ACMA

सत्यमेव जयते
Department of Heavy Industry
Ministry of Heavy Industries & Public Enterprises
Government of India

Grant Thornton
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Strategic Roadmap for International Business Development & Technology Acquisition

Automotive Component Industry of India

FOREWORD

The Indian auto component industry is well recognised globally with deep forward and backward linkages with several key segments of the economy. However with the transformations taking place all over the globe, the Indian Industry needs to keep itself abreast to survive and thrive.

In Automotive Mission Plan 2016-26, Indian auto sector plans to be amongst the top three globally in engineering, manufacturing and export of vehicles and components, encompassing safe, efficient and environment-friendly conditions for affordable mobility of people and transportation of goods, comparable with global standards. With a target to contribute 12 percent of India's GDP, and generate an additional 65 million jobs, AMP 2026 shows a lot of promise for our industry.

To align with, and achieve the targets of AMP 2026, ACMA mandated Grant Thornton to prepare a strategy and roadmap for the component industry to enable the Indian auto component industry globalize by increasing its share of exports and establish its footprint through mergers, acquisitions, joint ventures and other forms of alliances.

We would like to congratulate Grant Thornton for the successful completion of the study. Over 190 primary interviews have been conducted across India and select overseas countries. The report while answering eminent questions for the industry, also showcases the key priorities for ACMA and its member companies in the next 3-5 years. Additionally, it aims to identify structural and framework level changes which the Government of India can enable for the India auto component manufacturers and the overall industry to bridge the gaps.

We would like to acknowledge and thank each and every individual for sharing their perspective and learnings, which have been collated in this study for your benefit.

We urge the membership to take benefit from this study.

Nirmal K. Minda
President

Jayant Davar
Past President

The Automotive Component Manufacturers Association of India (ACMA)

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BACKGROUND

Grant Thornton India LLP was mandated by ACMA to assist with developing a strategic roadmap to enable the Indian auto component industry globalize by increasing its share of exports and establish its footprint through mergers, acquisitions, joint ventures and other forms of alliances.

In order to achieve the stated objective of this study, the report aims to answer the following questions;

(a) what are the gaps/issues/challenges which prohibit India from being a global leader;

(b) how does the India auto component industry build a favorable brand perception globally with respect to product development, technology and R&D;

(c) how does the India auto component industry gear up for headwinds arising due to adoption of new technologies and inventions;

(d) how could inorganic growth (including joint ventures and technical alliances) play a role in the growth plan towards AMP 2026;

The report also showcases the key priorities for ACMA and its member companies in the next 3-5 years. Additionally, it aims to identify structural and framework level changes which the Government of India can enable for the India auto component manufacturers and the overall industry to bridge the gaps.

The study was commenced in the first week of April 2018.

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Executive Summary

Growth of the Indian Auto Industry

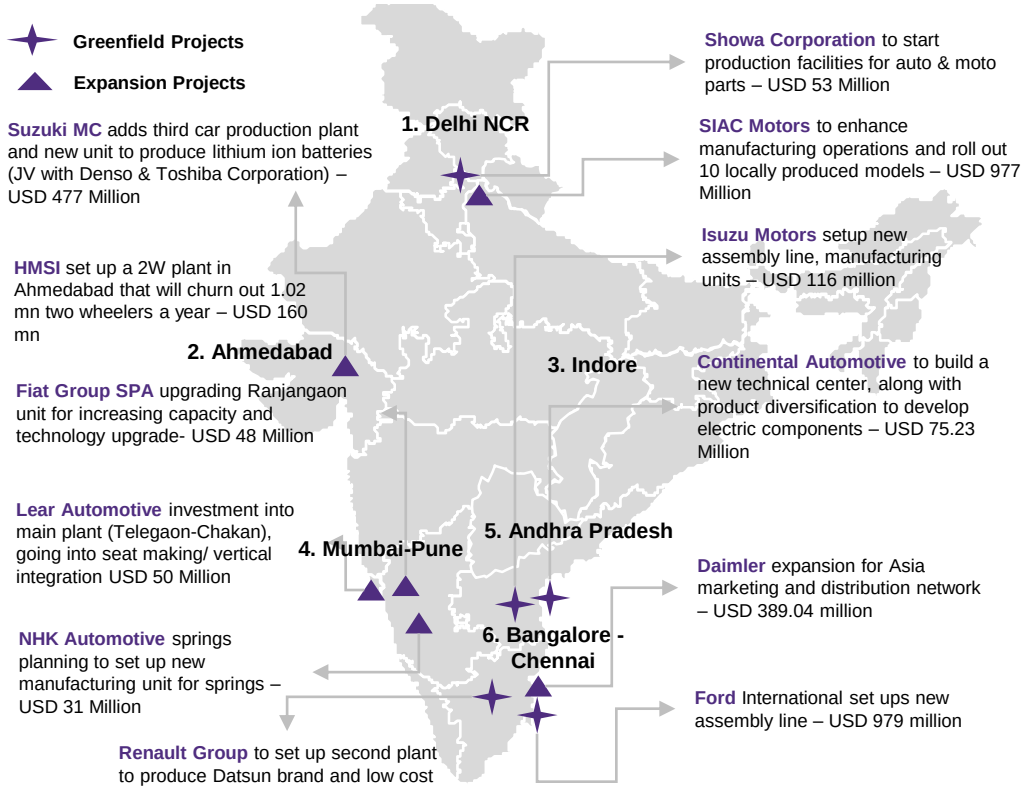
Current Scenario

- Production grew from **20.6 mn units** in 2012-13 to **29.1 mn units** in 2017-18
- Domestic consumption grew from **17.7 mn units** in 2012-13 to **25.0 mn units** in 2017-18
- Exports grew from **2.9 mn units** in 2012-13 to **4.0 mn** units in 2017-18

Increase in Regulatory Support

- 1982 saw Suzuki enter into the Indian market as the first FDI investment into the Indian automotive industry
- After 1991, the industry has seen many changes like the delicensing of the industry and the allowance of 100% FDI
- In 2006, the government introduced the AMP 2006-2016 with a goal of the auto industry contributing to more than 10% of India's GDP and providing employment to more than 25 mn people
- 2010 onwards, the government launched the National Electric Mobility Plan 2020, AMP 2016-2020, Faster Adoption & Manufacturing of Hybrid & Electric Vehicles (FAME) and better fuel economy standards including the BS-4 emission norms

Investments Hub (2014 – 16) - representative



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Business Growth – OEM & Tier Is

Key Challenges & Gaps Identified by Overseas Customers (OEMs, Tier Is and Aftermarket)

Technology & Innovation	• Indian suppliers lack technology advancement & innovation such *as light-weighting, battery manufacturing, alternative fuel component manufacturing*, *connected car features & digitization of components*. Indian suppliers are not preferred suppliers for products other than forged, cast and machined products • Indian suppliers are unable to provide bundled product solutions (i.e. products for more than 2-3 platforms), thus are not preferred. Also, the same supplier does not cater to both the aftermarket and vehicle sharing
Timely Delivery	• Over commitment on delivery timelines • *Wary to undertake air freight costs, to compensate for under delivery* • Inefficient port handling facility and processes contributing to product damages and rejection • Average delivery time from India is approximate 3-5 weeks (higher than Asian peers), due to infrastructure constraints
Product Quality	• One of the key challenges highlighted by overseas customers is *the inconsistency in the quality of products manufactured* by Indian suppliers • Process and specifications are not the same as that decided during the finalization of the prototype • Indian suppliers do not have the complete certifications nor do they adhere to the emission norms and safety standards as per EU and USA regulations
Price Competitiveness	• Indian suppliers (SMEs) do not have the bargaining power to get bulk prices as their volume requirement could be smaller in comparison to other players in the industry** • There is limited availability of certain raw materials/grades such as EPDM rubber** & steel** • The overall cost of the product is higher in comparison to other competing countries. For the aftermarket, Indian components are at *times 10-12% more expensive than its competitors* • Indian supplier are at least 5-6% more expensive than their competitive peers in China, Thailand and in some cases Indonesia
People & Culture	• Lack of cultural integration poses a big challenge between overseas customers and Indian suppliers • *Response time on quotations etc. is very low* • Style of marketing products is not as per international standards • *Constant apprehension to take risks related to claims and warranties* • Mindset to want to invest back into the business is lacking

***As heard by the suppliers in India*

Do's & Don'ts – For Indian suppliers

Do's		Don'ts	
Employ a quality process audit mechanism like the VDA 6.3 employed in Germany	*will help OEMs and Tier I customers, gain confidence in the product quality and ability of the supplier to deliver through strong internal processes*	Try not to over commit on timelines	*will reduce the trust between the customer and the supplier and deteriorate the perception of Indian suppliers in foreign markets*
Set up dedicated export divisions with expat representations for marketing and business development	*will increase sales as it will help eliminate the people and culture gap with foreign companies*	Avoid hiring employees in the sales and marketing team that are not open to cultural integration	*will help to increase the conversion rate of business development initiatives*
Invest in availing of product insurance towards recalls	*will help reduce liability in case of recalls etc.*	Suppliers should avoid to sell in countries without understanding the local requirements such as fuel emission norms, quality compliances, warranty claims, etc.	*Indian suppliers will be seen as suppliers wanting to push their product rather than offer information based solutions to customers*
Undertake efficient project management from the stage of confirmed orders to delivery	*will help international customers gain confidence and increase sourcing*	Avoid using second hand machines that have crossed their specified lifetime for the production of goods, especially meant for exports	*these machines will not function at the specified cycle time, thus leading to a miss match in the capacity utilization to production ratios*
Invest in technology & innovation like light weight materials, battery manufacturing, 3D printing, etc. to provide innovation based products to customers	*will help in being more competitive on account of technology & innovation*	Avoid cost cutting on expenses such as repair and maintenance	*Life of plant and machinery will be hampered, if not maintained leading to larger capex in the long run*
Undertake quality checks, as desired by the international suppliers, to make sure that the rejections are not on account of quality at all	*will help in providing products with consistent quality*	Avoid entering countries such as USA and Russia without a trading arm (including warehousing) in the respective countries	*will help customers gain confidence in foreign suppliers if they have a local presence or trading arm*
Invest in marketing events like trade shows and exhibitions in all countries which one wishes to capture through exports. Customers wish to see the presence of Indian suppliers	*will help in showcasing the products in the market and introducing foreign companies to Indian suppliers and their products.*	Avoid refraining from air freighting shipments if delays in delivery times are expected	*although it will impact the absolute profitability in the short term, it will show commitment on the suppliers behalf and could result in strengthening the relationship with customer*

Business Growth Strategy – OEMs & Tier Is
Key components which should be considered for sale while entering the respective countries in the short, medium & long term

Short Term

1. Develop light weighting prototypes
2. Cater to the following product categories in the short term

- *Body panels*
- *Wheel hubs*
- *Brake pads*
- *Steering parts*
- *Infotainment systems*
- *Rubber components*
- *Exhaust system*
- *Fuel systems*
- *Climate control (HVAC)*

USA

Supply small to medium components to Tier I suppliers in Mexico

Mexico

Medium Term

1. Develop casting and forgings for cold weather countries
2. The following product categories could be catered to in the medium term

- *Brake discs*
- *Suspension parts*
- *Steering parts*
- *Exhaust Systems*
- *Clime control (HVAC)*
- *Tires*
- *Shock absorbers*
- *Brake pads*

Russia

1. Tap opportunities related to the export of engine components made by the ductile iron technology in place of sheet metal
2. The following product categories could be catered to in the medium term

- *Hydraulics*
- *Transmission parts*
- *Axles*
- *Mitsubishi Fuso K2*
- *components*
- *Crankcases*
- *Clutch housing*

Japan

Consortium of Indian suppliers to pitch to Tata (JLR) in order to cater to the entire region

Slovakia

Tap OEM manufacturers like SEAT to gain access into the Spanish market and collaborate with local suppliers (act as a Tier II)

Spain

Long Term

1. Target OEMs with product range including light weighting technology products
2. The following product categories could be catered to in the long term

- *Brake drums & pads*
- *Electric motors*
- *Shock absorbers*
- *Electric heaters*
- *Electric pumps*
- *Electronic controllers*

Germany

1. Set up subsidiary in Brazil, export components to cater to the Argentina and the rest of Latin America market
2. The following product categories could be catered to in the long term

- *Fuel systems*
- *Battery fuel cells*
- *Climate control (HVAC)*
- *Interiors & accessories*
- *Suspension components*
- *ADAS sensors*

Brazil

1. Set up subsidiary in Russia, export components to then cater to the CIS markets
2. The following product categories could be catered to in the long term

- *Climate Control (HVAC)*
- *Seating Systems*
- *Interiors & accessories*
- *Infotainment*
- *systems*
- *Wheel hubs*
- *Tires*

Russia

Business Growth – Aftermarket

Do's & Don'ts – Aftermarket

Do's

Offer bundled product solutions (i.e. products across multiple platforms)	*will help in acquiring customers as aftermarket players are looking to tie up with suppliers who can cater to a range instead of just a few platforms and type of vehicles*
Diversify their customer base to sell to both OEMs, local service stations and body shop centers	*presence across all channels of distribution in the aftermarket space, would help in greater penetration*
Set up dedicated export divisions with expat representations for marketing	*could increase the size of order booking as it will help eliminate the people and culture gap with foreign companies*
Collaborate with other suppliers for bulk purchasing of raw materials and joint warehousing*	*will directly increase the bottom line because of reduced COGS and reduce the delivery timelines due to access to warehousing*
Invest in marketing events like trade shows and exhibits	*will help in showcasing the products in the aftermarket platform*
Cater to components that can withstand cold weather conditions in Russia and Canada	*will help aftermarket players penetrate the aftermarket in Russia and Canada*
Reduce the buildup of inventory by identifying platforms and their lifespan of those platforms in their respective countries	*will help in increasing operational efficiency*
Conduct research on the available export incentives and avail of the same	*will help in working capital optimization*

Don'ts

Avoid over committing on delivery timelines	*will increase the trust between the customer and the supplier*
Avoid hiring employees in the sales and marketing team that are not open to cultural integration. This is a key requirement for exports business development	*will help to increase the conversion rate of business development initiatives*
Avoid offering limited product solutions	*will help acquire customers as they are looking for bundled solution from every supplier*
Do not refrain from air freighting shipments if delays in delivery times are expected	*although it will reduce profitability in the short term, it will show commitment on the suppliers behalf and could result in long term growth of the relationship with the customer*

Country Specific Growth Strategy – Aftermarket

Short Term

Focus on the aftermarket for the identified platforms

USA

FORD
- *Ford Ecosport*
- *Ford Transit*

HARLEY DAVIDSON
- *Harley Davidson Street*

HONDA
- *Honda Accord*
- *Honda CRV*

HYUNDAI
- *Hyundai Elantra*
- *Hyundai Santa Fe*

MERCEDES BENZ
- *Mercedes Benz Sprinter*

TOYOTA
- *Toyota Corolla*
- *Toyota Tundra*

Focus on aftermarket for the platforms identified as domestic growth is low

Brazil

FORD
- *Ford Ecosport*

RENAULT
- *Renault Duster*

ROYAL ENFIELD
- *Royal Enfield Bullet 500*
- *Royal Enfield Classic 500*
- *Royal Enfield Continental GT*

TOYOTA
- *Toyota Corolla*

Focus on aftermarket products for the platforms identified as market is extremely unorganized

Russia

FORD
- *Ford Transit*

HYUNDAI
- *Hyundai Creta*
- *Hyundai Solaris*

KIA
- *Kia Rio*

LADA
- *Lada Granta*
- *Lada Largus*
- *Lada Vesta*

MERCEDES
- *Mercedes Sprinter*

RENAULT
- *Renault Duster*

VOLKSWAGON
- *VW Polo*

Tap into after-market for the following platforms

Slovakia

RENAULT
- *Renault Kangoo*

SKODA
- *Skoda Fabia*
- *Skoda Octavia*
- *Skoda Rapid*

VOLKSWAGON
- *VW Golf*

OTHERS
- *Peugeot Bipper*
- *Honda CBF*
- *Suzuki Intruder*

Short Term

Focus on aftermarket products for the platforms

Spain

FORD
- *Ford Ecosport*

SKODA
- *Skoda Fabia*
- *Skoda Rapid*

VOLKSWAGON
- *VW Polo*
- *VW Golf*
- *VW Vento*

YAMAHA
- *Yamaha XMAX 125*
- *Yamaha XMAX 300*

OTHERS
- *Nissan NV200 Largo*
- *Honda SH 125*

Focus on aftermarket products for the platforms

France

KAWASAKI
- *Kawasaki Z650*

RENAULT
- *Renault Captur*
- *Renault Clio*
- *Renault Duster*
- *Renault Fluence*
- *Renault Kangoo*
- *Renault Trafic*

YAMAHA
- *Yamaha NMAX 125*

OTHERS
- *Puegot 208*
- *Triumph Street*

Focus on aftermarket for the following platforms as the majority of the products are supplied by China & Taiwan

Mexico

HARLEY DAVIDSON
- *Harley Davidson Street 500*
- *Nissan NV200 Largo*
- *Chevrolet Aveo*

HONDA
- *Honda City*
- *Honda CRV*

VOLKSWAGON
- *VW Vento*

Focus on supplying aftermarket parts to local dealers in South Korea for local brands

South Korea

HYUNDAI
- *Hyundai Elantra*
- *Hyundai i10*
- *Hyundai i20*
- *Hyundai i30*
- *Hyundai Xcent*

HYOSUNG
- *Hyosung GV 125 C*
- *Hyosung GT-65R*

SSANGYONG
- *Ssangyong Rexton*

Country Specific Growth Strategy – Aftermarket

Medium Term

Tie up with Amazon for exclusive agreements to tap aftermarket via e-commerce

USA

Focus on the aftermarket for the platforms identified

Germany

AUDI
- *Audi A4*

BMW
- *BMW 3 series*

MERCEDES
- *Mercedes C Class*

VOLKSWAGON
- *VW Caddy*
- *VW Golf*
- *VW Jetta*
- *VW Passat*
- *VW Polo*

YAMAHA
- *Yamaha MT07*

OTHERS
- *Kawasaki Z900*
- *KTM 690 Duke*

Focus on supplying aftermarket parts to local dealers in South Korea for foreign brands

South Korea

BMW
- *BMW 3 series*

CHEVROLET
- *Chevrolet Beat*
- *Chevrolet Spark*

FORD
- *Ford Explorer*

MERCEDES
- *Mercedes C Class*

VOLKSWAGON
- *VW Golf*

Long Term

Focus on the aftermarket for the platforms identified

Japan

HONDA
- *Honda Fit*
- *Honda N-Box*
- *Honda Siente*

SUZUKI
- *Suzuki Xbee*

TOYOTA
- *Toyota Acqua*
- *Toyota Dyna*
- *Toyota Hiace*
- *Toyota Prius*

OTHERS
- *Daihtasu Move*
- *Nissan NV200*
- *Isuzu Forward*

Opportunity : ~25Mn vehicle units are exported from India each year. Replacement parts for these exported units forms the base of the opportunity in the aftermarket segment

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Inorganic Growth – M&A, JVs & Technical Alliances

Do's & Don'ts – Mergers & Acquisitions

Do's

- Conduct a detailed diligence on the target company
- Conduct a detailed diligence on the target industry and its projections for the long term
- Understand the strategic reasons for making the acquisition
- Pose as a customer to the target. Understand what the company offers and how they deal with their customers
- Talk to current customers of the target and understand from them their future plans with the target
- Think about synergies that could be developed through the acquisition of the company
- Talk to the staff and make sure you get their buy in while retaining the talent that you need

Don'ts

- Do not be dismayed by the sellers unrealistic price expectations
- Do not get too attached to the target, and understand that there could be other alternatives out there as well
- Do not assume that you know what is best for the target in different countries. Acclimatize yourself with the culture of the target company by interacting with the current staff and listening to them

Do's & Don'ts – Joint Ventures

Do's

- ❑ Collaborate with a company that has shared values
- ❑ Define the mission and vision of the collaboration
- ❑ Alignment of promotors is key*
  ** applicable for family promotor driven organizations*
- ❑ Collaborate with a company where you see significant value in the relationship
- ❑ Foreign companies typically prefer holding the majority stake in the new venture. This should be negotiated once you can demonstrate "what you can bring to the table"
- ❑ Clearly define the roles of both parties
- ❑ Conduct a detailed diligence and background check on the partner company
- ❑ Understand the strategic reasons for making the partnership

Don'ts

- ❑ Do not think of a partnership as a short term relationship
- ❑ Do not collaborate with a company who's values are not aligned with the values of your company
- ❑ Do not collaborate with a company that has lower standards of customer satisfaction
- ❑ Do not collaborate with a company without understanding the management, their principles and values and what the company stands for

Do's & Don'ts – Technical Alliance

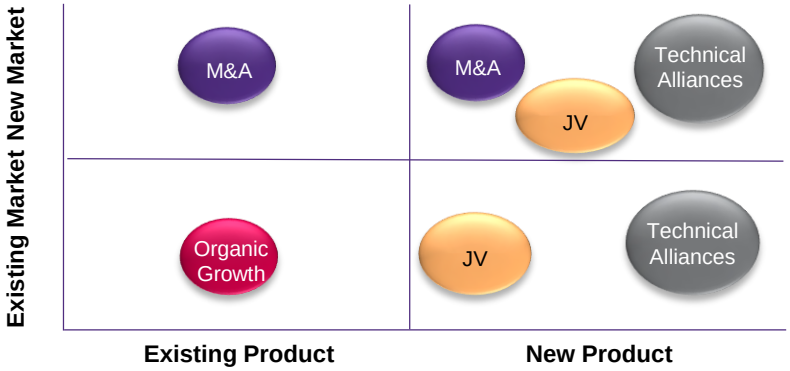
Do's

- In most collaborations, the foreign partner prefers keeping the technology under their control. Focus on indigenizing the technology through the collaboration
- A management fee should be structured and negotiated for against the royalty that the company is expected to pay the partner
- Negotiate the scope of the technical alliance very carefully. Only those products should form a part of the scope which you wouldn't want to undertake another alliance for, or supply individually
- For the products not in scope, no non-compete should be applicable. If a non-compete is applicable, then jurisdictions should be defined
- Trust has to be established for the success of the technical alliance

Don'ts

- Do no hesitate to show willingness towards joint efforts of product testing making improvements and go-to market strategies along with the technical alliance partner

Strategy for Mergers & Acquisitions, Joint Ventures & Technical Alliances



Medium Term

M&A	Joint Venture	Technical Alliance
USA: Acquire distressed assets as identified	USA: Tie up with Amazon to tap aftermarket	France: Alliances for disruptive technology access
Canada: Acquire small regional companies to acquire advanced technologies	Germany: JVs for technology such as exhaust gas recirculation, nitro carburizing, 3D printing	Russia: To develop technology in areas of Nano coating, to cater to products for extreme cold weather
	Mexico: JV to service TIs and develop supply chain	Canada:

M&A stands for Mergers & Acquisition ; JV stands for Joint Ventures

Short Term

M&A	Joint Venture	Technical Alliance
USA: To develop light weighting technology	Japan: JV to get access to technology around iron casting through automatic squeeze molding lines, forging via 6300T presses and machining on fully automated die casting lines	USA: To develop light weighting technology
Germany: Acquire distressed assets as identified		South Korea: Enter into technical alliances with Tier 1s to enhance technical knowhow and expertise

Long Term

Technical Alliance
USA: Collaborate with startups to get access to technologies for disruptive tech innovation

Case Study

Case Study: China

China: Supplier Categorization

1 Categorization

Exporting enterprises are divided into five categories – AA, A, B, C, & D. Enterprises in each category face different export measures. In essence, AA and A get facilitated with management facilities to ease the process of export compared to C and D.

- Enterprises that fall under the **AA and A** get custom clearance facilities. Apart from this, AA enterprises get appointed staff to ease the process, and the release of goods on confidence principle, and get inspection exemptions
- **Category B** enterprises face the conventional management measures
- **Category C** and **D** enterprises on the other hand face strict management measures for the processes of exportation

- ✓ Identifies weak suppliers who may require constant monitoring
- ✓ Motivates suppliers to strive for better performance
- ✓ Imposes a mechanism to monitor and processes in place

A enterprises

A category enterprises receive the following benefits :

- Custom officers arrive on site to carry out inspection
- Advanced custom declaration services are provided
- Advanced priority is provided throughout the process (i.e.: handling registration formalities, alteration and cancelling formalities, hosting custom declaration training
- Implementation of ”waiving custom duty deposit” and “nominal payment for custom duty deposit”

AA enterprises

AA category enterprises enjoys more benefits :

- Release of exporting goods on confidence principle
- Dedicated staff is appointed to ease the process of export and processes involved (i.e.; handling of custom clearance problems)
- Direct transmission and availability of electronic information for custom declaration form is present

B, C, & D enterprises

Enterprises that fall in the B, C, and D categories face the following measures :

- Category B enterprises face the conventional management measures without any additional benefits
- Category C and D enterprises on the other hand, experience strict supervision by the Customs for the processes including checking documentation, inspection of custom clearance.

Case Study: China

China: Export Incentives

1 Processing Trade

Processing trade refers to the business activity of importing all or part of the raw and auxiliary materials, parts and components, accessories, and packaging materials from abroad , using it to manufacture and exporting the finished products

Benefits

- Under the processing trade administration, payment on tariffs and tax on imports for material and parts imported can be deferred by Customs irrespective of whether these parts or materials are being purchased with foreign exchange or are supplied from overseas
- The enterprises are exempted from the VAT and consumption tax on processing trade i.e. **no** consumption tax have to be paid on the exported goods
- SMEs with taxable income less than Rmb100,000 are taxed 20% lesser rate on 50% of their income

If no exemption is offered then the enterprises have to pay the following amount:

- ✓ The consumption tax depends upon the value of the raw materials used and is filed and paid monthly. It can range from 1-56%
- ✓ The standard rate of VAT in China is 17%.

2 HNT (High & New Technology) Enterprises

State supported enterprises of new and high technologies (HNT) ***are taxed at a 15% lesser rate (Compared to the standard 25%)*** irrespective of the headquarters and investment type of the company.

The HNT certificate is to be renewed every 3 years after approval. The HNT program ensures that foreign enterprises follow the Chinese Industrial Policy Goals by forcing them to manage their global corporate IP structure.

