rights reserved. Lipper shall not be liable for any errors or delays in the content, or for any actions taken in reliance thereon."

Redistribution or reproduction is prohibited without written permission. Copyright © 2019 CFRA. All rights reserved.