Global auto market outlook and implications for Brazil

Oct 2015
Agenda

1. Global market overview
2. Key findings from the C-suite survey
3. Key considerations for the Brazilian automotive industry
Why: in the automotive and transportation sector, we are doing our part to enhance human mobility – getting people and product where they need to go better, faster and smarter – in a rapidly changing environment.

How: through our globally expansive sector network, we bring a strong point of view on the emerging issues across automotive and transportation – connecting more than 13,000 professionals with deep industry and technical expertise who understand what the trends of the future mean.

What: we work with our clients to deliver innovative – yet pragmatic - solutions to address their imperatives and deliver tangible business value around the disruptive trends and transformational challenges shaping tomorrow’s industry, today.
EY’s strong global connectivity enables us to assemble the right teams, share leading practices across the world and address Automotive and transportation companies’ needs, whatever location they are active in. This is a key added value for our clients.
We work with the biggest, brightest and best companies in automotive and transportation. This broad and deep exposure means we understand the dynamics of the sector and what the leading players are doing.
Agenda

- EY Global automotive and transportation sector
- Global market overview
- Key findings from the C-suite survey
- Key considerations for the Brazilian automotive industry
Global Market Overview - Our POV on sector mega trends
Key factors signalling the urgency to change faster

Industry likely to witness more change in the next 5 years than in the last 15 years

1. Growing local volatility will exacerbate global uncertainty
2. Battling for customer ownership
3. Accelerating pace of disruptive innovation
4. Digitization driving transformation across the value chain
5. Delivering to heightened scrutiny and accountability
6. Securing strategic resources

Our analysis of the automotive C-suite’s agenda indicates majority of the organisations lack preparedness, execution and resource alignment to enable faster change
Market Outlook – The auto industry is going through another cycle - the mix of markets driving growth has changed.. again!

Indicators for some markets are positive; potential for increased sales, driven by:
- Economic growth
- New model launches
- Improved financing conditions

Distressed markets pose obstacles for auto sales growth as a result of:
- Slower economic growth
- High taxes and interest rates
- Tight credit conditions
- Political tensions

* The Chinese market continues to grow, but the pace of growth has reduced due to slower economic growth.
Market Outlook - The pace of global auto sales is likely to slow down as sales growth in most emerging markets cool off.

Source: LMC Automotive (3Q15)

India and Eastern Europe are the only exceptions to the expected slowdown among major emerging markets.
Market Outlook – China, US and Western Europe to drive industry volumes over the medium term

- Relatively moderate growth in the US and China, coupled with weak sales in Brazil and Russia, has led to an almost flat performance in the overall LV market.
- Despite a slower expected growth rate, China and the US (given their large base) are likely to drive volumes for the industry over the medium term. The recovery in Western Europe to also contribute towards global volume growth.
- India is the only emerging market expected to grow faster than past growth - Falling inflation, lower interest rates and energy prices and a recovering consumer confidence driving recovery.
- Globally, compact SUV/MPV segment is expected to grow the fastest while conventional segments are likely to grow moderately or even decline - however, pace of growth for most segments is expected to slow down.

Global automakers need to adjust their business model to the new normal based on moderate sales growth over the next decade.
Market Outlook - Compact SUV/MPV segment is expected to grow the fastest while conventional segments are likely to grow moderately or even decline.

Source: LMC Automotive (3Q15)
Summary of global Commercial Vehicles (CV) sales outlook

- Global CV sales are likely to decline by 3.5% by 2018, due to economic slowdown in most high growth countries, led by China.
- Relatively high growth in the Indian subcontinent, moderate growth in Europe and steep decline in China, are likely to be key characteristics of the global CV market, by 2018.

Indicators for some markets are positive; potential for increased sales, driven by:
- Infrastructure and construction activities
- New emission regulations
- Replacement demand

Distressed markets pose obstacles for CV sales growth as a result of:
- Low industrial production
- High tax rates
- Tight credit conditions
Market Outlook – Mixed outlook for CVs in emerging markets; Brazil and China to witness demand decline, India witnessing mild recovery

- **China**: Slowing economy and rising inventories to lead to slowdown in CV demand in China.

- **Brazil**: Bottomed out demand for CVs, fueled by a stagnant economy and no new investment in infrastructure projects.

- **India**: Several government initiatives, such as privatization of ports, setting up ultra mega power projects will drive CV demand.

- **US**: Stable construction starts and infrastructure investment to drive CV demand.

