Global Automotive Supplier Study

Record profits versus increasing volatility

November 2014
The current status – Supplier profitability at an all-time high

The short-term challenge – Uncertainty rises as record profitability is expected to come to an end

The long-term challenge – An industry structure fundamentally changing

The conclusion – Key actions for automotive suppliers

Contacts – Roland Berger and Lazard Automotive teams
A. The current status – Supplier profitability at an all-time high
After an excellent 2013, 2014 is expected to be yet another record year for automotive suppliers globally

Key supplier performance indicators, 2005-2014e (n=~600 suppliers)

<table>
<thead>
<tr>
<th>Revenue growth</th>
<th>EBIT$^1$ margin [%]</th>
<th>ROCE$^2$ [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 109 119 116 99</td>
<td>132 137 148 ~155</td>
<td>6.0 5.7 6.5</td>
</tr>
</tbody>
</table>

1) EBIT after restructuring items  2) EBIT after restructuring items/capital employed

Source: Company information; analyst forecasts; Roland Berger/Lazard
Key drivers of these results are nicely growing vehicle production volumes in the main markets

Global light vehicle production volume\(^1\) by region, 2010-2014e [m units]

<table>
<thead>
<tr>
<th>Region</th>
<th>CAGR:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAFTA</td>
<td>9.3%</td>
</tr>
<tr>
<td>North America</td>
<td>-1.1%</td>
</tr>
<tr>
<td>World</td>
<td>4.3%</td>
</tr>
<tr>
<td>China</td>
<td>8.0%</td>
</tr>
<tr>
<td>Japan/Korea</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

\(^1\) Incl. light commercial vehicles \(^2\) Excluding CIS and Turkey

Source: IHS; Roland Berger/Lazard
Major decline in Brazil and Russia – Chinese manufacturers and premium OEMs are fueling this year's growth

Top 20 by country and by OEM group, light vehicle production

By production country

- Iran
- Indonesia
- Czech Rep.
- Spain
- Mexico
- China
- USA
- France
- Germany
- Japan
- UK
- India
- Canada
- South Korea
- Italy
- Russia
- Turkey
- Brazil
- Thailand

By OEM group

- Changan
- Dongfeng
- Mazda
- Daimler
- BAIC
- SAIC
- Toyota
- GM
- Ford
- PSA
- FCA
- RN
- VW
- RN
- VW
- RN
- VW

Avg. 3.9%

Production \( \Delta \) 2014e vs. 2013 [%] 2)

Total production 2014 [m units]

1) Incl. light commercial vehicles 2) Year-on-year growth rate

Source: IHS; Roland Berger/Lazard
Recent supplier performance adds up to a 5-year plateau of record margins – Gap between suppliers and OEMs remains constant

**OEM and supplier profitability (EBIT margin), 2001-2014e [%]**

**Y-o-y change in global light vehicle sales**

<table>
<thead>
<tr>
<th>Year</th>
<th>Suppliers</th>
<th>OEMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>3.6</td>
<td>3.2</td>
</tr>
<tr>
<td>2002</td>
<td>5.3</td>
<td>5.1</td>
</tr>
<tr>
<td>2003</td>
<td>5.4</td>
<td>5.1</td>
</tr>
<tr>
<td>2004</td>
<td>5.8</td>
<td>4.7</td>
</tr>
<tr>
<td>2005</td>
<td>6.0</td>
<td>4.9</td>
</tr>
<tr>
<td>2006</td>
<td>5.7</td>
<td>5.8</td>
</tr>
<tr>
<td>2007</td>
<td>6.5</td>
<td>2.1</td>
</tr>
<tr>
<td>2008</td>
<td>5.5</td>
<td>2.3</td>
</tr>
<tr>
<td>2009</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>2010</td>
<td>6.7</td>
<td>2.3</td>
</tr>
<tr>
<td>2011</td>
<td>6.9</td>
<td>1.8</td>
</tr>
<tr>
<td>2012</td>
<td>7.2</td>
<td>1.8</td>
</tr>
<tr>
<td>2013</td>
<td>7.0</td>
<td>1.8</td>
</tr>
<tr>
<td>2014</td>
<td>0.0</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Source: IHS; Factset; company information; Roland Berger/Lazard

1) Aggregated data for 14 European, North American and Asian OEMs (incl. results from financial services business)
Financial performance of suppliers varies greatly depending on region, company size, product focus and business model

