AUTOMOTIVE GVC ANALYSIS
INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
READER PLEASE NOTE:

As the scope of the activity is purely to test the methodology for its relevance and applicability, rather than to inform ongoing operations or project design, breadth of study is prioritized over rigor and empirical evidence. Information relies on market intelligence, no firm conclusions are drawn and recommendations are indicative only; illustrating the type of insight that could be derived using the approach given appropriate time and resource.
CONTENTS

1. Strategic Segmentation
   Slide 3

2. Determining the Value Chain for Each Segment
   Slide 24

3. Applying the Approach in Colombia
   Slide 33

4. Applying the Approach in Macedonia
   Slide 57

5. Applying the Approach in Mexico
   Slide 83

6. Applying the Approach in Vietnam
   Slide 98
1. STRATEGIC SEGMENTATION
INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
1. What does the automotive industry consist of?
   What are the different “businesses” that exist? Is it really as simple as 2-wheels, 4-wheels, trucks and autoparts?

2. What will the automotive industry consist of “tomorrow”?
   What trends are we seeing, in which direction is the industry heading?

3. What would it take to participate? To compete?
   What would it take for any country / region to compete in any one of the business segments that we have identified?

4. What would it take for COUNTRY X to participate?
   What do I have? What don’t I have? What policy needs to change? What investments need to be made?
Through “Strategic Segmentation”, we have tried to answer questions (1) and (2):

1. **What does the automotive industry consist of?**
   What are the different “businesses” that exist? Is it really as simple as 2-wheels, 4-wheels, trucks and autoparts?

2. **What will the automotive industry consist of “tomorrow”?**
   What trends are we seeing, in which direction is the industry heading?

3. **What would it take to participate? To compete?**
   What would it take for any country / region to compete in any one of the business segments that we have identified?

4. **What would it take for COUNTRY X to participate?**
   What do I have? What don’t I have? What policy needs to change? What investments need to be made?
What are the emerging Strategic Segments within the automotive industry?

**INTUITIVE / KNEE JERK SEGMENTATION:**

By no of wheels.....

By type of supplier.....
What are the emerging Strategic Segments within the automotive industry? (cont...)

### INTUITIVE / KNEE JERK SEGMENTATION:

<table>
<thead>
<tr>
<th>By no of wheels...</th>
<th>THESE ARE FINISHED PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>By type of supplier...</td>
<td>NOT BUSINESS SEGMENTS</td>
</tr>
</tbody>
</table>

By no of wheels....

By type of supplier....
Global industry trends and constraints…

Rates of urbanisation and congestion

Awareness of atmospheric pollution and increase in emissions controls

Ever more stringent crashworthiness and safety requirements

Emphasis has shifted to information technology

Product lifecycle is evolving
Increasing rates of urbanisation and congestion

- In 1800, 2% of the world’s population lived in cities. Now it’s 50%.
- Cities generate a disproportionate share of new private sector jobs.
- Cities cover only a fraction of the world's land mass but concentrate 80 percent of global GDP.
- Car usage is increasing year on year even in high-income economies.
Increasing rates of urbanisation and congestion - *Implications*

- Cities are becoming more crowded and road space more scarce. However as urbanisation is good for the economy, it is supported.
- Onus is on cities and local governments to find to reduce the demand for road space

- Public transport is may be seen as an inferior good; and as incomes rise, people switch away from inferior goods. This could be compounded in emerging economies with a growing middle class who may wish to replace bicycle/motorcycles with cars (as symbol of improved social class).
- High density conurbations tend towards integrated mass transport solutions. (It is cheaper and more efficient to take more people shorter distances). Systems are less successful in sprawling cities like Johannesburg
Pollution awareness and increase in emissions controls

In 2013, TRANSPORTATION contributed MORE THAN HALF OF CO2 and nitrogen oxides, and almost ¼ OF THE HYDROCARBONS emitted into the atmosphere¹

CO2 REGULATION is likely to TIGHTEN and not just in EUROPE. CHINA, the US and JAPAN have also enacted laws to REDUCE EMISSIONS

Carbon emissions from road transport

Key
Road CO₂ per km
Road CO₂ per person, tonnes
Cars per 1000 people

Canada 123.42
3.82
562

US 1,530.3
5.16
777

International Transport Forum²
Pollution awareness and increase in emissions controls

- Implications for automotive…

In 2013, TRANSPORTATION contributed MORE THAN HALF OF CO2 and nitrogen oxides, and almost ¼ OF THE HYDROCARBONS emitted into the atmosphere¹

CO2 REGULATION is likely to TIGHTEN and not just in EUROPE. CHINA, the US and JAPAN have also enacted laws to REDUCE EMISSIONS

OEMs will invest more in²
- e-Mobility (electrical/hybrid powertrains, batteries)
- lightweight and aerodynamic drag-reducing technologies

Opportunity for specialist suppliers to recapture power / value / margin
Ever more stringent crashworthiness and safety requirements

<table>
<thead>
<tr>
<th>CRASHWORTHINESS REQUIREMENTS</th>
<th>MANY PASSENGER VEHICLES now include (often as a differentiator) ADVANCED DRIVER ASSISTANCE features (e.g. infrared night vision, tire pressure monitoring systems, emergency brake assist, and electronic stability controls)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(e.g. seatbelts, airbags and crumple zones) are EVER MORE STRINGENT often requiring anthropomorphic crash test dummies and ADVANCED TESTING FACILITIES</td>
<td></td>
</tr>
</tbody>
</table>
Ever more stringent crashworthiness and safety requirements

- Implications for automotive...

**CRASHWORTHINESS REQUIREMENTS**
(e.g. seatbelts, airbags and crumple zones)
are **EVER MORE STRINGENT**
often requiring anthropomorphic crash test dummies and
**ADVANCED TESTING FACILITIES**

**MANY PASSENGER VEHICLES**
now include (often as a differentiator)
**ADVANCED DRIVER ASSISTANCE**
features (e.g. infrared night vision, tire pressure monitoring systems, emergency brake assist, and electronic stability controls)

Cost of testing continuously increasing

Safety requirements may vary from region to region

‘State-of-the-art’, accredited, well managed testing facilities are necessary to compete

Supply of subsystems may require advance Research and Development capacity
Emphasis has shifted to information technology

**THAT WHICH MADE “A CAR, A CAR”**
(e.g. speed, acceleration, torque, engine size, number of cylinders)
LESS IMPORTANT

Consumers want
**TRAFFIC INFORMATION services,**
and a host of
**INFOTAINMENT FEATURES,**
including internet radio and smartphone compatibility

Number of
**NETWORKED CARS**
will rise 30% year on year;
by 2020
**1 IN 5 CARS**
will be CONNECTED TO THE INTERNET

**Consumers want**
**TRAFFIC INFORMATION services,**
and a host of **INFOTAINMENT FEATURES,**
including internet radio and smartphone compatibility

Number of
**NETWORKED CARS**
will rise 30% year on year;
by 2020
**1 IN 5 CARS**
will be CONNECTED TO THE INTERNET
Emphasis has shifted to information technology

THAT WHICH MADE “A CAR, A CAR” (e.g. speed, acceleration, torque, engine size, number of cylinders) LESS IMPORTANT

Consumers want TRAFFIC INFORMATION services, and a host of INFOTAINMENT FEATURES, including internet radio and smartphone compatibility

Number of NETWORKED CARS will rise 30% year on year; by 2020 1 IN 5 CARS will be CONNECTED TO THE INTERNET

need to constantly identify differentiating features and services

Location is key. Remote Swedish cities (e.g.) may require total on-board solutions, whilst in busy Italian cities (e.g.) collaboration between road / car / data providers may be more feasible
Product lifecycle is evolving

Trend has moved from buying vehicles to leasing vehicles to **RENTING VEHICLES** (maintenance included)

Aftersales market is growing. **CHINA AFTERSALES** market is estimated to grow 20% a year¹

Specific requirements and preferences of the markets require a **LOCALISATION OF THE AFTERMARKET**
Product lifecycle is evolving

- Implications for automotive...

Trend has moved from buying vehicles to leasing vehicles to RENTING VEHICLES (maintenance included)

Aftersales market is growing. CHINA AFTERSALES market is estimated to grow 20% a year¹

Specific requirements and preferences of the markets require a LOCALISATION OF THE AFTERMARKET

Maintenance, durability and recycling much more important

Parts either need to be available JIT in consumer country or held as stock

In manufacturer / maintainer’s interest to monitor vehicles in realtime

Scania is already “directing” truck drivers to nearest garages and pre-booking hotel rooms!