- **Europe**: Replacement demand due implementation of Euro 6 norms and preference for trucks over railways for logistics will enable CV sales.
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EY’s third annual automotive survey of 125 global executives to find out what’s on the C-suite’s agenda for 2015-16.

Comparing key findings from the 3 Changing Lanes studies highlights urgency for industry to change – or face disruption

Embedding flexibility to react to the unexpected:
- Emerging markets volatility
- Resource availability
- Competition from new sectors and market entrants

2013-14
Urgency of strategic/tactical moves to manage risks and re-inventing value proposition:
- Developed markets slowdown
- Vehicle ownership loosing attractiveness
- Connectivity and mobility

2014-15

2015-16
Optimistic about strategic initiatives but concerned about:
- Preparedness for volatility
- Challenges in implementing operational and technological initiatives
- Securing resources, particularly talent
Analysis of the C-suite responses indicates 3 prominent strategic imperatives, which are not mutually exclusive, but need balanced representation at the boards of automotive companies.

**Opportunity Seekers:** focus on presence and success in high-growth geographies

**Change Agents:** driving innovation with a focus on R&D for the future

**Digital Enablers:** focus on optimization and standardization of technology and IT platforms
C-suite priorities for the next 18 months - reflects fewer executives feel prepared for volatility, driving efficiency and gaps in resources

1. Navigating volatility
   - 63% expect unfavorable impact from volatility
   - Only 20% feel well-prepared

2. Enhancing value proposition
   - 71% believe changing consumer demands support their value proposition
   - 29% feel well-prepared

3. Gaining competitive advantage
   - 71% believe enhancing value proposition gives competitive advantage
   - 27% feel well-prepared

4. Improving operational efficiency
   - 84% believe profitability driver operational efficiency initiatives
   - Only 16% feel well-prepared

5. Securing access to resources
   - 63% believe securing critical resources offer competitive advantage
   - Only 17% feel well-prepared
1. Rocky roads ahead
Navigating volatility

<table>
<thead>
<tr>
<th>Demand volatility — misfiring engines of growth</th>
<th>Cost volatility — business as usual</th>
<th>Political, economic and regulatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>58% expect unfavorable volatility</td>
<td>58% expect unfavorable volatility</td>
<td>72% expect unfavorable volatility</td>
</tr>
<tr>
<td>Only 19% feel well-prepared</td>
<td>Only 18% feel well-prepared</td>
<td>Only 25% feel well-prepared</td>
</tr>
</tbody>
</table>

58% feel well-prepared
19% expect unfavorable volatility

Only 58% expect unfavorable volatility
38% feel well-prepared

Only 18% expect unfavorable volatility
26% feel well-prepared

Only 25% expect unfavorable volatility
48% feel well-prepared

Bridging the gap — what can C-suites do?

- Strive for flexibility to navigate through emerging markets, cost and political volatility
- Develop an optimum capacity-demand balance at a regional level as a natural hedge to exchange rate volatility
- Capitalize on the upside potential of North America and China and ease of access to credit markets
2. Shifting gears
Enhancing value proposition

Bridging the gap — what can C-suites do?

- Align functional organizations to support the mobility and connectivity value proposition to capitalize on demand
- Managing trust and complexity throughout the customer life cycle to maintain customer loyalty
- Accelerate the transformation of distribution channels to give customers a seamless online and dealer store experience
3. Racing ahead
Gaining competitive advantage

<table>
<thead>
<tr>
<th>Market penetration/expansion</th>
<th>Product/services strategy and collaboration</th>
<th>Marketing and sales initiatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>67% enhance value proposition for competitive advantage</td>
<td>77% enhance value proposition for competitive advantage</td>
<td>66% expect demand for mobility services and vehicle types supports their value proposition</td>
</tr>
<tr>
<td>28% feel well-prepared to implement strategic initiatives</td>
<td>26% feel well-prepared to implement strategic initiatives</td>
<td>26% feel well-prepared to implement strategic initiatives</td>
</tr>
</tbody>
</table>

Bridging the gap —what can C-suites do?

- First movers will need to make the most of a shorter window to capitalize on differentiation
- Establish network of technology and business model partners within and outside the auto industry to improve agility of innovation process – including disruptive innovation
- Leverage marketing effectiveness monitoring and customer analytics tools to optimize digital strategies
4. Digital horsepower
Improving operational efficiency

Data management and analytics
- 84% believe improving profitability is the primary driver for implementing data management and analytics initiatives
- Only 12% feel well-prepared to implement key initiatives

Manufacturing efficiency related initiatives
- 86% believe improving profitability is the primary driver for implementing initiatives related to manufacturing operations
- Only 16% feel well-prepared to implement key initiatives

Supply chain management
- 86% believe improving profitability is the primary driver for implementing supply chain initiatives
- Only 12% feel well-prepared to implement key initiatives

Bridging the gap — what can C-suites do?
- Spearhead data management and analytics capabilities to drive agility of decision-making
- Flex global capacity to create a competitive advantage, especially in volatile operating scenarios
5. Fuel up

Securing access to resources

Bridging the gap — what can C-suites do?