Profitability trends in the global automotive supplier industry – 2014e vs. 2007

<table>
<thead>
<tr>
<th>Region</th>
<th>Company size</th>
<th>Product focus</th>
<th>Business model</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAFTA suppliers significantly improved their performance since the auto crisis to almost 8% EBIT</td>
<td>Suppliers with &gt;EUR 10 bn revenues maintained their strong profitability level of above 7% EBIT</td>
<td>Tire-focused suppliers maintained their strong margins</td>
<td>&quot;Product innovators&quot; had stable above-average margins of ~8%, further positive trend in 2014</td>
</tr>
<tr>
<td>Performance of Europe-based suppliers partly impacted by weak home market in 2013 (but positive trend in 2014)</td>
<td>Lower midsized suppliers (EUR 0.5 to 2.5 bn revenues) remained above average</td>
<td>Also powertrain suppliers remained above average</td>
<td></td>
</tr>
<tr>
<td>Chinese suppliers still very strong, but with gradually decreasing margin levels</td>
<td>Upper midsized suppliers (EUR 2.5 to 10 bn revenues) remained below average</td>
<td>Interior-focused suppliers saw margins decline and had the lowest profitability level overall of around 5%</td>
<td></td>
</tr>
<tr>
<td>Japanese suppliers on average remain at a weaker profitability level</td>
<td>Small suppliers (below EUR 0.5 bn revenues had the lowest profitability (~5%))</td>
<td>Margin of &quot;process specialists&quot; stayed stable, below average since 2007</td>
<td></td>
</tr>
</tbody>
</table>

Source: Company information; Roland Berger/Lazard
NAFTA-based suppliers are currently more profitable than their European peers – China-based suppliers recently on the decline

Key supplier performance indicators by region, 2013/2014 [%]

<table>
<thead>
<tr>
<th>Region</th>
<th>EBIT margin 2013</th>
<th>EBIT margin trend 2014</th>
<th>Revenue CAGR 2007-13</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>6.5</td>
<td>Up</td>
<td>11.7%</td>
</tr>
<tr>
<td>NAFTA</td>
<td>7.0</td>
<td>Up</td>
<td>1.9%</td>
</tr>
<tr>
<td>Europe</td>
<td>7.7</td>
<td>Down</td>
<td>4.5%</td>
</tr>
<tr>
<td>Japan</td>
<td>6.6</td>
<td>Up</td>
<td>0.4%</td>
</tr>
<tr>
<td>Korea</td>
<td>6.5</td>
<td>Up</td>
<td>14.6%</td>
</tr>
</tbody>
</table>

- Europe-based suppliers in principle benefit from leading technology positions in many segments and favorable customer mix – some large suppliers with weaker performance in 2013 vs. 2012 (and 2014) impacted the regional average
- NAFTA-based suppliers still benefit from substantial restructuring of their business during the 2008/2009 auto crisis
- China-based suppliers are still leading edge, but margin levels are gradually decreasing due to intensified competition
- Japan-based suppliers trapped by dependency on their home market and respective OEMs

Source: Company information; Roland Berger/Lazard
Very small and midsize suppliers lag behind in terms of EBIT margin – Large globally operating suppliers are top of the class

Key supplier performance indicators by company size (sales in EUR bn), 2013/2014 [%]

Leveraging scale on the cost side clearly paid off in recent years

Large multinational suppliers continued to benefit from the ongoing globalization

Midsize suppliers (EUR 2.5-10 bn revenues) "stuck in the middle" – performance remaining below average

Many very small suppliers suffered from the growing cost of going global in recent years

Source: Company information; Roland Berger/Lazard
Powertrain and tire-focused suppliers currently achieve the highest profitability – Interior suppliers remain significantly below average

Key supplier performance indicators by product focus, 2013/2014 [%]

> **Powertrain** margins reduced by intensified competition in this growing business – still on a high level

> **Exterior** suppliers improved in recent years, partly due to growing lightweight focus

> **Chassis** suppliers developed around the industry average for quite some time – future development increasingly driven by active safety

> **Tire** suppliers clearly benefited from their strong aftermarket business in recent years

> **Interior** suppliers continue to struggle with high commoditization pressure

Source: Company information; Roland Berger/Lazard
Product innovators clearly outpace process specialists in terms of profitability

Key supplier performance indicators by business model, 2013/2014 [%]

<table>
<thead>
<tr>
<th></th>
<th>Product innovators 1)</th>
<th>Process specialists 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue CAGR 2007-13</strong></td>
<td>4.3%</td>
<td>3.2%</td>
</tr>
<tr>
<td><strong>EBIT margin trend 2014</strong></td>
<td>8.1</td>
<td>6.4</td>
</tr>
<tr>
<td><strong>EBIT margin 2013</strong></td>
<td>Avg.=7.2</td>
<td></td>
</tr>
</tbody>
</table>

> Innovative products feature higher differentiation potential and greater OEM willingness to pay