Companies trying to exploit the aftermarket with a standardized global approach will most likely fail. Finding an individual approach is essential.
So the Automotive Industry *(both current and future)* is not segmented by engine size / wheel base / complexity but instead is a function of the density of the environment and the type of cargo…

<table>
<thead>
<tr>
<th>DENSE / URBAN / CITY ENVIRONMENT (OF THE NEAR FUTURE)</th>
<th>SPRAWLING / RURAL / SPARSELY POPULATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement of People</td>
<td></td>
</tr>
<tr>
<td>Individual</td>
<td>Strategic Segment 1</td>
</tr>
<tr>
<td>Groups</td>
<td>Strategic Segment 2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Movement of Merchandise</td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>Strategic Segment 5</td>
</tr>
<tr>
<td>Heavy</td>
<td>Strategic Segment 8</td>
</tr>
</tbody>
</table>

*World Bank Group Trade & Competitiveness*
So the Automotive Industry *(both current and future)* is not segmented by engine size / wheel base / complexity but instead is a function of the density of the environment and the type of cargo (cont…)

<table>
<thead>
<tr>
<th>Movement of People</th>
<th>Strategic Segment 1</th>
<th>Strategic Segment 2</th>
<th>Strategic Segment 3</th>
<th>Strategic Segment 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Congestion common</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Parking limited</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Pollution a concern</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Road (expansion) is limited</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Movement of Merchandise</th>
<th>Strategic Segment 5</th>
<th>Strategic Segment 6</th>
<th>Strategic Segment 7</th>
<th>Strategic Segment 8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environment</th>
<th>Strategic Segment 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>DENSE / URBAN / CITY ENVIRONMENT (OF THE NEAR FUTURE)</td>
<td></td>
</tr>
<tr>
<td>SPRAWLING / RURAL / SPARSELY POPULATED</td>
<td></td>
</tr>
<tr>
<td>INTERCITY</td>
<td></td>
</tr>
</tbody>
</table>

**World Bank Group**

*Trade & Competitiveness*
So the Automotive Industry *(both current and future)* is not segmented by engine size / wheel base / complexity but instead is a function of the density of the environment and the type of cargo (cont…)

<table>
<thead>
<tr>
<th>Movement of People</th>
<th>DENSE / URBAN / CITY ENVIRONMENT (OF THE NEAR FUTURE)</th>
<th>SPRAWLING / RURAL / SPARSELY POPULATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Strategic Segment 1</td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>Strategic Segment 2</td>
<td></td>
</tr>
<tr>
<td>Movement of Merchandise</td>
<td>Light</td>
<td>Strategic Segment 4</td>
</tr>
<tr>
<td></td>
<td>Heavy</td>
<td>Strategic Segment 8</td>
</tr>
</tbody>
</table>

- Little / no congestion
- Parking no problem
- Pollution less acute
- Road expansion and availability not a problem
Critically, each segment has its own *distinct value chain*

<table>
<thead>
<tr>
<th>Movement of People</th>
<th>Dense / Urban / City Environment (of the near future)</th>
<th>Sprawling / Rural / Sparingly Populated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Strategic Segment 1</td>
<td>Strategic Segment 2</td>
</tr>
<tr>
<td>Groups</td>
<td>Strategic Segment 3</td>
<td>Strategic Segment 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Movement of Merchandise</th>
<th>Intracity</th>
<th>Intercity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>Strategic Segment 5</td>
<td>Strategic Segment 6</td>
</tr>
<tr>
<td>Heavy</td>
<td></td>
<td>Strategic Segment 8</td>
</tr>
</tbody>
</table>
Next steps (3) and (4)…

1. What does the automotive industry consist of?
   What are the different “businesses” that exist? Is it really as simple as 2-wheels, 4-wheels, trucks and autoparts?

2. What will the automotive industry consist of over the next 10yrs?
   What trends are we seeing, in which direction is the industry heading?

3. What would it take to participate? To compete in each segment?
   What would it take for any country / region to compete in any one of the business segments that we have identified?

4. What would it take FOR ME to participate?
   What do I have? What don’t I have? What policy needs to change? What investments need to be made?
2. DETERMINING THE IDEAL VALUE CHAIN FOR EACH SEGMENT

INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
Activities are ideally present in the value chain at ‘local’ and ‘regional’ levels for a country to be able to compete.

Activities outside the ‘local’, or ‘regional’ level are considered ‘global’. They may be accessible but there proximity / just-in-time delivery is not necessary.
US Annual Manufacturing Survey Data alongside other publicly available trade information was used to understand the intensity of Labor vs Capital vs Energy vs R&D for a number of automotive manufacturing tasks.

<table>
<thead>
<tr>
<th>2007 NAICS codes a Meaning of 2007 NAICS codes and NAICS-based rollup code</th>
<th>VALUE ADDED</th>
<th>Labor intensity (hours worked per $1,000 value added)</th>
<th>Capital intensity (gross surplus per $1,000 value added)</th>
<th>Energy intensity (fuel and electricity cost per $1,000 value added)</th>
<th>R&amp;D intensity (R&amp;D expenses per $1,000 value added)</th>
</tr>
</thead>
<tbody>
<tr>
<td>level</td>
<td>NAICS.id</td>
<td>NAICS.display-label</td>
<td>YEAR.id</td>
<td>Labor intensity</td>
<td>Capital intensity</td>
</tr>
<tr>
<td>4</td>
<td>3361</td>
<td>Motor vehicle manufacturing</td>
<td>2011</td>
<td>4.4</td>
<td>814.5</td>
</tr>
<tr>
<td>5</td>
<td>336111</td>
<td>Automobile and light duty motor vehicle manufacturing</td>
<td>2011</td>
<td>4.0</td>
<td>830.2</td>
</tr>
<tr>
<td>5</td>
<td>336111</td>
<td>Automobile manufacturing</td>
<td>2011</td>
<td>4.5</td>
<td>811.8</td>
</tr>
<tr>
<td>5</td>
<td>336112</td>
<td>Light truck and utility vehicle manufacturing</td>
<td>2011</td>
<td>3.7</td>
<td>844.2</td>
</tr>
<tr>
<td>5</td>
<td>336122</td>
<td>Heavy duty truck manufacturing</td>
<td>2011</td>
<td>9.0</td>
<td>636.1</td>
</tr>
<tr>
<td>6</td>
<td>336120</td>
<td>Heavy duty truck manufacturing</td>
<td>2011</td>
<td>9.0</td>
<td>550.1</td>
</tr>
<tr>
<td>4</td>
<td>3362</td>
<td>Motor vehicle body and trailer manufacturing</td>
<td>2011</td>
<td>16.7</td>
<td>516.9</td>
</tr>
<tr>
<td>5</td>
<td>336211</td>
<td>Motor vehicle body manufacturing</td>
<td>2011</td>
<td>16.7</td>
<td>516.9</td>
</tr>
<tr>
<td>5</td>
<td>336211</td>
<td>Motor vehicle body and trailer manufacturing</td>
<td>2011</td>
<td>15.3</td>
<td>511.5</td>
</tr>
<tr>
<td>5</td>
<td>336212</td>
<td>Truck trailer manufacturing</td>
<td>2011</td>
<td>14.9</td>
<td>615.0</td>
</tr>
<tr>
<td>6</td>
<td>336213</td>
<td>Motor home manufacturing</td>
<td>2011</td>
<td>12.2</td>
<td>539.9</td>
</tr>
<tr>
<td>6</td>
<td>336214</td>
<td>Travel trailer and camper manufacturing</td>
<td>2011</td>
<td>21.2</td>
<td>408.5</td>
</tr>
<tr>
<td>4</td>
<td>3363</td>
<td>Motor vehicle parts manufacturing</td>
<td>2011</td>
<td>10.6</td>
<td>603.5</td>
</tr>
<tr>
<td>5</td>
<td>336311</td>
<td>Motor vehicle gasoline engine and engine parts manufacturing</td>
<td>2011</td>
<td>10.6</td>
<td>603.5</td>
</tr>
<tr>
<td>5</td>
<td>336321</td>
<td>Motor vehicle electrical and electronic equipment manufacturing</td>
<td>2011</td>
<td>10.4</td>
<td>606.4</td>
</tr>
<tr>
<td>6</td>
<td>336321</td>
<td>Motor vehicle electrical and electronic equipment manufacturing</td>
<td>2011</td>
<td>10.4</td>
<td>606.4</td>
</tr>
<tr>
<td>5</td>
<td>336333</td>
<td>Motor vehicle steering and suspension component (except spring) manufacturing</td>
<td>2011</td>
<td>12.1</td>
<td>587.4</td>
</tr>
<tr>
<td>6</td>
<td>336330</td>
<td>Motor vehicle steering and suspension component (except spring) manufacturing</td>
<td>2011</td>
<td>12.1</td>
<td>587.4</td>
</tr>
<tr>
<td>5</td>
<td>336344</td>
<td>Motor vehicle brake component manufacturing</td>
<td>2011</td>
<td>7.8</td>
<td>750.2</td>
</tr>
<tr>
<td>5</td>
<td>336340</td>
<td>Motor vehicle brake component manufacturing</td>
<td>2011</td>
<td>7.8</td>
<td>750.2</td>
</tr>
</tbody>
</table>

**Labor intensity** (hours worked per $1,000 value added)

- 2011: 4.4
- 2011: 4.0
- 2011: 4.5
- 2011: 3.7
- 2011: 3.0

**Capital intensity** (gross surplus per $1,000 value added)

- 2011: 814.5
- 2011: 830.2
- 2011: 811.8
- 2011: 844.2
- 2011: 626.1

**Energy intensity** (fuel and electricity cost per $1,000 value added)

- 2011: 14.2
- 2011: 14.0
- 2011: 15.3
- 2011: 12.1
- 2011: 13.6

**R&D intensity** (R&D expenses per $1,000 value added)

- 2011: 101.8
Ideal Value Chain Structure – 1. Movement of Individuals in Dense, Urban Environments
Ideal Value Chain Structure – 2. Movement of Individuals in Rural Environments

Local/Cluster Value Chain

Regional Value Chain

Global Value Chain

Final assembly
Labor intensity: 4.5 (mean = 11)
Minimum scale: 100k units

Colour Code
Ideal Value Chain Structure – 3. Movement of People in Dense Environments
Ideal Value Chain Structure – 4. Movement of Groups in Rural Environments
Ideal Value Chain Structure – 5. Intracity movement of light merchandise
Ideal Value Chain Structure – 6. Inter-city movement of heavy merchandise
3. APPLYING THE APPROACH IN COLOMBIA
INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
1. **Background and Context**  
   Slide 35

2. **Strategic Options for Colombia’s Automotive Industry**  
   Slide 44
Background and Context
Colombia’s automotive sector is in crisis

- After 40 yrs, Colombia still has a strong automotive industry which is almost completely limited to vehicle assembly (as opposed to production) and autoparts manufacture.