- Focus on securing access to talent and ensuring compliance for business continuity
- Extend the value chain to new industries to develop technology and infrastructure for powertrain and connectivity
- Devise innovative strategies to retain talent and utilize infrastructure to create competitive advantage
Changing Lanes - C-suites’ summary views from across the value chain
Auto companies need to strengthen preparedness, execution and resource alignment and move faster.

**Automaker executives**
- Securing talent and deploying data management and analytics top their agenda
- Less than 20% confident of their organizations’ implementation and deployment capabilities

**Supplier executives**
- Well-prepared to tackle platform consolidation, fuel efficiency and weight reduction targets
- However, concerns exist around executing market expansion and securing talent

**Auto retail executives**
- Aim to strengthen data management and customer analytics capabilities
- However, lack preparedness for cost control and availability of both consumer and corporate credit

**Captive finance executives**
- Expect regulatory environment to be challenging, but appear well-prepared
- However, challenged by securing talent and articulating effective product/service strategy
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**External perception of Brazil - Automotive and supplier executives are concerned about the short term outlook and are looking to undertake production cuts and lay-offs**

<table>
<thead>
<tr>
<th>Executive/Spokesman</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luiz Moan, President, Anfavea</td>
<td>“It's still a very difficult moment for the market with no short-term recovery in sight due to Brazil's ongoing recession”</td>
</tr>
<tr>
<td>Mustafa Mohatarem, Chief economist, GM</td>
<td>“Developing economies such as China and Brazil have not lived up to expectations, which has hurt US automakers”</td>
</tr>
<tr>
<td>Mark Fields, CEO, Ford</td>
<td>“The continuation of difficult macroeconomic conditions is likely to lead to another loss in the region this year”</td>
</tr>
<tr>
<td>Sergio Marchionne, Chief executive, Fiat Chrysler</td>
<td>“The slowdown in Latin America... has been an area that has caused all of us some concern”</td>
</tr>
<tr>
<td>Daimler’s Brazilian spokesman</td>
<td>“We have decided to cut working hours at our truck factory ... there have been many less trucks ordered and a rebound is unfortunately not expected”</td>
</tr>
<tr>
<td>Chuck Stevens, CFO, GM</td>
<td>“Clearly the macro environment in South America, and it's primarily Brazil, deteriorated versus even where we thought it was going to be”</td>
</tr>
<tr>
<td>Mahle Metal Leve’s spokesman</td>
<td>“We have decided to close a subsidiary in Rio de Janeiro. The decision is due to the phase-out of requests from customers and the lack of future perspective”</td>
</tr>
<tr>
<td>Rodrigo Baggi, auto industry analyst</td>
<td>“Behind the worst crisis in more than a decade, there is a uncertainty surrounding the country’s sluggish economy, reduced access to credit and a drop in consumer confidence”</td>
</tr>
<tr>
<td>Wolfgang Bernhard, head of Daimler’s CV unit</td>
<td>“The market in Brazil, struggling to overcome a crippling recession, will need one to three years to return to growth”</td>
</tr>
</tbody>
</table>
The short-term outlook for Brazil is challenging

- Focus will be on capacity utilization,
- New capacity creation will decline due to excess capacity and also competition from other emerging markets particularly Mexico
- Brazil is in a transition stage to edge up in global competitiveness on the back of its sophisticated businesses and pockets of innovation

The long term potential for the automotive market and the industry remains promising - however, companies need to make radical changes to be competitive for the future
A few considerations to tackle the current challenges

- Tackling capacity planning and management
- Reinventing value proposition
- Transforming automotive retail
The changed automotive landscape in Brazil requires proven capacity management solutions to maintain profitability levels.
The manifestation of the collaborative economy in urban mobility is disrupting traditional business models of automotive and transportation companies.

Traditional urban mobility choices...

Disrupted by alternative value proposition offered by new age car sharing companies.