> High entry barriers through intellectual property in many innovation-driven segments

> Competitive structure more consolidated in innovation-driven segments

> Higher fragmentation in many process-driven segments drives price competition

1) Business model based on innovative products with differentiation potential
2) Business model based on process expertise (while product differentiation potential is limited)

Source: Company information; Roland Berger/Lazard
Five key success factors have been applied by most of these players

Top 5 key success factors of top performers

1. Strong efforts to maintain/increase USP and **technological differentiation**

2. Focus on product segments with above-average **growth rates and margin potential**

3. Anti-cyclical **efficiency improvement** efforts (overheads, plant locations, …)

4. Strong increase of **production and engineering footprint** outside Triad markets

5. Good **organization** of processes and structures in globalized setups

Source: Roland Berger/Lazard
B. The short-term challenge – Uncertainty rises as record profitability is expected to come to an end
Short term, we expect slower growth with profit margins still remaining at a high level – Downside risks outweighing opportunities

Supplier global revenue and margin outlook, 2015/2016

**Revenue growth [2005=100]**

05 06 07 08 09 10 11 12 13 14e 15e 16e

100 109 119 116 99 118 132 137 148 ~155

**EBIT\(^1\) margin [%]**

05 06 07 08 09 10 11 12 13 14e 15e 16e

6.0 6.5 7.0 6.5 6.9 7.2 ~7.5

Source: Company information; Roland Berger/Lazard
Uncertainty about the market development in 2015 stays at the top of the supplier CEO agenda

Supplier CEO radar screen for 2015 and beyond

Note: Excluding product segment specific technology and operational issues

Source: Roland Berger/Lazard
Global light vehicle production is expected to continue its growth over the next two years – But at a much slower pace than before

Light vehicles production volume by region, 2011-2016 [m units]

<table>
<thead>
<tr>
<th>Region</th>
<th>2011</th>
<th>2014e</th>
<th>2016e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>76.9</td>
<td>88.0</td>
<td>94.3</td>
</tr>
<tr>
<td>NAFTA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Annual growth by region [CAGR, %]

- **Europe**: <0 to 0 to +2
- **NAFTA**: +9 to +2
- **Japan**: +6 to -7 to -8
- **China**: +10 to +6 to +8
- **Brazil**: -2\(^1\) to <0 to 0 to +7
- **India**: 0 to +4 to >10
- **Russia**: -2\(^1\) to 0 to 0 to +2\(^2\)

Note: Total bar size reflecting IHS volume forecast
1) Conservative estimate assumes lower actual level in 2014 compared to IHS forecast 2014 (but still assuming stable macroeconomic environment)
2) Assuming a still stable political environment

Source: IHS, Roland Berger/Lazard
Import embargos would negatively impact all sides – Introduction currently not likely but still possible

Russia crisis: Summary of impacts and conclusions of potential sanctions

<table>
<thead>
<tr>
<th>Scenario 1: Increase of import duties</th>
<th>Scenario 2: Embargo on CBU imports (&lt; EUR 30 k)</th>
<th>Scenario 3: Embargo on all CBU imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget impact for Russia</td>
<td>Profit loss for EU/US OEMs</td>
<td></td>
</tr>
<tr>
<td>EUR +55 m</td>
<td>EUR -100 m</td>
<td>EUR -1,420 m</td>
</tr>
<tr>
<td>EUR -465 m</td>
<td>EUR -175 m</td>
<td>EUR -550 m</td>
</tr>
</tbody>
</table>

Conclusions:

- **Limited impact** of an increase in duties for EU/US OEMs only – most likely **not worth the effort**
- Greater short-term and **long-term self-damage** to Russia through import embargos:
  - Short-term: budget revenue shortages higher than "punishment" effect
  - Long-term: strengthening of Chinese/Asian brands as direct competitors to Russian brands

Source: Roland Berger Study: Russian automotive market update: what would be the real cost of sanctions? (Sept. 2014)
OEMs are facing higher margin pressure – Impact of pricing and warranty cost increasing

Key drivers of increasing OEM margin pressure

> Growing difficulties to maintain end customer price levels – especially in Europe and China

> Increasing cost of product proliferation and shortening replacement cycles

> Rising warranty cost driven by a growing number of high-volume recalls

> Increasing complexity and variety of new automotive technologies

"The automotive industry faces fierce competition and high pressure on earnings!"
Martin Winterkorn, Volkswagen Group, October 2

"Germany is probably one of the toughest markets currently." Overall, the European market "is not really encouraging at the moment."
Dieter Zetsche, Daimler, October 2

Price levels in Europe are "still not where BMW expected them to be". "This is really tough competition with the corresponding consequences for prices."
Norbert Reithofer, BMW, October 2