1. Presence in China for over a year
2. Conduct R&D regularly, and convert intellectual property (IP) developed in products and services
3. Conduct business in the HNT sector
4. HNT enterprise should dedicated a minimum of 30% of its workforce with at least an associate degree and 10% of its workforce in R&D services
5. Invest 3-6% of the revenue of the HNT enterprise should be dedicated to R&D activities
6. Earn more than 60% of total revenue from HNT product and services

3 Grants

Grants : The municipal government provides a hefty grant of 30,000 RMB (approximately USD 3,500) if the following conditions are met:

1. The yearly volume of export should be at least USD 10 mn or more. The Actual export growth in the exports should be more than 25% as compared to the last year
2. A yearly export volume of such an enterprise must be at least USD 5 mn. Its actual export growth must be more than 40% over the last year, and it must have inward remittances earned from exports of at least 80%

Case Studies from India

1

Supplier specializing in forging, casting and machining

underwent financial crisis due to over leveraging of business

- customer was king – supplier air freighted product to avoid delays even though it resulted in a hit to the bottom line
- quality concerns were prevalent because of the low investment of capital in maintenance capex
- export business was lost to Chinese suppliers as they offered the same product at a 10-15% cheaper rate

2

Supplier specializing in forging

established a global footprint across Europe, North America & China

- warehouses were set up in foreign countries to improve delivery timelines
- training programs related to cultural integration were conducted for the sales and marketing department
- second hand machines were used for production
- samples were rejected >25 times for new export business, due to quality concerns

3

Supplier catering to the domestic and international market across OEMs, suppliers and aftermarket segments

established a global footprint and strong local aftermarket presence

- provided bundled packages for multiples platforms to the local aftermarket
- diversified their product portfolio in the wake of disruptive technology to now provide products for connected cars like sensors and cameras
- some export business was lost to Indonesian and Thai suppliers as they offered the same product at a cheaper rate

4

Supplier looking to increase its profitability by venturing into exports

increased export share of business from 5% to 20% in the past 5 years

- gained trust of a foreign customer by acquiring a local company in USA, developed the product with the customer through the local company and supplied the product to the customer from the local company for 2 years
- with the trust gained over the period of time, the customer was confident and procured the same product now from India with the "made in India" stamp
- initially tried to sell directly to the customer via the parent company and was unsuccessful

- air freight products to offset delays in deliveries
- have a dedicated export division with culturally integrated personnel
- invest in warehousing in foreign countries
- provide bundled packages catering to multiple platforms for the aftermarket
- diversify product portfolio to cater to disruptive technology

- avoid cost cutting in repair and maintenance expenditure
- cater to both the OEMs and local dealers and service stations for the aftermarket
- avoid usage of second hand machines for production of goods for exports
- do not refrain from conducting stringent quality check on goods for exports
- do not use the same production line for domestic and export products
- do not enter certain markets without a local presence in the country

Solutions & Roadmap

Solutions

1 Government of India

- Roll out of export incentives which (a) provide protection to exporters, against risk of customer non -payment and warranties trigger (b) replaces MEIS, and reduce manufacturing costs — Regulatory framework
- ICD Customs to function 7 days and 24*7 hours — Regulatory framework
- Reduction of import duties on non available Raw materials such as (a) High Speed Steel; (b) Lithium; (c) EPDM rubber etc. — Regulatory framework
- Reduction on interest costs — Regulatory framework
- Enhance FTAs with corridor countries such as Mexico, Poland and Slovakia — Regulatory framework
- Financial instruments should be available to the industry — Regulatory framework

2 ACMA

- ACMA "Enhance Globalization Program" should be rolled out
- Conduct exchange programs between Indian suppliers and OEMs overseas — Skill development
- Online portal for logistics consolidation to be implemented
- Mobilize access of companies like Power2SME for bulk purchasing of raw materials, to the suppliers — ACMA image
- Invite experts from institutes across the world for skill development across technologies and processes — Skill development
- Roll out backward integration and vendor development program between Tier I and Tier II
- Participate in trade shows as identified in line with Short, medium & long term strategy — Business development (Aftermarket)
- Apply for membership to ECCP (European cluster collaboration platform) — Business development (OEM) + ACMA Image

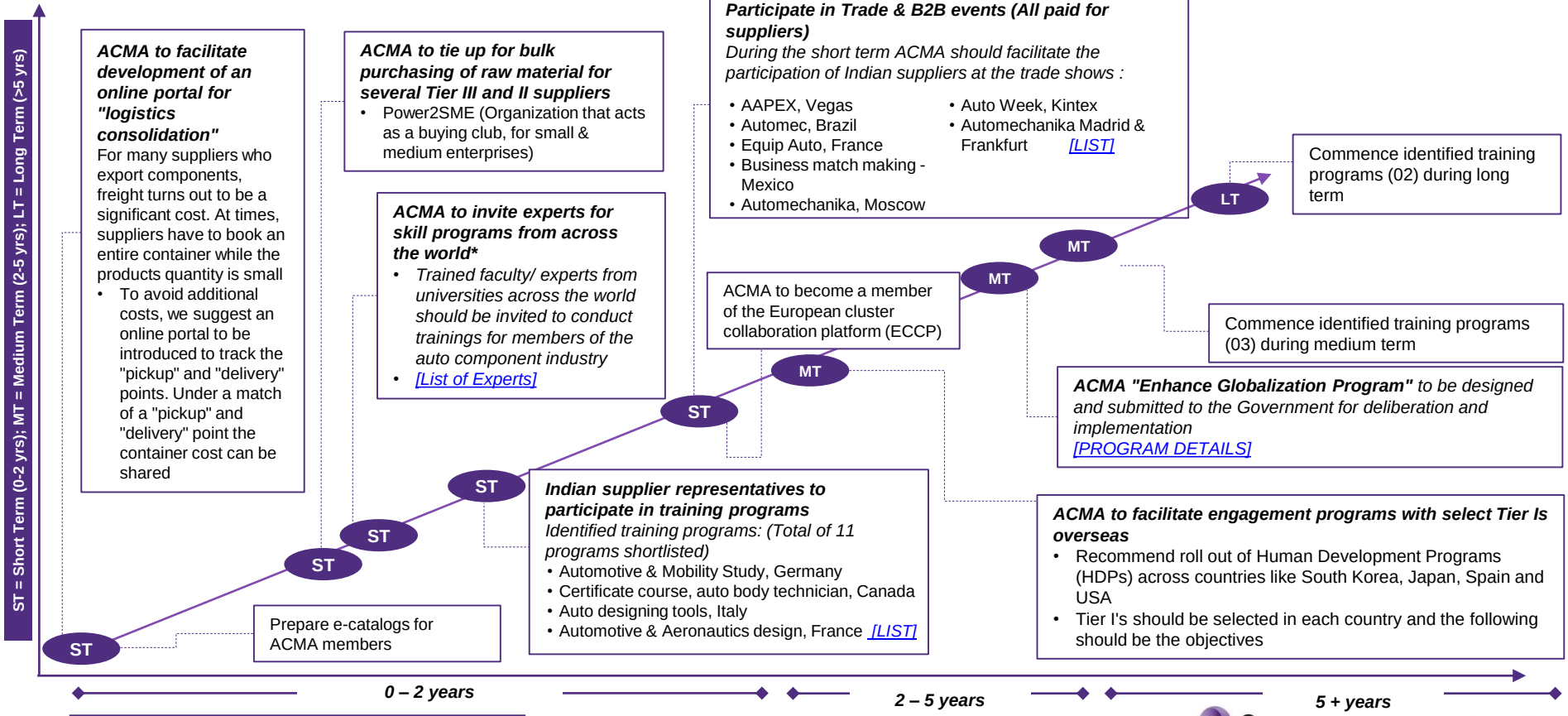
3 Suppliers (Tier I and II)

- Get the IATF 16949 certification — Business development
- Acquire or Collaborate for Technology & Innovation with identified startups across the world — Technology acquisition
- Approach the aftermarket distributors/retailers with bundled solutions including multiple platformm products — Business development
- Establish trading arms in recommended countries, as per short term roadmap — Business development
- Invest to acquire capabilities related to component manufacturing, with nano coating technology — Technology acquisition
- Setting up of dedicated export division — Business development

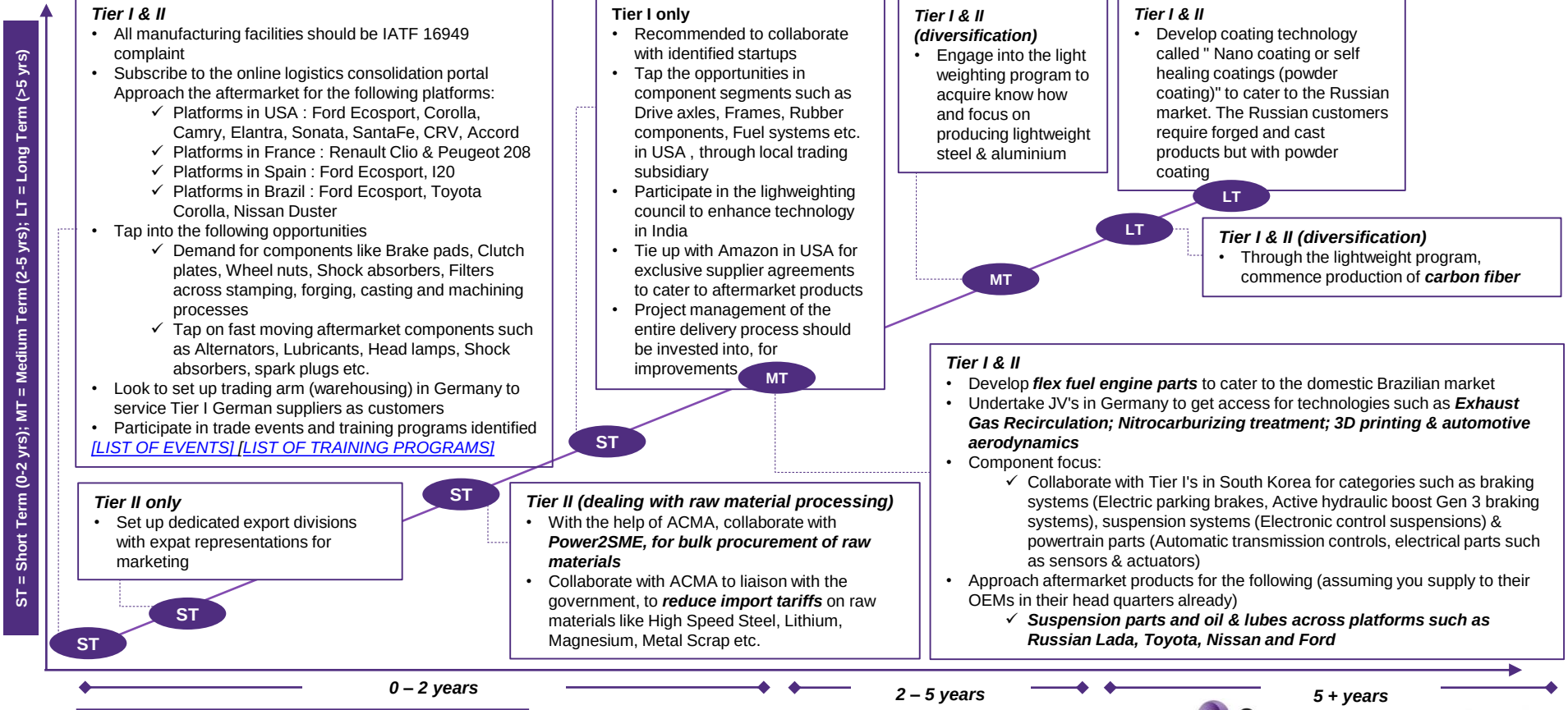
4 OEMs

- Forecasting of order requirements Vs actual schedules to be made more transparent — Business development

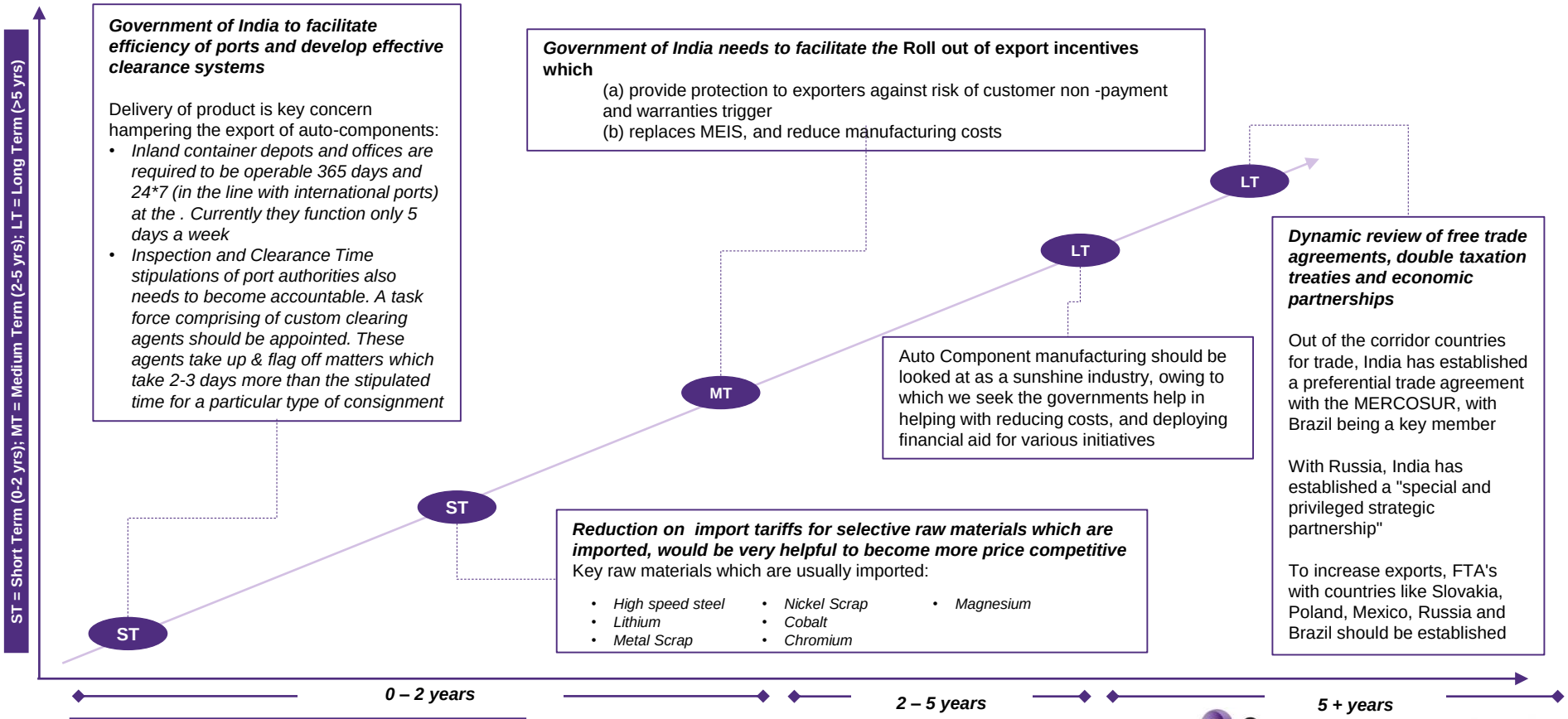
Roadmap for ACMA



Roadmap for Suppliers



Roadmap for the Government bodies



Detailed Report

1 Executive Summary

Growth Story so far

Business Growth – OEMs, Tier Is and Aftermarket

Inorganic Growth – Do's & Don'ts along with approach strategy

Case Studies

Solutions & Roadmaps – ACMA, Suppliers and Government

2 Approach & Methodology

Key countries identified, shortlisted and covered for the scope

3 Gaps & Challenges

Key Challenges – as we heard the OEM/IPO/Tier I/Aftermarket customer say

4 Solutions

Solution recommended for each gap area identified

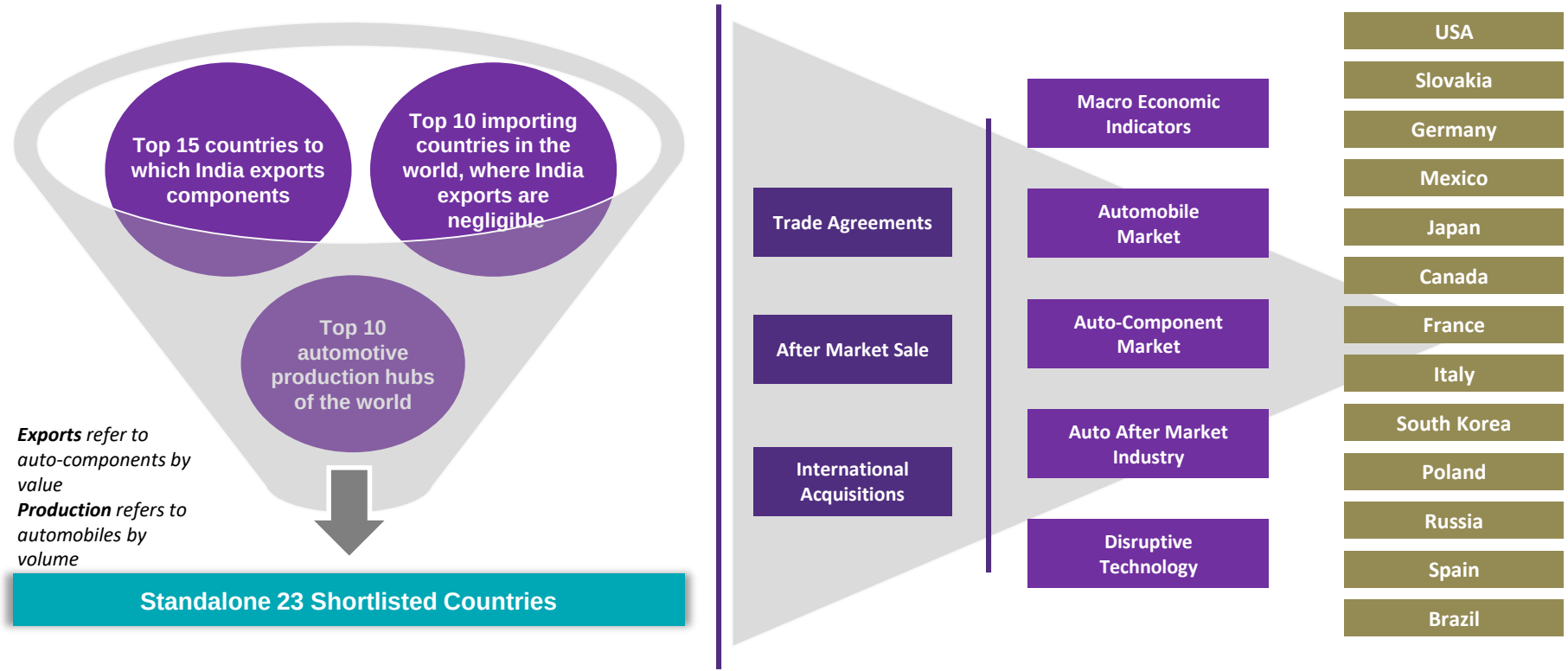
5 What we heard the customer say

By in scope country

6 Country Decks

United States of America
Mexico
Japan

Study Approach



Study Approach

India Study → **Overseas Countries**

1. **HS Code Study**: Deep understanding of Indian exports in order to identify the type of components/ parts being exported to the shortlisted countries. Further, auto-component imports of all 13 countries were analyzed to identify foreign demand as well as India's competitors in these respective markets

2. **Automotive & Auto Component Current State Assessment**: In order to understand the market in terms of demand, supply, trends, technology, drivers and challenges as well as regulations, GT studied all 14 countries (including India) in detail

3. **Identification of Industry players:** OEMs and Auto-suppliers of various segments and product offerings in all 14 countries (including India) were identified on the basis of current state assessment. ACMA supported GT in establishing meetings and primary interviews

Number of primary interviews held (meetings/calls)	73
Interviews with OEMs	23
Interviews with Tier I,Tier II and Tier III suppliers	50
Respondents by auto hubs (zones)	
North (Delhi & NCR)	32
West (Mumbai, Pune, Aurangabad)	29
South (Chennai, Bangalore, Coimbatore)	12

Number of primary interviews held overseas (meetings/ calls)	121		
Brazil	8	Poland	10
Canada	8	Russia	9
France	15	Slovakia	6
Germany	11	South Korea	11
Italy	5	Spain	8
Japan	9	United States of America	16
Mexico	5		

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Gaps & Challenges – What we heard the OEMs and/ or the IPOs say

Product & Process

- Indian suppliers lack technology advancement & innovation
- Currently the Tier I suppliers do not have a variety of products to offer that cater to technologies like light-weighting, battery manufacturing, connected car features & digitization of components
- Most Indian suppliers do not offer modularization based offerings, and thus at times are not preferred

Quality

- Indian suppliers do not undertake adequate quality checks, leading to higher rejection rates. This makes them non competitive at times
- Consistency in maintaining quality is a challenge that exists due to low levels of automation. Inconsistency causes loss in supplier recognition

Pricing

- There are cases where the Indian suppliers in comparison to Chinese or Indonesian suppliers are 6-8% higher in price, and thus non competitive

Capacity

- There are certain approved Tier I suppliers who have inadequate capacity, with no plan of investment in de-bottlenecking either. This causes the OEMs to discontinue imparting any platform orders

Perception

- Indian suppliers over commit and under deliver

People & Culture

- The cultural integration between Indian suppliers and overseas customers/ subsidiaries is very limited
- Response time on quotations is too long
- Style of marketing products is not as per international standards
- Mindset & approach : There are cases of unreasonable price inflation owing to the perception that international brands can afford to pay more
- Constant apprehension to take risks, could be related to warranties or otherwise

Logistics & Infrastructure

- Non scaled infrastructure with respect to shop floor, internal processes, machine handling automation, etc.

Gaps & Challenges – What we heard the Indian suppliers (Tier I and II) say

Product & Process

- Skillset to undertake rubber tooling in India is missing. Current suppliers get tooling done from China or Taiwan
- Inefficient port handling facilities and processes leads to product damage and rejections

Quality

- Quality issues occur due to an underdeveloped Tier II and Tier III segment of suppliers. Tier I suppliers manufacture in line with international standards

Pricing competitiveness

- Raw material for component manufacturing such as Rubber (EPDM), auto grade steel etc. are not readily available in India
- Indian suppliers have to pay for higher conversion costs and higher interest rates in comparison to their peers which leads to losses in orders
- Financial instruments – LC and BG support from government is not available to Indian suppliers the way they are available to competitors like China

Capacity

- Few Tier I suppliers prefer using their capacities to cater to domestic demand, rather than exports. Exports will require investing in new lines and separate teams
- There is a constant mismatch between the OEM demand and final uptake. This mismatch leads to false unutilized capacity levels during the year

Perception

- "Made in India" products are still perceived to be inferior in quality standards

People & Culture

- Number of Indian technical training institutes are not enough for the strength of blue collar workers required. In addition, the curriculum followed in institutes are not related to the skill sets required on the shop floor and otherwise

Logistics & Infrastructure

- Skepticism around investments in capacity and infrastructure due to lack of clarity around EV policy
- Custom clearances could take anywhere from 7 days to 60 days, which causes delivery issues
- Average delivery time from India is ~5 weeks (higher than Asian peers), due to infrastructural constraints

Gaps & Challenges : What we heard the Aftermarket customers and suppliers to aftermarket say

Customer

- Aftermarket distributors have limited access to suppliers. Typically 1-2 suppliers, which restricts the range of products available with the distributors
- Product delivery time is a key challenge
- Indian suppliers dealing with engine and engine parts usually do not deal in other components and vice-versa
- Majority of the suppliers do not provide an integrated model i.e. aftermarket parts as well as vehicle servicing

Supplier

- Lack of financing options
- Access to trained logistics firms is inadequate
- All parts that cater to platforms that get obsolete turn out to be sunk costs for the supplier. To avoid large inventory buildup, suppliers prefer to deal with only Maruti spare parts, due to Marutis large scale adoption
- Aftermarket perception: Since there is no brand, the price has to be low and thus consumers tend to negotiate on price a lot more. This also takes place because of the counterfeit products being sold
- Sustenance of working capital: All suppliers require advances while the payment terms with the customer are typically 4-6 months

Solution & Opportunity

- Deal in aftermarket products that cater to multiple platforms and do not require a company to install, but can rather be replaced at any garage
- Clutches and brake pads should be targeted for the genuine parts segment, not for the unorganized market
- Organized: engine, driveline and transmission parts
- Unorganized: electronics, body and chassis, suspension and braking systems

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Solutions

Gap/Challenge Area

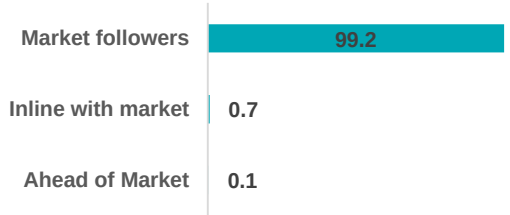
Technology & Innovation

- Indian suppliers lack technology advancement & innovation such as light-weighting, battery manufacturing, connected car features & digitization of components
- By 2030, vehicle manufacturers will need to increase lightweight component levels from 30% to 70% in order to have more efficient engine technology and compensate for electric drive weight increases

Impact

- Indian suppliers are not preferred suppliers for value added products. India is not a preferred sourcing destination for critical components
- OEMs overseas are looking for suppliers who have innovative products that are in line with the future trends of fuel efficiency, low CO2 emission etc. and thus countries like Japan, Germany, Taiwan, USA are preferred sourcing bases
  - This perception also does not help Indian suppliers in bargaining as low end products are outsourced to India

Percentage (%) of respondents who rate India's R&D activities as:



Solution

- ***Develop lighweighting technology in India***
  - Raw material and material costs constitute ~70% of the gross production value in automotive manufacturing
  - A reduction of 100 kgs weight can reduce vehicle fuel consumption levels by around 0.5 liters for every 100 km travelled. For electric vehicles, each kg saved helps extend the range
    - *a) Process technologies* for metallic lightweight construction are the most important
    - *b) Lighweighting construction materials* are needed to be used in manufacturing auto components to reduce production costs, improve production qualities, functionality and increase resilience
- ***Acquisition of technologically innovative startups***
  - *Gluon aiming at IOT from USA*
  - *Oryx focusing on smart sensors from Israel*
  - *CyberCar catering to Blockchain from USA*
  - *Divergent 3D, concentrating on 3D printing from USA*
  - *Fastned & StoreDot aiming at electrification from Netherlands and Israel respectively*

Solutions
How to develop lighweighting technology in India

Step I

Setting up of councils & defining responsibilities

- Council group A comprising of experts in the areas of:
  - Advanced materials
  - Production technology
  - Mechanics of materials
  - Digitization, with material testing
  - 3D printing
- Council group B comprising of a mix of OEMs, and Tier I suppliers in India

- Develop a mutually agreed "Product roadmap" with OEMs who's aim is the reduction of passenger car and 2W CO2 emissions
- Conduct research with experts on the roadmap targeted, identify technical areas of existing strengths and weaknesses within the country

Step II

Tie up with the recommended institutes for research & development

- Aachen Center for Integrative Lightweight Production (AZL)
  - Undertakes transformation of lightweight design to mass production
- Institute of Lightweight Engineering & Polymer Technology (ILK)
  - Conducts research and development projects in resource-saving light weight construction with high material and energy efficiency
- Leichtbau Baden Wuerttemberg
  - The agency facilitates know-how from within the state to promote innovative potential
- MAI Carbon
  - Is a leader in CFRP technology. It collates a host of experts to establish the use of CFRP technology in mass production
- EcoMat (Center for Eco-efficient Materials & Technologies)
  - Monitors and analyzes technologies as a system for industry application purposes

What we heard the overseas customers say!

