Automotive Industry Outlook:
Managing Volatility and Leveraging Opportunities in a Dynamic Market Environment

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Big Picture: Global Automotive Outlook

Implications for the Global Automotive Industry

Counter-synchronization of auto sales cycles across world regions continues with emerging markets and developed markets on opposite waves; wave amplitude likely to dissipate in time.

Risk of broad retreat from globalization
Trump, Mexico, China
Brexit, Eurozone

Increased risk of new disruptive business models
"breaking the forecast"

Risk of longer-term planning volatilities
Uncertainties hurt long-term planning
Global Economic Growth has Peaked and is Vulnerable; Trade Tensions Weigh on Outlook

Source: IHS Markit Data Insight

World Average 2019 = 2.9%
Global Light Vehicle Sales
Volatility Impacts the Near-Term Outlook; Mobility Dynamics Drive Slower Growth Long Term

Source: IHS Markit Light Vehicle Sales Forecasts

Growth rate peaks - downhill from here
The Changing Automotive World

Emerging Markets Outlook is Key to Growth; Limited Potential in Mature Markets

Note: Mature Markets = US, Canada, Japan, S Korea, Australia, New Zealand, Western Europe
Source: IHS Markit Light Vehicle Sales Forecast

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Global Light Vehicle Production
Marginal Growth Driven by Asia and South America; Material Risks Remain

Source: IHS Markit Light Vehicle Production Forecast

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Global Production Growth

Transition from Mature Markets to Emerging Markets Intensifies in the Longer Term

Millions

-2 0 2 4 6 8 10

Greater China 6.6
South Asia 4.7
Europe 1.7
South America 1.3
Middle East/Africa 0.8
North America 0.6
Japan/Korea -0.4

36 million

15 million
US: Light Vehicle Sales Outlook
Gauging the Health of the Market

- Consumer confidence
- Economic growth
- Job growth
- Credit availability
- Vehicle fleet age/composition

- Wage growth
- Incentives vs. average transaction prices: can the discipline be maintained?
- Scrap rate/vehicle density
- Yield curve inversion?
- Tariff/trade tensions

- Fed action/interest rates
- Risk of policy mistakes
- Lease returns/used vehicle pricing/residuals
- Rising input costs
- Vehicle affordability pressures
US: Light Vehicle Sales Outlook
Market Shifting to a “Declining Plateau”; Mobility Dynamics Factor in Longer Term

Post market peak: weaker buying conditions, slower job creation, affordability driven by higher interest rates, legislated content and urbanization slows momentum

Source: IHS Markit Light Vehicle Sales Forecast
US: Light Vehicle Sales Outlook
Pool of Potential Buyers Remains Strong

Light Vehicles in Operation (VIO) by VIN Year

Total VIO = 271M

Source: IHS Markit
US Light Vehicle Sales in Alternative Scenarios

**Positives**
- Consumer confidence
- Economic growth
- Housing recovery
- Job growth
- Credit Availability

**Negatives**
- New & used vehicle pricing
- Off lease returns
- Incentives
- Longer loan terms
- Interest rate outlook
- Uncertainty

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**Light Vehicle Sales (Quarterly SAAR)**

- **Baseline (60%)**
- **Pessimistic (25%)**
- **Optimistic (15%)**

Source: IHS Markit
U.S.: Light Vehicle Sales Outlook
Are We Reaching a Saturation Point for CUV Models? Differentiation will be Critical!

U.S. CUV Model Count by Sub-Segment

Source: IHS Markit Light Vehicle Sales Forecast
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North American Light Vehicle Production

Push to Reduce Exposure to Cars and Tariff/Trade Situation Impacts Near-Term Outlook

**Short-term pain, longer-term gain**

- Finding balance
- Incentives
- Fleet
- Inventory
- Production planning (e.g. car vs. light truck, electrification, etc.)
- Quality versus quantity
- Growth due primarily to localization and portfolio expansion
- Off-shoring
- Cancellations
- Backfilling

**North American Light Vehicle Production**

<table>
<thead>
<tr>
<th>Year</th>
<th>Production Volume (Millions)</th>
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<tbody>
<tr>
<td>2015</td>
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</tr>
<tr>
<td>2016</td>
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<tr>
<td>2017</td>
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<tr>
<td>2018</td>
<td>17.0</td>
</tr>
<tr>
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<td>16.8</td>
</tr>
<tr>
<td>2020</td>
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<tr>
<td>2021</td>
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<tr>
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<td>17.2</td>
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<tr>
<td>2026</td>
<td>17.3</td>
</tr>
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</table>

Source: IHS Markit

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Production Outlook

North American Light Vehicle Production by Country

Source: IHS Markit Light Vehicle Production Forecast

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North American Light Vehicle Production

Customer Mix is Changing; Opportunity Targeting is More Critical than Ever!

- Asian, German and ‘Other’ OEM production accelerates with continued localization and new white space products.
- Detroit 3 production declines due to plant rationalization, product realignment and vehicle production sourcing decisions.
North American Light Vehicle Production
Vehicle Mix Continues to Change; Segment Targeting is Necessary

Cars Struggle; SUVs Soar

<table>
<thead>
<tr>
<th>Year</th>
<th>Car (Millions)</th>
<th>Utilities (Millions)</th>
<th>Pickup (Millions)</th>
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</tr>
</tbody>
</table>
Powertrain Technology Outlook
Regional Preferences and Incentives Result in a Varied Propulsion Mix; Watch the Model Count!

Global Propulsion Design Islands in 2031

- **North America**: 65% ICE, 9% MHEV, 8% FHEV, 6% PHEV, 12% Electric
- **Europe**: 40% ICE, 27% MHEV, 10% FHEV, 3% PHEV, 12% Electric
- **Japan/South Korea**: 41% ICE, 23% MHEV, 10% FHEV, 8% PHEV, 6% Electric
- **Greater China**: 29% ICE, 46% MHEV, 7% FHEV, 5% PHEV, 13% Electric

**Source**: IHS Markit Powertrain Production Forecast

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Thank You!

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