- Having once played hosts to Volvo, Isuzu, Chevrolet, Ford, Toyota, Mitsubishi, Nissan, Daimler and Mazda - has experienced a steady exodus of vehicle manufacturers over the last few years with Mazda closing its doors most recently (April 2014) and switching to an import-only strategy.

- The Automotive Sector contributes 4% of the total industrial productive sector, of which 1.1% corresponds to the assembly of motorcycles.

- The majority of Colombia’s automotive production and assembly capacity is located in Bogotá and its surrounding metropolitan area. At 2,640m (8,660 ft) above sea level, plants are located in difficult to access terrain in a country whose shortcomings in inter-regional freight transport are well documented.
A small home market makes it difficult to exploit economies of scale…

- Colombia’s home market is limited. In 2013, Colombia’s car ownership was 84 vehicles per 1000 habitants. This compares to 249 per 1000 inhabitants in Brazil in 2011.

- Growth has been steady (between 1985 and 2012 vehicle sales have grown 322.5%) but as analysis by Fedesarrollo (2014) shows, the growth in the number of vehicles per person, it is possible that the growth of vehicle sales/ownership in Colombia is not keeping pace with the growth of the middle class.

- In 2013, 147217 automobiles were sold, 74745 utility vehicles, 20364 pick-ups, 18294 commercial cargo vehicles (trucks), 17325 taxis, 12192 vans and 3716 commercial passenger vehicles (buses).

### Motor vehicles (per 1,000 people in 2010)

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colombia</td>
<td>71</td>
</tr>
<tr>
<td>USA</td>
<td>803</td>
</tr>
<tr>
<td>Mexico</td>
<td>265</td>
</tr>
<tr>
<td>Brazil</td>
<td>249</td>
</tr>
<tr>
<td>Germany</td>
<td>564</td>
</tr>
</tbody>
</table>
Reduction of trade barriers came before auto industry was ready to compete…

- Colombia has traditionally had very stringent local content rules which have been in place for 20 yrs (Trade Agreements that demand a minimum regional content of 34.6% for light vehicles and 18% for vehicles over 16 passengers).

- However, following an FTA with Mexico signed a few years ago, Mexican exporters no longer pay any premium at all to export to Colombia.

- Similarly, Argentina and Brazil’s tariffs dropped to 15% recently and other FTAs with US, EU and Korea will mean that in 5 – 8 yrs all import tariffs will have disappeared (apart from Japan).

- At a time when the Colombian Peso is particularly strong, this open competition from neighbors and stronger international players makes it very difficult for Colombian companies (particularly smaller autoparts manufacturers) to compete.
Share of imported vehicles are increasing steadily

- After a much celebrated peak in the domestically produced cars sold in Colombia sales in 2011, sales immediately started to decline.

- Although the drop in sales is nothing compared to the industry crash that followed the 2008 global financial crisis (2009 figures were 57.2% of 2007 figures), the decline in sales since 2011 has sparked a great deal of pessimism in the country.

- Some have laid the blame squarely with Mexico, which has been able to sell to Colombia over the last few years without the 35% import tariff that other countries have historically had to pay.

- However, the total drop in sales of Colombian-made vehicles (148,655 – 133,584) of 15,000 is barely matched by the ‘increase’ in imports (166,991 – 166,451) of 400 vehicles.
Exports appear to be growing….

- Up until breakdown of diplomatic relations between Colombia and Venezuela in 2009, Colombia was exporting the great majority of its vehicles to Venezuela (83% in 2007).
- At this time, Colombia’s exports were already suffering following the global financial crisis. However, since this period, Colombia has shown very strong growth recovery.
- Indeed, from a purely statistical standpoint, Colombian exports in the automotive sector grew by 50% in 2013 (from USD$574m in 2012 to USD$857m in 2013).

Global Exports from the Automotive Sector

- TOTAL
- VENEZUELA
- ECUADOR
- MEXICO
- ARGENTINA
- PERU
- CARIBE Y CENTROAMÉRICA
- ESTADOS UNIDOS
- PANAMÁ
…but closer inspection reveals fragility…

- The high number of exports to Mexico, Argentina and Ecuador were dominated by the Renault Sofasa plant which exported 34,622 of Colombia’s 48,866 exported vehicles for 2013 (corresponding to 71% of exports). 43.4% of Renault’s exports went to Mexico, 32.8% to Argentina and 7.2% to Ecuador.

- This high production at the Renault plant was likely due to the fact that one of Renault’s Brazilian plants was undergoing refurbishment and was unable to serve the Argentinian market.

- Unfortunately, since the plant re-started production, exports to Argentina have plummeted 100% to almost negligible sales.

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SIGNIFICANT GROWTH</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uruguay</td>
<td>144,340</td>
<td>196,730</td>
<td>5,461</td>
<td>129,112</td>
</tr>
<tr>
<td>Bolivia</td>
<td>159,875</td>
<td>750,264</td>
<td>199,974</td>
<td>3,539,267</td>
</tr>
<tr>
<td>Oceania</td>
<td>12,847</td>
<td>7,980</td>
<td>34,488</td>
<td>3,478,040</td>
</tr>
<tr>
<td><strong>HIGHEST EXPORTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>1,279,928</td>
<td>2,210,109</td>
<td>165,049,041</td>
<td>255,265,591</td>
</tr>
<tr>
<td>Argentina</td>
<td>6,953</td>
<td>188,277</td>
<td>30,868,923</td>
<td>249,033,586</td>
</tr>
<tr>
<td>Ecuador</td>
<td>251,205,493</td>
<td>253,712,896</td>
<td>251,472,518</td>
<td>204,513,890</td>
</tr>
</tbody>
</table>
Colombia’s autoparts manufacturers have particularly struggled…

Colombia’s autoparts manufacturers currently supply local assembly plants with parts related to the motor train (clutch and engine components), the chassis (breaks, steering, suspension, exhaust, chassis), the exterior (such as body work and glass), interior (e.g. seats, seatbelt and interior panels) and electronics (batteries, lights, air-conditioning, cables and wiring).

Unfortunately, those parts that are provided, tend to be of a low level of technology and sophistication (e.g. breaks and tyres as opposed to assisted steering systems).

However greater local demand is needed for local autopartistas to invest in high-technology processes and products.
Motorcycle manufacture on the other hand is booming

- The ‘break-even’ point for motorcycles is likely to be a lot less than for passenger vehicles as reduced safety requirements mean less capital investment in research and development. Be that as it may, whilst Colombia only sells on average 300,000 cars per year, more than 600,000 motorcycles were registered in 2014.

- Crucially, 92.7% of these motorcycles were assembled locally in principal by Auteco (38.6%), Incolmotos (19.2%), Fanalca (16.5%), Corbeta (16.2%), Suzuki (9.5%). These trends may be a reflection of the fact that, the industry leaders (India, Japan and China) are not from the countries that Colombia has FTAs with. This means that Colombia’s market is a little more protected. Conversely, Colombia has FTAs with EU, USA, Canada, Mexico, Mercosur and soon, Korea; the companies in those countries are world leaders in passenger cars and have understandably flooded the market with their more competitive options.

- Perceived uncertainty in Argentina and Brazil’s protectionist tendencies also contribute to making Colombia an attractive option for motorcycle assembly.

- The implication is that Colombia may be able to continue to compete in motorcycles and perhaps even other ‘simpler’ vehicles with reduced research and development requirements (e.g. tractors).
Strategic Options for Colombia’s Automotive Industry
(indicative only*)
Colombia will struggle to compete in the traditional automotive sector without increasing its local market

The critical mass of annual car production in 2006 was around 500,000 units. This number is likely to have swelled significantly as the automotive industry has grown over the last 10yrs during which time we have seen countries like China emerge as market heavyweights.

Today, Colombia still registers only 300,000 new vehicles a year. This number being shared by three local vehicle assemblers (GM Colomotores, Renault Sofasa and Hino Motors) and the importers who currently import just under 60% of all vehicles sold (see Figure 2).

<table>
<thead>
<tr>
<th>Movement of People</th>
<th>DENSE / URBAN / CITY ENVIRONMENT (OF THE NEAR FUTURE)</th>
<th>SPRAWLING / RURAL / SPARSELY POPULATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Strategic Segment 1</td>
<td>Strategic Segment 2</td>
</tr>
<tr>
<td>Groups</td>
<td>Strategic Segment 3</td>
<td>Strategic Segment 4</td>
</tr>
<tr>
<td>Movement of Merchandise</td>
<td>Light</td>
<td>Strategic Segment 5</td>
</tr>
<tr>
<td></td>
<td>Heavy</td>
<td>Strategic Segment 8</td>
</tr>
</tbody>
</table>

World Bank Group
Trade & Competitiveness
Colombia is it participating (well) in very few of the value chain activities in this business segment…
Palliative Care: Increasing Local Demand

If Colombia was to pursue strategies that might artificially prolong the Colombian auto-industries participation in this business segment, there are a number of measures that policy makers might consider in order to increase local demand:

• Introduce financial support / incentives for end consumers (most of the drop in sales (about 50,000) of domestically produced vehicles arose from private vehicles)

• Introduce car scrappage programs. Car scrappage programs often create demand for new cars (to replace those scrapped) and in some cases (depending on the structure of such schemes) providing financial support to local automotive industries.

• Improve road Infrastructure. Colombia’s government could also consider improving Colombia’s inter-city transportation to reduce the cost and make that mode of transport more attractive (compared to flying – currently the difference in cost is often negligible).
However increasing local demand will undermine efforts to reduce traffic congestion.