Mobility sharing players aim to offer differentiated flexibility.
EY has identified three key success factors in designing a sustainable mobility sharing business strategy that the Brazilian automotive industry can leverage:

1. **Identifying the optimal business model variant**
   - Selection from a complex set of variables across four key layers:
     - Infrastructure and resources
     - Value proposition
     - Customer segments
     - Partners and stakeholders

2. **Understanding profit drivers**
   - These vary across business model variants, but the most significant are:
     - Pricing model
     - Asset ownership structure
     - Technology infrastructure

3. **Customizing to city’s dynamic attributes**
   - EY’s Urban Mobility Index (UMI) helps profile cities on four key factors:
     - Overall infrastructure strategy, sources
     - Management of energy
     - Support to corporations
     - Priorities for citizens.

While differentiation comes from value proposition and customer segments, competitive advantage comes from infrastructure and partners/stakeholders.

New age companies adopt dynamic pricing models according to the real-time demand-supply scenario.

UMI provides the necessary framework to help city administrations interact with all mobility stakeholders to build tomorrow’s fully integrated transportation platform.
Opportunity to reinvent automotive retail in Brazil evolving from bricks-and-mortar to an omni-channel strategy

Shifting from product-driven to a customer-centric approach

Offering mobility services based value propositions instead of ownership

Providing seamless brand experience across channels

Consumers will no longer have a need for a traditional dealership
Operating and performance
- Compliment government’s measures to spur demand through attractive financing schemes, incentives, etc.
- Identify and leverage pockets of growth still existing in the market
- Build analytics capabilities to positively impact customer interactions, pricing and incentive strategies, supply chain efficiencies
- Focus on exports to tackle domestic slowdown and benefit from the depreciated Brazilian Real

Managing tax and regulations
- Develop a diversified tax strategy to tackle the reinstatement of consumer tax on new vehicles
- Focus on technology and connectivity to devise new tax models
- Develop interconnected competencies and business insight to manage broad tax issues and minimize tax risks

Investment and capital
- Investing in local supply chain to build technological capabilities and ensure sustainability
- Focus on flexible production systems and converting fixed costs into variable costs
- Integrate government incentives, direct loans and guarantees in capital raising strategies
- Use need-based and strategic alliances, JVs and acquisitions to gain technology and geographic coverage

Compliance and reporting
- Introduce connected reporting to bridge internal and external reporting requirements
- Integrate big data and advanced forensic data analytics to reduce fraud and corruption risks
- Develop an integrity and compliance program to guide the organization’s decisions and meet regulatory requirements
Thank you for your attention!

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Brazil is in a transition stage to edge up in global competitiveness on the back of its sophisticated businesses and pockets of innovation.

World economic forum divides the global economies into three major categories of factor driven, efficiency driven and innovation driven, and the ones transitioning between the three:

<table>
<thead>
<tr>
<th>Efficiency Driven Economy</th>
<th>Economies in Transition</th>
<th>Innovation Driven Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Mexico</td>
<td>US</td>
</tr>
<tr>
<td><strong>Positives:</strong></td>
<td><strong>Positives:</strong></td>
<td><strong>Positives:</strong></td>
</tr>
<tr>
<td>Huge market size, favorable demographics and moderate budget deficit</td>
<td>Stable macroeconomic environment, reasonably good transport infrastructure</td>
<td>Presence of innovation ecosystem, highly sophisticated businesses</td>
</tr>
<tr>
<td><strong>Concern/Improvement:</strong></td>
<td><strong>Concern/Improvement:</strong></td>
<td><strong>Concern/Improvement:</strong></td>
</tr>
<tr>
<td>Barriers to entry along with investment rules, access to financing</td>
<td>Low level of ICT uptake, quality of education system</td>
<td>Weakness in macroeconomic environment, weak trust in politicians and government</td>
</tr>
</tbody>
</table>

Mexico

**Positives:**
- Stable macroeconomic environment,
- reasonably good transport infrastructure

**Concern/Improvement:**
- Low level of ICT uptake,
- quality of education system

Brazil

**Positives:**
- Large market size,
- sophisticated business and pockets of innovation

**Concern/Improvement:**
- Transport infrastructure weak,
- macroeconomic performance,
- access to financing

US

**Positives:**
- Sophistication in businesses and innovation,
- excellent university system

**Concern/Improvement:**
- Weakness in macroeconomic environment,
- weak trust in politicians and government

Germany

**Positives:**
- Presence of innovation ecosystem,
- highly sophisticated businesses

**Concern/Improvement:**
- Labor market efficiency,
- High public debt

### Ease of doing business

Brazil significantly lags its peers in ease of doing business.