"The discount battle remains tough."
Karl Schlicht, Toyota Europe, October 2

Source: Press; Roland Berger/Lazard
Over recent years, actual retail prices have been continuously deteriorating in many major markets – Even in China

Snapshot of regional price discount patterns [% of retail price]

<table>
<thead>
<tr>
<th>Discount top 30 models</th>
<th>Monthly incentives</th>
<th>New car discounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.1</td>
<td>18.9</td>
<td>19.4</td>
</tr>
</tbody>
</table>

1) Top 30 vehicle models with highest registration numbers  
2) Total manufacturer, dealer and auto financing incentives to new car buyers across all main OEMs in the US

Source: CAR Institute; iFind; CNW Marketing Research; Roland Berger/Lazard
Particularly European OEMs have kicked off additional cost reduction efforts, creating friction in their supplier relations

Recent OEM cost reduction efforts and impact on supplier relations

**Recent OEM cost reduction efforts**

<table>
<thead>
<tr>
<th>OEM</th>
<th>Scope and impact</th>
</tr>
</thead>
</table>
| VW          | Reduce cost by ~EUR 7 bn, of which 5 bn in Volkswagen brand until 2018  
1/3 by fixed cost reduction, 1/4 by sales and ~1/4 by R&D, and others  
Fewer models and additional product offers                                                                                                                                                                                                                       |
| BMW         | Reduce costs by several hundred million euros annually until 2020  
Reduce R&D budgets, flexibilize production  
Particular focus on Mini and 1 series                                                                                                                                                                                                                         |
| Daimler     | Realign global production to reduce operating costs by 5-6% annually (in addition to already existing cost saving programs)  
Increased standardization, job shifts, reduced vertical integration and investment                                                                                                                                                                                   |
| PSA         | "Back in the race" turnaround plan, targeting lower production cost by EUR 1,100 per vehicle by 2018 – additional measures already announced  
Comprehensive set of measures, including reduced number of models, upgraded auto plants, boosted market share in growing markets, reduced jobs and lowered labor costs                                                                                             |
| Renault-Nissan | Raised the goal for combined alliance savings by 7.5 percent, accelerating cooperation efforts (save "at least" USD 5.8 bn by 2016)  
Stepped up joint projects in development, manufacturing, purchasing and human resources                                                                                                               |

Source: Company information; press; IHS Global Study on OEM-Supplier relations October 2014; Roland Berger/Lazard
C. The long-term challenge – An industry structure fundamentally changing
Automotive suppliers need to manage a broad variety of long-term challenges

Supplier CEO radar screen for 2015 and beyond

Note: Excluding product segment specific technology and operational issues

Source: Roland Berger/Lazard
RoW markets do not have the momentum of BRIC, but growth is stable and selected RoW markets outperform in a global context.

Light vehicle (LV) sales and production, 2002-2020 [m units, %]

### Sales

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2013</th>
<th>2020e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Next gen. growth markets</td>
<td>56.6</td>
<td>83.3</td>
<td>102.8</td>
</tr>
<tr>
<td>RoW</td>
<td>14%</td>
<td>13%</td>
<td>13%</td>
</tr>
<tr>
<td>BRIC</td>
<td>11%</td>
<td>37%</td>
<td>42%</td>
</tr>
<tr>
<td>Japan</td>
<td>10%</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>USA</td>
<td>30%</td>
<td>19%</td>
<td>16%</td>
</tr>
<tr>
<td>W.Europe</td>
<td>29%</td>
<td>16%</td>
<td>15%</td>
</tr>
</tbody>
</table>

### Production

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2013</th>
<th>2020e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Next gen. growth markets</td>
<td>57.1</td>
<td>84.7</td>
<td>105.0</td>
</tr>
<tr>
<td>RoW</td>
<td>13%</td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>BRIC</td>
<td>11%</td>
<td>17%</td>
<td>36%</td>
</tr>
<tr>
<td>Japan</td>
<td>10%</td>
<td>11%</td>
<td>41%</td>
</tr>
<tr>
<td>USA</td>
<td>21%</td>
<td>11%</td>
<td>7%</td>
</tr>
<tr>
<td>W.Europe</td>
<td>29%</td>
<td>13%</td>
<td>12%</td>
</tr>
</tbody>
</table>

1) Argentina, Indonesia, Iran, Malaysia, Mexico, Poland, Slovakia, South Africa, Thailand, Turkey

Source: IHS; Roland Berger/Lazard
Of all markets beyond Triad/BRIC, Mexico, Indonesia, Thailand, Iran and Poland make up ~85% of incremental volume.