- Bogotá’s bus rapid transport (BRT) system, Transmilenio, began operation in 2000. It is currently the world’s largest transportation system of its kind.

- The system was introduced in large part to address congestion in Bogotá.

- Whilst the program was initially successful, congestion has returned; at the average Bogota commuter spends in traffic every day went from 51 minutes in 2002 to 72 minutes in 2012. The onus is on authorities to reduce, not increase, the demand for road space.

- Additionally, the Colombian government has undertaken commitments to the international community to reduce GHG emissions through its adoption of the International Renewable Energy Agency (IRENA) statute.
Palliative Care: Colombia could explore an ‘expansion’ of its home market to include its neighbours

Ecuador is Colombia’s third largest export market, however Colombia is losing market share perhaps due to advancements in Ecuador’s own automotive industry.

Peru on the other hand imports 100% of its vehicles; moreover the import of used cars is prohibited. Growth has been strong and stead, something which Colombia would do well to Capitalise on.

Sales to Bolivia (also part of Communidad Andina) grew sharply in recent years (1669% from 2012 to 2013) but this still represents comparatively small penetration ($3.5m vehicles (exported to Bolivia versus $204m to Ecuador). Imports in the region from all global exporters (not just Colombia) presents a much more even picture and demonstrates Colombia’s potential to gain market share.
But the industry would still need to work towards the regionalisation of products and parts to survive.

Structural issues that would still need to be addressed (e.g. high cost of importing necessary raw materials, expensive or unavailable financing for new investments)

Colombia’s autopartistas would still need to investigate adaptive development strategies that will allow them to capture the potential value in ‘colombianisation’ of vehicles sold locally (Colombia) or quasi-locally (Peru, Bolivia and Ecuador).

As an example Toyota Corolla’s international success is largely possible because of the regional adaptations Toyota makes to the vehicle in each of its markets.

<table>
<thead>
<tr>
<th>The Market</th>
<th>The Preference</th>
<th>The Difference…</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>Americans view their cars as an expression of their lifestyle: They want them to project a youthful image and have soft seats and soft steering for relaxed cruising on the highway</td>
<td>In the United States the vehicle has a more streamlined appearance and softer seats.</td>
</tr>
<tr>
<td>EU</td>
<td>Europeans attach great importance to safety, which means that they appreciate such features as more solid doors. They want their cars to be stable on the road and accelerate quickly in the low gears</td>
<td>In Europe, vehicles have more solid (looking) bumpers and headlights that are integrated into the car body</td>
</tr>
<tr>
<td>Japanese</td>
<td>Japanese focus on fuel efficiency, modern design and practical details</td>
<td>In Japan there are more drink holders as an example</td>
</tr>
</tbody>
</table>
Leap of Faith: Regional popularity of BRT systems could serve as a spring board for Colombia

- Population and urbanisation growth trends, coupled with associated road congestion and environmental concerns has contributed to the popularity of BRT systems as an affordable alternative to light rail solutions (trams) and metro systems.

- Compared with the manufacture of private vehicles (4.4 hours worked per $1000 value added), bus manufacture is extremely labour intensive (21.2 hours worked per $1000 value added).

- The lesser automation means that scale is not as important as it is with the production of commercial vehicles and crucially for Colombia, the high cost of shipping large parts makes importing (vs local manufacture) less attractive.

Passengers per day - Global

Cities where BRT systems are planned or under construction
Whilst Colombia’s participation in the traditional bus segment is also limited...
...the BRT/ networked trucks segment is more expansive...
..and there are opportunities for Colombian industry to appropriate this value.
Leap of Faith: Organising industry towards value-added services

- Colombia’s Fourth Generation Program presents an opportunity for Colombian industry to leap forward.
- Not only will heavy equipment vehicles be required to support the construction directly (excavation and earthworks), but once the construction is finished, Colombia will be able to take better advantage of its strategic geographic position;
  - The government is targeting a 24-30% reduction in travel time and a 15-20% reduction in transportation costs.
  - There is an opportunity for Colombian industry to take advantage of this likely boom in demand for heavy vehicles.
  - There is an opportunity to regionalize products and adapt technologies specifically for the Colombian context; this might address rough/uneven terrain (e.g. designing and becoming proficient in the production of specialised frames, chassis, suspension etc) or perhaps power/torque requirements for Colombia’s varied topography.
But industry and government must look beyond traditional assembly and supply of parts...

- OEMs cannot offer many of these services can be offered without strong local capacity and infrastructure to provide and support them. The onus is then on local industry to prepare itself and the government to make investments and policy recommendations to support that preparation.

- If industry/government does not react to this trend and prepare accordingly, then not only will this very lucrative side of the market be hampered from developing in Colombia but there will also Colombia’s transport and logistics will also likely lag behind regional competitors.

- Colombia’s autopartistas have seen some gains. Whilst suppliers to the major assemblers have floundered, those who manufacture replacement parts for the aftersales market have seen some strong gains in both home and foreign markets.

  - Software installed in our truck fleet diagnoses problems and sends alerts to a local call center where staff redirect drivers to local dealers stocked with replacement parts. We also send information to the dealer before the truck arrives, so they can pull up the truck/driver’s information (warranty, customer data) so as to provide a tailored experience.

  Dieter Haban (paraphrased), CIO of Daimler AG subsidiary.
4. APPLYING THE APPROACH IN MACEDONIA

INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
## CONTENTS

**APPLYING THE APPROACH IN MACEDONIA**

1. **Background and Context**  
   Slide 59

2. **Strategic Options for Colombia’s Macedonia’s Industry**  
   Slide 74
Background and Context
Overview of the European Periphery Automotive Regional Value Chain

- Europe regional value chain comprises the following 13 countries:
  - Turkey
  - Poland
  - Czech Republic
  - Romania
  - Croatia
  - Bulgaria
  - Serbia
  - Montenegro
  - Macedonia
  - Algeria
  - Morocco
  - Tunisia
  - Egypt

- Major end-market for this regional value chain is Western Europe.
- Other countries in the region are excluded, since their economies are well developed or the countries have very little automotive presence.
### Expected sales potential in 2020

<table>
<thead>
<tr>
<th>Region</th>
<th>PV [000 units]</th>
<th>CV [000 units]</th>
<th>2W [000 units]</th>
<th>Broader addressable market as % of total global market in 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkey</td>
<td>1,067</td>
<td>62</td>
<td>238</td>
<td>PV 21% 61%</td>
</tr>
<tr>
<td>Algeria</td>
<td>460</td>
<td>0</td>
<td>207</td>
<td>CV 16% 46%</td>
</tr>
<tr>
<td>Poland</td>
<td>459</td>
<td>22</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td>260</td>
<td>0</td>
<td>253</td>
<td></td>
</tr>
<tr>
<td>Romania</td>
<td>225</td>
<td>8</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td>215</td>
<td>13</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Morocco</td>
<td>177</td>
<td>17</td>
<td>207</td>
<td></td>
</tr>
<tr>
<td>Tunisia</td>
<td>81</td>
<td>16</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Croatia</td>
<td>72</td>
<td>5</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Serbia</td>
<td>58</td>
<td>4</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Bulgaria</td>
<td>40</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Montenegro</td>
<td>15</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Macedonia</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

1) Sales data

Source: IHS Automotive, OICA, Company annual reports US Commercial Service, News reports, RedSeer, Roland Berger

Note: Broader addressable market includes sales of West Europe, Central Europe, East Europe.
Germany and France are key trade partners for the region. Czech Republic, Poland, Turkey and Romania are net exporters.

### Export

<table>
<thead>
<tr>
<th>Country</th>
<th>Top 3</th>
<th>Rest</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Rep.</td>
<td>45%</td>
<td>55%</td>
<td>26,959</td>
</tr>
<tr>
<td>Poland</td>
<td>48%</td>
<td>52%</td>
<td>20,131</td>
</tr>
<tr>
<td>Turkey</td>
<td>35%</td>
<td>65%</td>
<td>14,937</td>
</tr>
<tr>
<td>Romania</td>
<td>42%</td>
<td>58%</td>
<td>7,141</td>
</tr>
<tr>
<td>Morocco</td>
<td>67%</td>
<td>33%</td>
<td>991</td>
</tr>
<tr>
<td>Serbia</td>
<td>65%</td>
<td>35%</td>
<td>616</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>58%</td>
<td>42%</td>
<td>426</td>
</tr>
</tbody>
</table>

1) Czech Rep. – Czech Republic

### Key Export partners

- **Germany** – 30%, **France** – 8%, **Slovakia** – 7%
- **Germany** – 28%, **Italy** – 11%, **United Kingdom** – 9%
- **France** – 14%, **Germany** – 11%, **Italy** – 10%
- **Germany** – 22%, **France** – 13%, **Russia** – 7%
- **France** – 46%, **Spain** – 12%, **Egypt** – 9%
- **Italy** – 50%, **Germany** – 10%, **Russia** – 5%
- **Romania** – 28%, **Germany** – 22%, **Russia** – 8%

### Import

<table>
<thead>
<tr>
<th>Country</th>
<th>Top 3</th>
<th>Rest</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Rep.</td>
<td>56%</td>
<td>44%</td>
<td>11,287</td>
</tr>
<tr>
<td>Poland</td>
<td>52%</td>
<td>48%</td>
<td>14,189</td>
</tr>
<tr>
<td>Turkey</td>
<td>52%</td>
<td>48%</td>
<td>14,298</td>
</tr>
<tr>
<td>Romania</td>
<td>47%</td>
<td>53%</td>
<td>4,554</td>
</tr>
<tr>
<td>Morocco</td>
<td>49%</td>
<td>51%</td>
<td>3,308</td>
</tr>
<tr>
<td>Serbia</td>
<td>49%</td>
<td>51%</td>
<td>1,250</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>48%</td>
<td>52%</td>
<td>1,379</td>
</tr>
</tbody>
</table>

1) Czech Rep. – Czech Republic

### Key Import partners

- **Germany** – 40%, **Korea** – 10%, **Poland** – 6%
- **Germany** – 35%, **Italy** – 9%, **France** – 8%
- **Germany** – 34%, **France** – 10%, **Spain** – 8%
- **Germany** – 27%, **France** – 13%, **Turkey** – 7%
- **France** – 22%, **Germany** – 18%, **Romania** – 9%
- **Germany** – 24%, **Italy** – 17%, **France** – 8%
- **Germany** – 29%, **Italy** – 10%, **Hungary** – 9%

Source: UN Comtrade, RedSeer, Roland Berger
Whilst Macedonia exports mostly auto-components and imports mostly passengers vehicles...