<table>
<thead>
<tr>
<th>Ease of Doing Business Rank*</th>
<th>China</th>
<th>Brazil</th>
<th>Mexico</th>
<th>India</th>
<th>Malaysia</th>
<th>US</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of Doing Business Rank*</td>
<td>90</td>
<td>120</td>
<td>39</td>
<td>142</td>
<td>18</td>
<td>7</td>
<td>14</td>
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<tr>
<td>Starting a business (rank)</td>
<td>128</td>
<td>167</td>
<td>67</td>
<td>158</td>
<td>13</td>
<td>46</td>
<td>114</td>
</tr>
<tr>
<td>Dealing with construction permits</td>
<td>179</td>
<td>174</td>
<td>108</td>
<td>184</td>
<td>28</td>
<td>41</td>
<td>8</td>
</tr>
<tr>
<td>Getting electricity</td>
<td>124</td>
<td>19</td>
<td>116</td>
<td>137</td>
<td>27</td>
<td>61</td>
<td>3</td>
</tr>
<tr>
<td>Registering property</td>
<td>37</td>
<td>138</td>
<td>110</td>
<td>121</td>
<td>75</td>
<td>29</td>
<td>89</td>
</tr>
<tr>
<td>Getting credit</td>
<td>71</td>
<td>89</td>
<td>12</td>
<td>36</td>
<td>23</td>
<td>2</td>
<td>23</td>
</tr>
<tr>
<td>Protecting investors</td>
<td>132</td>
<td>35</td>
<td>62</td>
<td>7</td>
<td>5</td>
<td>25</td>
<td>51</td>
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<tr>
<td>Paying taxes</td>
<td>120</td>
<td>177</td>
<td>105</td>
<td>156</td>
<td>32</td>
<td>47</td>
<td>68</td>
</tr>
<tr>
<td>Trading across borders</td>
<td>98</td>
<td>123</td>
<td>44</td>
<td>126</td>
<td>11</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>Enforcing contracts</td>
<td>35</td>
<td>118</td>
<td>57</td>
<td>186</td>
<td>29</td>
<td>41</td>
<td>13</td>
</tr>
<tr>
<td>Resolving insolvency</td>
<td>53</td>
<td>55</td>
<td>27</td>
<td>137</td>
<td>36</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Doing Business 2015, World Bank
Market Outlook – The pace of global auto sales is likely to slow down as sales growth in most emerging markets cool off

Falling inflation, lower interest rates and energy prices and a recovering consumer confidence is expected to driving auto sales in India

Market Outlook – The pace of global auto sales is likely to slow down as sales growth in most emerging markets cool off

Rising interest rates, inflation and unemployment is expected to suppress vehicle demand over the next few years

Tight credit conditions and weak consumer sentiments drag down vehicle sales

Increased auto finance penetration, fast dealership expansion and low vehicle density to drive light vehicle sales

Improving credit conditions and economic growth continue to spur demand in the US

Increased auto finance penetration, fast dealership expansion and low vehicle density to drive light vehicle sales

Source: LMC Automotive (3Q15, 4Q12)

Note: Size of the bubble indicates LV sales during 2014; sales in million units have also been mentioned in parenthesis after the name of the country/region.

*Period under consideration for the growth forecast: 2014-18
Market Outlook - Compact SUV/MPV segment is expected to grow the fastest while conventional segments are likely to grow moderately or even decline.

- CAGR 2012-14: Sub Compact SUV Non premium (0.3)*
- CAGR 2014-18F: Sub Compact SUV Non premium (1.2)
- CAGR 2014-18F: Compact SUV Non premium (5.5)
- CAGR 2014-18F: Compact SUV Premium (0.9)
- CAGR 2014-18F: Compact MPV/Minivan Economy (1.5)*
- CAGR 2014-18F: Small SUV Non premium (1.3)*
- CAGR 2014-18F: Compact Car Non premium (10.3)
- CAGR 2014-18F: Medium SUV Non premium (3.2)
- CAGR 2014-18F: Lower Medium SUV Non premium (1.4)
- CAGR 2014-18F: Lower Medium SUV Non premium (1.4)
- CAGR 2014-18F: Light Truck Economy (0.6)
- CAGR 2014-18F: Sub-Compact Car Non premium (6.2)
- CAGR 2014-18F: Compact Car Economy (1.5)
- CAGR 2014-18F: Midsize Car Non premium (5.2)
- CAGR 2014-18F: Compact Car Economy (1.5)
- CAGR 2014-18F: Midsize Car Non premium (5.2)
- CAGR 2014-18F: Compact Car Non premium (10.3)
- CAGR 2014-18F: Large Pickup Non premium (2.4)
- CAGR 2014-18F: Compact SUV Non premium (5.5)
- CAGR 2014-18F: Compact SUV Non premium (5.5)