Top 10 LV production markets beyond Triad/BRIC by incremental volume [m units]

<table>
<thead>
<tr>
<th>Country</th>
<th>Incremental Volume [m units]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>2.0</td>
</tr>
<tr>
<td>Thailand</td>
<td>22.0</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.7</td>
</tr>
<tr>
<td>Iran</td>
<td>0.6</td>
</tr>
<tr>
<td>Turkey</td>
<td>0.3</td>
</tr>
<tr>
<td>Argentina</td>
<td>0.7</td>
</tr>
<tr>
<td>Slovakia</td>
<td>0.0</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.3</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.2</td>
</tr>
<tr>
<td>Rest positive</td>
<td>1.2</td>
</tr>
<tr>
<td>Rest negative</td>
<td>27.1</td>
</tr>
<tr>
<td>2020e</td>
<td>7.7%</td>
</tr>
<tr>
<td>2013</td>
<td>6.9%</td>
</tr>
<tr>
<td>~85%</td>
<td>~45%</td>
</tr>
<tr>
<td>~40%</td>
<td>~45%</td>
</tr>
<tr>
<td>~35%</td>
<td>~40%</td>
</tr>
</tbody>
</table>

CAGR 2013-2020: 7.7%, 6.9%, 7.5%, 3.9%, 9.2%, 3.8%, 0.4%, 4.0%, 3.8%, 4.1%

Source: IHS, Roland Berger/Lazard
Most recent M&A deals were driven by technology and customer/market access – Economics-driven consolidation still not picking up

Major types of M&A motivation

<table>
<thead>
<tr>
<th>Technology access</th>
<th>Market/customer access</th>
<th>Economics-driven consolidation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; Achieving access to new or strengthening already existing technology/material or process capabilities to secure/establish USP</td>
<td>&gt; Achieving access to regions or customers not served to date – via existing business or asset deals (e.g. capacity of production locations)</td>
<td>&gt; Optimization of highly fragmented and inefficient market structures, featuring a large set of market participants, of which many are rather struggling to survive based on achievable revenues, capacity utilization and margins</td>
</tr>
<tr>
<td>&gt; Completion of existing portfolio to offer &quot;one-stop shopping&quot; from a – horizontal (e.g. steel or aluminum and related process competencies) or – vertical perspective (e.g. increased value add)</td>
<td>&gt; In the past, typically driven by established market players, today, primarily led by emerging market players</td>
<td>&gt; Typically occurring in process-focused segments</td>
</tr>
<tr>
<td>&gt; Rationale of many of the recent deals – easiest to communicate sustainable &quot;value add&quot; to investors</td>
<td>&gt; Pure &quot;expansion&quot; deals without technology focus rather rare</td>
<td>&gt; Relatively low share of transactions</td>
</tr>
<tr>
<td>&gt; Driver of many Chinese transactions</td>
<td>&gt; Driver of many cross-border transactions, e.g. from Japan</td>
<td>&gt; Not favored by the OEMs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; Buyers often cautious about restructuring activities required</td>
</tr>
</tbody>
</table>

Empirical evidence in recent deals

Typically go hand in hand
Emerging market investors play a major role in supplier M&A nowadays – Most of the recent transactions technology driven