**EXPORT**

- **Tunisia**
  - Vehicles: 16%
  - Components: 84%
  - Quantity: 296
- **Croatia**
  - Vehicles: 37%
  - Components: 63%
  - Quantity: 206
- **Egypt**
  - Vehicles: 62%
  - Components: 38%
  - Quantity: 124
- **Macedonia**
  - Vehicles: 32%
  - Components: 68%
  - Quantity: 34
- **Montenegro**
  - Vehicles: 95%
  - Components: 5%
  - Quantity: 4
- **Algeria**
  - Vehicles: 86%
  - Components: 14%
  - Quantity: 0.18

**Key Export commodities**

- Components [PV, CV] - 83%
- Buses - 54%, Components [PV, CV] - 38%
- Components [PV, CV] - 66%
- Trucks - 37%, PV - 30%
- Tractors - 79%

**IMPORT**

- **Tunisia**
  - Vehicles: 86%
  - Components: 14%
  - Quantity: 1,742
- **Croatia**
  - Vehicles: 86%
  - Components: 14%
  - Quantity: 873
- **Egypt**
  - Vehicles: 73%
  - Components [PV, CV] - 27%
  - Quantity: 3,501
- **Macedonia**
  - Vehicles: 93%
  - Components: 7%
  - Quantity: 279
- **Montenegro**
  - Vehicles: 93%
  - Components: 7%
  - Quantity: 128
- **Algeria**
  - Vehicles: 95%
  - Components: 5%
  - Quantity: 7,714

**Key Import commodities**

- PV - 46%, Trucks - 27%
- PV - 57%
- PV - 41%, Components [PV, CV] - 25%
- PV - 50%
- PV - 64%
- PV - 51%, Trucks - 29%

Source: UN Comtrade, RedSeer, Roland Berger
Elsewhere in the region, Turkey, Czech Rep. and Poland have sizable domestic PV production with additional growth expected in the future...

<table>
<thead>
<tr>
<th>Country</th>
<th>Production in 2020 ('000 units)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TURKEY</strong></td>
<td>&gt; PV – 1,351</td>
<td>&gt; Most of the vehicles are completely built inside the country</td>
</tr>
<tr>
<td></td>
<td>&gt; CV – 33</td>
<td>&gt; Passenger vehicle production expected to grow at a CAGR of 4% till 2020</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; OEMs(^1) producing inside the country – Renault/Nissan, Ford, Fiat,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hyundai, Toyota, Honda, Daimler, Isuzu</td>
</tr>
<tr>
<td><strong>CZECH REPUBLIC</strong></td>
<td>&gt; PV – 1,195</td>
<td>&gt; Most of the vehicles are completely built inside the country</td>
</tr>
<tr>
<td></td>
<td>&gt; CV – 3</td>
<td>&gt; OEMs(^1) producing inside the country – Volkswagen, Hyundai, Toyota,</td>
</tr>
<tr>
<td></td>
<td>&gt; 2W – 4</td>
<td>Tatra</td>
</tr>
<tr>
<td><strong>POLAND</strong></td>
<td>&gt; PV – 936</td>
<td>&gt; Passenger vehicle production expected to grow at a CAGR of 10% till 2020</td>
</tr>
<tr>
<td></td>
<td>&gt; CV – 14</td>
<td>&gt; High export potential due to its proximity to Western European markets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; Most of the vehicles are completely built inside the country</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; OEMs(^1) producing inside the country – Fiat, Volkswagen, GM</td>
</tr>
<tr>
<td><strong>ROMANIA</strong></td>
<td>&gt; PV – 454</td>
<td>&gt; Relatively low labor and land cost</td>
</tr>
<tr>
<td></td>
<td>&gt; CV – 0.1</td>
<td>&gt; Passenger vehicle production expected to grow at a CAGR of 4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; OEMs(^1) producing inside the country – Renault/Nissan, Ford, Roman</td>
</tr>
</tbody>
</table>

\(^1\)Only an indicative list, not the complete list of OEMs
And some North African countries such as Morocco and Algeria are gradually developing and are expected to be future automotive production centers.

<table>
<thead>
<tr>
<th>Country</th>
<th>Production in 2020 ['000 units]</th>
<th>Comments</th>
</tr>
</thead>
</table>
| MOROCCO    | > PV – 361                      | > Passenger vehicle production expected to grow at a CAGR of 6% till 2020  
                                                                                                     | > More than 70% of the vehicles are completely built inside the country  
                                                                                                     | > OEMs\(^1\) producing inside the country – Renault/Nissan, SOMACA, Daimler |
| EGYPT      | > PV – 124                      | > Less than 35% of the vehicles are completely built inside the country now and it is expected to increase to approx. 55% in 2020  
                                                                                                     | > OEMs\(^1\) producing inside the country – El Mansour Automotive, Hyundai, Renault/Nissan, Daewoo Motor Egypt, Suzuki, Bavarian Auto group, Daimler, Toyota, AvtoVAZ |
| SERBIA     | > PV – 93                       | > Most of the vehicles are completely built inside the country  
                                                                                                     | > OEMs\(^1\) producing inside the country – Fiat |
| ALGERIA    | > PV – 38                       | > Currently less than 1,000 vehicles are produced in the country through CKD\(^2\) model  
                                                                                                     | > Renault/Nissan looking to completely build their vehicles from the country itself before 2020, which provides a huge opportunity for auto value chain development in the country  
                                                                                                     | > OEMs\(^1\) producing inside the country – Renault/Nissan, Daimler |
| BULGARIA   | > PV – 7                        | > Transition expected from the current CKD\(^2\) model to completely built units inside the country  
                                                                                                     | > OEMs\(^1\) producing inside the country – Great Wall |

\(^1\)Only an indicative list, not the complete list of OEMs  
\(^2\) CKD – Completely Knock Down, assembly of the vehicle happens in the country with parts being imported from other countries
As regional incomes increase, OEMs and Tier 1 suppliers are looking to develop systems/component hubs in Eastern European countries…

Potential auto investments\(^1\) till 2020

<table>
<thead>
<tr>
<th>Country</th>
<th>Investment Details</th>
</tr>
</thead>
</table>
| **POLAND**       | > Volkswagen plans to invest USD 1.1 billion in a van factory with an annual capacity of 85,000 vehicles  
> South Korean automobile manufacturer expected to invest USD 330 million in the next few years  
> Volkswagen plans to invest USD 300 million in engine plant with an annual capacity of 1 million engines |
| **ROMANIA**      | > Renault to invest USD 300 million in a gearbox assembly plant  
> Daimler to invest USD 400 million to expand the capacity of transmission assembly plant in the next 2 years  
> Ford to invest USD 300 million in setting up an engine facility |
| **CZECH REPUBLIC** | > Hyundai Mobis to invest USD 100 million to set up car lamp production facility to supply for Hyundai’s manufacturing in Czech & Slovakia  
> Nexan Tire corp. to set up a tire manufacturing plant by investing USD 1.1 billion |

\(^1\) Investment information is not exhaustive and based on publicly available information and industry insights
Currently, the European RVC’s supplier base (by component and process) is comparable to other emerging Automotive Regional Value Chains.
The majority of automotive suppliers in the European RVC are concentrated in countries like Poland, Turkey, or the Czech Republic...

Country wise supplier presence – By component type [# of suppliers]

1) Others - Small & general parts, clean energy system, climate control parts
2) E&E - Electric/Electronic parts
3) Total component suppliers need not necessarily match the total number of suppliers in a country, since a single supplier can supply multiple components

Source: Industry reports, RedSeer, Roland Berger
Turkey, Poland, and the Czech Republic have high supporting industry presence, Romania & Egypt show moderate supporting industry potential...

Magnitude of supporting industries by country (output in USD million)

- Turkey: 121,040 USD million
- Poland: 118,627 USD million
- Czech Republic: 66,772 USD million
- Romania: 29,569 USD million
- Egypt: 20,223 USD million
- Morocco: 17,393 USD million
- Bulgaria: 13,877 USD million
- Serbia: 9,148 USD million
- Tunisia: 8,444 USD million
- Algeria: 3,952 USD million
- Croatia: 1,300 USD million
- Macedonia: 194 USD million
- Montenegro: 69 USD million

Legend:
- Black: Chemicals & Chemical products
- Orange: Basic metals
- Yellow: Fabricated metal products
- Blue: Machinery & equipment
- Red: Rubber & Plastic products
- Grey: Electrical machinery & apparatus
- Green: Other
### Minimum labor cost [USD/month]

- Egypt: 111
- Tunisia: 198
- Bulgaria: 207
- Algeria: 211
- Romania: 232
- Serbia: 238
- Macedonia: 265
- Morocco: 280
- Montenegro: 286
- Czech Republic: 428
- Croatia: 502
- Poland: 513
- Turkey: 558

### Cost to export [USD/container]

- Egypt: 625
- Tunisia: 775
- Bulgaria: 1,375
- Algeria: 1,270
- Romania: 1,485
- Serbia: 1,455
- Macedonia: 1,376
- Morocco: 595
- Czech Republic: 985
- Croatia: 1,215
- Poland: 1,335
- Turkey: 1,050

### Import duty [%]

- Egypt: 40%
- Tunisia: 17%
- Bulgaria: 30%
- Algeria: 7%
- Romania: 7%
- Serbia: 7%
- Macedonia: 7%
- Morocco: 25%
- Czech Republic: 7%
- Croatia: 7%
- Poland: 7%
- Turkey: 10%

### Comments

- Growth of Poland and Romania primarily driven by preference of OEMs to source systems/components from EU countries to avoid additional customs procedures.
- Proximity to West Europe and low labor costs expected to drive investments in countries like Morocco, Algeria, and Egypt for final assembly.