Source: LMC Automotive (3Q15, 4Q13)

*Indicative figures for CAGR 2012-14. Sub Compact SUV Economy, Sub Compact SUV Non premium, Compact MPV/Minivan Economy, Small SUV Non premium had a CAGR of 70% 53% 64% 41% during 2012-14

Note: Size of the bubble indicates sales during 2014; sales in million units have also been mentioned in parenthesis after the name of the country/region. Only select 1m+ segments taken

*Period under consideration for the growth forecast: 2014-18
Despite emerging markets potential, Mexico stands out on capacity addition due to strategic location and high utilization.

- **Global LV capacity utilization**
  - **US** (93%) CAGR production 2014-18F
  - **Japan** (84%) CAGR production 2014-18F
  - **Western Europe** (80%)
  - **Eastern Europe** (69%)
  - **SE Asia** (64%)
  - **India** (58%)
  - **China** (64%)
  - **Brazil** (64%)
  - **Russia** (54%)
  - **SE Asia** (64%)
  - **Mexico** (93%)

**Key Points**

- **Overcapacity likely to sustain over the next few years**, as foreign automakers continue to increase capacity, anticipating a rise in demand and market share.
- **Rapid expansion in production and capacity** expected over the next few years due to Mexico’s proximity to the US, low costs and free trade agreements with various countries.
- **US automakers have been reluctant to add capacity** owing to the expected slowdown in auto industry.
- **A decline in sales coupled with weak exports has forced automakers to idle assembly lines and resort to layoffs**.

**Note:** Size of the bubble indicates capacity utilization during 2014; capacity utilization (%) has also been mentioned in parenthesis after the name of the country/region.

Source: LMC Automotive (3Q15)
Compact and sub-compact vehicles are expected to drive global LV sales growth

...while SUVs and crossovers are expected to remain a popular body style in light of changing customer preferences

Note: Size of the bubble indicates sales during 2014; sales in million units have also been mentioned in parenthesis after the name of the country/region.

Source: LMC Automotive (3Q15, 4Q13)
Regional vehicle demand remains the key driver of production ...

Note: Size of the bubble indicates LV production during 2014; production in million units has also been mentioned in parenthesis after the name of the country/region.

Source: LMC Automotive (3Q15, 4Q12)

- Vehicle production to grow only marginally over the next few years as the market is expected to recover after the mid of 2016
- Production is expected to grow as automakers add capacity largely driven by recovery in domestic sales
- LV production is expected to grow as foreign automakers continue to add capacity in light of the long term sustainability of sales growth
- Lower production costs and proximity to plenty of growth markets lure automakers to expand production

... strong growth in India and Mexico and a moderate growth in Europe, US and China is expected to drive automotive production for the next decade

*Period under consideration for the growth forecast: 2014-18
OEMs continue to align vehicle production investments to match local supply with demand...

Global LV production comparison (2014-18F)

US (CAGR: 1.2%)  Germany (CAGR: 0.7%)  India (CAGR: 8.7%)  China (CAGR: 5.5%)  Mexico (CAGR: 10.9%)  SE Asia (CAGR: 2.9%)  Brazil (CAGR: -3.1%)

...new plant activity will continue to be focused on high potential and relatively low cost countries
Market Outlook: Mixed outlook for CVs in emerging markets; Brazil and China to witness demand decline, India undergoing mild recovery

Several government initiatives, such as privatization of ports, setting up ultra mega power projects will drive CV demand.

Indian Subcontinent (0.3)

Middle East (0.1)

Africa (0.2)

Greater China (1.9)

Central/South America (0.3)

North America (0.9)

Europe (0.5)

SE Asia (0.3)

The demand for Medium and Heavy commercial vehicles is at an all time low, fueled by a stagnant economy and no new investment in infrastructure projects.

Slowing economy and rising inventories to lead to slowdown in CV demand in China. CN4 norms have led to increase in CV prices, leading to postponement of purchase.

Global on-road CV sales growth

Overall CV demand in Europe is expected to grow due to replacement demand as a result of implementation of Euro 6 norms. Strong preference for trucks over railways for logistics will also drive trucks demand.

Demand for on-road CVs which picked up until 2014, has been tapering down due to high inventory levels and mild slow down in construction starts.