Overview of main acquisitions, 2011-2014

<table>
<thead>
<tr>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayraktarlar / Odelo</td>
<td>Bohong / Wescast Industries</td>
<td>Amtek / Neumayer Tekfor</td>
<td>Amtek / Kaiser</td>
</tr>
<tr>
<td>BHAP/ Inalfa</td>
<td>Bosch / SPX</td>
<td>BorgWarner / Wahler</td>
<td>Amtek / Kuepper Group</td>
</tr>
<tr>
<td>Citic / KSM Castings</td>
<td>Continental / Freudenberg molded brake parts</td>
<td>Gentex / JCI HomeLink</td>
<td>AVIC / Fehringer</td>
</tr>
<tr>
<td>CQLT / Saargummi</td>
<td>Continental / Parker Hannifin MCS</td>
<td>Gentherm / W.E.T. Automotive</td>
<td>AVIC / AVIC</td>
</tr>
<tr>
<td>Gestamp / ThysenKrupp Metal Forming</td>
<td>Delphi / FCI MVL</td>
<td>Grammer / Nectec</td>
<td>Bosch / ZF Lenksysteme</td>
</tr>
<tr>
<td>GKN / Getrag driveline business</td>
<td>Faurecia / ACH Interiors</td>
<td>Halla / Visteon Climate business</td>
<td>Delphi / Unwired Technology</td>
</tr>
<tr>
<td>Inteva / Arvin Meritor Body System bus</td>
<td>Grupo Antolin / CML</td>
<td>Huayu Automotive Systems / Yanfeng Visteon JV</td>
<td>ElringKlinger / Polytetra</td>
</tr>
<tr>
<td>Iochpe-Maxon / Hayes Lemmerz</td>
<td>Hebei Lingyun Industrial / Kiekert</td>
<td>Mahle / Behr</td>
<td>Federal-Mogul / TRW valves business</td>
</tr>
<tr>
<td>Martinrea / Honsel</td>
<td>Lear / Guilford Mills</td>
<td>Nidec / Honda Elesys</td>
<td>Lear / Eagle Ottawa</td>
</tr>
<tr>
<td>Ningbo Huaxiang / Selliger</td>
<td>Magna / Ixetic</td>
<td>Ningbo Huaxiang / HIB Trim Parts</td>
<td>MAHLE / Letrika</td>
</tr>
<tr>
<td>Ningbo Joyson Electronic / Preh</td>
<td>Metalsa / ISE Automotive</td>
<td>TMT / ZF Boge</td>
<td>Sensata / Schrader</td>
</tr>
<tr>
<td>Nisshinbo / TMD Friction</td>
<td>Nemak / JL French Automotive</td>
<td>Tokai Rubber / Anvis</td>
<td>Shanghai Prime Machinery / Nedshroef</td>
</tr>
<tr>
<td>Samvardhana Motherson Group / Peguform</td>
<td>Tupy / Cifunsan</td>
<td>Wangfeng / Meridian Lightweight</td>
<td>Visteon / JCI Automotive Electronics bus.</td>
</tr>
<tr>
<td>Toyota Boshoku / Polytec Automotive Interior bus.</td>
<td>Wuhan Iron &amp; Steel Group / ThysenKrupp Tailored Blanks</td>
<td>Wanxiang Group / A123</td>
<td>ZF / TRW</td>
</tr>
<tr>
<td>Valeo / Niles</td>
<td></td>
<td>Group of Chinese investors / iee</td>
<td></td>
</tr>
</tbody>
</table>

Key: Acquiror / Target

Source: Thomson; Merger Market; press research; Roland Berger/Lazard
In selected areas, traditional suppliers will face new competition

Overview of new entrants into the automotive industry – Connectivity example

- Answer client demand for services/connectivity, optimize vehicle design and usage, new revenues, …
- Reach new customers and test models (PAYG, PHYD, peer-to-peer, anticipation, …)
- Consolidate position on intelligence systems, data analytics, avoid new entries, …
- Extend the user intimacy universe, data collection and monetization opportunities, …
- Capture connectivity and usage, extend business to security, etc. …

Source: Roland Berger/Lazard
The ongoing technology shift is expected to generate new revenue and profit opportunities – But requires heavy upfront investments

Technology/legislation – Future developments

> **Full-scale vehicle connectivity** with consumer devices emerging as a **must-have feature** in the near future – Innovation potential for the human machine interface, but also risk for established automotive suppliers to lose revenue and margin potential to non-automotive competitors

> **Advanced driver assistance systems** further grows in importance as **main innovation area** in the vehicle (alongside powertrain electrification and lightweight construction) – New (software) applications/solutions largely based on existing hardware

> In the long term, **fully autonomous driving capability** emerges on the horizon – Still various technological and legal **obstacles to overcome**

> **Ongoing electrification of the powertrain** – Focus on combustion engine optimization (in conjunction with further hybridization) through 2020, breakthrough of **fully electric vehicles thereafter** (driven by even tighter CO₂ emissions regulations)

> **Rising cost pressure on less-innovative** (process-driven) **segments** – Resources to be freed up to fund innovations

1) Harvey ball indicating "confidence level" on the hypotheses; empty = low, full = high

Source: Roland Berger/Lazard
To support the reduction of road fatalities, the regulatory framework related to safety applications will become even stricter.

Increasing safety regulations in Europe – Selected examples

- Within the last decade, the focus of regulations has shifted toward pedestrian protection – introduction within two phases:
  - Phase 1 contains impact on adult head and lower leg form
  - Phase 2 adds impact on child head and hips
- Shift toward active safety systems
- Further mandatory implementation of driver assistance systems currently under discussion

Source: EC; ETSC; Roland Berger/Lazard

1) November 2012 for new models; January 2014 for all new vehicles  
2) November 2013 for commercial vehicles with >3.5t GMV; November 2015 for all newly registered vehicles
The evolution of ADAS systems will ultimately result in the introduction of full autonomous driving functionality.