---

1) Import duty obtained for Central & Eastern European countries and used for the respective categories.

How can the Western Balkans improve their insertion into the European Periphery Automotive Regional Value Chain?

OEMs Plants in Europe within a 1 & ½ days from the Western Balkans

Two distinct integrations in the EP RVC: Serbia (PVs) and Macedonia (components)

**IMPORT**

- **Serbia**: 68% Vehicles, 32% Components (PV, CV) - 31%
- **Macedonia**: 93% Vehicles, 7% Components (PV) - 50%

**EXPORT**

- **Serbia**: 80% Vehicles, 20% Components (PV) - 65%
- **Macedonia**: 32% Vehicles, 68% Components (PV, CV) - 66%

**Legend**: Vehicles, Components
Serbia Automotive: a solid manufacturing base geared towards a single OEM...

A Solid Automotive Footprint... Leading to Good Performance... Built around the FDI Strategy of one OEM...

Main Automotive Plants in Serbia (OEM, Tier 1, Tier 2)

- FRL-fabrika Kolubara
- Lakatnik
- ConchTech Fluid Serbia
- Norma Group
- Igb Automotive Corps
- Robert Bosch
- Ageina Technologies
- Vuka Corporation
- Autoventi
- Procter
- FAP-Fabrika Automobilskih Delova
- Fiat Automobili Srbija
- Magneti Marelli
- Sigil
- Žastava Topacimica
- Johnson Controls Automotive
- TVP Suradnja
- PMC Automotive
- Gamma Line
- Promotor Insa
- Žastava Kovacina
- PPT-Prva Poteleka
- Knitt Autoflex Yug
- Le Belier Livnica
- Livnica Klinika AI
- DAD Dräxlmaier Automotive
- Mecaplast Serbia
- FAM Seconj AI
- MARS
- Slatina Nova
- Ikarbus
- IPK Industrija
- Precizne Mehanike
- GRAH Automotive
- Grammer System
- Yura Corp.
- D Company
- Tigar Tyres
- Tigar Technical Goods
- Cooper Tire & Rubber Company

Turnover of the Serbian Automotive Industry

<table>
<thead>
<tr>
<th>Year</th>
<th>Turnover (€ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>2,089</td>
</tr>
<tr>
<td>2012</td>
<td>1,394</td>
</tr>
<tr>
<td>2011</td>
<td>929</td>
</tr>
<tr>
<td>2010</td>
<td>837</td>
</tr>
<tr>
<td>2009</td>
<td>645</td>
</tr>
<tr>
<td>2008</td>
<td>732</td>
</tr>
<tr>
<td>2007</td>
<td>620</td>
</tr>
</tbody>
</table>

Product Breakdown of Serbia Automotive

- Passenger cars: 54.00%
- Tires: 11.32%
- Wiring harness: 9.50%
- Casted & machined parts: 4.54%
- Car seats: 3.12%
- Body parts: 2.23%
- Rubber hoses: 1.26%
- Car Batteries: 1.14%
- Seat Covers: 0.92%
- Oils & lubricants: 0.67%
- Pressed parts: 0.66%
- Wiper system: 0.64%
- Trailers: 0.60%
- Forged & machined parts: 0.46%
- Ball bearings: 0.41%
- Other: 4.21%

FIAT and Main Automotive FDI in Serbia
Macedonia Automotive: the New Kid on the Block in the European RVC?

Main Automotive Plants in Macedonia

Current and Pipeline Tier 1 and Tier 2 FDI in Macedonia

Performance of Auto-Components Industry

An Embryonic Automotive Base... A Recent Wave of Automotive FDI... Is Auto-Parts the Entry to the EP RVC?

Macedonia Automotive: the New Kid on the Block in the European RVC?

An Embryonic Automotive Base... A Recent Wave of Automotive FDI... Is Auto-Parts the Entry to the EP RVC?

Macedonia Automotive: the New Kid on the Block in the European RVC?

An Embryonic Automotive Base... A Recent Wave of Automotive FDI... Is Auto-Parts the Entry to the EP RVC?

Macedonia Automotive: the New Kid on the Block in the European RVC?

An Embryonic Automotive Base... A Recent Wave of Automotive FDI... Is Auto-Parts the Entry to the EP RVC?

Macedonia Automotive: the New Kid on the Block in the European RVC?

An Embryonic Automotive Base... A Recent Wave of Automotive FDI... Is Auto-Parts the Entry to the EP RVC?

Macedonia Automotive: the New Kid on the Block in the European RVC?

An Embryonic Automotive Base... A Recent Wave of Automotive FDI... Is Auto-Parts the Entry to the EP RVC?

Macedonia Automotive: the New Kid on the Block in the European RVC?

An Embryonic Automotive Base... A Recent Wave of Automotive FDI... Is Auto-Parts the Entry to the EP RVC?

Macedonia Automotive: the New Kid on the Block in the European RVC?

An Embryonic Automotive Base... A Recent Wave of Automotive FDI... Is Auto-Parts the Entry to the EP RVC?

Macedonia Automotive: the New Kid on the Block in the European RVC?

An Embryonic Automotive Base... A Recent Wave of Automotive FDI... Is Auto-Parts the Entry to the EP RVC?

Macedonia Automotive: the New Kid on the Block in the European RVC?

An Embryonic Automotive Base... A Recent Wave of Automotive FDI... Is Auto-Parts the Entry to the EP RVC?

Macedonia Automotive: the New Kid on the Block in the European RVC?

An Embryonic Automotive Base... A Recent Wave of Automotive FDI... Is Auto-Parts the Entry to the EP RVC?

Macedonia Automotive: the New Kid on the Block in the European RVC?

An Embryonic Automotive Base... A Recent Wave of Automotive FDI... Is Auto-Parts the Entry to the EP RVC?

Macedonia Automotive: the New Kid on the Block in the European RVC?
Strategic Options for Macedonia’s Automotive Industry

(indicative only*)
Can Macedonia Compete in the “Toyota Corolla” Segment in Europe?

- **DENSE / URBAN / CITY ENVIRONMENT (OF THE NEAR FUTURE)**
  - Movement of People
    - Individual
    - Groups
  - Movement of Merchandise
    - Light
    - Heavy

- **SPRAWLING / RURAL / SPARSELY POPULATED**
  - Strategic Segment 1
  - Strategic Segment 2
  - Strategic Segment 4

**Demand Trends in the EU:**
- more onboard electronics
- high fuel efficiency
- stringent environmental regulation
- increased safety
- networked mobility

**Strategic Segments:**
- Strategic Segment 5 (Light)
- Strategic Segment 6 (Heavy)
- Strategic Segment 7 (Groups, Dense)
- Strategic Segment 8 (Groups, Sprawling)
Serbia (Macedonia’s neighbor and competitor) has a relatively good positioning through FIAT in Seg 2 although both strategic positioning and supply chain efficiency risks exist…
Is Macedonia better off in becoming a auto-parts hub for specific component systems in Segment 2?
Macedonia could focus on specific Auto-Component Systems (Electronics, Interior, Exhaust, Telematics) to leverage skilled labor, low cost, R&D niches, and FDI tech-assets.
A Small Country for a Big Product: Macedonia and Bus Manufacturing...

Demand Trends for Bus:

- Global demand to reach US $41 billion and 664,000 units by 2018
- Growth of urban population & need to reduce traffic congestion
- Growth in the number and size of private transportation companies
- More stringent emissions standards and diffusion of electric, hybrid models

<table>
<thead>
<tr>
<th>Movement of People</th>
<th>Movement of Merchandise</th>
<th>DENSE / URBAN / CITY ENVIRONMENT (OF THE NEAR FUTURE)</th>
<th>SPRAWLING / RURAL / SPARSELY POPULATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Light</td>
<td>Strategic Segment 1</td>
<td>Strategic Segment 2</td>
</tr>
<tr>
<td>Groups</td>
<td>Heavy</td>
<td></td>
<td>Strategic Segment 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>INTERCITY</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strategic Segment 6</td>
<td>Strategic Segment 8</td>
</tr>
</tbody>
</table>
Macedonia’s positioning in the Bus European Periphery RVC in Segment 4 - Movement of Groups in Rural Environments
Deepening and Expanding the Bus Manufacturing Value Chain in Macedonia…

Bus manufacturing structural requirements fit well Macedonia as a potential production hub in the European RVC

- Small minimum investment size to (Euro 25 million) vs. 1 billion Euro for PV plant (FIAT)
- Labor intensive (21.2 hours worked per $1K of value added vs. 4.4 hours worked per $1K of value added for PV manufacturing)
- Discrete production process and small batches production runs
- Buyers require tailor-made solutions
- High ratio of unit value ($300K to $400K) to transport costs makes shipping long distance is a viable
- Supply chain with made-to-order linkages and high-intensity information exchange

- €25M investment
- 431 employees
- Production of intercity coaches (500 for US market)
- Started operations in 2013
- Sourced locally chassis modules (Aktiva) & fiberglass body parts (Uniplast)
- Potential to localize high-volume low-value components
Strategic Repositioning Option 1: Macedonia as a specialized hub for selected automotive component systems for Strategic Segment 2:

- the gap with the ideal local value chain activities is too wide to pursue a narrow FDI attraction strategy targeted at European OEMs operating in segment 2
- develop an upgrading policy, both in terms of targeted FDI attraction and Tier 2 and 3 supplier base development for segment 2 in up to three auto-component systems: Electronics and Electrical, Interiors, Exhaust (catalysts), Telematics, Transmission, or Suspension.