Note: Size of the bubble indicates CV sales during 2014; sales in million units have also been mentioned in parenthesis after the name of the region. *Eurasia represents- Belarus, Moldova, Russia, Serbia, Turkey and Ukraine

Market Outlook: Trucks Class-8 and Class-3 dominate the global CV sales with 35% and 29% share, respectively

Greater China (39%) and North America (20%) regions comprise the most of Class-3 trucks. Growth of Class-3 trucks in these countries will be defined by growth of hub and spoke model and independent truckers with fleet of smaller vehicles filling up the demand which can't be met by large trucks.

Greater China (35%), North America (16%) and Europe (14%) regions comprise the most of Class-8 trucks. Growth of Class-8 trucks in these countries will be defined by speed of highway infrastructure projects, replacement demand, demand for heavy-duty trucks for freight movement and increase in construction starts.

Note: Size of the bubble indicates sales during 2014; sales in million units have also been mentioned in parenthesis after the name of the country/region.

Market Outlook: China and Brazil set to witness steep decline in off-road CV sales; India and North America show promising growth

Infrastructure investment set to drive growth of off-road CVs but project delays, environmental clearances and nascent public-private partnership (PPP) model could pose challenges.

A recovery in the platinum mining sector and increased activities in heavy construction and long haulage are likely to be the main drivers of demand for equipment.

China’s slowing economy has led the booming off-road CV market to cool off. The country is witnessing slow down in investment projects.

The capacity of Brazil’s construction industry declined to 60% in 1H15 vs. 69% in 1H14, owing to lower domestic demand and higher taxes. This has led to decline in CV and construction equipment demand.

Overall CV demand to remain string owing to infrastructure spending. Agricultural equipment demand to remain weak in the US due to lower farm income.

Greater China (3.6)

Central/South America (0.3)

Middle East (0.1)

Indian Subcontinent (0.7)

Europe (0.5)

SE ASIA (0.1)

Eurasia* (0.2)

North America (0.9)

India and North America show promising growth

Market Outlook: China and Brazil set to witness steep decline in off-road CV sales; India and North America show promising growth

Global off-road CV sales growth

Note: Size of the bubble indicates off-road CV sales during 2014; sales in million units have also been mentioned in parenthesis after the name of the region.* Eurasia represents Belarus, Moldova, Russia, Serbia, Turkey and Ukraine.
Market Outlook: Agricultural equipment sales dominate the global off-road CV demand

Global off-road CV sales growth by segment

<table>
<thead>
<tr>
<th>Category</th>
<th>Sales (in million units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavators (0.4)</td>
<td></td>
</tr>
<tr>
<td>Wheel Loaders and Dozers (0.2)</td>
<td></td>
</tr>
<tr>
<td>Tractor/Loader/Backhoes (0.1)</td>
<td></td>
</tr>
<tr>
<td>Crawlers (0.04)</td>
<td></td>
</tr>
<tr>
<td>Rollers (0.1)</td>
<td></td>
</tr>
<tr>
<td>Finishing Equipment (0.04)</td>
<td></td>
</tr>
<tr>
<td>Rough Terrain Forklifts (0.04)</td>
<td></td>
</tr>
<tr>
<td>Skid Steer Loaders (0.1)</td>
<td></td>
</tr>
<tr>
<td>Mixers (0.1)</td>
<td></td>
</tr>
<tr>
<td>Sprayers (0.05)</td>
<td></td>
</tr>
<tr>
<td>Bore/Drill Rigs (0.04)</td>
<td></td>
</tr>
<tr>
<td>Finishing Equipment (0.04)</td>
<td></td>
</tr>
<tr>
<td>Utility vehicles (0.3)</td>
<td></td>
</tr>
<tr>
<td>Ag Tractors (2.5)</td>
<td></td>
</tr>
<tr>
<td>Other Ag Equipment (2.8)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Size of the bubble indicates sales during 2014; sales in million units have also been mentioned in parenthesis after the name of the country/region. Only select 40k+ segments taken.

Market Outlook: Brazil and China to witness negative growth due to high inventory levels; thus putting pressure on global CV production

Owing to the economy slowdown several OEMs have resorted to production cuts. Moreover, the FINAME* funding earlier at 100% of vehicle value has been capped at 50%-70% of vehicle value, which will have a direct impact on production of trucks.

Despite government measures to stimulate projects, a high inventory levels in China may lead to lower CV production in the country.

Strong demand for trucks for freight movement and replacement demand from Euro-6 norms will lead OEMs to increase production.

The increase in trucks demand that began from 2011 will likely continue as the demand for smaller trucks for last mile deliveries will see rapid increase.