Focus areas should be	Short Term		Medium Term	
	Lightweight steel & aluminium	Gear sets & IC Engine components	Carbon fiber composites	Smart components

Step III

Create a highly skilled and qualified workforce

- Undertake training programs through identified universities and courses

RWTH Aachen University

The program in structural mechanics and lightweight design is offered by the faculty of mechanical engineering in the RWTH AACHEN University. The prime focus of this program is on Static, Strength, Stability and Dynamic of Lightweight structure along with numerical and experimental investigations

The head of the institute is Univ.-Prof. Dr.-Ing. Kai-Uwe Schröde

Leichtbau Baden Württemberg

The Development Agency for Light weighting in Baden Württemberg offers commercial programs related to lightweight technology. They offer education and training programs related to lightweight technology along with initiating joint projects in the field of lightweight construction

Solutions
Startups that can be acquired to get access to new age technology which can then help India in its journey to globalization

Startup	Country Of Origin	Description	Area of Technology
Gluon	USA	Startup that focuses on the development and use of IoT in automotive vehicles • Provides connectivity within vehicles and helps with monitoring and diagnosing your car with the help of simplified data accessible through apps • Provides a platform through which car owners can connect to the OEMs, auto part suppliers and repair shops	IoT (Internet of Things)
Oryx	Israel	With the future of automotive sensors moving towards AI, the Israeli startup focuses on providing a cheap LiDAR which is essential for a great depth vision performance for autonomous driving • In specifications, it also has a good signal-to-noise ratio (superior than that present in scanning systems) • These LiDARs are made with silicon based light sensing antennas	Smart Sensors
CyberCar	USA	CyberCar codes data to make it secure for sharing at a blockchain operated platform for the connected vehicles. Since the future lies in the cars being run simply on data, CyberCar provides data in the safest way possible allowing zero compromise with data integrity.	Blockchain
Divergent 3D	USA	Using the booming technology of 3D printing, Divergent 3D is a startup that exploits this technology for the production of joints to strengthen chassis for cars by improving the connection of carbon fiber materials • The company aims to produce the first ever supercar "BLADE" that is expected to take 2.5 seconds from 0-60 through the same technology in the future	3D Printing
Fastned	Netherlands	One major challenge that Electric Vehicles face is the lack of proper infrastructure to charge cars in minutes. Fastned aims to solve this issue through the use of its "ultra fast" 350kW charging technology	Electrification
StoreDot	Israel	A startup that is also making advancements in the infrastructure to charge electric cars. With the use of a specific multifunctional electrode, their car charging battery called the FlashBattery is high powered and has a high energy storage. This makes it extremely fast in charging the car batteries within about five minutes preparing the vehicle for travel of up 480 kms	Electrification

Valid as of June 30 2018

Solutions

Gap/Challenge Area

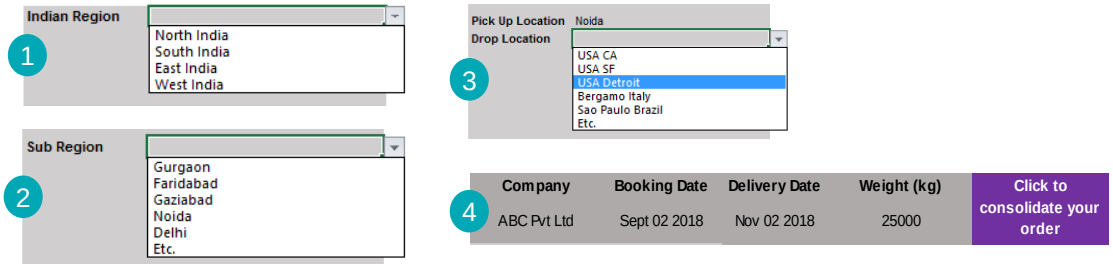
Pricing Competitiveness

- Indian suppliers (SMEs) do not have the bargaining power to get bulk prices as their volume requirement could be smaller in comparison to other players in the industry
- There is non availability of certain raw materials/ grades such as EPDM rubber

Impact

- The overall cost of the product becomes higher in comparison to other competing countries like China
- The loss of one part numbers order book leads to a ripple effect and loss of all potential orders thereafter
- A competitor gets the opportunity to become a sole supplier

Sample



Solution

Tie up for bulk purchasing with

- Power2SME

Non availability of raw materials

For the following list of raw materials, the tariff department of the GOI should be approached to initiate a potential reduction in tariff

- *Carbon Black*
- *High speed steel*
- *Lithium*
- *Metal Scrap*
- *Nickel Scrap*
- *Cobalt*
- *Chromium*
- *Magnesium*

Online portal for "logistics consolidation" leading to price decrease

- For many suppliers who export components, freight turns out to be a significant cost. At times, suppliers have to book an entire container while the products are very small in quantity
- To avoid additional costs, we suggest an online portal to be introduced to track the "pickup" and "delivery" points. Under a match of a "pickup" and "delivery" point the container cost can be shared

Solutions

Gap/Challenge Area	Impact	Solution
Product Quality		
▪ One of the key challenges highlighted by overseas customers is the inconsistency in the product quality manufactured by Indian suppliers ▪ Process and specifications are not the same as the ones decided during finalization of prototype ▪ Indian suppliers do not have the complete certifications required as per EU and USA standards	▪ Once a poor quality batch is detected, the customer does not wish to place any orders in the future with the same suppliers – confidence level and perception get deterred ▪ This is a key reason, due to which suppliers from countries like Indonesia and Taiwan have taken over the wallet share of the Indian suppliers	▪ Certification of IATF 16949 should be mandatory IATF 16949 is the globally recognized quality management standard for the automotive industry. It brings together standards from across Europe and the US and provides a framework for achieving best practice with regards to the design and manufacture of products for the automotive supply chain ▪ Invite experts for skill programs from across the world ▪ Stronger development programs between Tier I and Tier II Understanding the needs and requirements of Tier II & III suppliers by interacting with them on a daily basis Hand-holding Tier II & III suppliers through production processes and educate them about the best practices that are prevalent in the industry
People & Culture		
▪ Cultural integration poses a big challenge between the overseas customers and Indian suppliers ▪ Response time on quotations etc. is too low ▪ Style of marketing products, is not as per international standards ▪ Constant apprehension to take risks related to claims and warranties	▪ South Koreans believe that the Chinese culturally integrate better, which is one of the prime reasons for orders being awarded to Chinese suppliers ▪ The Japanese trust Indians more than the Chinese but culturally feel that China is closer to them than India	▪ Exchange programs could take place with OEMs and select Tier Is overseas ▪ The exchange should take place both ways ▪ Human development programs (HDPs) to be rolled out across South Korea, Japan, Spain, Slovakia and USA ▪ OEMs and Tier Is should be selected in each country and the following should be the objectives ▪ Spending 4 weeks semi annually at the manufacturing plants overseas. Members from the OEMs shop floor to visit India for 4 weeks semi annually ▪ At any given point of the year, one person from each OEM should be in India and one from India should be overseas

Solutions
IATF 16949 detailing – key requirements to be certified

Definition

- IATF 16949 is an internationally recognised quality management standard for the automotive industry which amalgamates the norms from USA and Europe and gives a structure to accomplish best practice with respect to the manufacturing of automotive components
- It is created by the International Automotive Task Force (IATF) which consists of some major OEMs like Ford, BMW, VW, Daimler, PSA etc. along with automotive trade organizations
- The main aim of the certification is to improve the quality of automotive business by reducing the discrepancy in the supply and by emphasizing defect prevention
- The major change in IATF 16949 over ISO/ TS 16949 is that it brings quality management and continual improvement practices into the operations of the company

Advantages

- IATF16949 has become a necessity for the OEMs and the automobile manufacturers for expanding their business in the international market since the certification provides the proof that the business has the required prerequisites to compete in the international market segment
- The certification helps in enhancing brand image along with customer satisfaction. Once certified, the automobile manufacturers are provided with better access to global markets and investment projects
- Since the manufactures have to adhere to certain norms, this increases the consistency, thus making the production more efficient

Requirements

- **Scope**: This includes the scope of the standard and the notes to cover products with embedded software
- **Terms and definitions:** All the terms and definitions for the automotive industry for example accessory parts, challenge parts, manufacturing services are present in ISO 9000:2015
- **Leadership:** Requires top management to identify “process” owners who must be competent and understand their roles in relation to the QMS
- **Support:** Right resources, people and infrastructure should be present to meet the organizational goals. Requires an organization to determine and provide the necessary resources to establish, implement, maintain and continually improve the QMS
- **Performance evaluation:** This organization is required to monitor, measure, analyze and evaluate the methods which are employed
- **Normative references:** All the fundamentals and vocabulary are reference with respect to ISO 9000
- **Context of the organization:** Organize, implement, maintain and improve a quality management system and follow a systematic approach to achieving continual improvement
- **Planning:** Requires the organizations to asses and treat the risks associated with the production. Required to establish measurable quality objectives. Planning of changes which must be done in a systematic manner
- **Operation:** This includes the execution of the plans and processes that enable the organization to meet customer requirements and design products and services
- **Improvement:** The organizations are required to determine and identify opportunities for improvement such as improved processes to enhance customer satisfaction

Solutions
Training Institutes

Country	Name of the University	Name of the Course	Duration	Description
Germany	RWTH International Academy	Vehicle Acoustics - NVH	5 Days- Full time	The program revolves around acoustics of the vehicles that includes noise, vibration, harshness which is very important for the development of vehicles.
Germany	RWTH Aachen University	Automotive and Mobility Studies	26 days	RWTH Aachen University offers an overview of alternatives to combustion engines, with the concepts of future vehicle power trains, including structures of alternative power trains. It also covers alternative fuels, such as alcohol, natural gas and hydrogen, as well as their properties and production
Germany	Vocational school, Berufsschule	Vocational training for Industrial Electronics Engineer	3.5 years	The training focuses on how to operate assembly components, measure electrical parameters, check control systems and program machine controls.
Germany	Vocational school, Berufsschule	Engineer for sanitary, heating and air-conditioning systems	3.5 years	The course offers the following specializations: water, ventilation, heating, environmental engineering or renewable energies. All trainees learn how to work with metal and plastics, i.e. drilling, screwing and welding techniques
Canada	Saskatchewan Polytechnic	Certificate of Auto Body Technician	8 months	The program gives a solid foundation in the knowledge and skills needed to work in motor vehicle body repair and refinishing along with practical training in basic and advanced metal work, bench work and safe working procedures
Canada	Fanshawe College	Vocational training for Motive Power Technician (Automotive)	2 years	This program prepares individuals to pursue a career in the automotive service/repair industry. This program is designed to provide the student with a strong basis in trade-related academics, safety training, and the foundation technical skills needed for employment in the automotive industry
Canada	Ogvewoh Skills and Trade Training Centre Information	Automotive Technology program	2 months	The individuals are trained about tools and equipment, brakes and anti-lock brake traction control system ,suspension, differentials, electrical system and computerized controls, engine installation, disassembly and troubleshooting, ignition system, fuel system, emission system – air care, general maintenance, transmissions, and tires, drive lines and power trains, exhaust, cooling, and steering.

Updated as of June 30 2018

Solutions
Training Institutes

Country	Name of the University	Name of the Course	Duration	Description
Canada	Conestoga college	Training program for automotive repair/service	1 year	This program is designed to provide the student with a strong basis in trade-related academics, safety training, and the foundation technical skills needed for employment in the automotive industry
USA	WyoTech, Blairsville and Laramie Campus	The Automotive Technology core training program	6 months	This program will focus on Basic Engine Management Systems, Drivability , diagnostics, Drivetrain Systems, Chassis.
USA	Lone Star College	Automotive Technology program	336 hours	The automotive technician certificate provides insights into repair and maintenance services of automobiles and knowledge related to Electrical as well as brake systems is also covered in the program.
Japan	Nissan Automobile Technical College	Vehicle Mechanics program	2 years	This institute offers a variety of vocational courses which give the students an opportunity to get hands on experience in factories.
Italy	Scuola politecnica di design	Training in Car Design Tools	10 months	The One Year Course in Car Design Tools is designed to transfer a complete understanding of automotive strategy, planning, and the relevant design techniques
Italy	Istituto europeo di design torino	Summer Course in Car Design	3 Weeks	The main focus of the training program is on automobile design and Development of technical drawing skills.
France	ESTACA	Automotive and Aeronautics Design Program	4 months	The program teaches students automotive designs and provides them with means to achieve high quality and reduction in costs along with latest skills to achieve excellence in automotive design.

Updated as of June 30 2018

Solutions

Gap/Challenge Area	Impact	Solution
Infrastructure incapability ***Physical Infrastructure*** ▪ Custom clearances could take anywhere from 7 to 60 days ▪ Average delivery time from India is ~5 weeks (higher than all its Asian peers) ▪ Non scaled infrastructure with respect to shop floor, internal processes, machine handling automation etc. ***Financial Infrastructure*** ▪ Non availability of support towards bank guarantees and any other form of financial guarantees	▪ Delay in delivery of products causes customers to chose suppliers from other countries as their preferred option for sourcing ▪ OEMs cannot afford for their lines to close, thus timely delivery is essential for vendor selection ▪ As per the world Bank index for customs clearance and performance, India is ranked at the 42nd position ▪ Higher risk taking appetite of competitor suppliers who have the support system around financial infrastructure	▪ ***ICD working days*** ○ Inland container depots should be functional at the ports on a 24X7 basis. Today the ICD's are functional only for 5 days ○ A task force comprising of custom clearing agents should be appointed. These agents raise matters which take 2-3 days more than the stipulated time for a particular type of consignment ○ ACMA to categorize companies based on the ACMA "Enhance Globalization Program' ○ ACMA to also liaison with the government to get funds that it can utilize as financial incentives for companies eligible by the EGP ○ Companies that are in the top tier of this categorization should be eligible for the financial incentives
General improvements	***Improve material use efficiency : Recycling*** Internal recycling is the reuse of the offcuts within the company's processes whereas external recycling is the sale of generated off cuts (& scraps) to other press part companies for their consumption ***Energy Saving*** Installation of natural lighting fixtures, energy-efficient lighting, efficient use of compressors	▪ ACMA to formulate a design for a "Enhance Globalization Program" ▪ *The design shall then be presented to the Government for implementation*

Solutions
ACMA's "Enhance Globalization Program" design

ACMA's shall undertake the formulating to design an "Enhance Globalization Program" that aims to aid and recognize suppliers in the business of auto-component exports basis categorizations.

The design of the program will be presented to the Government of India for deliberation and implementation (upon agreements)

Sample Program Design

- **Export business of component suppliers to compromise at least x% of total turnover and growing at y% for two consecutive years**
- **All Tier I and Tier II suppliers need to undertake vendor relationship and training programs with their respective vendors**
- **Undertake technology integration of products or supply chain which meets EURO VI norms or IATF 16949**
- **Partnerships or technological collaborations with overseas customers or competitors will be given significant weightage**

→ **Points system applicable on each KPI defined to obtained the scorecards** →

Following are the key aids and benefits:

- ❖ All expense paid trip to at least two trade events where ACMA participates
- ❖ Preference for custom clearances
- ❖ Preference for insurance cover towards product damage and warranty claims

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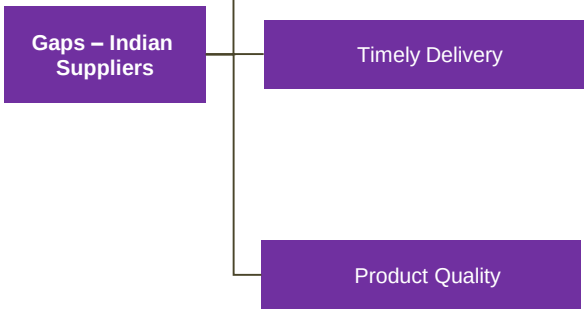
Japan

Brazil – Chinese suppliers are preferred by Brazilian Tier I or OEMs because China's delivery lead time is shorter than India's

Area	Description	Impact
Gaps – Indian Suppliers		
Timely Delivery	▪ Indian suppliers typically overcommit and under deliver. The products do not reach on the target date 80% of the time. The Brazilian market has large import duties and taxes on products, which also means that the products are generally stuck at customs for a longer duration ▪ Countries like China have circumvented this problem by setting up warehousing facilities in Brazil	▪ Chinese suppliers are preferred over Indian suppliers
Pricing competitiveness	▪ In 2017 São Paulo's Environmental Agency announced the implementation of Euro VI regulations. Heavy duty vehicles will need to comply with these standards by 2019 and motorcycles by 2020 ▪ The local OEMs and suppliers are looking for parts which are compliant to these norms. China and Thailand have proven to be more price competitive than India	▪ Demand for parts which are Euro VI compliant ▪ Aftermarket parts for all platforms supplied prior to the shift in technology
Product quality	▪ ~90% of the vehicles sold in Brazil are flex fuel vehicles (capable of running on either gasoline or ethanol in any proportion) ▪ Indian products (specially engine parts) are not designed and equipped for flex fuel vehicles	▪ USA and Germany are preferred as suppliers for flex fuel components ▪ Indian companies such as Hero Motocorp, have been developing engines specifically for Brazil, to meet the flex fuel demand

Source: Primary interviews

Canada – Cultural differences, coupled with geographical disadvantages and inadequate product quality contribute to low penetration levels of Indian auto component suppliers in Canada



Area	Description	Impact
People & Culture	▪ Indian suppliers do not undertake research to understand how the Canadian auto component industry works and its local market requirements ▪ Indian suppliers do not have enough of a presence in Canada and are not present in Canadian based events showcasing potential technologies and solutions required for building potential partnerships with Canadian OEMs and suppliers	▪ Lower Canadian market penetration across OEM and Tier I suppliers focusing on future technologies & collaboration ▪ Lower profitability as due to limited access across commoditized segments
Timely Delivery	▪ Indian suppliers are perceived to make commitments that they don't adhere to when it comes to delivery timelines ▪ The internal infrastructure in India, especially at the ports and customs causes delays in the stipulated timelines. Apart from this, the internal infrastructure of China is far better than that of India ▪ India also suffers from a geographical disadvantage when it comes to competing with countries like US and Mexico from where Canada imports 75% of its materials	▪ Negative perception of Indian suppliers in terms of adhering to delivery timelines
Product Quality	▪ The quality of the products supplied from competing countries like China and US are more consistent than the quality of products supplied from India ▪ The Indian suppliers capability of matching prototypes to the specifications provided at the time of pre-sampling is very low ▪ Inadequate product quality also includes issues like inconsistency in product quality	▪ A negative perception about Indian suppliers and their capability to deliver consistently to the Canadian OEMs and suppliers ▪ Lower Canadian market penetration across OEMs and Tier I suppliers

Source: Primary interviews

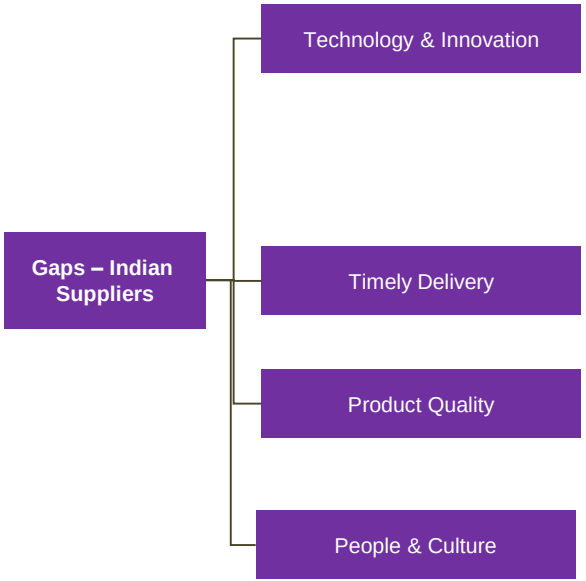
France – Inadequate product quality and compliance with norms like Euro VII, UNECE and TS 16949, in addition to lack of technological capabilities to manufacture dual transmissions, electronic exhausts and lithium batteries are the biggest gaps that the French customers face with Indian suppliers

Gaps – Indian Suppliers

Area	Description	Impact
Technology & Innovation	▪ Majority of the Indian auto component suppliers are not able to deliver highly specialized technological components and parts due to the lack of skill set and investment in mature technology ▪ Customers are looking for suppliers with technological capabilities such as (a) dual transmission clutch (b) electronic exhaust systems & (c) lithium batteries	▪ France relies heavily on EU countries, namely Germany, Italy and Spain for highly integrated component solutions and technologically developed components
Timely Delivery	▪ Indian suppliers require almost double the delivery time in comparison to Chinese & other Asian suppliers	▪ French suppliers feel that logistics plays a vital role and prefer Eastern Europe or Turkish suppliers over India
Product Quality	▪ Majority of the French customers seem to perceive India as a low quality production hub. Inspite of this, the customers believe that the Indian suppliers can produce a better quality product than the Chinese. But the Chinese deliver consistent quality with no fluctuations in external PPM's ▪ Most of the Indian suppliers are not able to meet the latest emission standards provided by the European commission (EURO VI) while majority of French suppliers are migrating to EURO VII standards. Further, Indian suppliers do not adhere to UNECE safety standards, nor do the manufacturing processes hold the TS-16949 certification standards	▪ French customers undertake multiple testing and quality audits which leads to a decrease of wallet share for Indian vendors ▪ Euro VI emissions norms, UNECE safety standards and TS 16949 certification should be complied with, else Indian suppliers could continue to lose wallet share
People & Culture	▪ French OEMs have attributed the poor perception of India auto component products to the lack of culture integration and the language barrier	▪ China and Italy are able to bag larger orders (inspite of a language barrier), as they have French speaking members in their marketing & sales teams

Source: Primary interviews

Germany – Lack of domestic presence, along with non-compliant standards in quality is a key concern of German customers. However, overall quality concern is more of a perception gap than an actual gap



Area	Description	Impact
Technology & Innovation	▪ India is perceived as a low cost and low technology based supplier country according to German suppliers. The Indian suppliers do not comply with the safety standards or emission norms implemented in the EU, which are technology driven ▪ The Indian supplier base is traditionally a print to manufacture supplier country instead of an integrated solution provider, whereas German OEMs/ Tier Is have immense opportunity from other LCC countries supported by technical markets such as Mexico or Poland ▪ In some cases, Indian forging and casting suppliers require handholding as they are not able to reduce the weight of the component in line with the shift in dimensions of the components, due to advanced precision technology	▪ Lower German market penetration across OEM and aftermarket segments of Indian products (local presence is a must)
Timely Delivery	▪ The Indian suppliers lose out on German orders to Eastern European countries, as they can deliver supplies in approximate 36-48 hours	▪ German suppliers are able to cater through domestic production or imports from supporting countries where German plants have been set up such as Czech Republic or Poland
Product Quality	▪ With the launch of industry 4.0, German OEMs and association have launched internal processes and quality compliances such as VDA 6.3 audit that multiple leading Indian Tier I suppliers are not aware of, and do not possess the capability skills to meet these requirements	▪ For mass market and low-tech functionality components, German customers prefer Chinese suppliers as delivery is guaranteed. This is in spite of Indian suppliers offering almost the same quality and price
People & Culture	▪ Multiple German OEMs have attributed the poor perception of India to the lack of market/ culture awareness, professional communication skills and global understanding. As per German OEMs, it takes years to build a trustworthy healthy relationship with Indian suppliers as communication in English (especially the dialect and diction) is a big challenge	▪ Germans have established their supplier base in Eastern Europe as the communication and cultural integration is relatively easier

Source: Primary interviews

Italy – Indian suppliers have not been able to provide consistent quality products; setting up a corporate customer center in Italy is vital for gaining market share in the country

Gaps – Indian Suppliers

Area	Description	Impact
Technology & Innovation	▪ Indian suppliers are not able to provide engineered proto-types for multiple segment offerings and lack the knowledge/ awareness with respect to new technology shaping the global industry ▪ Italian customers look at India as a low cost country and depend on the developed auto-hubs for technological solutions	• Lower Italian market penetration across OEM and aftermarket segment of Indian products (local presence is a must)
Timely Delivery	▪ Suppliers in India are hardly able to meet their order deadlines causing bottleneck delays for the Italian customers ▪ Geographic location is a huge disadvantage as well as compared to EU countries and Turkey	• In spite of Indian suppliers offering the same quality and sometimes better costing, Italian suppliers prefer Chinese and Turkish vendors for low-tech mass products as delivery is certain
Product Quality	▪ Indian suppliers are not able to maintain the product quality post bagging the Italian purchase orders. Aspects such as grade change of raw materials, inconsistent product specifications and precision gaps are common factors leading to poor quality ▪ Lastly, Indian product offerings are not line with European standards and norms which set back the demand for Italian customers	• As majority of OEMs in Italy are EU based, their respective home-grown countries play a vital role in supplying components • Italian customers do not provide more than 5-10% of their wallet share to Indian suppliers as trust is extremely inconsistent
People & Culture	▪ Italian customers have a poor perception of Indian vendors in terms of honest communication and understanding of business. Indian suppliers take days to reply or revert on urgent needs ▪ Further, the lack of culture and knowledge integration of Indian vendors makes it harder for Italian customers to gain trust	• Italian customers have established their supplier base in Eastern Europe as work ethics, communication and cultural integration is relatively easier

Source: Primary interviews

Japan – Non timely delivery, inadequate product quality and cultural gaps are the main challenges that Japanese OEMs and Tier I suppliers face with Indian suppliers

Gaps – Indian Suppliers

Area	Description	Impact
Technology & Innovation	▪ Japanese OEMs and suppliers do not look at India as a source of technologically advanced products. Instead, they look at India as a low-cost manufacturing hub	▪ India is looked at as a source for low tech products for which countries like China and Indonesia are already supplying to Japan
Timely Delivery	▪ Indian suppliers tend to overcommit on delivery and usually do not stick to the agreed upon timelines ▪ Geographic location is a disadvantage as well when compared to countries like China, Thailand and Indonesia that are closer to Japan	▪ Suppliers from China, Thailand and Indonesia are preferred ▪ Bad experiences with regard to delivery timelines with Indian suppliers have led to a negative perception of Indian suppliers in the Japanese market
Product Quality	▪ Product quality is one of the largest issues that Japanese suppliers have with Indian products. The tolerance levels of Indian products are not as per the specifications ▪ Second hand machines procured from countries like Japan are used by Indian suppliers. These machines were scrapped in Japan because they weren't producing the required quality and output ▪ Consistency of quality is also an issue with products supplied by Indian suppliers ▪ The whole process might be dependent on one person, and if that person is unavailable, then the whole process is affected	▪ Lower Indian product penetration in the Japanese market as product quality is key for the Japanese ▪ Lower profitability due to limited access across commoditized segments
People & Culture	▪ The cultural gap coupled with the language barrier is a huge deterrent to business between India and Japan ▪ Indians are not capable of understanding the drawings for parts required by Japanese OEMs and Tier I suppliers	▪ Suppliers from China, Thailand and Indonesia where the cultural barriers are lower are preferred over Indian suppliers

Source: Primary interviews

Mexico – Mexican auto component manufacturers are not aware of the products available from India as Indian auto component manufacturers do not invest enough in showcasing their products in Mexico

Area	Description	Impact
Gaps – Indian Suppliers: Timely Delivery	▪ Indian suppliers are known to overcommit and not be able to stick to the stipulated timelines ▪ The internal infrastructure in India, especially at the ports and customs causes delays in the stipulated timelines. Apart from this, the internal infrastructure of China is far better than that of India	▪ Lower Mexican market penetration across OEM and aftermarket segment (local presence is a must) ▪ Delay in shipment time as compared to China
Gaps – Indian Suppliers: People & Culture	▪ Indian auto component suppliers do not have any presence in Mexico because they fail to advertise and market in the Mexican automotive market ▪ As a result Mexican auto component suppliers know very little about Indian component suppliers as they fail to promote their products in Mexico	▪ Chinese suppliers are preferred over Indian suppliers as Chinese companies spend large amounts of money on marketing and advertising in Mexico
Gaps – Indian Suppliers: Price Competitiveness	▪ Currently, there are no FTAs established between India and Mexico. Products exported from India to Mexico are liable to be taxed and therefore will be more expensive than products from countries with which Mexico has already established FTAs	▪ Lower Mexican market penetration across OEM and aftermarket segment as Indian products are more expensive

Source: Primary interviews

Poland – Lack of local presence, and association with regional clusters are key reasons for low penetration of Indian suppliers in Poland and Europe; Poland is a gateway market to Europe attracting significant FDIs from OEMs globally