Strategic Repositioning Option 2 – Macedonia as a regional hub for bus manufacturing for Strategic Segment 4:

- Target the sectoral FDI attraction strategy for automotive towards additional OEMs operating in strategic segment 4, as a way to create a critical mass of bus manufacturers in country and position Macedonia as a regional hub for final assembly
- Deepen the local supply chain for bus manufacturing, by implementing tailored supplier development programs for potential local Tier 2 and Tier 3 suppliers, with a focus on those value chain activities already present but in need of upgrading such as interiors, exteriors, or tooling.
5. APPLYING THE APPROACH IN MEXICO
INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
1. Background and Context  
Slide 85

2. Strategic Options for Mexico’s Automotive Industry  
Slide 92
Background and Context
Mexico is now the world’s fourth largest exporter of finished vehicles, after Japan, Germany and South Korea

- For every US$ 10 million of gross exports of vehicles: US$ 4.5 million consists of value added in the Mexican car sector, and additional US$2.5 million of value added by Mexican producers of intermediate inputs (largely rubber and plastics) and the remaining US$ 3.0 million of foreign value added (largely iron and steel).

- Mexico’s advantages have derived from its low production costs, proximity to the US market – which absorbs around 70 percent of its exports – and preferential access to other markets, primarily in Latin America, Canada and the EU.

- Until recently, these suppliers sold almost all of their output directly to Mexican-based OEMs. This meant that Mexico’s direct exports consisted only of a few labor intensive products like wire harnesses and seat covers. Imports meanwhile consisted of basic inputs like sheet steel and resins for plastics.

- Its cost advantage is also strong for products with a high value to volume ratio, including most finished vehicles and engines. When the Japanese electronics company Pioneer, for example, relocated production of its small audio speakers for automobiles from Mexico to Shanghai, it left the assembly of its large, customized car speakers in Mexico, because they were too big to ship cost-effectively from China.
Free trade agreements coupled with industry-incentives are important factors attracting automotive players to the country

- The principal regulatory influence on the Mexican automotive industry has been the signing of free trade agreements, starting with NAFTA in 1994 which reinforced regional production by eliminating intra-regional tariffs on parts and finished vehicles, but also a further round of agreements with 44 countries, including the EU in 2000.

- These had the effect of opening up production in Mexico’s interior and boosting the potential for Mexican exports of finished vehicles.
Low manufacturing cost in Mexico, driven by low labour and natural gas costs is a major factor for attracting investments.

**Cost drivers**

<table>
<thead>
<tr>
<th>Manufacturing Cost Index</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>Mexico has cost advantage over Brazil, Canada, and USA</td>
</tr>
<tr>
<td>Germany</td>
<td>By 2015, Mexico is estimated to be around 29% less expensive than China in terms of unit labor cost (i.e. wages adjusted for productivity)</td>
</tr>
<tr>
<td>Canada</td>
<td>Natural gas prices in Mexico are significantly low due to high supply in the market</td>
</tr>
<tr>
<td>Japan</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td></td>
</tr>
<tr>
<td>China</td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td></td>
</tr>
</tbody>
</table>

- Senior Member, IHS Automotive

"Dramatic increase in wages are not expected in the automotive sector in Mexico because salaries for skilled laborers are already higher than average salary"
Mexico’s automotive industry is highly dependent on US Demand

- Mexico overtook Japan as the second largest exporter to the US market, after Canada, in 2013 – and will likely remain largely an export platform.

- Domestic sales of new vehicles are lower per unit of population in Mexico than in the rest of Latin America (around eight per 1,000 inhabitants compared to 20 elsewhere), reflecting poorer availability of credit, weak income growth and, above all, cheap second-hand imports from the United States.

- The structural evolution of the Mexican industry is also likely to be driven by trends in the US market. These include;
  
  1. greater fuel efficiency, which implies optimization/downsizing of the internal combustion engine, the development of alternative engines (fuel cells/batteries) and the use of lightweight materials (e.g. carbon fiber chassis and parts);
  
  2. connectivity & self-driving vehicles, which implies additional investment in vehicle-internet communication, in cost-effective radar and sensors and after-market devices for vehicle-vehicle communication.
There are two principal automotive ‘clusters’ in Mexico.

- Production is now clustered in two locations: in a band across the north of the country, along the border with the United States, in Chihuahua, Coahuila and Nuevo Leon; and in the states bordering Mexico City, in Guanajuato, Queretaro, Jalisco, Estado de Mexico and Puebla – the ‘Bajio’ and ‘Centro.’
Production levels of the main OEMs in Mexico are forecast to increase steadily until the end of the decade

A number of process and organizational developments will likely affect the evolution of the Mexican industry. Among them are the trends towards:

- the introduction of 3-D printing which has increased the potential for decentralized product testing;
- the devolution of responsibility for assembling systems of components (e.g. instrument panels, brake systems) from OEMs to tier 1 suppliers;
- energy efficiency and increased use of renewables together with reduced consumption of water and production of waste
Strategic Options for Mexico’s Automotive Industry
Mexico is well established in the Toyota Corolla Segment (2)
Significant market potential exists for Tier 2 suppliers through localization of products currently imported in Mexico

- Many of the OEMs came to Mexico with their own Tier 1 suppliers and the removal of local content requirements under NAFTA led to the consolidation or disappearance of pre-existing Mexican suppliers.
- There is still a sharp disconnect between the foreign-owned OEMs and Tier 1 companies and the population of home grown firms.
- Many current Tier 1 firms feel that the Tier 2 and 3 supplier base is too fragmented and lacking in scale to be worth investing in. Around 90 percent of these components are currently imported.

Tier 2 components – Domestic opportunities

Market potential [USD bn, 2012]

Total market opportunity in 2012 – USD 68.2 bn
Expected market opportunity in 2020 – USD 80.5 bn

1) Calculated value (using a growth rate of 3.6% from auto parts production forecast)
2) Others include Ceramics, Tubing, Sintering, Extrusion, Fiberglass, Glass, Material dielectric
Source: Ministry of economy – Mexico, RedSeer, Roland Berger
Innovation is concentrated among OEMs and established foreign-owned Tier 1 suppliers

- There is a well-established network of 106 design centres in Mexico, spread across all systems but they are overwhelmingly associated with international companies.

- Volkswagen used Mexico as the base for developing its New Beetle model, which involved cooperation between engineers and designers in Mexico, California and Germany.

- At around the same time, Delphi relocated one of its research and development centres to Ciudad Juarez and subsequently set up other technical centres in Saltillo and Querataro. In the last five years, Ford has increased the number of engineers it employs in Mexico from 120 to 900 and plans to increase...
Current development strategies could allow Mexico to appropriate more value from its current segment.
But potential spillovers are limited when compared with ‘The Uber Segment’ (Segment1) which is also expanding. Mexico could position itself to caption this value.
6. APPLYING THE APPROACH IN VIETNAM
INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
CONTENTS

1. Background and Context  
   Slide 100

2. Strategic Options for Colombia’s Macedonia’s Industry  
   Slide 107
Background and Context
Vietnam principally produces three products: two-wheelers, passenger cars, and commercial vehicles

- After 1991, the Vietnamese automobile industry has begun to change dramatically owing to the open policy of Vietnamese government in which incentive policy for automobile industry was gradually taken shape. In 1991, Auto Hoa Binh formed a joint-venture partnership with Philippines, called Vietnam Motors Corp. (VMC) and started the era of automotive production in Vietnam.

- The two-wheeler industry is well developed and has a very strong supplier base. About 90% of the value added in this segment is domestic value added with only some of the most advanced electronic components imported from Japan or Thailand.

- The added value in the passenger car segment is achieved in a number of stages: welding, painting and attaching bulky items or low value-added parts that are fit for local sourcing, such as tires, batteries and wire harnesses.

- Buses and trucks have a higher local content, with 30% of engines, gear boxes and the transmission systems and 70% of electrical components produced domestically. In particular, truck frames and trunks are entirely domestically produced.
Vietnam registered 40 million units in 2014, for a population of 90 million.

- Two-wheelers (motorcycles and scooters) are the most common means of transport in Vietnam.
- Ninety percent of the almost 3 million units sold in 2013 were produced by the five largest two-wheeler makers in the country – Honda, Yamaha, Suzuki, SYM, and Piaggio – which possess an installed capacity of more than 5.5 million units.
- Two-wheeler production in Vietnam are assembled and components manufactured in the country with the exception of some small components that are imported from Japan or Thailand.
The elimination of import tariffs for automobiles under the ASEAN Free Trade Area (AFTA) puts Vietnam’s auto industry at a crossroads

- The automotive industry in Vietnam has struggled to increase its domestic value added and move past the original assembly model established in the 1990s.