Global CV production growth

Note: Size of the bubble indicates CV production during 2014; sales in million units have also been mentioned in parenthesis after the name of the region.
* FINAME: FINAME is one of the three subsidiaries of Brazilian Development Bank (BNDES) which provides financing for purchase and sales operations of Brazilian machinery and equipment.
Brazil’s share of global capacity additions has come down over the past few years on rising concerns around its long term market potential.

**Global capacity addition announcements**

- **US$ billion**
  - 2009: 11.2
  - 2010: 16.6
  - 2011: 24.4
  - 2012: 16.1
  - 2013: 17.1
  - 2014: 21.8

**Investment announcements in US$ billion**

**yoy growth**

It is noteworthy that despite the weakness in domestic demand, the Chinese automaker Chery aims to enhance its production in Brazil this year, given the long term potential of the market.

Various automakers with planned capacity expansions in Brazil are reviewing their plans in the light of a sharp decline in vehicle sales.

**Share of total capacity addition investments announced**

- **Brazil**
  - 2009: 26%
  - 2010: 5%
  - 2011: 12%
  - 2012: 6%
  - 2013: 9%
  - 2014: 9%

- **Mexico**
  - 2009: 8%
  - 2010: 2%
  - 2011: 14%
  - 2012: 16%
  - 2013: 0%
  - 2014: 14%

- **China**
  - 2009: 47%
  - 2010: 64%
  - 2011: 57%
  - 2012: 60%
  - 2013: 72%
  - 2014: 53%

**Brazil’s share of total capacity investments announced in 2014**

- 2009: 9%
- 2010: 14%
- 2011: 16%
- 2012: 6%
- 2013: 9%
- 2014: 9%

The paradigm shift in auto retailing over the next decade, based on five key pillars:

1. Focus on customer-centricity
2. Customizing value propositions
3. Creating an engaging digital journey
   - Improving the digital experience
4. Redesigning distribution networks
   - New channels to reach consumers
5. Crafting an omni-channel brand strategy
   - Develop a seamless customer experience across all channels

Managing trust and complexity throughout the customer life cycle.
The integrated urban mobility vision is moving closer to reality as shared mobility business models succeed.

<table>
<thead>
<tr>
<th>Future of urban mobility</th>
<th>Vehicle characteristics</th>
<th>Digital infrastructure</th>
<th>Cross-sector stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Web-integrated</td>
<td></td>
<td>Automotive manufacturers</td>
</tr>
<tr>
<td></td>
<td>V2V, V2I, V2X communication</td>
<td>Real-time travel information</td>
<td>Infrastructure providers</td>
</tr>
<tr>
<td></td>
<td>Customizable</td>
<td></td>
<td>Transport/travel providers</td>
</tr>
<tr>
<td></td>
<td>Hardware and software reconfiguration</td>
<td>Connected transport infrastructure</td>
<td>Research institutions academia</td>
</tr>
<tr>
<td></td>
<td>Autonomous</td>
<td></td>
<td>Mobility sharing providers</td>
</tr>
<tr>
<td></td>
<td>Control shifts from driver to vehicle</td>
<td>One-stop payment system</td>
<td>Connectivity providers</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td></td>
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<tr>
<td></td>
<td>Fuel-efficient/alternate powertrain</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Collaborative economy is necessitated by urbanization and driven by digitization

Key drivers of the collaborative economy...

- Urbanization drains natural resources
- Digitization disrupts distribution channels
- Evolving consumer behavior is resulting in different societal norms

...which is now at the center stage of consumption

Sources: UNEP; World Urbanization Prospects, UN; Ovum; International Data Corporation

Urbanization:
- Drains natural resources
- 41 Megacities by 2030 (population of >10m)

Digitization:
- Disrupts distribution channels
- 64% Smartphone penetration by 2019; 31% in 2014

Evolving consumer behavior:
- Resulting in different societal norms

Rise of the collaborative economy:
- Accommodation providers (without owning real estate)
- Media streaming companies (without owning/creating content)
- Goods and services providers (without owning products)
- Mobility providers (without owning cars)

Most popular categories of collaborative consumption providers
Key considerations for mobility stakeholders and how EY can help

**What you should be thinking and planning about?**

**Consumer centricity**
- Deploying a multi-channel digital strategy
- Addressing trust and data privacy issues
- Enabling service customization and integration

**Products and services**
- Considering an integrated mobility-centric strategy
- Building vehicles around cities
- Investing in city infrastructure development

**Partnerships**
- Gaining access to customer relationships, data
- Enabling collaborative development of regulatory framework

**Mobility Innovation Services**
Building a better working world with cross-sector collaboration
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