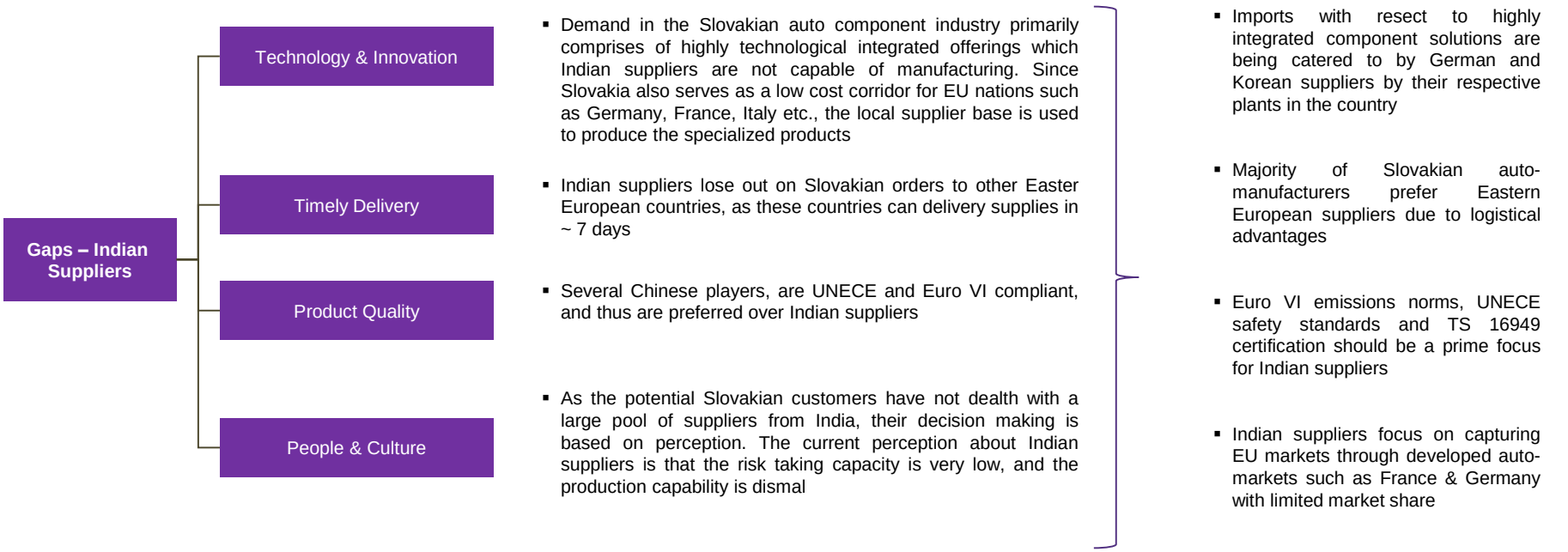
Source: Primary interviews

Russia – Lack of local market presence, absence of physical infrastructure and cold temperature technologies for Russian market and supplier and OEM relationships (for Russian) contribute to lower penetration of Indian suppliers in the Russian market

Area	Description	Impact
Gaps – Indian Suppliers: Timely Delivery	▪ Indian suppliers don't have a dedicated helpdesk/ industry representation in Russia ▪ Indian suppliers don't have local warehousing and sales representative in Russia for their export business	▪ Lower Russian market penetration across OEM and aftermarket segment (local presence is a must) ▪ Delay in shipment time as compared to China, Japan, South Korea
Gaps – Indian Suppliers: Product Quality	▪ Inability to meet local demand and quantity due to local capacity constraints and lack of investment for export lines & quality processes ▪ Packaging inefficiencies leading to product damage	▪ Lower Russian market penetration across OEM and aftermarket segment (local presence is a must) ▪ Lack of commitment to quality consistency required by Russian Tier Is and OEMs in Russia
Gaps – Indian Suppliers: People & Culture	▪ Indian suppliers don't have partners/ subsidiary companies to showcase local presence and commitment to local market ▪ Less frequent visits by Indian promoters and business heads in Russia for exploring business opportunities	▪ Lower Russian market penetration across OEM and Tier I suppliers focusing
Gaps – Indian Suppliers: Technology & Innovation	▪ Russia is a cold region with sub zero temperatures; this calls for greater investment and alliance with local Russian suppliers and OEMs to understand local product requirement, undertaking R&D and investments to address local product demand ▪ e.g.: Coating technology required for Russia is not available with Indian suppliers; this calls for greater investments, R&D and Collaboration with Tier I and OEMs	▪ Lower Russian market penetration across OEM and Tier I suppliers & aftermarket segment ▪ Lack of premium opportunities for Indian suppliers as the market opportunity is across commoditized product base governed by logistics efficiency, pricing and supplier relationships

Source: Primary interviews

Slovakia – Indian suppliers have very low visibility within the Slovakian market, and thus do not feature as preferred suppliers. However, with JLR setting up a new plant, large opportunities could arise



Source: Primary interviews

South Korea – Non timely delivery, inadequate product quality and cultural gaps are the main challenges that South Korean OEMs and Tier I suppliers face with Indian suppliers

Gaps – Indian Suppliers

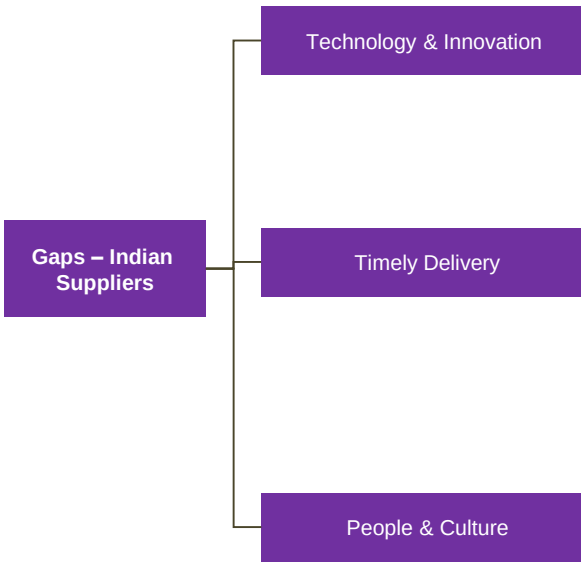
Area	Description	Impact
People & Culture	▪ South Korean suppliers believe that there is a cultural gap with Indian suppliers and therefore they struggle to do business with India suppliers ▪ This gap is however mitigated by Chinese suppliers and therefore Korean suppliers prefer Chinese suppliers to Indian suppliers	▪ Chinese suppliers are preferred over Indian suppliers
Technology & Innovation	▪ South Korean OEMs and suppliers do not see India as a source for technologically advanced parts. They look at Japan, Germany and the US for technologically advanced parts, while looking at India as a low cost manufacturing hub	▪ India is only looked at as a source for low tech products for which countries like China are already supplying to South Korea
Timely Delivery	▪ Indian suppliers tend to overcommit on delivery and usually do not stick to the agreed upon timelines for delivery ▪ Geographic location is a disadvantage as well when compared to countries like China	▪ Suppliers from China are preferred ▪ Bad experiences with regard to delivery timelines with Indian suppliers lead to a negative perception of Indian products in the South Korean market
Product Quality	▪ Product quality is one of the largest issues that South Korean suppliers have with Indian products ▪ Consistency of quality is also an issue with products supplied by Indian suppliers	▪ Lower Indian product penetration in the South Korean market as product quality is key to the South Koreans ▪ Lower profitability, due to limited access across commoditized segments

Source: Primary interviews

Spain – Lack of awareness, coupled with inconsistent product quality across batches and absence of partnerships with European OEMs and Tier Is contribute to lower penetration of Indian suppliers in the Spanish market

Source: Primary interviews

United States of America (USA)
- Lack of technology & innovation, non timely delivery, absence of local presence and cultural gaps



Area	Description	Impact
Technology & Innovation	▪ Indian suppliers are perceived as print to manufacture suppliers. They don't invest in R&D for future requirements to work with international suppliers who are looking at "Solution based partnership" rather than "Product based partnerships" – especially for EVs & Connected Cars (both hardware and software)	▪ Lower US market penetration across OEM and Tier I suppliers focusing on future technologies & collaboration ▪ Lower profitability due to limited access across commoditized segments
Timely Delivery	▪ Indian suppliers are perceived to make commitments that they don't adhere to when it comes to delivery timelines ▪ The internal infrastructure in India, especially at the ports and customs causes delays in the stipulated timelines. Apart from this, the internal infrastructure of China is far better than that of India	▪ Negative perception of Indian suppliers in terms of adhering to delivery timelines ▪ Loss of market share to Chinese suppliers even at competitive rates
People & Culture	▪ Indian suppliers don't undertake research before exploring international markets to understand local market requirement ▪ Indian suppliers don't have a dedicated helpdesk/ industry representation in US ▪ Indian suppliers are not active in participation in local US based events showcasing solutions and technologies required for building potential partnerships with US based suppliers & OEMs ▪ Indian suppliers are hesitant in making investments in frequent travel for building relationships and trust with local OEMs and suppliers as a demonstration of their commitment to local market	▪ Lower US market penetration across OEM and Tier I suppliers & Aftermarket segment

Source: Primary interviews

1 Executive Summary

Growth Story so far

Business Growth – OEMs, Tier Is and Aftermarket

Inorganic Growth – Do's & Don'ts along with approach strategy

Case Studies

Solutions & Roadmaps – ACMA, Suppliers and Government

2 Approach & Methodology

Key countries identified, shortlisted and covered for the scope

3 Gaps & Challenges

Key Challenges – as we heard the OEM/IPO/Tier I/Aftermarket customer say

4 Solutions

Solution recommended for each gap area identified

5 What we heard the customer say

By in scope country

6 Country Decks

United States of America
Mexico
Japan

Department of Heavy Industry
Ministry of Heavy Industries & Public Enterprises
Government of India

Brazil

Country deck

Executive Summary

- Aftermarket industry should be tapped for larger margins. Small compact passenger vehicles which are exported from India and otherwise, will demand for parts over the next 5-8 years
- Due to the lack of technology and high production costs, the imports of components is still in huge demand. This is a large opportunity for the Indian suppliers

Opportunity

Short Term

- Focus on aftermarket products for the platforms :
- Ford Ecosport; Toyota Corolla; Renault Duster etc.

Medium Term

- Invest in distressed assets, under the pretext that ROTA 2030 is implemented

Strategy to increase export to the Brazil market

Long Term

- Set up subsidiary in Brazil, export components to then cater to the Argentina and rest of Latin America market

Summary

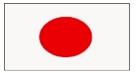
Competitors to India

China

USA

Germany

South Korea

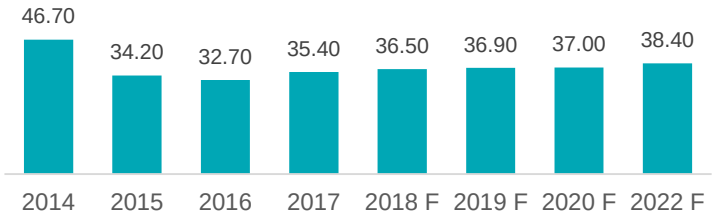


Japan

Argentina

The Brazilian automotive industry has shown signs of recovering during the last year. The Industry achieved a turnover of USD 36 bn, producing 3.6 mn units. Passenger vehicles accounted for the largest segment in the automotive industry of Brazil

Brazil automotive manufacturing industry value (USD bn)

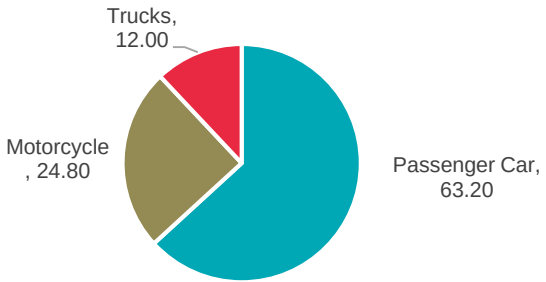


Source: Market line , ANFAVEA

Description

- The Brazilian automotive industry has shown signs of recovery in 2017. It was valued at USD 35 bn last year
  - Demand for Brazilian manufactured cars drove the growth in 2017, where the industry experienced a 28.4% recovery
  - In 2017, the industry produced 3.6 mn units through the recovery
- The industry's poor performance during the historic period has been due to the political and economic instability in the country
- Improvements in 2017 resulted in the industry's strong double digit growth. The potential for growth therefore is very much present in the Brazilian industry granted that the right socio-economic environment persists

Brazil Automotive Market: Classification 2016 - 2017



Source: ANFAVEA *Figures in %*

Description

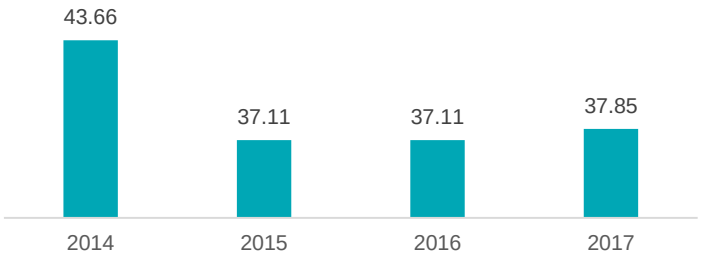
- The Brazilian auto manufacturing industry comprises of the production of passenger cars, trucks and motorcycles
  - Cars had the highest volume in the Brazilian automotive manufacturing industry in 2017, with production of 2.3 mn units
  - In 2017 over 700,000 units were exported
  - The Brazilian car manufacturing industry has been negatively impacted by a series of political and corruption scandals in the country

Electric Vehicle & Hybrids

- A number of major global car manufacturers such as Volvo, Aston Martin, and Jaguar Land Rover have announced plans to switch over to manufacturing only electric or hybrid cars at some point within the coming decade

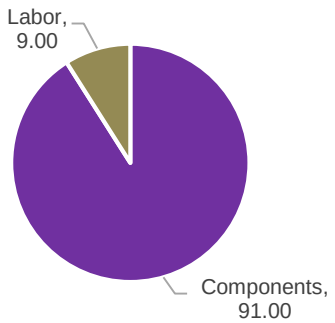
Brazil's auto parts market is driven by OEMs building their respective Tier Is; the market not having a very strong Tier II and III base, products which are low on technology and innovation and challenged by high import duties on parts to be imported

Brazil Auto Parts Industry Revenue (USD bn)



Source : Marketline

Brazil aftermarket



Figures are in %

Description

- Brazilian origin auto parts suppliers were unable to meet the policy targets, such as a single source supplier, thus most of them were either downgraded to become tier II suppliers or acquired by the global players, who have established themselves in Brazil
  - The import tax is 35%, 55% of industrial product tax, 18% of state tax and 11.6% social contribution tax. This makes the cost of the product to become 2x of the original
  - Tax exemption on products by country and Free trade agreements help in exporting products to Brazil
  - In spite of the stringent protection, vehicle manufacturers rely heavily on imported auto parts. They do so largely because of the difficulties and high costs of doing business in the country

Description

- The Brazilian automotive aftermarket has seen strong double digit growth in the recent years
  - The segment generated USD 28.8 bn in 2017
- The segment has grown largely due to the rising vehicle age in the country, fueled by reduced demand for new cars
- The threat of substitutes comes mainly from fake components. The sector has responded through the creation of 'Manufacturers against Product Piracy' (MAPP) which seeks to prevent counterfeit components from entering the supply chain
- Total of ~150,000 aftermarket businesses in Brazil, split in the following manner:
  - Distributers and retailers - 60%; Service shops – 36%; Car dealers services- 4%
- Key players are Advance auto parts & Autozone. They function through the traditional brick & mortar stores in addition to online access. DIY and DIFM are the common formats

The Brazilian automotive industry poses opportunities for Indian suppliers in their aftermarket segment. The OEM segment can be tapped to build relationships with customer who are using Brazil as a corridor for Argentina, Uruguay, Venezuela, Chile, Colombia, Peru etc.

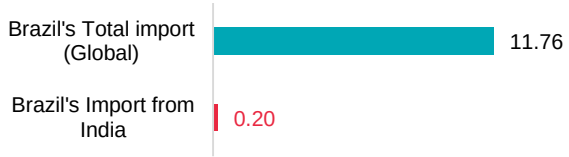
Brazil Automotive Industry

Drivers/Trends	Description	Impact
High reliance on imported vehicle products	▪ The Brazilian market is dominated by foreign OEMs and Tier I's. Most of the homegrown Brazilian suppliers failed on accounts of quality and technology, thus were either demoted as Tier II manufacturers or were acquired by Tier I's	▪ ***Import of auto parts from Asian countries to benefit*** *under the assumption that the industry is not as sound as on grounds of technology and quality*
ROTA 2030 to replace Inovar Auto (2012 – 2017)	▪ ROTA 2030 is designed to replace the country's Inovar-Auto program, and ease WTO concerns on how Brazil had taxed imported cars and products at rates >30%, above Brazil's WTO import tax ceiling	▪ ***Implementation of ROTA 2030*** *will help ease the duty structures, thus leveraging India's cost competitiveness*
Economic downturn has led to reduced demand of new cars	▪ The country has gone through large political and economical unrest in the last 3-4 years. 2017 saw a change and upsurge in the economy	▪ *Used car vehicles to drive up demand for replacement parts in* ***aftermarket sector***
High labour cost , poor infrastructure & taxes	▪ Brazil has large labor unions and union protection mechanisms, which do not help in ease of doing business. Also, the wage settlements for laborers is high. The infrastructure is inadequate to help mitigate delays in delivery etc.	▪ ***Demand for import of products*** *from low cost leveraged countries, increases. This is possible only is import tax exemptions are applicable*
High barriers to entry	▪ It is increasingly difficult for new entrants to this industry as brand strength, manufacturer reputation, and price are the areas offering scope for gaining a competitive advantage. are faced with the need for high capital investment to set up manufacturing facilities, yet also require a superior distribution network in order to compete within the industry	▪ *Strategy related to "Localization is Globalization" will not be applicable as a potential strategy to tap the Brazilian market*

Source: GT Primary interviews & analysis, ROTA 2030

Brazil is India's key export destination for the Ford Ecosport. The current trend in Brazil is to retain owned cars for a longer duration. This creates enough opportunity for Indian suppliers to tap the aftermarket in Brazil for specific platforms

Brazil's Import Trade: Auto Components (USD bn, 2016-17)

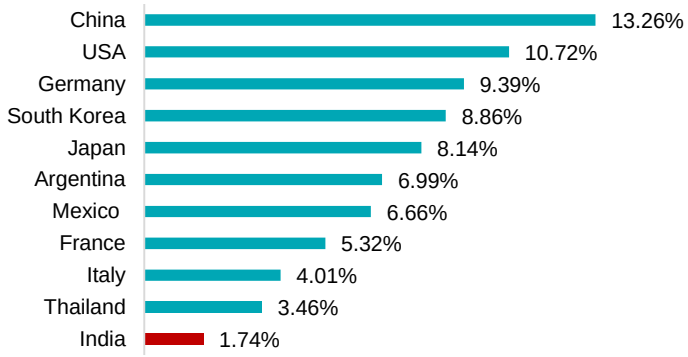


Source: GT Analysis

Description

- Many multinational automotive system integrators are producing in Brazil, such as Dana, Magnetti Marelli, SKF and ZF
  - Brazil is importing components such as Gear boxes; cylinder blocks; transmission axles; suspension shock absorbers & Spark ignition engine components
  - 4 – 5% of the total imports into Brazil, are towards motorcycle parts

Brazil : Top importing countries (2016-17)



Source: GT Analysis

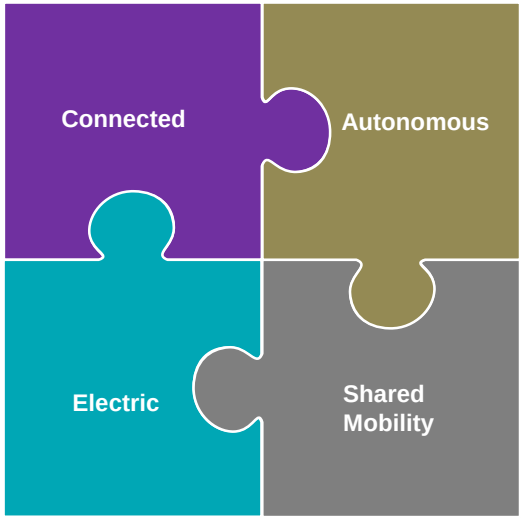
Description

- Gear Boxes and parts constitute for 12.94% of the imports into the country followed by safety seat belts at 7.92%
  - The platforms that are typically imported into Brazil (Top 20) are:
    - FIAT : Palio, Strada, Lino, siena
    - Honda : Civic, FIT
    - Toyota : Corolla, Hilux
    - Ford : Fiesta, Ecosport
    - Renault : Sandero, Duster, Classic, Logan
    - Hyundai : HB20 (equivalent of i20)
    - Chevrolet : Onix, Prisma, S10
    - Volkswagen : Fox, Saveiro, Voyage, UP
- India exports the largest number of Ford Ecosports to Brazil, thus the parts for the platform will be a demand for the next 5-8 years

The Brazilian industry has a low penetration of electric vehicles; connected cars and shared mobility is on the rise and autonomous is still at an introductory stage. The penetration of electric vehicles is low due to the incapability of the electric grids to provide electricity for charging the vehicles and charging station in the times to come

- In 2018, revenue for the connected car market equals USD 452 mn
- Penetration rate for the market is 3.8% and is expected to be 9.1% in 2022
- Connected car hardware is the biggest segment within this market which amounts to USD 425 mn currently. This market generally contains two subsectors:
  - Basic telematics
  - infotainment & communication systems
- Average revenue per connected car is USD 224 and is expected to go down to USD 139 by 2022
- There has been an increasing volume of smartphone sales in Brazil (increase by 55% in 2015 compared to 2014 volume) indicating the affinity for technology by consumers which also supports the growth in need for connected cars
  - Gemalto and Embratel are examples of companies that are making steady progress through On-Demand Connectivity and e-SIM technology

- The Brazilian EV market is extremely small as on date. Across BEV's and HEV's, the country has ~2500 cars registered till 2017
- The barriers to transition from ICE to cleaner vehicles are very intrinsic to the country
  - Lack of incentives for newer technologies
  - The Brazilian government has cut import duties on new hybrid cars, but does not include any tax breaks or other perks
  - The rationale is that the country's electricity grid doesn't have the capacity to handle an influx of plug-in cars and their charging needs



- The concept of autonomous technology is very new to Brazil. Autonomous feature in cars has not hit the road yet

- The Total revenue generated from the ride sharing segment in brazil increased from USD 459 mn in 2016 to USD 686 mn in 2018 and is further expected to grow to USD 1,116 mn by 2022
- The number of users in the Ride Sharing segment have increased from USD 9.8 mn in 2016 to USD 14 mn in 2018 and are expected to increase by USD 20.2 mn in 2022.
- The average revenue per user (ARPU) in the Ride Sharing segment amounts to USD 49.12 in 2018
- In brazil the preferred options for consumers is Uber (54%), 99 Taxis (12%), Easy Taxi (5%), Cabify (4%) etc.

Source: GT primary & secondary analysis

High cost of production, clubbed with low automation adoption and lack of technology innovation and infrastructure has caused further challenges to the already hurting Brazilian industry

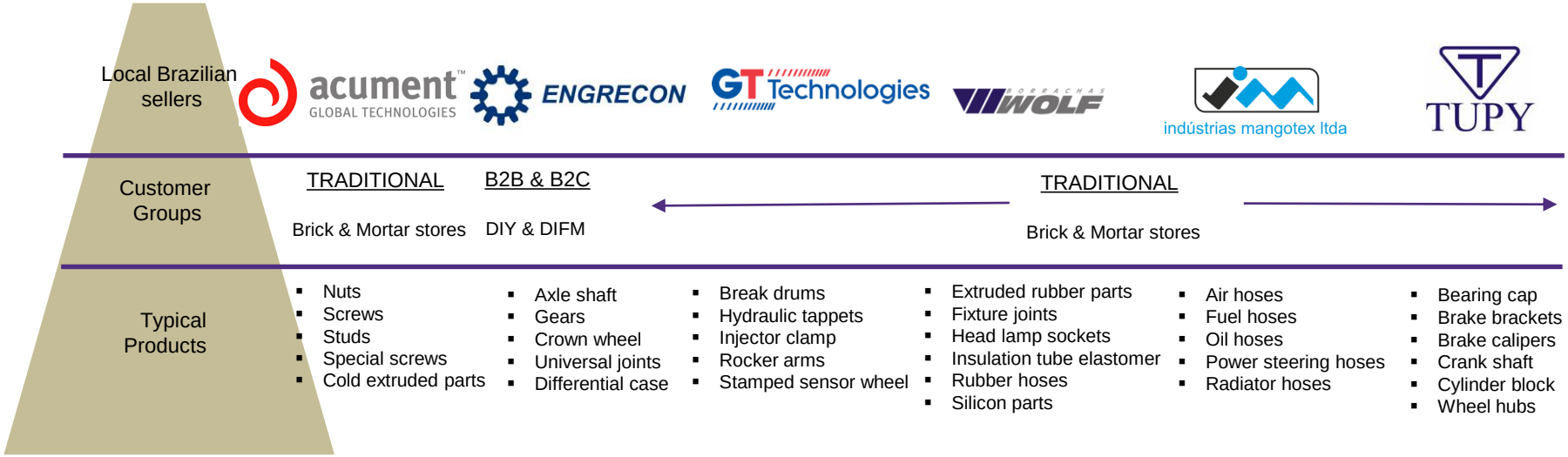
Challenge	Description	How are Players Reacting

Lack of new technology and R&D adoption	Most Tier Is in Brazil are global automotive component manufacturers. These manufacturers are facing a challenge with the level of skill, technology & R&D available in Brazil	▪ Technology adoption for the switch from ICE to cleaner vehicles, is almost negligible. The consumers demand Electric vehicles, due to the rising fuel prices. Thus, suppliers are importing hybrids in small quantum's
		  ▪ Nissan leaf's are deployed as Taxi's in the country
		▪ OEMs: Players like BYD (China), Mitsubishi and Volvo are investing in JVs and greenfield projects to manufacture EVs, Electric buses, and hybrid buses respectively in Brazil
		  ▪ They are not looking to service the domestic market (due to the lack of demand) in the short to mid term horizon

Lack of investments by local firms to ramp up infrastructure	Due to the economic downturn that has taken place in Brazil, the local firms have not been able to invest in ramping operations	▪ Local suppliers in Brazil are looking to import products, inspite of high duty structures. The companies are in conversation with the government to reduce the taxes etc. under ROTA 2030.
High production costs	The country imposes very high labor costs, through minimum wages & high taxes lead to very low margins	▪ Suppliers and OEMs are importing large parts from overseas markets, specially countries like China who have a low cost advantage

Source: GT Primary & analysis

Online and Traditional retailers deal in wide variety of components; product width and depth is critical for supplying components to aftermarket sellers in US



Source: GT Primary & Secondary data analysis

The Brazilian aftermarket segment is attractive, due to the reduction in new car registrations and the life of cars being used, increasing. It is also the segment that attracts higher margins for Asian suppliers, despite high import duties levied on products by the Brazilian government

Components	Brazil Aftermarket Demand			Competitive Intensity	
	Short Term	Medium Term	Long Term	China	USA
Lighting Components	H	H	M	H	M
ICE & engine parts - Flex fuel technology	H	H	M	M	H
Shock absorbers	H	H	H	H	M
Electronic & exhaust systems	H	H	H	H	M
Suspension & Components	H	H	H	M	M
Interior & Accessories	L	M	H	H	L
ADAS/ Sensors	L	L	M	L	H
Seats	L	M	M	H	M
Plastic molding components	H	H	M	H	L
Cylinder heads / Cylinder Blocks	H	H	M	M	H
Traditional Axles	M	M	M	M	L
Exhaust	M	M	L	H	M
Brakes	M	M	M	H	M
Battery/ Fuel Cells	L	L	M	M	H
Climate Control/ HVAC	L	M	H	M	H
Suspension & Components	H	M	M	M	H
Fuel System	L	M	H	M	H

"H" stands for High, " M" for Medium and "L" for Low

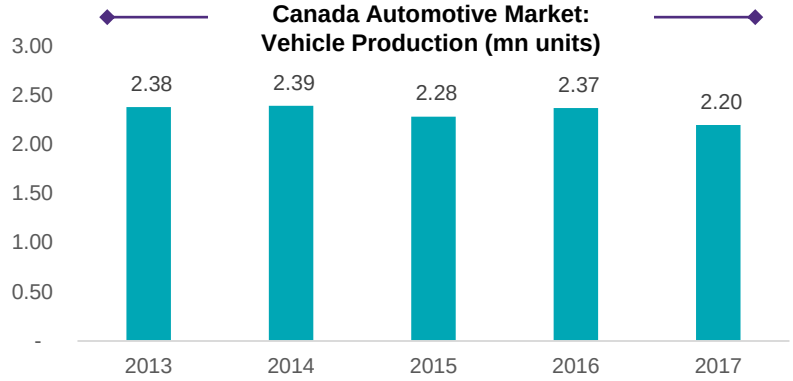
- Demand in the long term will be dependent on the implementation of ROTA 2030 along with the correction on import duties

Department of Heavy Industry
Ministry of Heavy Industries & Public Enterprises
Government of India