- Very high import tariffs have protected the domestic assembly of cars in Vietnam since its inception. Despite government efforts to increase local content, two and a half decades after the first OEMs started producing cars in Vietnam, the majority of parts and components continue to be imported and only simple manufacturing tasks are performed in country.

- Local content in the passenger vehicle segment is very low (around 10-20%) while that of buses and trucks is slightly higher (30%-50%).

- The planned elimination of all import tariffs between ASEAN member countries by 2018 will open up the local market to imports from more efficient producers like Thailand and Indonesia that have been gaining market share in the Vietnam market over the last couple of years.

<table>
<thead>
<tr>
<th>Domestic Taxes for Automobiles by Capacity (2014)</th>
<th>1-9 seats</th>
<th>10-15 seats</th>
<th>Others (trucks, buses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCT</td>
<td>45%-60%</td>
<td>30%</td>
<td>15%</td>
</tr>
<tr>
<td>Less than 2,000 cc</td>
<td>45%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2,000-3,000 cc</td>
<td>50%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>More than 3,000 cc</td>
<td>60%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>VAT</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Other</td>
<td>10-15%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Registration fees</td>
<td>10-15%</td>
<td>10-15%</td>
<td>10-15%</td>
</tr>
</tbody>
</table>
Vietnam has been unable to develop a successful local industry of parts and components in part because the small size of its local market

- Despite having a population of about 90 million, Vietnam is a small market in ASEAN and represents less than 3% of auto sales within this regional block.

- Production is highly fragmented and as a consequence most plants do not reach minimum economies of scale.

- A typical full-scale auto assembly plant produces between 200,000-300,000 cars per year, while the largest plant in Vietnam has a capacity of less than 40,000 vehicles per year.

- Consolidation is not likely to solve the problem as the difference in plant size compared to Thailand or Indonesia are very high.

- Not only are Vietnamese plants small relative to their Thai counterparts (the former are less than a fifth of the size of the latter, on average) but that the entire production capacity in the auto industry in Vietnam equals the production capacity of only one large auto plant in Thailand.

- Economies of scale and the elimination of tariffs in ASEAN will make it hard for Vietnam to compete in the personal car segment.
Vietnam has been unable to develop a successful local industry of parts and components in part because the small size of its local market (cont…)

### ASEAN: Motor Vehicles Sales (2014)

<table>
<thead>
<tr>
<th>Country</th>
<th>2W</th>
<th>CVs</th>
<th>PVs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>268,300</td>
<td>5,500</td>
<td>3,900</td>
</tr>
<tr>
<td>Indonesia</td>
<td>9,243,500</td>
<td>92,700</td>
<td>1,264,800</td>
</tr>
<tr>
<td>Malaysia</td>
<td>599,700</td>
<td>6,900</td>
<td>662,200</td>
</tr>
<tr>
<td>Myanmar</td>
<td>358,500</td>
<td>97,900</td>
<td>353,700</td>
</tr>
<tr>
<td>Philippines</td>
<td>807,400</td>
<td>2,200</td>
<td>227,100</td>
</tr>
<tr>
<td>Thailand</td>
<td>2,298,400</td>
<td>23,400</td>
<td>1,084,300</td>
</tr>
<tr>
<td>Vietnam</td>
<td>3,574,000</td>
<td>19,600</td>
<td>92,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17,149,800</strong></td>
<td><strong>248,200</strong></td>
<td><strong>3,688,500</strong></td>
</tr>
</tbody>
</table>

### ASEAN: Motor Vehicles Production (2014)

<table>
<thead>
<tr>
<th>Country</th>
<th>2W</th>
<th>CVs</th>
<th>PVs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Indonesia</td>
<td>8,135,900</td>
<td>92,300</td>
<td>1,304,000</td>
</tr>
<tr>
<td>Malaysia</td>
<td>578,400</td>
<td>12,100</td>
<td>632,800</td>
</tr>
<tr>
<td>Myanmar</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Philippines</td>
<td>676,100</td>
<td>2,100</td>
<td>96,300</td>
</tr>
<tr>
<td>Thailand</td>
<td>2,994,800</td>
<td>22,700</td>
<td>2,160,400</td>
</tr>
<tr>
<td>Vietnam</td>
<td>4,677,200</td>
<td>N.A.</td>
<td>82,700</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17,062,400</strong></td>
<td><strong>129,200</strong></td>
<td><strong>4,276,200</strong></td>
</tr>
</tbody>
</table>
Strategic Options for Vietnam’s Automotive Industry
Vietnam’s participation in Segment 2 (Movement of Individuals in Rural Environments) is consequently weak.
High population densities and sparse road networks in Vietnam’s largest cities are incompatible with adoption of cars as the main mode of transportation in urban areas.

- Vietnam has seen rapid motorization as a result of rising per capita incomes and increased urbanization.
- The number of registered motorcycles increased from 1.2 million in 1990 to 37 million in 2013.
- Motorcycles provide affordable and flexible door-to-door mobility for the majority of Vietnamese citizens and account for close to 80% of vehicular trips taken in the country.
- With incomes expected to continue to rise and an urban population that is forecast to grow, motorization levels are expected to increase in the short to medium term.
- Furthermore, Vietnam’s per capita income is reaching the threshold after which most countries have seen a rapid increase in car ownership.
- However, urban densities in Vietnam’s largest cities are among the world’s highest (272 and 150 inhabitants per hectare in Hanoi and HCMC, respectively, compared to 86 in Paris, 62 in London and 370 in Hong Kong) and congestion is already becoming a critical problem due to motorcycles, cars and buses competing for limited road space.
Vietnam could seize this opportunity to develop intelligent transportation systems in its biggest cities and develop its domestic automotive industry accordingly.

- No city in Vietnam currently has a well-functioning urban transport system and regular bus services are largely underdeveloped in Hanoi and HCMC.

- Intelligent Transport Systems (ITS) are a suite of public transport planning, operations management and customer service applications that are enabled by advanced information and communications technologies.

- They can enhance the effectiveness, efficiency, and usability of the public transport service offer. An ITS obtains data from multiple sources—mostly in real time including sensors, detectors, video cameras, radar and its own bus fleet—and uses data analytics to enhance day-to-day operations, including service planning and the use of technology to effectively synchronize traffic lights.

- Several cities around the world are integrating urban passenger transport into ITS in order to enhance efficiency of mass transport systems.
The renewed emphasis on public transportation as the core of the new mobility model will increase demand for buses, which can create new manufacturing jobs.

- By 2030, Vietnam will need 38,285 buses in circulation to meet demand, if it were to switch to the proposed model of urban mobility (ITPE 2015).

- Assuming a standard replacement rate of buses of 12-15 years and that the majority of buses are produced locally, this could translate into between 300 and 500 jobs by 2030.

- Furthermore, because the local bus industry is in a position to develop more capabilities beyond assembly, the type of jobs created will be better and wages will be higher.

- For instance, by building capacity in mold-making and testing, the local bus industry could pay a wage premium of over 25% in relation to wages in the basic activities that are currently being undertaken like interior assembly, seats and wiring.

- On the other hand, the operation of an intelligent bus system in big cities like Hanoi and HCMC will also create an additional—although modest—number of jobs: A bus operations control center with typical responsibilities (coordinating bus operations, responding to mechanical breakdowns, managing on-time performance, among others) could provide an additional 30-40 jobs per major city in which it is implemented.
With some intervention, Vietnam might be able to serve this segment (Segment 4 - Movement of Groups in Rural Environments)
Vietnam could also see the digital transportation services ecosystem blossom through the development of transportation applications.

- An ITS system like the one proposed provides plenty of opportunities for local engineers to develop software for bus scheduling, maintenance scheduling, integrated ticketing systems, and Real-Time Passenger Information (RTPI) for smart phones, in addition to services needed to integrate third-party software into the public transport system.

- Furthermore, ITS always need adjustment, enhancements and upgrades and provide opportunities for long-term maintenance services contracts for local firms. In the United States, three occupations with higher-than-average wages (software developer, hardware developer, and engineer) account for 32 percent of the jobs needed in the ITS industry.

- Besides developing software directly linked to transportation intelligent systems, local developers will find opportunities to develop smart phone applications that respond to locality-specific transport issues.

- For instance, if a significant percentage of traffic congestion is directly linked to searching for a parking space, this will provide incentives to develop applications that, relying on sensors installed at each parking space, allow users to use GPS to find empty parking spaces in the city.

- These skills—and the hardware/infrastructure investments needed to bring these solutions to market—could be transferred to develop services and solutions for other advanced industries like logistics, transportation and healthcare.
Vietnam of the Future: networked ITS systems?

Local/Cluster Value Chain

Regional Value Chain

Global Value Chain

VENICE DESIGN & TESTING

TOOLING EX/INT

EXTERIOR 336370 336211

CAP

INTERIOR 336360

LAB

ASSEMBLY

SHIP

NETWORK MNGMT

ROADS RAILS

MAINTENANCE

RECYCLING

TOOLING CHASSIS

CHASSIS 336330 336340

CAP

ELECTRONIC 336320

CAP

POWERTRAIN 336310 336350

CAP

OTHER 336390

CAP

ELECTRON. DESIGN & TESTING

KNL

KNL

FINANCIAL SERVICES

KNL

KNL

KNL

KNL
Resource intensity and economies of scale

Knowledge Intensive VC Activities (training)

Capital Intensive VC Activities (investment)

Labor Intensive VC Activities (labour % cost)

Natural Resources (reliance on environmental factor conditions)

Energy Intensive VC Activities (energy % cost)

Value Chain Linkages by time and information intensity

Just In Time linkage (24-48 hours)
Low information exchange | High Information exchange

Made to order linkage (weeks)
Low information exchange | High Information exchange

On stock linkage (months)
Low information exchange – High Information exchange