**ADAS – Innovation roadmap**

- ~2013: Lane change assist, Lane keep assist, Parking assist steering only
- ~2014: "Parking with App"
- ~2015: Construction zone assist
- ~2016: Emergency steering assist, Multiple lane assist
- ~2017: Emergency steer assist, Intersection assist
- ~2018: Valet park assist
- ~2019: Highway pilot
- ~2020: High way chauffeur
- ~2025: Fully autonomous system (door2door)
- >> 2025: Urban automated driving, Fully auto valet parking (V2I)

1) Highway pilot = Highway chauffeur + higher degree of automation  
2) Tested – date of series production not available

Source: Press research, conference proceedings, Roland Berger/Lazard
Autonomous cars will become reality in the next 10 years – All major OEMs have launched their own initiatives

Autonomous driving – Development and outlook

1994: EUREKA 1) field testing
2013: Mercedes-Benz: "Bertha" 2) test drive in 100km of dense traffic
2020: Introduction of the first self-driving car 3)
2035: Large proportion of cars autonomous 4) All cars autonomous 5)
2050: All cars autonomous 5)

Current players & highlights

BMW  Audi  Toyota  Volvo
Nissan  Daimler  Google
Autoliv  Bosch  Delphi
Continental  Denso  TRW

A Mercedes S500 "Intelligent Drive"
> Concept car
> Autonomous journey made from Mannheim to Pforzheim

B Toyota Lexus LS
> Start of production in late 2017
> Tests in Michigan and Tokyo already executed

Implications for the car insurance business model

> Significant lowering of the incidence of car accidents through autonomous cars
  – Thus lower insurance premiums

> Claims increasingly less prevalent but more expensive in the future
  (as with real estate insurance)

> Predictive models for drivers becoming less significant
  – Customer loyalty/retention, damage processing, etc. more important

> New competition (e.g. from OEMs/Google offering autonomous vehicles combined with warranty and insurance)

2035: Autonomous cars completely transformed traditional car value chains – However, legal issues still not resolved at this time

1) Project to investigate autonomous cars, cars drove 1,000 km autonomously in Paris
2) Mercedes test vehicle autonomously covered the approximately 100-kilometer stretch between Mannheim and Pforzheim, while negotiating dense traffic and complex traffic situations
3) According to Google’s self-driving car project director, Chris Urmson
4) Study: "Autonomous Vehicles" (Q3 2013) by Navigant Research (global research institute)
5) Study: "Emerging Technologies: Autonomous Cars – Not If, But When" (2014) by IHS Automotive

Source: Navigant Research; IHS Automotive; Volvo; Roland Berger/Lazard
Connected vehicles business models are based on vehicle and journey data – Market players already positioning themselves

Connected vehicles – Development and outlook

Mid 1990s:
M2M communication

2011:
Internet-based infotainment

2015:
Introduction of eCell

2020:
Complete vehicle interconnectedness

Key players (extract)

OEM:
- BMW
- Daimler
- Audi

Supplier:
- Bosch
- Continental
- TRW

IT/Telco:
- Google
- Apple
- Telefonica

Technology service providers:
- OCTO
- Airbiquity

Highlights

A  BMW Connected Drive
  > In-car information and entertainment services and apps, e.g.:
    - E-mail, organizer and calendar functions
    - Different entertainment apps
    - Access to social media

B  Hyundai Blue Link
  > Integrated in-car solution; Bluetooth connection to smartphone content:
    - Automated SOS calls in emergencies
    - Roadside assistance
    - Vehicle location in the event of theft

Need for interconnecting living environments – OEMs offering ever-increasing innovative "connected vehicle" solutions

1) Introduction of "M1" by Siemens makes wireless machine-to-machine communication possible

Source: Roland Berger/Lazard
Regulatory requirements push improvements in most regions –
In Europe, the US and Japan, there is also a strong customer pull

Assessment CO₂ emission/fuel consumption regulation and customer pull

> Corporate CO₂ emissions target [g/km]
> CAFE[^3] [g/mi]
> Additional ZEV regulation CARB
> Fuel efficiency targets [km/l]
> Potential[^4] corporate CO₂ emissions targets [g/km]²
> Additional potential fleet xEV target share
> Inovar – Auto energy efficiency increases [MJ/km]

Customer pull[^3]

- Customer will only buy cars with most efficient/lowest CO₂ emissions technology (medium term)
- Customers do not consider CO₂ emissions/consumption in purchase decision (medium term)

1) Average weight-dependent CO₂ emissions target  
2) Example for passenger car  
3) End customer pull for low CO₂ emission/low fuel consumption powertrain and/or alternative powertrains  
4) No decision made yet

Source: FAW; EPA, EU; Inovar; Roland Berger/Lazard
In Europe, all OEMs focus on ICE optimization and road load reduction to comply with 95 g target – Minor xEV also required