Canada

Country deck

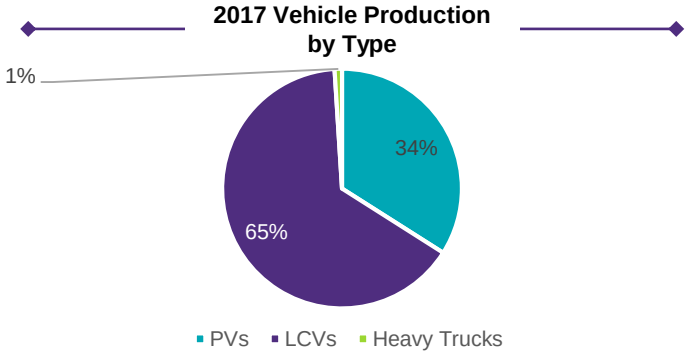
Canada is the 10th largest vehicle producer in the world. Automotive manufacturing is one of Canada's largest industrial sectors, accounting for 10% of manufacturing GDP. Canada produces an average of 2.3 mn units a year, of which, in 2017, 65% are LCVs, 34% are PVs and 1% are heavy trucks



Source: International Organization of Motor Vehicles (OICA)

Description

- Canada is the 10th largest vehicle producer in the world. Automotive manufacturing is one of Canada's largest industrial sectors, accounting for 10% of manufacturing GDP and 23% of manufacturing trade
  - The automotive manufacturing is highly concentrated in Ontario which accounts for 100% of Canada's light vehicle production, 400 auto part manufacturers and 94% of industrial shipments
- On an average, Canada produces around 2.3 mn cars a year, out of which 85% are exported
- The automotive manufacturing sector in Canada directly employs around 125,000 workers in vehicle assembly and auto parts manufacturing and another 380,000 in distribution and aftermarket sales and service



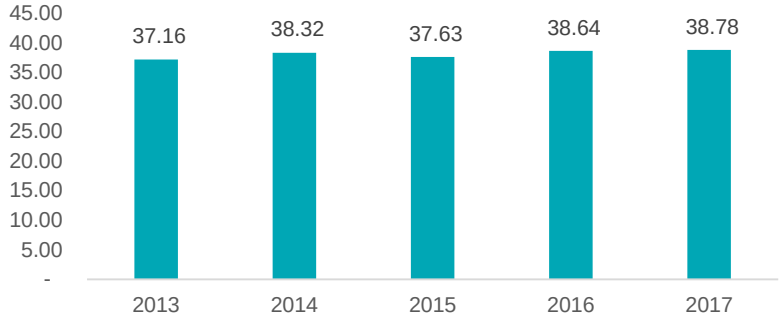
Source: International Organization of Motor Vehicles (OICA)

Description

- In 2017, LCVs accounted for 65% or 1.43 mn units of vehicles produced in Canada
  - PVs were the second largest category accounting for 34% or 750,000 units followed by around 200,000 units of heavy trucks
- From 2013 to 2014, the market share of LCVs has grown from 59% or 1.40 mn units to 65% or 1.43 mn units
  - The market share of PVs has reduced from 41% or 0.97 mn units in 2013 to 34% or 0.75 mn units in 2017
- Canada's automotive industry consists of around 1,100 companies with 1,275 facilities which includes 20 passenger and commercial vehicle plants with a capacity to produce 2.4 mn units a year

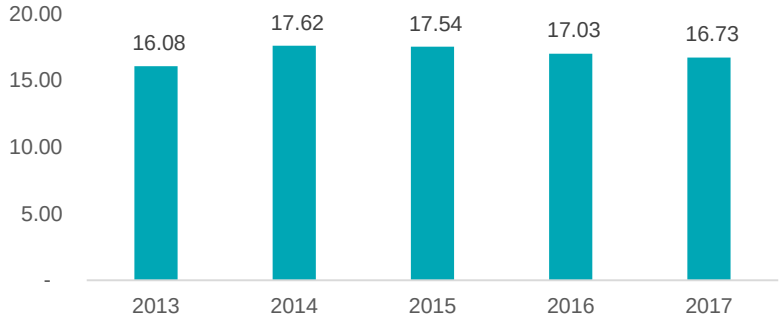
Canada is largely an export oriented country, exporting 86% of what is produced within the auto industry in Canada. While auto part imports account for USD 39 bn, auto part exports account for only USD 17 bn in Canada

Canada Auto Parts Imports (USD bn)



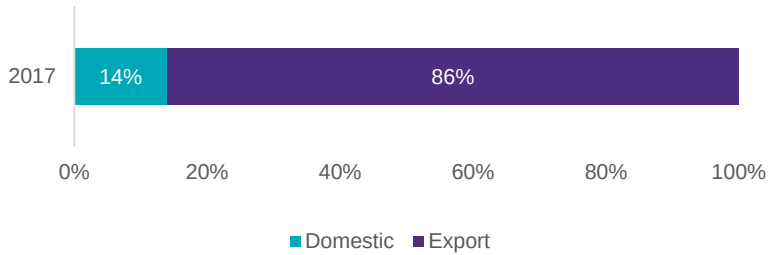
Source: Government of Canada

Canada Auto Parts Exports (USD bn)



Source: Government of Canada

Production & Export/ Domestic Ratio



Description

- Canada is a export oriented country; 85% of the vehicles produced in 2017 were exported out of Canada
- In 2017, auto parts worth USD 39 bn were imported into Canada, while exports worth USD 17 bn were exported to the rest of the world
- In 2017, gasoline engine and engine parts were the highest imported product into Canada, accounting for 19% or USD 7.3 bn
    - The second highest imported product into Canada in 2017 was other engine and power transmission equipment and motor vehicle transmission and powertrain parts that accounted for 12% each
- Gasoline engine and engine parts were also the highest exported product from Canada, accounting for 20% or USD 3.4 bn

Canada’s automotive players, present in India

OEMs in India

Suppliers in India

Westport™ Fuel Systems

LINAMAR
Power to Perform

MAGNA

OEMs/ Suppliers not in India

HTT AUTOMOBILE

Strength Through Technology
Multimatic

ZERO EMISSION NO NOISE
ZENN

CAMI

Campagna
Est. 1988

INTERMECCANICA

NEW FLYER

MARTINREA

manac

Grant Thornton | An instinct for growth™

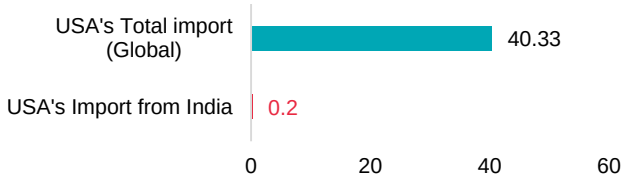
The Canadian auto market is fairly stable and will witness slow and steady growth in the next 5 years. EVs are however, expected to displace the sale of traditional ICE engines, with the government increasing is spend on the development of EVs and alternate fuel vehicles

Canada Automotive Industry

Drivers/Trends	Description	Impact
Increase in sale of LCVs	▪ The market share of LCVs has grown from 59% or 1.40 mn units in 2013 to 66% or 1.56 mn units in 2016 ▪ The decrease in the share of PVs can be attributed to the increase in popularity of shared mobility in Canada	▪ ***Increase in the demand for LCVs*** *in the Canadian automobile market* ▪ *Increase in shared cars* ***will drive down the demand of PVs*** *in Canada*
Increase in car sharing	▪ Industry experts in Canada estimate that by 2030, one out of ten cars sold in Canada would be a shared vehicle. Ride sharing services like Uber and Lyft are already present in Canada	
Growing used car market	▪ Used vehicle sales have continuously increased over the last 5 years with a CAGR of 1.12% to reach a value of USD 8.15 bn in 2017	▪ *Used car vehicles to drive up the demand for replacement parts in the* ***aftermarket sector***
Increased focus on EV and disruptive technology	▪ Sale of EVs in Canada rose by 68% between 2016 and 2017. Connected cars and autonomous vehicles are also expected to grow within the Canadian automobile industry ▪ The government is also providing R&D grants such as the Automotive Supplier Innovation Program (ASIP) grant and capital grants such as the CME Smart Green Fund	▪ *Demand for EVs and electronic auto components is expected to increase*
Increase in oil prices	▪ Oil prices in Canada are expected to reach USD 70 by 2023, which is a 30% growth from the current oil prices	▪ *The increase in oil prices is expected to lead to* ***an increase in the demand for alternate fuel vehicles***

Canada imported a total of USD 40 bn worth of auto components in 2017. Of this, only 0.50% or USD 202 mn worth of products were exported from India to Canada. The US is the largest supplier of auto components to Canada followed by Mexico and China

Canada : India Export Import Trade: Auto Components (USD bn, 2016-17)

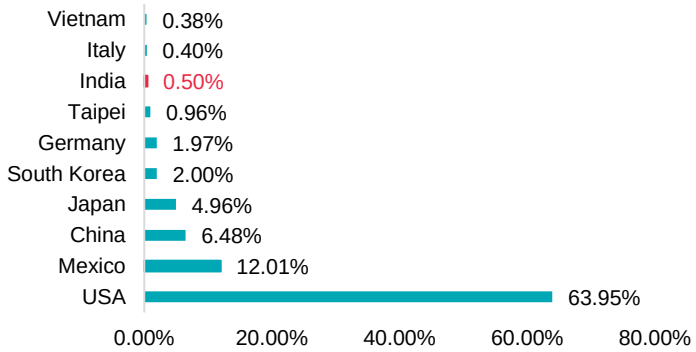


Source: GT Analysis

Description

- The Indian Auto Component Sector exported products worth USD 202 mn to Canada in 2016-17
- The total imports of Auto components into Canada globally including India in 2016-17 is estimated at USD 40 bn

Canada : Top importing countries (2016-17)



Source: Trademap

Description

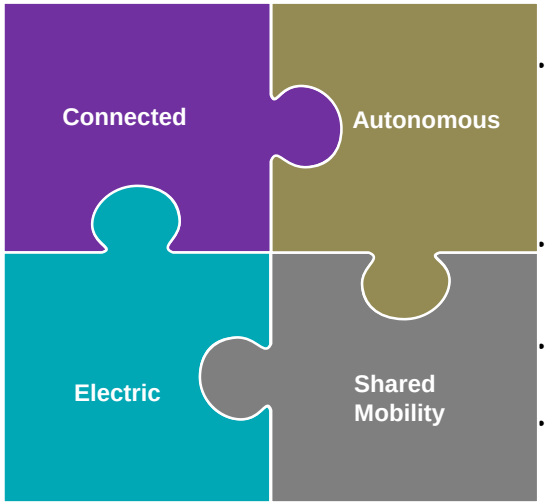
- The US dominates auto component imports into Canada with almost 64% of all auto component imports coming in from the US
- Mexico is the second largest provider of auto components to Canada with a market share of 12% followed by China and Japan with 6.5% and 5% respectively
- India only accounts for 0.5% of all auto component imports into Canada

Canada Supplier Challenges – Due to cheaper labor costs available in Mexico, many international auto and auto component manufacturers have moved their production to Mexico. Investment in R&D is also limited in technologies that are required to address the demand generated from the disruptive technology that is going to effect the industry

Challenge	Description	How are Players Reacting
Investment in R&D	Investment in technology and R&D is limited in Canada especially in technologies like propulsion systems and light-weighting technology that need to meet global standards and the increasing pressure by the government to increase fuel economy and reduce vehicle emissions	▪ Canadian auto part suppliers are constantly looking for incentives and subsidies by the government that would help them increase their investment in technology and R&D ▪ A large proportion of both Canadian- and foreign-owned plants view government incentives to attract or retain OEM assembly capacity as contributing or strongly contributing to their success
High Cost of Labor	The average wages of labor in Canada is eight times the average wages of labor in Mexico	▪ Foreign auto and auto part makers that had invested in Canada have moved to Mexico as it provides an abundance of skilled and cheap labor at a fraction of the cost in Canada
Dependence on US for Exports	Canada exports 85% of its automobile exports to the US. There is a large uncertainty over NAFTA and therefore exports from Canada to the US might decrease in the future	▪ Canadian auto part and automobile exports are looking to export their products to other countries, thereby reducing their dependence on the US automobile market for exports
Loss of market share to Mexico	As of 2007, Canada and Mexico produced the same amount of cars. Today, Mexico produces 1.5 mn more cars a year than Canada. This is because auto and auto part makers are moving their production to Mexico because the average wages in Mexico are an eight of the wages in Canada	▪ Auto and auto part makers are looking at automation and the use of technology as a part of the manufacturing process to reduce its dependency of skilled labor

While the growth of electric and hybrid vehicles is growing rapidly in Canada, autonomous vehicles are still in the early stages of entering the market. Due to adverse weather conditions in Canada, additional measures and checks are required in the development of autonomous vehicles. Ride sharing is also expected to increase, with revenues expected to increase from USD 440 mn in 2017 to USD 754 mn in 2022 representing a 12.3% CAGR

- The revenue in the connected car market of Canada in 2017 amounted to USD 413 mn. In 2018 this revenue is expected to increase to USD 435 mn
- This revenue is forecasted to increase by a CAGR of 5.3% to reach USD 508 bn by 2022
- As of 2018, connected hardware is the largest segment and accounts for USD 404 bn (93% of the market)
- Currently the connected car penetration is at 15% and is expected to reach 30% in the next 4 years



- Autonomous vehicles in Canada are still in their early stage of entering the market.
- Canada is taking the required measures to develop autonomous vehicles to withstand its harsh climate condition
- With companies such as Blackberry with its QNX Autonomous Vehicle Innovation Centre, and Uber testing it's driverless technology in Toronto, Canada is taking essential steps to ensure the development of autonomous vehicles in Canada
- The University of Waterloo's research team, McKinzie, is conducting research to use Sedan's software for the use of autonomous cars in the cold conditions

- In 2017, sales for electric vehicles (PEV, PHEV, BEV) were reported at 37,130 units, with PEV corresponding to the highest sales of 18,560
- The top selling models of the electric vehicles in Canada are Chevrolet Bolt EV (BEV), Chevrolet Volt (PEV), Tesla X (BEV)
- Various subsidies and incentives are offered by the government to promote the sale of electric vehicles example: new vehicles are exempted from the acquisition tax
- 2017 also noted an increase in the infrastructure to support the rise of electric vehicles with 5,841 chargers, an increase from 4,215 chargers from 2016
- Electric vehicle sales in Canada rose by 68% in 2017 compared to the sales in 2016

- The amount of ride sharing users in Canada in 2017 were 2.2 mn. In 2018, this number increased to 2.4 mn and is forecasted that the users would increase by a CAGR of 9.8% to reach 3.3 mn by 2022
- The revenue for ride sharing market in 2017 was USD 440 mn which is expected to increase by a CAGR of 12.3% to reach USD 745 mn in 2022
- The second segment of the shared mobility is the car sharing/rentals. The number of car sharing users in Canada in 2017 were reported to be 1.9 mn. The number is expected to remain constant till 2022.
- The revenue for car rental market in 2017 was USD 814 mn which is expected to increase by a CAGR of 1.8% to reach USD 885m in 2022.
- The major ride sharing companies in Canada are Uber, Facedrive and Kagnaride.

Maturity of the industry in terms of Technology

	Technological Area	Description
1	Adaptive Cruise Braking	The adaptive cruise barking system automatically adjusts the speed of the vehicle in order to maintain an appropriate distance with respect to the position of the vehicle ahead. The system reduces the speed to maintain the safe distance and in case of extreme circumstances, it triggers the Impact alert which tells the driver to apply full braking
2	The Prevost Electronic Stability Program (ESP)	This technology enables automatic detection of driver's movements and driving patterns and utilizes this movement to apply brakes instantaneously for avoidance of any obstacle. The technology leverages the monitored information about drivers' pattern for wheel movement, steering actions, acceleration process and other such movements and helps maintain control over the vehicle in unpredictable situations and also decreases rollover risks with increased stability
3	Westport HDPI 2.0	Westport HDPI 2.0 is a natural gas technology which operates at the power of a diesel engine for heavy duty trucks without compromising on vehicle performance and economics of a diesel engine. It provides the same power (>400 HP), torque, engine braking and drivability as a diesel engine along with reducing the CO2 emissions in order to meet the latest emission standards. Moreover, it reduces the greenhouse gas emissions by 20-100% and leads to cost savings
4	Clearview	A software that combines consumer-friendly camera technology with the rear and side view mirrors in vehicles to give improved vision while parking, changing lanes, backing out of a driveway etc. It consists of self-cleaning cameras installed in the mirrors with a regulatory compliant side view mirror or rear view mirror which displays live-video feed This technology helps in cutting down on drag, reducing vehicle noise, blind spots and provides a more secure and comfortable view of the road for both older people and young drivers
5	FiT PACK	It is a conformable CNG tank which uses optimum sized chambers to form CNG fuel storage in shapes that conform to other types of energy storage like battery packs and liquid fuels using multiple, connected optimally sized chambers It helps in achieving up to 35% added storage when compared to the older CNG cylinders. Moreover it uses a single fuel module instead of multiple CNG cylinders and is compatible with all forms of RNG as well and lower fuel costs

Maturity of the industry : Export Incentives

- Export Development Canada (EDC) is an export credit agency that provides funding to the Canadian companies which helps them respond to international business opportunities, thus facilitating the export trade
    - It is an independent self-funding enterprise that provides insurance and financial services, bonding products and small business solutions to Canadian exporters and investors and their international buyers. EDC is responsible for supporting approximately 14% of total Canadian exports and investment abroad. As of 2017, the Canadian exports increased from USD 630 bn to USD 662 bn

- EDC provides funding to the international buyers, thus eliminating the risk of non-payment. The exporters receive payment as per the terms and conditions of the contract while customers abroad receives the extended payment terms

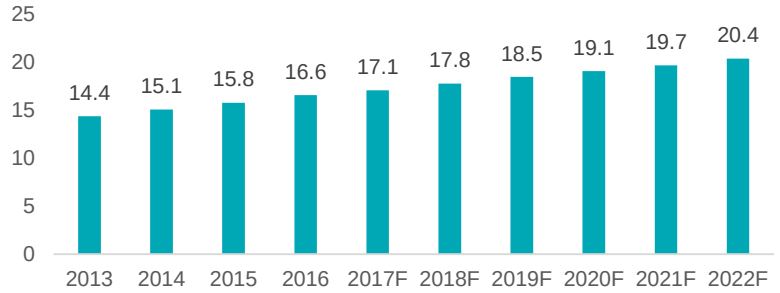
- The Trade Agreement between Europe, and Canada has suppressed 98% of the custom fees, making trade and commerce relatively easier than before. The United States of America continue to be Canada's prime economic partner and represent the biggest share of the country's exports
- Other agencies like Export market access and CanExport provides backing up to USD 130,000 to insure approximately 50% of the eligible expenses which includes expenses such as business travel to target markets, participation at trade fairs and trade missions, registration fees and booth expenses

- Since Canada is a relatively small market, the "made in Canada" program has had a large impact on the international front, ad researchers have shown that exports help companies boost sales and profits. With the increase in global competition, Canada has greater incentives to expand exports

- In Canada, the Government provides aids and grants to finance the cost of hiring and training which includes federal and provincial programs offering USD 20,000 and more to various enterprises. Example: The Ontario Exporter Fund provides small and medium-sized businesses with up to USD 80,000 (up to 50% of salary) in the form of a non-repayable grant to hire a dedicated Export Manager

As used vehicles increase to become popular in Canada, the aftermarket segment is also expected to grow. The aftermarket segment is also expected to grow with the increase in popularity of ride sharing

Canada Automotive Aftermarket Value (USD bn)

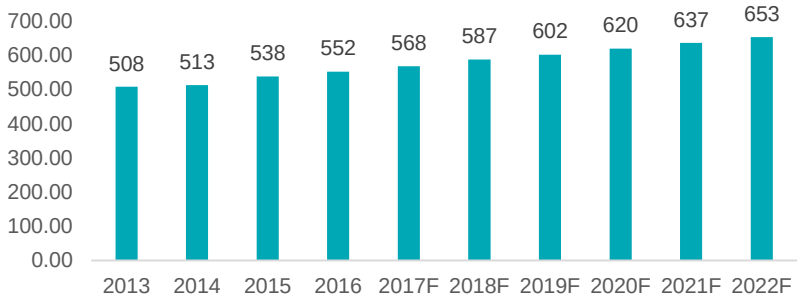


Source: Marketline

Description

- The Canadian automotive aftermarket grew by 3% in 2017 to reach a value of USD 17.1 bn
- The CAGR for the period from 2013 to 2017 was 4.3%
- In 2017, the Canadian aftermarket accounted for 4.8% of the aftermarket sector value of America
- As of 2017, the components sector accounted for 81.6% of the market's total value while the labour segment accounted for the rest

Canada Automotive Aftermarket Volume (mn units)

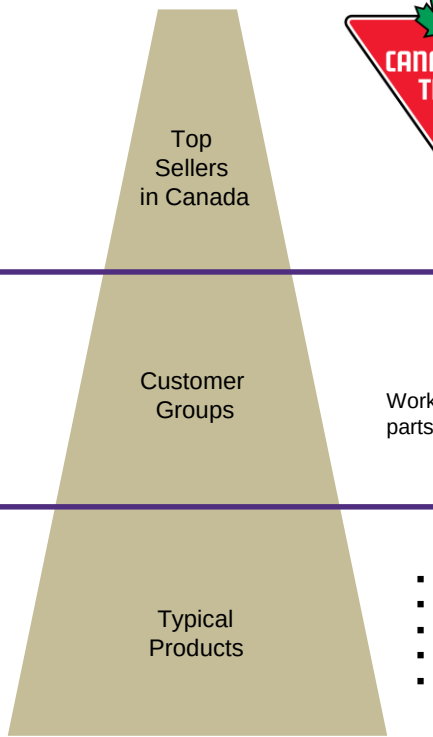


Source: Marketline

Description

- The aftermarket volumes grew at a CAGR of 2.8% between 2013 and 2017 to reach a total of 0.57 bn units in 2017
- It is forecasted that the volume would increase to 0.65 bn by the end of 2022 indicating a CAGR of 2.8% for the period 2017-2022
- The increase in the aftermarket volume can be attributed towards increase in consumer spending

The DIFM market, with an annual growth rate of 3.6% from 2011, has grown at a faster pace than the DIY market, with an annual growth rate of 1.1% for the same period, in Canada. The DIY market makes up around 14% of the total retail sales and is expected to shrink with the growth of the DIFM market



Top Sellers in Canada	Canadian Tire	CARQUEST Auto Parts	GPC	Advance Auto Parts / Canada Parts Online
Customer Groups	B2B: Workshop mechanics, parts managers	B2B2C: DIFM	B2C: DIY	STANDARD CUSTOMERS: Standard End Customers
Typical Products	▪ Snowmobile equipment ▪ Winter tyres ▪ Batteries & Chargers ▪ Car shelters ▪ Other car accessories	▪ Impact Sockets ▪ Engine & drivetrains ▪ Chassis ▪ Oil & Lube services ▪ A/C services	▪ Power Transmission ▪ Paint Supplies ▪ Automotive accessories ▪ Hose ▪ Hydraulic Components	▪ Battery ▪ Spark Plugs ▪ Tyres ▪ Brake Pads & Shoes ▪ Oil Filters	▪ Bumpers ▪ Fenders ▪ Hoods ▪ Door Handles ▪ Lights

Tyres **Consumable & Accessory**

Rubber Parts **Mechanical Parts**

Source: GT Primary & Secondary data analysis

France

Country deck

Executive Summary

- PV and LCV imports from supporting markets such as Germany and Spain is expected to increase
- Market for Electric vehicles and Autonomous vehicles is projected to significantly boost in the near future due to policies and early adoption of consumers
- Used car vehicles along with government policy to drive up demand for replacement and maintenance parts in aftermarket segment

Opportunity

Short Term

- Focus on independent aftermarket products for the platforms : Renault Clio & Peugeot 208

Medium Term

- Technical collaborations & JV with French Tier-1 suppliers, in order to cater to EV or Autonomous products

Strategy to increase export in the French market

Summary

Mature technologies such as:

- ***Passive Entry Start Systems***
- ***Turbo Pure Tech-Cylinders***
- ***Ammonia Storage and Delivery System (ASDS)***
- ***Virtual Prototyping***

Best Practices & Technology

Competitors to India

Germany

Spain

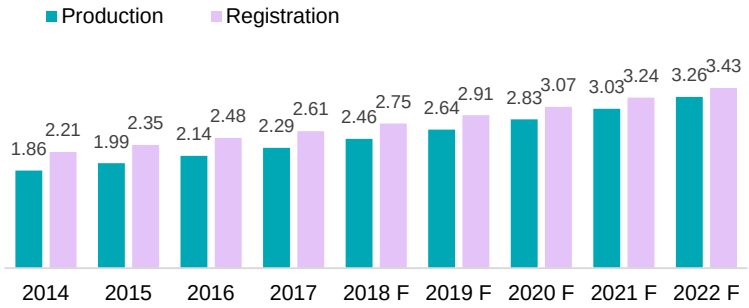
Italy

China

Turkey

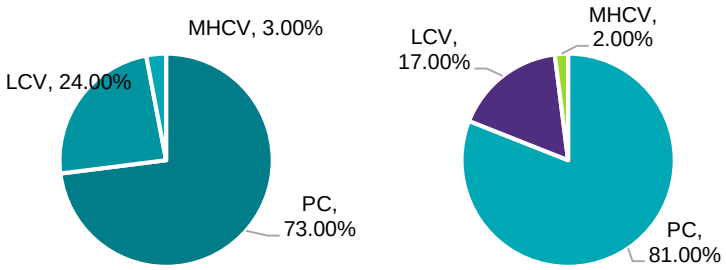
France is the 10th largest market accounting for ~2.27 mn units in vehicle production in 2017; PC and LCV segments dominate with over 97% market share in terms of production and 98% in terms of registration indicating its position as a global leader in the premium car segment

France Automotive Market: Vehicle Production & Registration (mn Units)



Source: European Automobile Manufacture Association

France Automotive Market: Classification (In %)



Source: European Automobile Manufacture Association

Description

France is the world's 10th largest vehicle manufacturer after Spain and Brazil. It is also the 3rd largest vehicle manufacturer in the European Union after Germany and Spain.

- The total vehicle production is expected to grow to 3.3 mn by 2022, growing at a CAGR of 7.3%. Vehicle registration is expected to reach 3.4 mn units by 2022 with a respective CAGR of 5.6%
- The France Automotive industry generated over 224,000 jobs in 2016 which accounted for 7% of all jobs in the French industrial sector.
- The prime automobile manufactures in France are PSA group which is the 2nd largest manufacturer in Europe and the Renault group which is the 3rd largest manufacturer in Europe.
- **By 2040, it is forecasted that France will ban the sales of petrol and diesel vehicles in order to meet the new emissions and climate target**

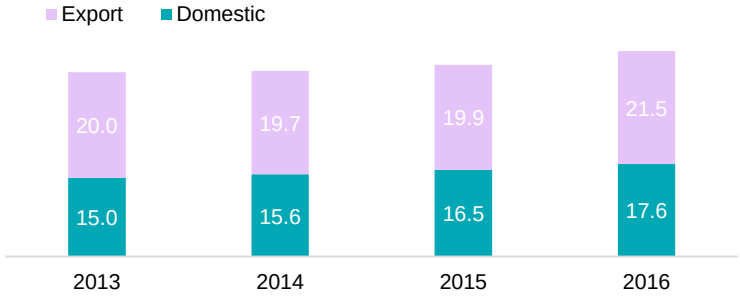
Description

Passenger car and LCV segments dominate the automotive market, collectively accounting for over 97% of the total market as of 2017 in terms of production & registration.

- The passenger vehicles production was estimated to be 2.11 mn which accounted for 73% of the total production of vehicles. The LCVs production was estimated to be 0.43 mn which accounted for 24% of the total production.
- The PSA group is responsible for producing 56% of domestic French automobiles. While the Renault group is responsible for 43% of the production. Combined, they account for 89% of share in the passenger cars segment.
- In 2015, the ratio of new to used cars sold was 1:3 with 50.8% of vehicle registrations were for vehicles more than 8 years old.

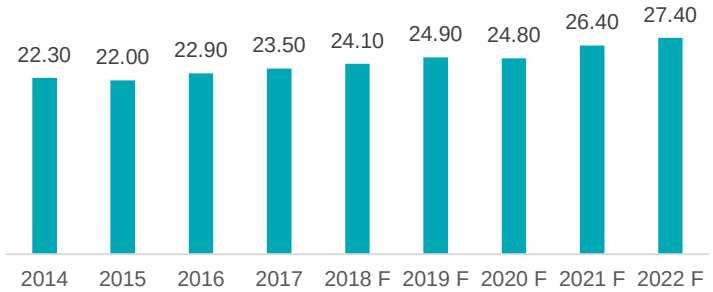
75% of auto components in France is supplied through Tier-1 with 50% of the OEM aftermarket parts sales being controlled by the OEM in France

France Auto Parts Industry Growth Trend (USD bn)



*Source: FIEV (*French Vehicle Suppliers Association)

France After Market Growth (USD bn)



Source: Market line July 2017 Report

Description

- In 2016, the domestic equipment market was valued at USD 17.6 bn, growing at a CAGR of 5.6% (2013-16). This growth can be attributed to the increase of light duty and passenger vehicle registrations in the EU.
- As of 2016, the main categories of automotive parts included in these figures are: powertrain equipment (39.1%), vehicle interiors (27.1%), body components (17.2%), tyre-to-road components (12%), and equipment for measurement, diagnostics and repairs (4.5%) as per 2016 figures
- Domestic Tier I suppliers supply 75% of the vehicle parts. These parts are produced under car manufacturers' specifications. With 70,333 people employed as of December 2016, the total workforce of the equipment supplier sector contracted by 3%.
    - In 2016, companies with more than 500 employees only represents 17% of the total number of companies, but account for 57% of the total turnover and 63% of employees in the sector. 136 foreign suppliers are located in the country representing 59% of the sector's turnover.

Description

- The France automotive aftermarket was valued at USD 23.5 bn industry in 2017, growing at CAGR of 1.85 and expected to reach 27.4 bn in 2022.
    - The automotive aftermarket of France accounts for 9.4% of the European automotive aftermarket sector value.
    - The components segment accounts for 73.8% of the market's overall value while the repair & services segment accounts for 26.2%.
    - OEMs supply their aftermarket parts network directly from Tier I supplier's production plants. They supply their car dealerships and repair garages. There were an estimated 22,292 car dealers and 6,943 repair garages working under OEM brands in France in 2014.

France’s automotive players, present in India

OEMs in India

RENAULT
Passion for life

PSA
GROUPE

Suppliers in India

Valeo

faurecia

PLASTIC OMNIUM

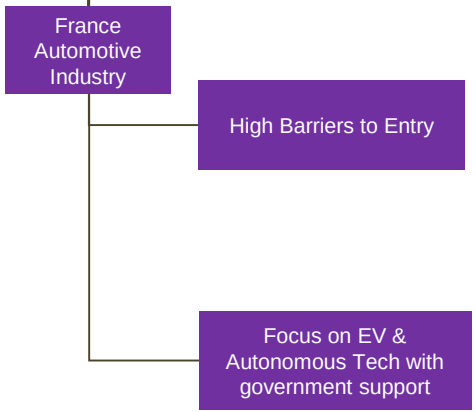
DASSAULT SYSTEMES

Suppliers not in India

OSCARO

AdduXi Groupe

France Drivers & Trends



Drivers/Trends	Description	Impact
Economic Performance & Reforms	▪ The French economy is one of the largest and strongest in Europe. France's real gross domestic product (GDP) has increased from 0.18% in 2012 to 1.85% in 2017. It is forecasted that France's GDP would increase to 2.07% in 2018. ▪ This increase in the GDP is because of the robust performance in the automotive sector. The revenue generated by automotive components increased by 2.5% in 2016	▪ *Increased economic performance to drive vehicle demand and consumption*
Growing Used Car Market	• The used/second hand car market in France has shown a significant rise in the past few years. The sale of the used vehicles increased by 2.1% and reached 5.652 mn in 2015. • Further, in 2018 the government implemented a nation wide policy which requires testing of vehicles older than 4 years on 134 testing points and 340 minor points (criteria) ranging from seatbelts to simple maintenance. Lastly, the country has new to old car ratio of 1:3 which indicates a tremendous potential for aftermarket	▪ *Used car vehicles to drive up demand for replacement parts in aftermarket sector*
High Barriers to Entry	• Many French auto manufacturers and suppliers exercise strong control over distribution and retail networks, with well-organized buying offices that have put in place very stringent selection processes for new suppliers, products and services. • The option of going greenfield is extremely difficult as well due to extremely high labor costs, multiple regulatory approvals and extremely high competition	▪ *Dependency on Imports on other countries is expected to increase in the future*
Focus on EV & Autonomous Tech with government support	• France is one of the prominent electric car markets in the European Union with a total of 29,194 electric car sales in 2016 with the country banning gasoline vehicles by 2040. Euro emission standards, which will become compulsory by 2022, aim to reduce C02 reductions by 27%. • The subsidies for newly purchased electric cars are expected to go up to EUR 10,000 . There is a large cash incentive for buying an EV or Hybrid vehicle in France. • Exemption from registration tax based on regions (100% or 50%) and from company car tax; EV owners benefit from premium of €4,000-7,0000. • Discount on toll and parking fees on buying an EV is also available	▪ *The demand for EV is expected to grow on account of ban on diesel and petrol vehicles by 2040.* ▪ *The subsidies/grants offered along with standards implemented would further increase the demand for electric vehicles.*

Source: GT Primary & analysis, FIEV and Media Sources

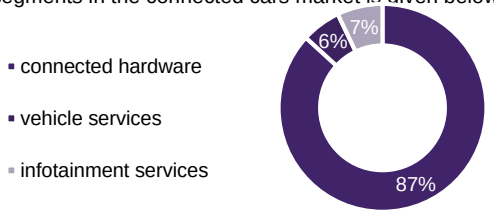
The major challenges faced by the automotive industry in France include high working capital, investment requirements leading to high debt levels and financing needs, coupled with strong competition and price pressure.

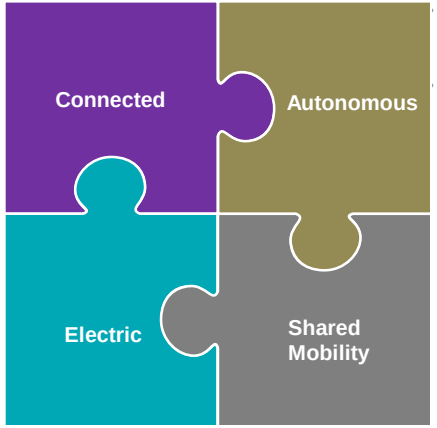
Challenge	Description	Players Reacting
High Cost of Production	France has one of the highest labor costs in the European region. The players also face constraints related to an available pool of capital and investors	French OEMs are constantly looking for low cost suppliers to cater to the high costs and non availability of investments. For example, they use Czech Republic (a low purchasing power hub) to manufacture the Citroen C1 and Peugeot 107. The Peugeot 207 is manufactured in Slovakia
Shortage of EV batteries	Due to the introduction of new emission standards, the automotive suppliers are shifting towards powertrain electrification to achieve the desired CO2 targets. This has resulted in changes in consumer behavior and their mobility needs. The auto component suppliers are required to change their business models. The automotive suppliers are also facing issues related to batteries for EVs.	An emergence of multiple start ups in the EV arena, such as NAWA Technologies, funded from France's main energy-research agency. Their technology when it comes to EV batteries is ahead of the curve

Source: GT Primary & analysis

France is leading the race of the Electronic Vehicle market while policy support is allowing autonomous to hit the roads by mid-2019; Phenomena of ride sharing is creating a significant impact in consumer behaviour and needs of the country

- As per the statistics and the observations, revenue in the connected car market of France amounts USD 938 mn in 2018.This is expected to climb to USD 1,250 mn by 2022, at an annual growth rate of 7.4%.
- Connected Hardware, the markets largest segment has a market volume of USD 862 mn as of 2018. Currently the connected car penetration is at 24.3% and is expected to reach 54.5% in the next 4 years. The segregation for the various segments in the connected cars market is given below:





- France is establishing a legislative framework that will allow the testing of autonomous cars on public roads by 2019. Autonomous vehicles are likely to be tested in France as early as next year. Areas of potential include self-driving shuttle services and intelligent trucks which can load their own cargo without a driver and unload it at their destination
- The goal is to support development and continue being competitive for global markets. The French government views autonomous cars as a way to reduce accidents on the road, which have been increasing in the past few years.
    - PSA Group, which controls Peugeot and Citroen, has received clearance from French government to run controlled self-driving trials on public roads. In addition to PSA, automotive electronics and parts maker Delphi and Transdev plan to use autonomous taxis to carry passengers.

- France is one of the prominent electric car market in the European Union with a total of 29,194 electric car sales in 2016. The sales grew at a rate of 26.17% which increased the number to 36,778 in 2017. BEV constitutes 68% of the total market share while PHEV contributes 32%
    - The top selling models by France OEMs in 2017 were Renault Zoe (15,245), Peugeot Ion (874), and Citroen C-Zero (545).

By 2040, it is forecasted that France will ban the sales of petrol and diesel vehicles in order to meet the new emissions and climate target. This would further increase the sales of Electric vehicles.

The subsidies for newly purchased electric cars are expected to go up to EUR 10,000.

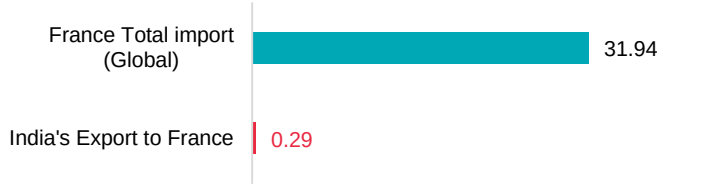
- A grant of EUR 2,000 will be provided for the destruction of cars registered before January 2006
- Exemption from registration tax based on regions (100% or 50%) and from company car tax; EV owners benefit from premium of EUR 4,000-7,0000
- Discount on toll and parking fees on buying an EV

- Estimated users of car sharing in France in 2014 were 153,000. In 2018, this number increased to 1.97mn and is expected to increase to 2.1 mn by 2022.
- Car sharing is typically used in multi person households. Since this household type dominates France, thus the car sharing users are increasing.
    - 30% of the population in France have abandoned their car by using car sharing.
    - Approximately 74% of the population of France know about various ride sharing options.
- In 2018, the amount of ride sharing users is estimated to be 4.39 mn. This number is expected to increase to 6.1mn by 2022.The revenue for Car sharing market in 2018 is USD 869.2 mn and the revenue for ride sharing market is USD 641.8 mn.

Source: GT primary & secondary analysis

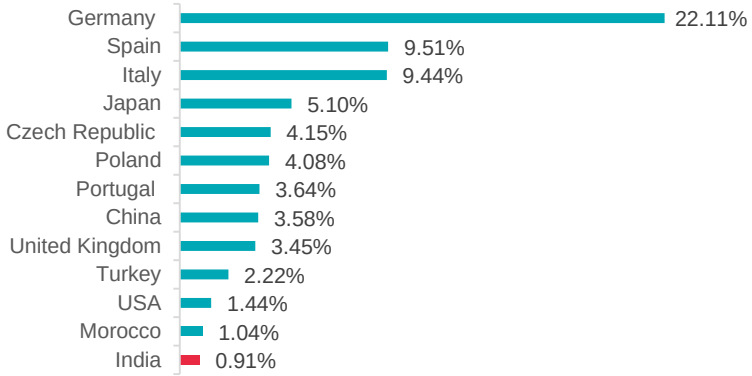
Indian suppliers could explore the opportunities that exist with the demand for gear boxes, combustion engines, brakes and ignition wiring sets

France India Export Import Trade: Auto Components (USD bn, 2016-17)



Source: GT Analysis

France: Top importing countries (2016-17)



Source: GT Analysis; Figures in %

Description

- The Indian Auto Component Sector exported products worth USD 0.29 bn to France in 2016-17. While the total imports of Auto components into France in 2016-17 is estimated at USD 31.94 bn
- Following are the largest segments of import into France globally:
  - ❖ Gear boxes and parts
  - ❖ Combustion Engines parts
  - ❖ Body parts & accessories
  - ❖ Brakes & parts
  - ❖ Ignition wiring sets

Description

- Germany dominates the France import markets with over 22.1% share followed by Spain (9.5%) and Italy (9.4%)
  - Majority of the France OEMs such as Renault , Peugeot , Citroen have set up their manufacturing industries in Germany and Spain.
    - EU countries account for ~65% of the France imports.
    - India accounts for 0.9% of France import share primarily supplying products suitable for use solely or principally with compression-ignition internal combustion, air pumps, pneumatic tires and gear boxes.

Maturity of the industry in terms of Technology

Technological Area	Description	Impact on Component
1 **Passive Entry Start system**	The Passive entry system uses the Bluetooth technology that allows the smartphone or the smart watch to communicate with the vehicle i.e. a virtual key is installed in the smartphone which allows it to start the vehicle and gives the access to vehicle data such as tire pressure, fuel level and last location parked.	The key installed can be transferred to another smartphone as a result, the person who receives the key will be authorised to use the vehicle • *Keyless cars*
2 **48 Volt Technology**	A 48V system can cope with higher energy demand from the vehicle and equipment. 48 Volt electrical systems typically power stop-start motors, hybrid motors and turbochargers, allowing for smaller engines with better fuel economy and performance. It turns the vehicle, in combination with a petrol or diesel engine, into a “mild hybrid”. For light urban vehicles, a 48V battery can also, function as one of the power units, propelling the vehicle and allowing emission free driving at short range	48 Volt systems handle hydraulic and mechanical accessories such as power steering, power brakes, water pump, radiator cooling and air conditioningtargets • *With some advancements, the technology could replace ring gears manufacturing*
3 **Turbo Puretech 3 cylinder technology**	The turbo Puretech 3 cylinder petrol engine introduced by PSA, has decreased the fuel consumption by a huge amount and has also reduced the CO_2 emissions by 18%. With the help of Gasoline particulate filters, it has achieved a reduction of 75% in particulate emissions	PSA and other similar customers are looking for suppliers with technologies that help in reducing fuel consumption and reduce CO_2 emission from vehicles • Suppliers with products that showcase lighweighting technology are of interest

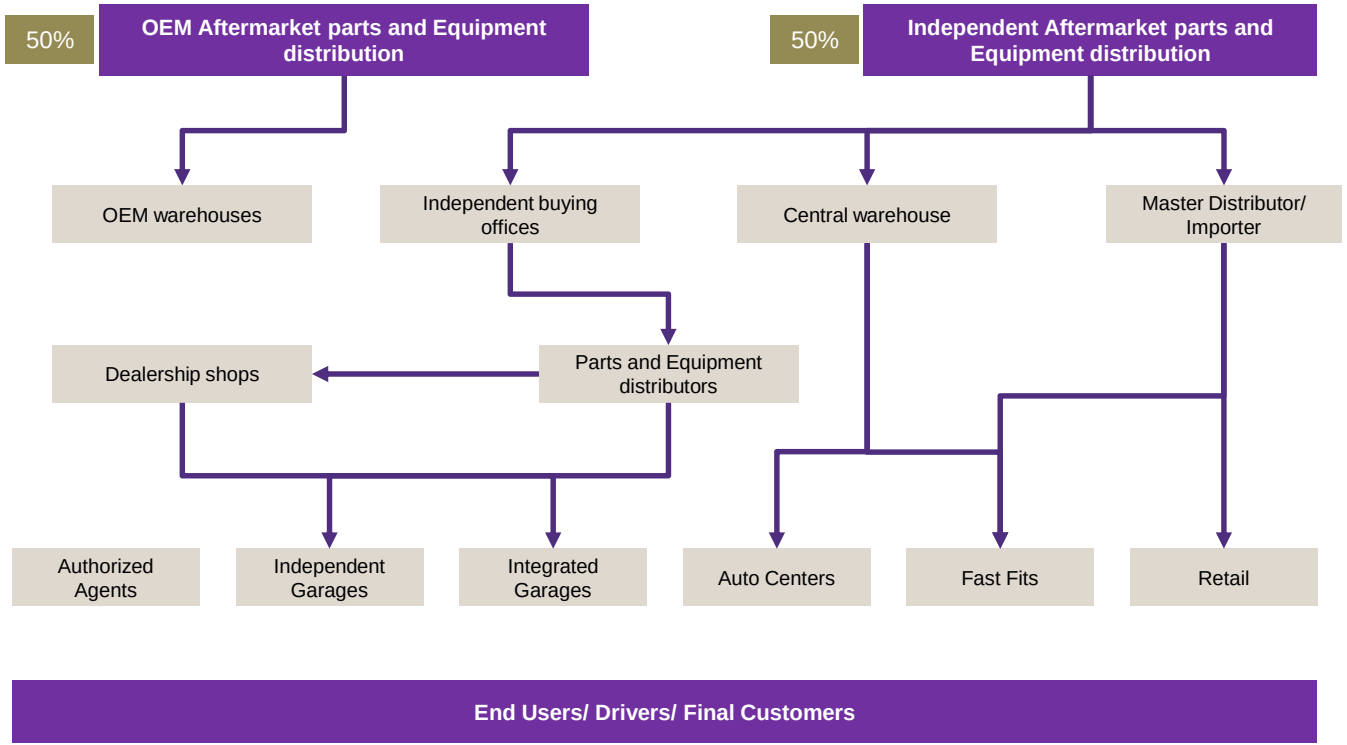
Source: GT Primary & analysis ; FIA

Maturity of the industry in terms of Technology

Technological Area	Description	Impact on Component
4 **Virtual Prototyping**	The ESI group has introduced Virtual Performance Solution which helps the automobile engineers and manufacturers to test their creations/ innovations on virtual prototypes. It also allows virtual testing of product performance across multiple domains using a single core model.	It involves using computer-aided design (CAD), computer-automated design (CAutoD) and computer-aided engineering (CAE) software to validate a design before committing to making a physical prototype.
5 **Ammonia Storage and Delivery System (ASDS)**	Ammonia Storage and Delivery System is designed to reduce the harmful NO_x emissions up to 99% even at low temperatures by using pure ammonia stored in solid form in the vehicle. The solution helps in improving the air quality which allows the manufacturers to comply with the latest Euro emission standards. Moreover, it reduces the time required to commence NO_x reduction in the exhaust system and can even operate under freezing weather.	The ASDS system is readily replacing the SCR technology or the AdBlue technology since the ASDS can eliminate the NO_x emissions up to 99% while the SCR system reduces only an average 32% of the NO_x under the same driving conditions. Moreover, the ASDS weighs one third less than AdBlue and only takes up half of the space, thus further improving the fuel efficiency. By 2020, it is forecasted that most of the auto manufacturers will replace AdBlue by the ASDS system.

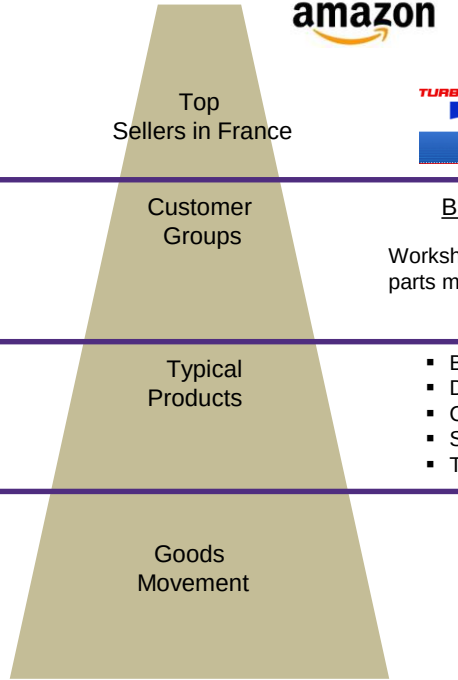
Source: GT Primary & analysis ; FIA

In 2015, the online sale of spare auto parts represented 12% of the total spare auto parts distribution turnover, while 2% of total market is based on remanufactured components in the country



Taking into account outlets and secondary retail outlets, the network of stocking distributors is estimated at about 2,200 in France.
There are around 4,000 repair shops for vehicle construction / repair. This figure does not take into account OEMs and brand agents who also do body repair in their own repair shops.
15,100 independent automotive mechanics. The number of mechanic shops which do not belong to any repair network is estimated at 6,700.
The remaining 8,400 display specialist logos belong to companies such as Bosch, Delphi, Denso and independent automotive repair networks such as Garage AD, Top Garage, Gef-Auto and Autofit
7,515 superstores and supermarkets (1,915 superstores and 5,600 supermarkets)
5,530 auto centers and neo-specialists (fast-fit centers, auto centers, tire shops, window shops
6,130 authorized technical control centers
11,476 traditional fuel stations often equipped with a garage space
3,500 secondary fuel distribution outlets (integrated repair shops)

In France, OEMs are the only choice for buyers for the aftermarket components, while the dealerships are still a widely used distribution channel for the French automotive aftermarket.



Top Sellers in France				
Customer Groups	B2B Workshop mechanics, parts managers	B2B2C DIFM	B2C DIY	STANDARD CUSTOMERS Standard End Customers
Typical Products	▪ Brake ▪ Disc Pads ▪ Clutch ▪ Shock absorbers ▪ Tyres	▪ Brake ▪ Disc Pads ▪ Filters ▪ Tyres	▪ Battery ▪ Filters ▪ Spark Plug ▪ Tyres ▪ Wiper Blades	▪ Accessory ▪ Lubricants ▪ Floor Mats ▪ Tyres ▪ Wiper Blades
Goods Movement	FAST MOVING ▪ Starters/ Alternators ▪ Alternators ▪ Lubricants ▪ Shocks & Springs ▪ Parking Censors ▪ Block Heaters ▪ Head Lamps ▪ Windscreen wiper blade	MEDIUM MOVING ▪ Tires ▪ Filters ▪ Brake Disc ▪ Spark Plugs ▪ Battery ▪ Timing belt ▪ Headlight ▪ Lubricants	SLOW MOVING ▪ Brake drums & pads ▪ Replacement Motors ▪ Exhaust Parts ▪ Clutch discs ▪ Thermostats ▪ Body Parts	

Tyres **Consumable & Accessory**

Rubber Parts **Mechanical Parts**

Source: GT Primary & Secondary data analysis

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Department of Heavy Industry
Ministry of Heavy Industries & Public Enterprises
Government of India

Germany

Country deck

Executive Summary

- Production leader of premium car segment globally with imports from supporting EU markets such as Hungary and Poland
- Demand of Casting & Forging components through imports is going to increase in the near future
- Approved certified OEM suppliers have potential to cater to After-market components basis industry structure in the country
- German suppliers will require to outsource the production of components which require new technologies. Opportunities across "in-cabin connected technologies" both across hardware and software design & integration for Indian suppliers

Opportunity

Strategy to increase export in the German market

Short Term

- Acquire distressed assets such as Whitesell Germany GmbH (threaded fasteners)

Medium Term

- Form JVs in Germany to get access for technologies such as Exhaust Gas Recirculation; Nitro carburizing treatment; 3D printing & automotive aerodynamics

Long Term

- Target OEMs with product range including light weighting technology products

Summary

- **Mature technologies such as:**
  - Light weighting
  - SCR Technology
  - Thermography & Infracted Technology
  - Nitro carburizing treatment
  - 3D printing & automotive aerodynamics
- VDA 6.3 Quality Audit Process – Mandatory for all German Suppliers
- Dual Educational Training Program set up by the Government

Best Practices & Technology

Assets/ Companies available for sale/ JV

Takata Sachsen

- The company manufacturers airbags and is based in Elterlein, Germany. **As of June 2017, the company is under reorganization**

*Valid as of June 30 2018

Competitors to India

Czech Republic

Hungary

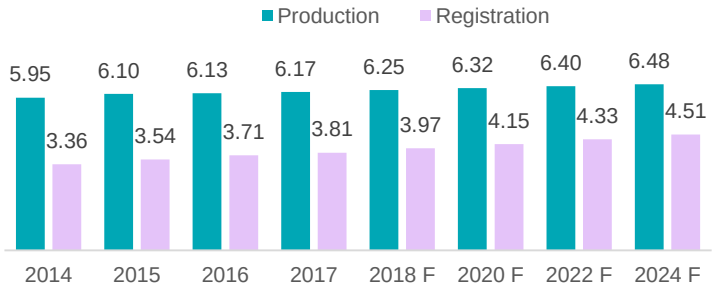
Poland

China

Turkey

Germany is the 4th largest market accounting for ~6.2 mn units in vehicle production in 2017; PV and LCV segments dominate with over 97% market share in terms of registration; Germany is home to over 47 OEM manufacturing plants – this is the highest in Europe

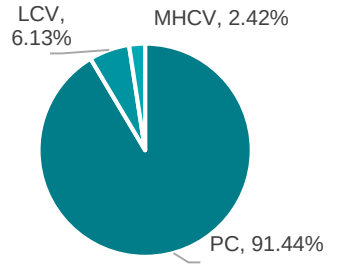
German Automotive Market: Vehicle Production & Registration (mn Units)



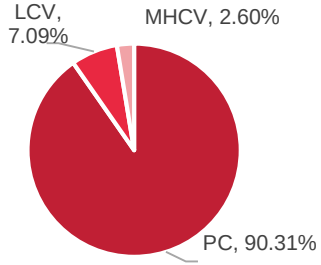
Source: European Automobile Manufacture Association

German Automotive Market: Classification (In %)

Production



Registration



Source: European Automobile Manufacture Association

Description

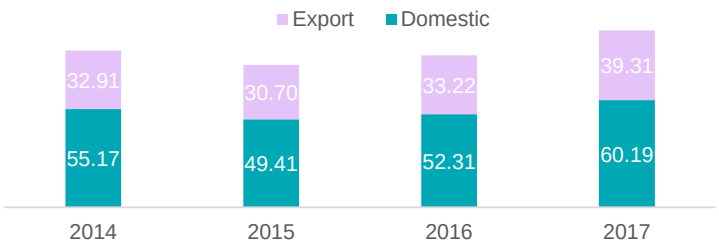
- Germany is the world's fourth-largest vehicle manufacturer-after China, the US and Japan-accounting for a third of total EU output and 6.6% of global production
  - The new vehicle registration in 2017 stood at 3.7 mn vehicles (including light trucks also known as LCV) in spite of European vehicle sales being volatile, German manufacturers have been successful in selling the perception of German automotive engineering to the new middle class in the world's emerging economies
  - The country has the largest concentration of OEM plants (47*) in Europe with Auto being the largest industry in the country
- The German Automotive industry generated over 790,000* direct jobs in 2015 including designing, engineering, manufacturing, and supplying parts and components to assemble, sell and service new motor vehicles

Description

- Passenger car and LCV segments dominate the automotive market collectively accounting for over 95% of the total market in 2016-17 in terms of production & registration
  - In the PV platform, VW including Audi accounts for almost 30% of the market followed by Mercedes which stands at 9% in terms of new registrations
  - With respect to the CV market, Daimler accounts for almost 22% of the market followed by Volkswagen at 16% and Ford at 12%
- The CV market structure accounts for only 7-10% (in terms of production & registration) primarily due to the low demand in the country

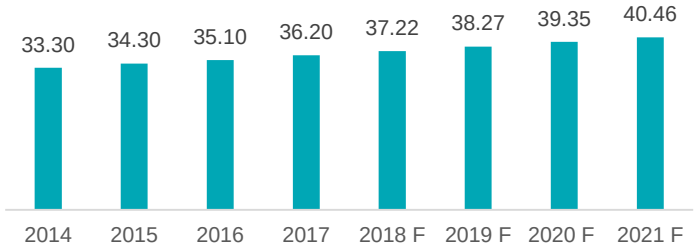
Auto Component market was estimated ~USD 99 bn with exports contributing to 40% in 2017; Aftermarket sector was estimated at USD 35 bn in 2017 dominated with OES segment (~70%)

German Auto Parts Industry Growth Trend (USD bn)



Source: VDA 2016

German After Market Growth (USD bn)



Source: Market line July 2017 Report

Description

- The German auto parts manufacturing industry's revenue in 2017 stood at USD 99.5 bn growing at CAGR of 4.1%. Out of the total, export sales attributed 40%
  - The German automotive component industry employed a total of 300,944 persons in the year 2015, an increase of 1.9% compared to 2014
- Around 20 of the world's top 100 automotive suppliers are German companies. 85% of the auto component suppliers operating in Germany are medium-sized companies and they provide up to 70% of the value added within the domestic automotive sector
- Many of the German automotive companies are also a beacon of German Mittelstand which constitutes the SMEs of the country
  - The contribution of German auto component sector to the overall turnover of the German automotive industry in 2015 was close to 17%

Description

- The automotive aftermarket is valued at USD 35 bn industry (2017) with a compound annual growth rate of 2.8% and is projected to reach USD 41 bn in 2021.
  - 70% of the after market is component and parts sale while 30% is mechanic and garage services. In 2015, 16% of aftermarket parts sales can be attributed to e-commerce in the country
  - The majority of after-market parts market is dominated by OE' registered suppliers due to sheer number of platforms per OEM in the country
  - Stringent government regulations that aim to improve fuel efficiency have also become more prominent both in Germany; this is likely to increase the need for the maintenance of older vehicles
  - Delticom, one of the largest player expanded its portfolio with selected spare parts and accessories, lubricants, workshop equipment, etc.