CO₂ emissions reduction [g/km] – European example

> Assessment is based on potential CO₂ emissions reduction in each car model of an OEM
> ICE optimization is the most cost-efficient lever for CO₂ emissions reduction, followed by road load reduction, xEV least efficient cost/benefit ratio
> Assumed changes in fleet structure
  - Limited shift toward smaller vehicle segments
  - No change in average vehicle power
  - No active shift in fuel shares in a model line
> Credits for low CO₂ emitting vehicle are not considered
> Potential of ICE almost 100% leveraged – Further reductions need to come from xEVs

Source: Roland Berger simulation
To meet long-term regulation and customer pull, "new powertrain solutions" will be required – Electrification will likely be a main lever

Propulsion share 2020 and 2025\(^1\) [% of sales]

1) Optimistic scenario: globally strict CO\(_2\) emissions/fuel consumption regulation; high energy cost; high cost reduction HV batteries; high investments in recharging infrastructure

Source: Roland Berger simulation
D. The conclusion – Key actions for automotive suppliers
Suppliers need to ride the next wave of efficiency gains, while getting prepared to benefit from the industry shift

Key actions for automotive suppliers

<table>
<thead>
<tr>
<th>Short term</th>
<th>Long term</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> Drive smart <strong>efficiency improvements</strong> (indirect production, overheads,...)</td>
<td><strong>1.</strong> Maintain/sharpen unique selling proposition with clear <strong>technological</strong> or <strong>process differentiation</strong></td>
</tr>
<tr>
<td><strong>2.</strong> Increase/maintain <strong>flexibility</strong> across the entire value chain (production, R&amp;D, purchasing,...)</td>
<td><strong>2.</strong> Focus on product segments with <strong>above-average growth rates</strong> and <strong>margin potential</strong> – actively leverage <strong>M&amp;A opportunities</strong></td>
</tr>
<tr>
<td><strong>3.</strong> Keep <strong>key resources</strong> motivated and &quot;available&quot; for potential task forces</td>
<td><strong>3.</strong> Balance <strong>regional</strong> and <strong>customer share</strong> – from a revenue but also value creation perspective (production, R&amp;D, sourcing,...)</td>
</tr>
<tr>
<td><strong>4.</strong> Closely manage <strong>investment decisions</strong> and <strong>one-time costs</strong></td>
<td><strong>4.</strong> Establish <strong>best-in-class processes and structures</strong> to remain efficient and flexible in more complex globalized setups</td>
</tr>
<tr>
<td><strong>5.</strong> Cautiously <strong>monitor market</strong> developments and <strong>signals</strong> for a possible <strong>downturn</strong></td>
<td><strong>5.</strong> Apply scenario techniques and <strong>regularly review/adapt defined strategy</strong></td>
</tr>
</tbody>
</table>

Source: Roland Berger/Lazard
E. Contacts
Roland Berger Automotive: A strong global team with more than 300 consultants dedicated to clients in the automotive industry

Roland Berger Automotive: More than 300 dedicated consultants globally

**Key facts**

- Global team of **more than 300 dedicated automotive consultants**
- Over **400 clients** in the automotive industry
- More than **1,500 successful projects** since 2000
- Proven **leading-edge tools** and methodologies
- Thought leadership in the worldwide automotive community, producing highly regarded studies and top quality research

**Source:** Roland Berger
Lazard Automotive Practice: Unparalleled coverage of the global automotive sector

Lazard Automotive: ~70 bankers with strong senior expertise in the automotive sector

Selected Lazard transactions

- ZF Friedrichshafen: Acquisition of TRW Automotive
- Wahler: Sale to BorgWarner
- Fiat: Acquisition of remaining equity in Chrysler
- Dongfeng: Acquisition of a minority stake in PSA
- Anvis: Sale to Tokai Rubber Industries
- A123: Sale to Wanxiang (out of Ch. 11)
- KPS Capital: Acquisition of Bosch’s foundation brakes business
- Delphi: IPO of the company
- Honsel: Sale to Martinrea / Anchorage
- Hilite: Sale to 3i
- US Treasury: Sale of Chrysler stake to Fiat
- US Treasury: IPO of GM
- Cooper Standard: Restructuring
- Continental: EUR 1.1 bn capital increase
- UAW: Restructuring of OPEB liabilities of GM, Ford and Chrysler
- Volkswagen: Acquisition of a 49.9% stake in Porsche
- Opel: Advising the German Ministry of Economics on the Opel situation
- Metaldyne: Merger with AsahiTec

Source: Lazard

1) In Latin America, JV MBA Lazard
Note: Strategic alliances for Central/Eastern Europe, Russia, Mexico and Korea