Key German OEMs and Suppliers operating in India

OEMs in India	Suppliers in India	Suppliers not in India
Mercedes-Benz, Audi, Volkswagen, Porsche, BMW, Daimler, Maybach, Volkswagen Truck & Bus	Bosch, Continental, Mahle, AMG, Schaeffler, Dürr, ZF, Flabeg, Ziehl-Abegg, Mann+Hummel, ZF Sachs, Rehau, Hella, Borgward	FTE automotive, BBS, Rieger Tuning

Rising economic performance, investment in R&D, favorable used car market metrics & global brand image for Germany as an innovator for mobility technology to drive the automotive industry in Germany

Germany Automotive Industry

Drivers/Trends	Description	Impact
Economic Performance & Reforms	▪ Germany is the fastest growing developed nation in the world with GDP growth variation rate increasing from 0.5% in 2013 to 2% in 2017 ▪ The automotive industry's contribution to the German economy is also substantial, supporting 900,000 jobs and EUR 100 bn in GVA each year	▪ *Increased economic performance to drive vehicle demand and consumption*
Technology Neutrality Approach & Implementation	▪ Due to the VW emission case and increased focus on emission norms, diesel vehicles have witnessed a decline by 17% in sale from 2017 ▪ In Feb 2018, the Federal Administrative Court in Leipzig allowed multiple cities with authority to legally ban older, more polluting diesel cars from selected districts ▪ Germany is adopting technology neutrality approach to steer away from Diesel powertrains	▪ *Demand for alternate fuel platforms to increase in coming years considering the Technology Neutrality approach taken by German Suppliers & OEMS*
Increasing 'Made in Germany' Demand	▪ Demand for both German Automobiles as well as components is on the rise globally, with every fifth car sold worldwide belonging to a German OEM. ▪ The Premium car segment is on the rise globally and offers higher margins for automotive suppliers than volume segment. Key growth driver especially for German suppliers (approx. 75% of total global premium car production is "made in Germany") is growing global perception which is associated with high quality, durability, efficiency and safety.	▪ *Demand for German made cars & component is expected to grow in the future.*
Automotive Technology Leader of Europe	▪ Germany is popularly known as the world's automotive innovation hub with R&D expenditure in 2015 amounting to EUR 20.6 bn, equivalent to 40% of Germany's total R&D expenditure an increase by 4.6% from 2014. The R&D spending of the German automobile sector results in more than 3,650 patents each year	▪ *Strong in-house R&D capabilities reduce dependency for technological advanced products,*
Growing Used Car Market	▪ According to ZDK (Central Association of German Automotive Industry), traders sold EUR 67.6 bn worth of used cars in 2016, up 17% year on year. Due to which there has been a significant rise in average second-hand car prices. The average age of gasoline vehicles is 8.1 years while for passenger cars is 6.8 years	▪ *Used car vehicles to drive up demand for replacement parts in aftermarket sector*
Government Support & Trade Incentive	▪ The government's aim of 1 mn electric fleet by 2020 under the National Electric Mobility Plan is key policy driving electrification ▪ The EU FTA in the form custom union exempts custom duty for trade between all 27 nations excluding the UK. This has allowed the continent to boost trade with others significantly	▪ *Demand for EV to grow on account of increasing incentives* ▪ *Trade is expected to increase as well*

Source: GT Primary & analysis, VDA Articles & Industry Reports

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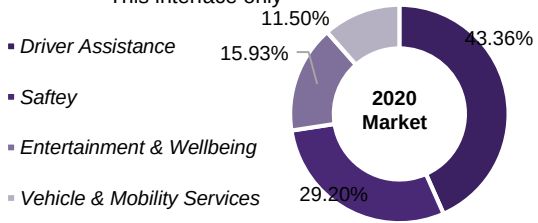
Key Challenges present in the Domestic Automotive & Auto-Component Industry

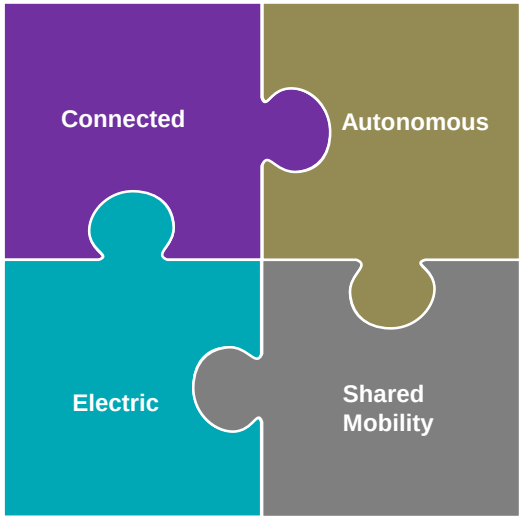
Challenge	Description	How are players reacting
Rising cost of Production	Driven by rising costs, suppliers and OEMs in Germany are focusing on regional LCCs to gain cost advantage while focusing on quality and efficient supply chain management German companies spent on average 31.70 euros (USD 43.61) per hour worked in 2017, while average labor costs in the EU were 23.70 euros.	Eastern Europe companies along with ASEAN outsourcing hubs have become the major destinations of investments from German suppliers. Countries such as Poland, Slovakia & Czech Republic have become key markets as majority of production for both OEMs and suppliers have been shifted
Dependence on Casting & Forging Parts	With German auto component suppliers shifting to highly integrated technology based solution/parts, the country has become highly dependent on imports for conventional casting, forging and machining components	Trade show organizer Messe Stuttgart announced plans to introduce a new event for producers of iron and steel forgings and castings to exhibit their capabilities for design and production.
Implementation of Industries 4.0	In 2011, the government launched its Industrie 4.0 initiative; a high-tech strategy which promotes the computerization of traditional industries and a shift from “centralized” to “decentralized” smart manufacturing. As with many IoT related initiatives, data security is a big concern with Industry 4.0	German players have started setting greenfield plants overseas as adhering to Industries 4.0 requires a significant investment in terms of CAPEX.

Source: GT Primary & analysis

With early adoption and policy push of electric vehicles and R&D practices to help Germany remain the innovation hub of the world

- The connected cars scenario in Germany is driven by multiple OEM, Tier-1 suppliers along with niche startups. OEMs and Tier I suppliers are making significant investments across Telematics, ADAS, Mobility Services & Infotainment
  - By 2020, the connected car market is expected to reach USD 113 bn, from current (2015) USD 31 bn growing at 29% CAGR
  - An initiative by the VDA NEVADA-Share & Secure deals exclusively with the transfer of data between the vehicle and the vehicle manufacturer's server using an interface which is already available in many modern vehicles. This interface only





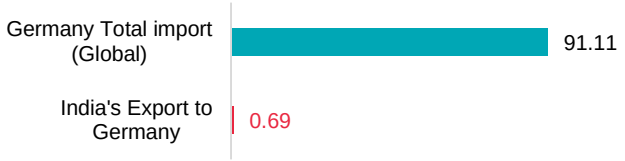
- As of December 2017, a total of 129,246 plug-in electric cars have been registered in Germany since 2010. The country ranked as the eighth largest plug-in market in the world and the fifth largest in Europe
  - The top selling models in 2017 were the Audi A3 e-tron (4,454), Renault Zoe (4,322), and BMW i3 (4,319)
- The government's aim of 1 mn electric fleet by 2020 under the National Electric Mobility Plan is key policy driving electrification including key incentive such as
  - 10 year PEV income tax exemption
  - Bonus of EUR 4,000 (BEV) and EUR 3,000 (PEV)

- For traditional manufacturers, autonomous development would not be at all negative.
  - Admittedly vehicle fleets across Germany would shrink, although this is also an important point for local authorities, since lesser parking spaces would be required, and traffic due to decrease in parking/searching time. However, since each vehicle would be used for higher mileage, it would need to be replaced by a newer model more frequently than today
- The death of a pedestrian in USA due to an autonomous Uber vehicle has lead to multiple policy engagements due to which multiple global OEM have slowed their autonomous ambition. However, BMW in March 2018, announced new facility in Germany for autonomous testing and adoption:
  - These self-driving cars would undergo a test regime equivalent to 250 mn driven kilometers (155 mn miles)
- Shared mobility providers also known as Transportation network companies (TNCs) are on-demand ride services offered through a smartphone app. They have seen a great deal of growth worldwide in recent years
- There has been an increased focus by traditional OEMs in Germany to transform their business models from being a pure manufacturer of vehicles to "vehicle as a service"
  - Hamburg-based mytaxi launched in 2009 and was acquired by Daimler in 2014 which caters to nearly 40% of the ride sharing market in Germany
  - In March 2013, Ford launched Ford2Go, a car-sharing program in 6 German cities

Source: GT primary & secondary analysis

India's share in German imports stood at 0.76% in 2017 (of USD 91.1 bn) providing significant opportunity for improving export share; increased localization of German OEMs & Suppliers in EU's LCC countries backed by EU trade policy makes it easy for component sourcing; needless to say it is backed by efficient supply chain & infrastructure

Germany India Export Import Trade: Auto Components (USD bn, 2016-17)

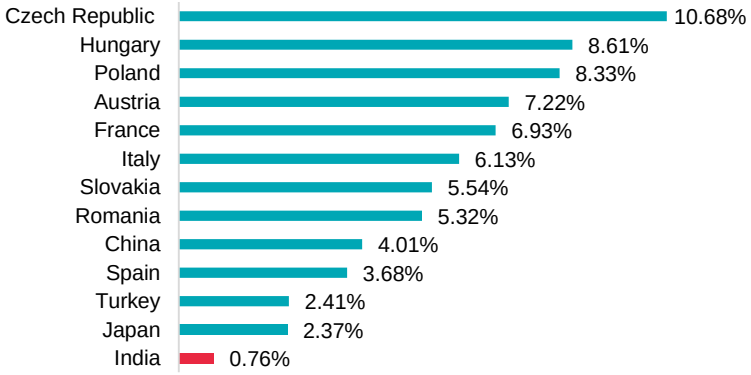


Source: GT Analysis

Description

- The Indian Auto Component Sector exported products worth USD 0.69 bn to Germany in 2016-17
- The total imports of Auto components into Germany globally including India in 2016-17 is estimated at USD 91.11 bn

Germany Top importing countries (2016-17)



Source: GT Analysis; Figures in %

Description

- Czech Republic dominate the Germany import markets with over 10% share followed by Hungary (8.6%) and Poland (8.3%)
  - Approximate 90% of German OEM such as VW, Audi, Daimler as well as auto component suppliers such as Bosh, ZF, Continental, etc. have set up manufacturing plants or acquired counter parts in Poland, Hungary & Czech Republic
  - The location of the three supporting markets for Germany has a crucial benefit of distance along which results in delivery of supply in 36-48 hours along with the EU free trade zone allowance and nil customs duty
- EU countries account for ~65% of the German imports
  - India accounts for 0.8% of import share primarily supplying products across Casting, Forging, Engine Components, Braking, Gearbox, Ignition & wiring related parts

Technology emergence and adoption by German OEMs and Suppliers

	Technological Area	Description	Impact & Adoption
1	SCR technology(AD Blue)/Exhaust Gas recirculation	The main aim of the Selective Catalytic reduction system is to reduce the harmful NO_x emissions in order to comply with the Euro emission standards. It is an after treatment technology that makes use of an aqueous urea solution known as AdBlue to achieve the desired emission targets. The major components of the system are AdBlue dosing control and injection unit, SCR catalyst and the AdBlue tank. **Exhaust Gas recirculation** is another method which helps in the reduction of NO_x emissions.	The major impact of SCR technology is on the Heavy duty diesel engines. However in order to comply with the latest EURO VI standards, the German OEMs such as BMW, Volkswagen, Audi and Mercedes Benz have started selling their motor vehicles equipped with an SCR system that uses AdBlue. Furthermore, diesel engine suppliers have also started to adopt this technology.
2	Nitro carburizing/Plasma Treatment	The majority of automobile manufacturers are shifting towards Nitro carburizing in order to increase the corrosion resistance in various auto components and to enhance their look. The concept of the nitro carburizing is to make an auto part surface harder by imparting carbon and nitrogen to its surface. Plasma Treatment has various advantages when it comes to automobile industry. The main functions of the Plasma treatment is to enhance the wettability of exterior components in automobiles and to prevent moisture ingress of the headlights.	The technology of nitro carburizing is being majorly used by the auto components manufactures .This process is also being used by the power train engines. The traditional treatment-substrate-systems are being replaced by various advanced treatments for example: Nitro Carburizing.
3	Thermography & Infratec Technology	Thermography is defined as the process of using infrared camera systems to detect the flaws in electric systems of cars and the motor vehicles without damaging the device under crash testing. There are some cases in which the flaws of the auto parts can only be detected through temperature changes, for example Heated seats and window heating. In these cases, the infrared systems are used to test the functionality. Moreover, this technology can also be used to test fast rotating subjects like brakes and tires with the help of IRBIS rotate	Due to its various uses, the auto component suppliers and OEMs are shifting towards infrared scanning technology instead of crash tests in order to control the damage of the device under testing.

Source: GT Primary Inputs, Annual Reports, ACEA

Technology emergence and adoption by German OEMs and Suppliers

	Technological Area	Description	Impact & Adoption
4	**Efficient electric and automated systems**	The introduction of automated or the autonomous systems have revolutionised the automotive industry. These vehicles are capable of examining the environment and navigating without any human contribution. The automated systems require no human intervention even in times of complex traffic. **Electrification:** In order to achieve the emissions free target given by the European emission standards, the automobile manufacturers are shifting towards electric engines. The idea is to use electricity in order to reduce CO_2 emissions and fuel consumption, without compromising driving performance or pleasure.	Due to the introduction latest emission standards, all the major OEMs are shifting towards efficient electric and automated systems in order to achieve the target reduction in CO_2. The carbon dioxide emissions could cut down by 8 to 10 g/km by 2020-2021 through electrification alone using the right mix of PHEV (plug-in hybrid electric vehicle), FHEV (Full Hybrid Electric Vehicle), and BEV (Battery Electric vehicles). Under EURO VII most of the OEMs will switch to electric and automated vehicles.
5	**3D printing/Lightweight**	With the technological development in the automobile industry, 3D printing is evolving the automotive industry by making motor vehicles stronger and lighter with the help of various lightweight polymers. Apart from the lightweight and the artistic design of the vehicles, 3D printing helps in delivering working prototype in record turnaround time. It has also led to steady reduction in lead-time by 40% to 90% and cost reduction up to 60%. Moreover it also helps in the creation of watertight and moisture resistant barrier for auto components.	Due to the introduction of 3D printing in the automotive industry, the majority of the manufacturers have started producing more robust designs, lighter and stronger products. The Auto component suppliers are using 3D technology to produce Functional mounting brackets, high detail visual prototypes
6	**Automotive Aerodynamics**	The aerodynamics mainly affects the design, speed, handling and fuel efficiency of the automotive industry (Automobiles). The main focus of the automotive aerodynamics is on reducing the drag which helps the car to cut through air more easily which further decreases the fuel consumption. It also aims at reducing wind noise and preventing undesired lift forces at high speeds. Aerodynamics simulation changes the vehicle development process which helps in the reduction of development costs and design cycle time.	The major impact of aerodynamics will be on the commercial vehicles. The visual style of the commercial vehicles will be majorly affected. In order to achieve fuel efficiency, the OEMs and suppliers are focusing on automotive aerodynamics

Source: GT Primary Inputs, Annual Reports, ACEA

Best Practices: VDA 6.3 compliance & integration of Vocational Education System within the German Auto Industry

VDA 6.3 Quality Process Audit

The VDA 6.3 is a quality audit process which is mandatory for all auto-component suppliers and pushed by German OEM. However, with German OEM dominating the global market, multiple international suppliers have invested significantly in order to become VDA 6.3 certified.

Requirements:

- **Technical Specifications 16949-** This is an internationally recognized quality management system for the production, installation, design and development of automotive products. The assessment a company goes through for acquiring this certificate include two rounds of visits from Initial Certification Audit. During the visit the assessor will evaluate many aspects of the business including but not limited to the following:
  a) Scope of activity and processes.
  b) Records of internal audits in the past 12 months and one complete audit conforming to the requirements.
  c) Key performing Indicator of the company with sample audits of processes as well as detailed compliance standard
- **Formula Q- Capability** of a company stands for quality capability. This is a way to prove to the buyers before purchase that the supplier has the capability to deliver the desired quality of product. A way of proving this capability is to have auditing reports for the products from the responsible departments as well as self-certification.
- Like majority of quality certifications periodic internal audits are necessary to attain VDA 6.3 as well. As mentioned above Q capability requires the manufacturer to self-assess and certify its products once every 12 months

German Automakers are only giving contracts/wallet share to suppliers (domestic or international) or who are certified, making it an entry strategy for multiple suppliers.

Maintaining standards laid by VDA 6.3 would improve the quality of a supplier's products and allow them to constantly address challenges in their supply chain which would eventually lead to greater customer satisfaction

Dual Vocational Education System

The Vocational Training Act of 1969, introduced this close alliance between the Federal Government, the federal states and companies with a view to providing students with training in nationally recognized occupations. This is certified by a regulatory body, i.e. a chamber of industry & commerce or a chamber of crafts & trades. Trainees in the dual system typically spend part of each week at a vocational school and the other part at a company, or they may spend longer periods at each place before alternating.

- There are currently around 330 occupations requiring formal training in Germany. With almost 70 out of 100 students who leave the school have applied for vocational training programs
- The requirements for the program and the application procedure depends upon the type of the training program and the type of the company, however recruitment becomes extremely viable for industry seekers.

Training occupation	Description
Electronics technician	*Designs, builds, installs, and repairs electrical components used for aspects including communication and navigation. Conducts tests to gather data and then does analysis and interpretation of data*
Mechatronic technician	*Designs, develops, and aids in installing the mechatronic (products from a combination of mechanical engineering, electronics, and computer engineering) products*
Cutting machine operator	*Uses skill sets and knowledge of machines to saw, cut, slit to produce goods and products*

The dual vocational programs helps in producing skilled workers with flexible credentials which makes them proficient of working in their target fields along with raising educational levels in a non-academic context. This further helps in increasing the economic productivity of the country. Due to the presence of dual vocational programs, the workforce in Germany hit a record high of 41.74 mn. The average employed workforce in Germany from 2015-2018 is 41.248 mn

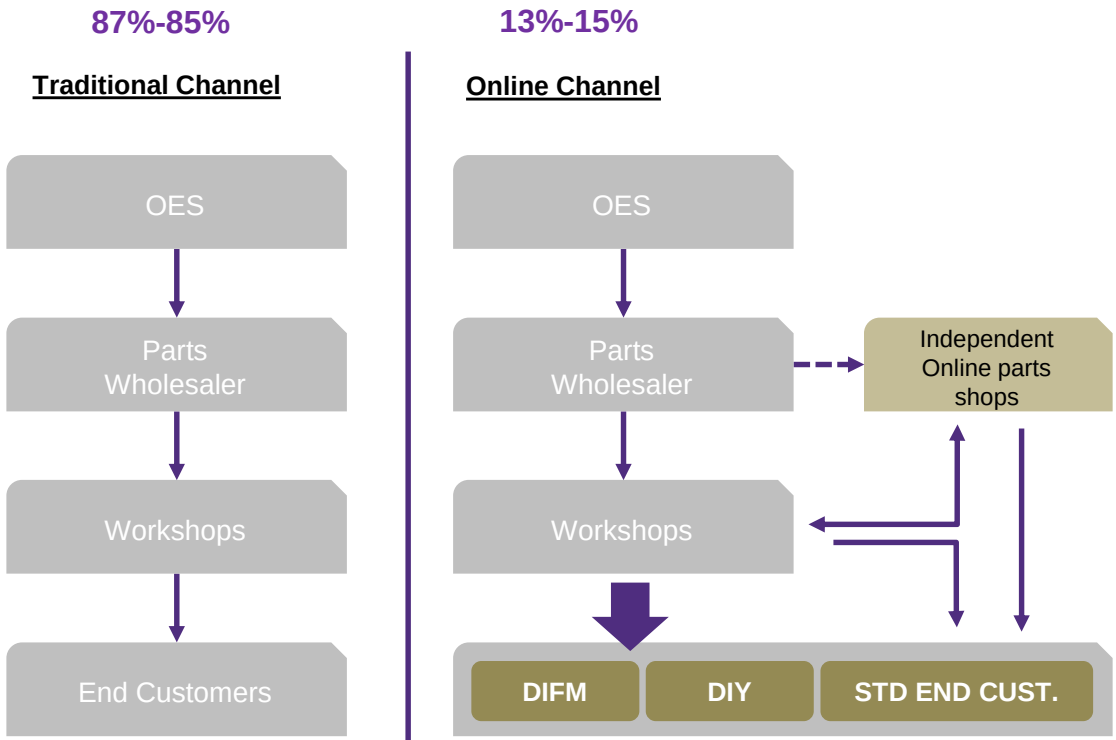
Key Component categories were mapped in line with parameters chosen based on discussion with Germany based OEMs, Suppliers with an objective to asses where and how Indian suppliers can make in-roads into German market

Components	Germany Demand			Competitive Intensity	
	Short Term	Medium Term	Long Term	Czech Republic	China
Lighting Components	L	M	H	H	L
ICE & engine parts	M	M	L	H	H
Shock absorbers	M	H	H	M	H
Electronic & exhaust systems	H	H	L	H	M
Transmission Shafts	M	M	L	L	H
Interior & Accessories	H	H	H	H	M
ADAS/ Sensors	M	H	H	L	L
Seats	H	H	H	M	L
Plastic molding components	H	H	H	L	L
Cylinder heads / Cylinder Blocks	M	L	L	M	L
Traditional Axles	M	L	L	M	L
Brakes	H	H	H	H	H
Battery/ Fuel Cells	M	H	H	M	H
Climate Control/ HVAC	H	H	H	M	L
Suspension & Components	H	H	H	H	H
Fuel System	H	M	L	H	L

"H" stands for High, " M" for Medium and "L" for Low

Source: Primary Interactions with German OEMs & Associations

Majority of the German aftermarket for auto-parts and components is controlled by OEM and their respective Tier-1 suppliers. Further, setting up a shop in the country is vital to enter the market

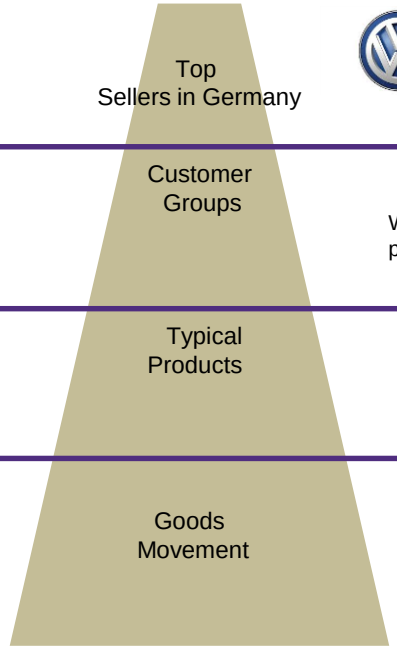


Source: GT Primary & Secondary data analysis

It is difficult for aftermarket parts enterprises to enter Germany's market for various reasons: warranty concerns, a highly sophisticated market, as well as fierce global competition.

- Majority of the aftermarket is original OEMbased, which means that OEM suppliers are the after-market manufacturers as well
- High barriers for new-to-market (NTM) manufacturers and products, especially for product groups such as lubricants, additives, care products, and other aftermarket parts and accessories. As they require high investments in marketing and/or local sales staff in order to gain market share, which can only be achieved through displacement of competitors.
- Distributors and agents are very reluctant to take on new products and brands, unless the product's unique selling proposition is strong and the foreign manufacturer shows commitment to invest in product development in Germany

53% of aftermarket workshop services are provided by OEM centers (OES), while 39% is provided by independent third parties; only 8% of the market is DIY ("do it yourself")



Top Sellers in Germany				
Customer Groups	B2B Workshop mechanics, parts managers	B2B2C DIFM	B2C DIY	STANDARD CUSTOMERS Standard End Customers
Typical Products	▪ Brake ▪ Disc Pads ▪ Clutch ▪ Shock absorbers ▪ Tyres	▪ Brake ▪ Disc Pads ▪ Filters ▪ Tyres	▪ Battery ▪ Filters ▪ Spark Plug ▪ Tyres ▪ Wiper Blades	▪ Accessory ▪ Lubricants ▪ Floor Mats ▪ Tyres ▪ Wiper Blades
Goods Movement	FAST MOVING	MEDIUM MOVING	SLOW MOVING	
	▪ Starters/Alternators ▪ Alternators ▪ Lubricants ▪ Shocks & Springs ▪ Parking Censors ▪ Block Heaters ▪ Head Lamps ▪ Windscreen wiper blade	▪ Tires ▪ Filters ▪ Brake Disc ▪ Spark Plugs ▪ Battery ▪ Timing belt ▪ Headlight ▪ Lubricants	▪ Brake drums & pads ▪ Replacement Motors ▪ Exhaust Parts ▪ Clutch discs ▪ Thermostats ▪ Body Parts	

Tyres **Consumable & Accessory**

Rubber Parts **Mechanical Parts**

Source: GT Primary & Secondary data analysis

OEM & Tier I Segment – Local presence, investment in export capacity, R&D capability and Financial risk taking ability is a pre-requisite for market play across OEMs and Tier I segment in Germany

Segment	Market play: Pre-Requisites		Imperative	Segment
• Traditional Body Panels & Stamping • ICE & Components • Drive Axles • Wheels and Tyres • Brakes • Suspension and Components • Rubber & Plastic Components • Fuel Systems	✓ Euro VI/VII Standards ✓ UNCE Safety Standards	1. JIT Requirement from OEM and Tier I – high risk of assembly line disruption in case of shortage 2. High degree of supply chain alignment with OEMs and Tier I suppliers 3. Local Presence (Supply & Manufacturing) – preferably manufacturing as per customer discussions 4. High Warranty risks and liability (Powertrain Components) 5. Large volume perpetual contracts to improve margin play 6. Export capacity to meet overseas customer demand	1. Local presence is a must (manufacturing/ warehousing) 2. Higher risk taking ability 3. Dedicated local representative 4. Investment in Capacity for exports	Tier I,2 & 3 Supplier
• Climate Control/ • HVAC Components & systems • Seating and Components • Interior & Accessories	✓ VDA 6.3 Quality Audit ✓ National Electric Mobility Plan	1. JIT Requirement from OEM and Tier I – high risk of assembly line disruption in case of shortage 2. High degree of supply chain alignment with OEMs and Tier I suppliers 3. High Warranty risks and liability (Powertrain Components) **4. High Design Capability (interior and accessory segment)**	1. Local presence is a must (manufacturing & warehousing) 2. Higher risk taking ability 3. High Design Capability and R&D Investment (3D and CAD capabilities)	Tier I & Select Tier II suppliers
• Infotainment Systems • Battery & Fuel Cells • Electronics • ADAS/ Sensors • Electric Drivetrain • Exhaust	✓ German Law & Regulatory Procedures	**1. High R&D Capability & Investments** **2. Long gestation period for prototype commercialization** 3. Software integration and solution bundling capability 4. High Warranty risks and liability 5. Local Presence and high engagement levels with OEMs and Tier I from Design phase	1. High R&D Investments (Software Design, Software and Component Integration) 2. Demonstration of solution rather than products 3. High financial appetite for risk	Tier I Suppliers

Source: GT Primary & Secondary data analysis

High
Medium
Low

Synergies in line with Indian Industry Capability

Grant Thornton | An instinct for growth™

Italy

Country deck

Executive Summary

- Italy has the largest two and three wheeler market in Europe
- Opportunities with respect to CNG and LPG technology for OEMs/Tier-1 suppliers as well aftermarket players, pose as easy opportunities
- Vehicle and component imports is expected to increase in the future as the domestic supply is not meeting the domestic demand
- Significant opportunities across "in-cabin connected technologies" both across hardware and component design

Opportunity

Strategy to increase export in the GER market

Short Term

- Set up trading arms to cater to aftermarket players in Italy for FCA and PSA platforms such as Panda, Tipo, Lancia ypsilon, Citroen c3

Medium Term

- Collaborate with Italian suppliers to source CNG/LPG fuel technology for OEM and Aftermarket

Long Term

- Set up subsidiary/plant in Eastern Europe such as Slovakia or Czech Republic to cater to developed EU markets especially Germany

Summary

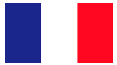
Best Practices & Technology

Mature technologies such as:

- Forged Composites-Carbon Fiber upgrade
- Kinetic Energy Recovery Systems
- Gasoline direct injection technology
- Ethanol Flex fuel technology
- Multi-Valve actuation Technology

Competitors to India


Germany


France

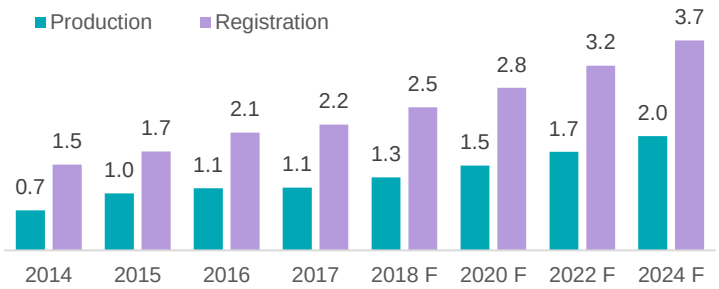

China


Poland


Turkey

Italy is ranked the fourth largest automotive market in Europe. In 2017, the Italian automotive manufacturing value reached USD 20.1 bn with PV and LCV segments dominating 97% of the market share in terms of registration indicating its position as a global leader in the premium car segment

Italian Automotive Market: Vehicle Production & Registration (Mn Units)

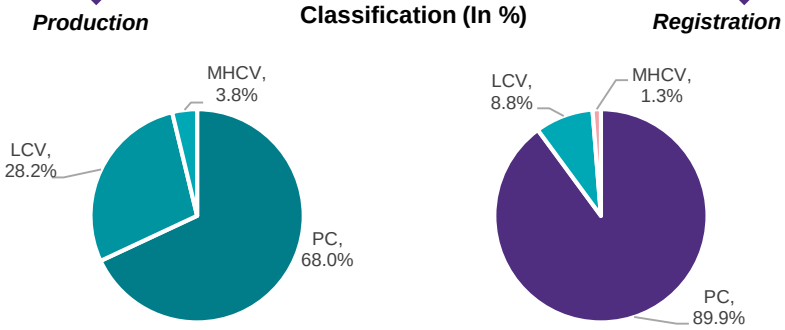


Source: European Automobile Manufacture Association

Description

- The Italian automobile production registered a CAGR 16.2% (2014-2017), and is projected to reach 2.0 mn units by 2024. Registration of vehicles is on the rise (CAGR of 13.7%) and is expected to reach 3.7 mn units.
- An estimated 56% of PV's and 80% of CV's in Italy are produced to cater to international markets. Foreign brands represent 71% of the Italian automotive market including components
- With an annual CAGR of 14.1% (2013-2017) for vehicle manufacturing revenues, Italy is expected to reach USD 30.4 bn
  - Of new vehicles produced, 57% are diesel, 32.8% are gasoline and 10.2% use alternative fuels (including battery cells). LPG (Liquid Petroleum Gas) and CNG (Compressed Natural Gas) cars, account for 78.5% of the Italian alternative fuel vehicles market.

Italian Automotive Market: Classification (In %)



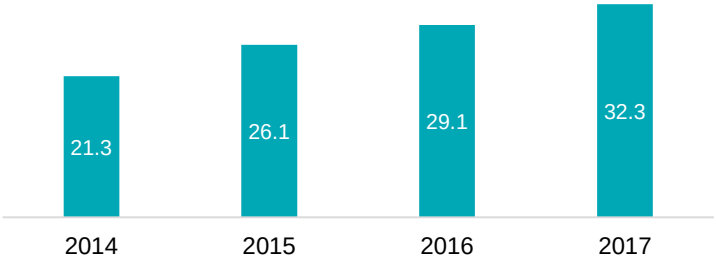
Source: European Automobile Manufacture Association

Description

- In terms of production, PV accounts for 68% with respect to production and almost 90% in terms of registrations
  - In 2016, Italian manufacturers had a 29% market share of the passenger vehicles market. FCA (Fiat-Chrysler Automobiles) is the only significant auto manufacturer producing cars and light commercial vehicles in Italy.
  - FCA has a 50% joint venture with the French PSA Group in the light commercial vehicles sector and dominates the market.
  - CNH industrial which includes brands such as Iveco, accounts for about 50% of new light CV registrations and about 40% of heavy CV sales

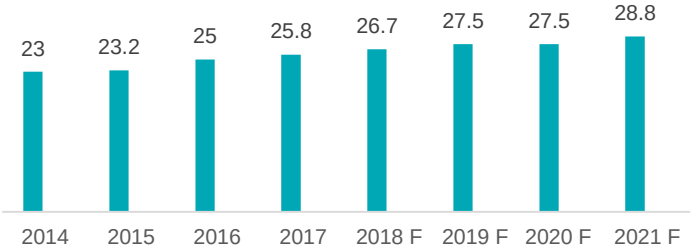
Leading Italian based OEM tend to own or indirectly invest in the companies that are in charge of manufacturing and supplying their main mechanical, body components and spare parts; ensuring backward integration in the industry

Italy Auto Parts Industry Growth Trend (USD Bn)



Source: ISTAT 2017

Italy Aftermarket Growth (USD Bn)



Source: Market line January 2018 Report

Description

- Domestic component production of auto-component increased from USD 21.3 bn in 2014 to USD 32.3 bn in 2017, registering a CAGR of 14.8%
  - As of 2016, Italy's prime export destination for the automotive components market remains Germany which represents 19.5% of total exports in this sector, which is followed by Japan (~11%)
  - The auto component industry in Italy consists of around 2,000 companies out of which around 400 are Tier I suppliers.
  - The auto component sector provides direct employment to 159,000 personnel in Italy
  - Italy also homes major luxury sports OEMs where all phases of the development, design, assembling and sale of vehicles are undertaken domestically

Description

- The Italian automotive aftermarket is a USD 25.8 bn industry (2017) with a compound annual growth rate of 3% and is projected to reach USD 28.8 bn by 2021.
  - The Italian after market comprises of auto parts components (76.9% of total revenue) and garage/services provided (23.1% of total revenue).
  - The total turnover of the Italian Garage Equipment Manufacturers was EUR 2.5 bn in 2017, with 81% of the component parts being exported overseas
  - Technology integration in the auto aftermarket is key trend driving the sector with 78% of aftermarket specialist companies participating in process innovations. However, online sale and services of aftermarket is relatively low in the country. This is because Italy has lowest level of Internet penetration of all European countries

Italy’s presence in Indian automobile industry

OEMs in India	Suppliers in India	Suppliers not in India
FIAT	brembo	agv
PIAGGIO	CARRARO	TRASMISSIONI COLOTTI
	MAGNETI MARELLI	
	oerlikon graziano	
	SDF Farming Technology. Since 1927.	
	Bonfiglioli Forever Forward	

Growing used car market along with CNG/LPG integration and an enormous large two-wheeler market provides easy access to Indian suppliers to cater to Italy

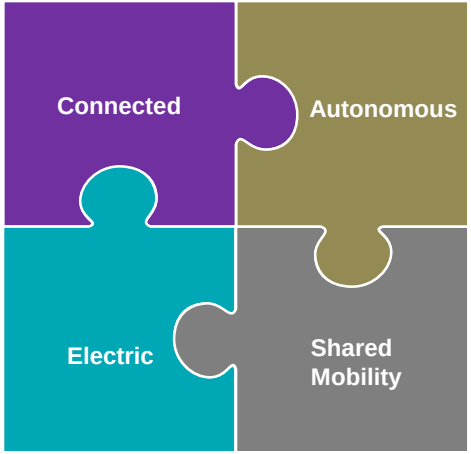
Italian Automotive Industry

Drivers	Description	Impact
Economic Performance & Reforms	▪ In 2016 the GDP at market prices grew by 1.6% and 0.9% by volume. The Italian automotive industry accounts for about 20% of gross value added in industry, 5% of manufacturing employment and 8% of the country's total exports	▪ *Increased economic performance to drive vehicle demand and consumption*
Growing two-wheeler market	▪ Italy is one of the largest European markets for motorcycles and mopeds; in 2015 the fleet stock of two- and three-wheeled vehicles was 8,540,000 units. In 2016, over 193,100 new two- and three-wheeled vehicles were registered	▪ *Demand for two wheelers as well as respective parts and after-market opportunity is present*
Growing Used Car Market	▪ The market for used vehicles in Italy exceeded 2.2 mn units in 2016. Many used vehicles can be retrofitted to LPG/CNG in order to keep their operating costs affordable ▪ 47% of car fleet in Italy still do not meet the Euro 4 emission standards	▪ *Used car vehicles to drive up demand for replacement parts in aftermarket sector*
High Barriers to Entry	▪ The cost of labor in Italy is extremely high in comparison to East EU countries such as Poland, Slovakia, increasing the total production cost ▪ Further, the Ministry for Infrastructure and Transport regulates the approval and sale of all motor vehicles and their trailers, and of systems, components. This decree requires multiple licenses and regulatory approvals each year for smooth operations	▪ *Dependency on imports is going to increase in the future, as Auto FDI (greenfield) decreases*
Automotive Technology Leader of Europe	▪ Italy was the third largest spender on automotive R&D and new innovation in the EU. The country was granted 333 automotive patents in 2016 which constitute 4% of global patent grants ▪ 40% of total R&D undertaken in the country in 2016 belonged to the Automotive and component industry	▪ *Strong in-house R&D capabilities reduce dependency for technological advanced products,*

Source: GT Primary & secondary analysis, MEMA, AASA

The encouragement of Italian government bodies along with precise policies of electronic mobility provides critical infrastructure for the future; there are opportunities for Indian suppliers to integrate with IT software providers to cater global markets

- The 2017 revenue for the Connected Car market is estimated to amount to USD 665 mn which is expected to grow with a CAGR of 8.8% from 2018-2022 (the values exclude the B2B services)
  - The total volume of connected cars used in 2017 was 3.8 mn and is expected to reach 12.6 mn by 2022 with a CAGR of 31.8%
  - Italy stands sixth in both, user penetration and revenue, in this segment globally



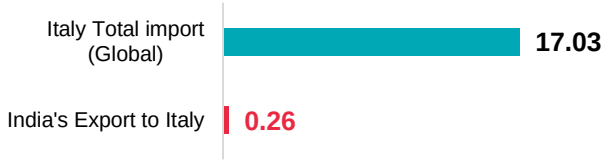
- Alternative fueled cars consist of 11.7% of the market, up 24% on volumes in 2016; the segment is made up of: 6.5% of gasoline-LPG cars, 1.7% of petrol-methane cars, 0.1% of electric cars, 3.4% of hybrid cars (including plug-ins).
- Italian revenues for hybrid and electric cars totaled USD 1,793 in 2017, representing a CAGR of 43.7% from 2013-2017 which is higher than that of Germany (38.5%) and France (19.3%)
  - 4,980 charging stations in 2,568 locations
  - Hybrid car sales of 66,258 units (97.1% of market volume) while Electric car sales amounted to 1,967 units (2.9% of market volume)
- Despite strong growth rate between 2013-2017, Italy is in it's early stage of adoption for the Electric Vehicles due to the lack of government promotions and slow growth of infrastructure
  - Lack of growth can also be due to the FCA's (Fiat Chrysler Automobiles) slow adoption of hybrid or electric cars; FCA, the leading Italian car manufacturer, aims to electrify around half of it's vehicles by 2022

- Italy is welcoming the use of autonomous driving with government support through incentives as well as projects
  - Project AUTOPILOT was launched in 2017 by ERTICO deploying ITS, with the aim to expand the use of autonomous vehicles by launching its real life testing in France, Finland, Netherland and Italy. It aims to reach 50% of the global market by 2035.
  - Moreover, this year the Italian parliament agreed to allow universities, research institutions, and vehicle manufacturers to conduct road tests for driverless cars
  - In 2017, Italian manufacturing giant Fiat Chrysler announced that it would be partnering up with a BMW operated group and with Google's Waymo for the development of autonomous cars

- Currently, the Italian revenue for the shared services (Ride sharing and Car sharing) amounted to approximately US USD 1.2 bn in 2017, with car sharing comprising 60% of the market share. The revenue for car sharing services are predicted to grow with a CAGR of 5.1% whereas that for ride sharing with 13.8% (2016-2022)
  - 2017 saw the number of car sharing users to be 2.8 mn, while users for ride sharing were 3 mn
- Italy, being recognized as the second largest EU country with private car ownership that facilitated a 25% of total greenhouse gas emissions and 30% of total energy consumption, introduced the National Law of 28 December 2015, No. 221, which aimed at reducing pollution levels as well as traffic, giving way to a bright future for the shared mobility sector

India's share in Italian imports of components stood at 1.5% in 2017 (of USD 17 bn) providing significant opportunity for improving export share; rising costs in Italy have forced OEMs and suppliers have set up plants in Eastern Europe and China due to value cost savings

Italy India Export Import Trade: Auto Components (USD Bn, 2016-17)

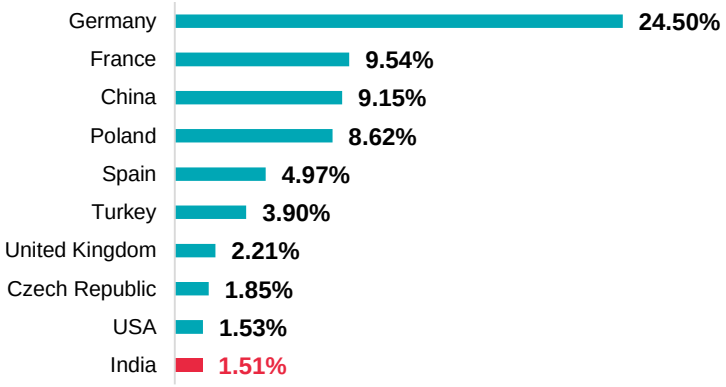


Source: GT Analysis

Description

- The Indian Auto Component Sector exported products worth USD 0.26 bn to Germany in 2016-17
- The total imports of Auto components into Germany globally including India in 2016-17 is estimated at USD 17.03 bn

Italy: Top importing countries (2016-17)



Source: GT Analysis; Figures in %

Description

- Germany dominates the Italian import markets with over 24% share followed by France (9.5%) and China (9.1%)
  - Approximate 73% of total Italian component imports is from EU-28 countries. China, Turkey and India have a total share of 15% of total imports
  - A key driver for growth in the country is the growing domestic after market. OEM and Tier-1 suppliers are not meeting the current demand of vehicles in the country.
  - India accounts for 1.5% of import share primarily supplying products across Casting, Forging, Engine Components, Braking, Gearbox, Ignition & wiring related parts
  - While the Chinese suppliers with a market share of 9.1% are offerings products such as ball bearings, brakes and parts, tires, DC motors.

Maturity of the industry in terms of Technology

	Technological Area	Description	Impact on Component
1	**Forged composites technology/Carbon fibre technology**	The carbon fibre has numerous properties for example: Its ability to reduce mass, reduce tooling investment, eliminate corrosion and denting, and improve sound damping and vibration which makes it a perfect raw material for achieving the desired light weighting goal. The base technology used in CFRP is known as Carbon – long fibre thermoplastic-direct (C-LFT-D).	All the components of the target car chassis made of alum are replaced by C-LFT-D components and a 10% weight reduction with the same rigidity has been verified can be achieved. The CFRTP panel is 74% lighter than the steel panel.
2	**Kinetic Energy Recovery System/Gasoline direct injection technology**	**Kinetic Energy Recovery System** converts the mechanical energy which is produced by braking into electrical energy which can be stored in the batteries and can be reused in various situations for example while overtaking other cars or while providing a power boost to the vehicle. **Gasoline direct injection** is an enhanced injection system for gasoline engines system which operated under intense pressure i.e. 100 bar and uses the concept of turbocharger in order to achieve a reduction in the engine sizing and fuel consumption which helps in increasing fuel efficiency which further reduces the harmful CO2 and NOx emissions.	
3	**Ethanol Flex Fuel Technology**	The **flexible fuel technology** is designed to run on more than one fuel i.e. Ethanol/alcohol fuels. It uses sugarcane-based ethanol fuels in order to reduce the toxic emissions released by the process of combustion, thus providing various environmental benefits.	
4	**MultiAir valve-actuation technology**	Mult iAir valve-actuation technology is a 4-stroke internal combustion engine which improves the fuel efficiency by reducing the CO_2 emissions.	The engine incorporates fully variable intake valve lift and timing control through the use of hydraulics to control valve operation. Moreover, the intake event control has been improved.

Italy Export Incentives

There are various export incentives present in Italy in the form of Central government grants, European subsidies, Regional Development grants and various benefits offered from the local communities and provincial authorities

- In order to promote the export of various goods and services from Italy to the rest of the world, the banks grants low interest loans to the Manufactures or the suppliers who are responsible for the export. The value of the loan can be as high as 85% of the amount of goods and services exported. The financing is given over a period of five years as interim financing on overseas customer payments

- Incentives offered by SACE (Italian Export Credit and Project Finance Agency): SACE provides an extensive range of insurance and financial products and services, including insurance against non-payment risk for Italian enterprises that export various goods and services. SACE is also responsible for guaranteeing that loans are granted by the bank to Italian companies which exports various goods and services.

Free Trade Zones/ Foreign Trade Zones (Within EU)

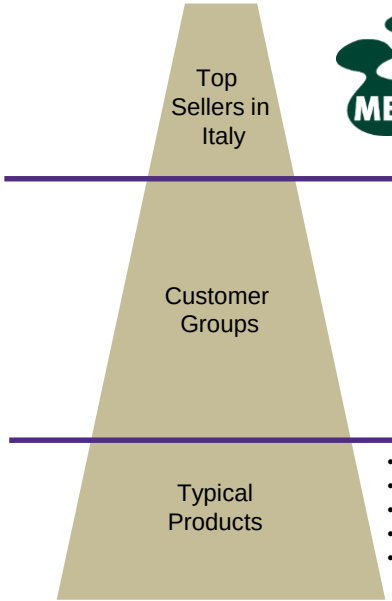
- The major free trade zones in Italy are located in Trieste and Venice. Both are located in the northern part of Italy. There are various benefits which are provided to the exporters in Italy in the Free trade zones **(Export within EU)**

- Customs duties are deferred for 180 days from the time the goods leave the Free trade Zones and enter another EU country. The goods are also allowed to undergo transformation which is free of any customs restraints

- The FTZ also allow for a complete exemption from any of the duties on products coming from a third country and re-exported to a non-EU country

- The goods from any country can be imported in Italy without the payment of taxes and various duties as long as the goods imported can serve as raw materials in the production or manufacturing of a product that will be exported from Italy

With 78% of aftermarket specialist companies participating in process innovations from 2014-2016, the Italian aftermarket is booming with multiple suppliers providing the latest technology for auto components.



Top Sellers in Italy	MEC DIESEL ENGINE PARTS SPECIALIST	blu OFFICINA	Norauto	ECS
Customer Groups	B2B Workshop mechanics, parts managers	B2B2C DIFM	B2C DIY	STANDARD CUSTOMERS Standard End Customers
Typical Products	• Pistons • Alternators • Throttle bodies • Oil pumps • Turbo chargers	• Cylinder heads • Injections • Engines • Filters • Sensors	• Filters • Tyres • Wiper Blades • Accessory • Lubricants • Floor Mats	• Transmissions • Exhaust • Fuel system • Filters • Batteries

Top Sellers in Italy	CRAVEDI Ricambi auto e veicoli industriali	MIRAGLIO	1805 D'Ieteren	DTR VMS Italy
Customer Groups				
Typical Products	• Alternators • Brakes • Suspensions • Steering wheel • Headlights	• Accessory • Lubricants • Floor Mats • Tyres • Wiper Blades	• Transmissions • Exhaust • Fuel system • Clutch and pedal	• Cabin • Wheels • Axles • Shafts

The market for used vehicles in Italy exceeded 2.2 mn units in 2016. Many used vehicles (especially the more powerful and gasoline powered) can be retrofitted to LPG/CNG in order to keep their operating costs affordable. In the last 15 years, LPG retrofitting has reached more than 2 mn units, whereas CNG retrofitting has exceeded 400,000 units. The total turnover of retrofitting vehicles was estimated at USD 270 mn in 2014 with network of over 6,000 car repair shops

Source: GT Primary & Secondary data analysis

Department of Heavy Industry
Ministry of Heavy Industries & Public Enterprises
Government of India

Japan

Country deck

Executive Summary

- China contributes to almost a third of the imports into Japan. As labour costs increase in China, India can be seen as an alternative source of procurement. Products that can be imported into Japan include cylinder blocks, steel turbo housing, forklifts, small engine parts and blocks
- Focus on the aftermarket, especially for platforms that are common between Japan and India like Toyota Acqua, Prius, Corolla, Camry, Honda City, Sienta, N-box, Suzuki Xbee, WagonR

Opportunity

Short Term

- JV's with companies having plants with aluminium casting lines in Thailand and Indonesia

Medium Term

- Tap opportunity related to the export of engine components made with ductile iron technology

Long Term

- Joint ventures with Japanese companies to acquire capabilities around iron casting through automatic squeeze moulding lines, forging via 6300 T presses and machining on fully automated die casting lines

Strategy to increase export to the Japanese market

Competitors to India


China


Thailand


Vietnam


USA


South Korea


Germany

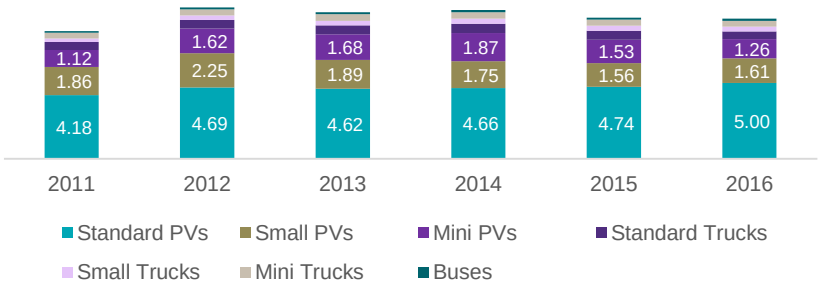
Summary

- Expansion of Japanese OEMs and auto component suppliers globally through acquisitions and JVs
- As a practice, Japanese companies look for local companies in countries where they can offer technology and innovation coupled with the strengths of the local company to either:
  - Address the local demand for the country
  - Use the country as a manufacturing hub for exports

Best Practices & Technology

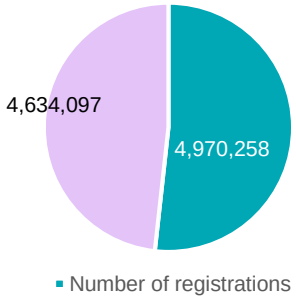
Japan has been one of the top 3 car producing countries since the 1960s. In 2016, Japan produced a total of 9.2 mn units of motor vehicles, by 0.8% from the previous year. Of these 9.2 mn units, 48.2% or 4.6 mn units were exported

Japan Automotive Market: Vehicle Production (mn units)



Source: Japan Automobile Manufacturers Association (JAMA)

Unit Registrations vs Unit Exports (2016)



Source: Japan Automobile Manufacturers Association (JAMA)

Description

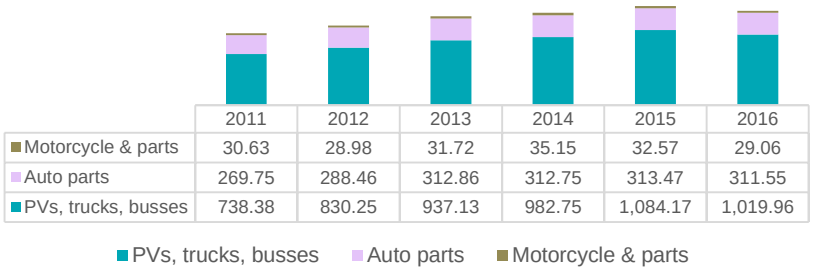
- Japan has been one of the top 3 car producing countries since the 1960s and is a world leader in automotive manufacturing, technology and innovation
- The country's largest manufacturing sector is the transportation machinery industry, of which automotive related manufacturing takes up 89%. Automotive components and vehicles account for 18% of all manufacturing shipments from Japan
- The automotive industry in Japan is one of the economy's core industrial sector
  - In 2016, motor vehicle production in Japan totalled 9.2 mn units down 0.8% from the previous year
  - PV production rose 0.6% to a total of 7.87 mn units. Within PVs, standard and small car production increased by 5.4% and 3.5% respectively to 5 mn and 1.61 mn units respectively, while minicar production declined 17.4% to 1.26 mn units
- Trucks and buses that accounted for 14.45% of total volume production in 2016 decreased by 8.3% to 1.2 mn units and 5.9% to 0.13 mn units respectively

Description

- Japan is highly focused on exporting both automobiles and auto components across the globe
- Automotive vehicles account for ~16% of Japan's exports, while vehicle parts account for ~5% of total exports from Japan
- Japan exports a large amount of the cars produced in the country
  - Out of the 9.2 mn units produced domestically in 2016, 48.2% or 4.6 mn units were exported while the rest were used as domestic consumption
- As of 2016, imports of automobile and automobile parts added up to USD 189 bn while exports added up to USD 1,360 bn

Exports form a large part of the Japanese auto industry accounting for 48% of the vehicles produced in Japan. The US is the largest importer of Japanese automobiles, accounting for 1.9 mn units or 37.5% or of total exports of motor vehicles from Japan

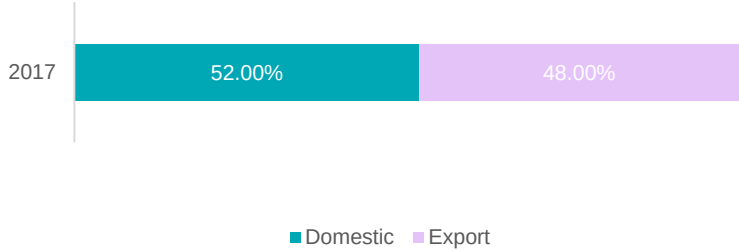
Automotive Exports from Japan (USD bn)



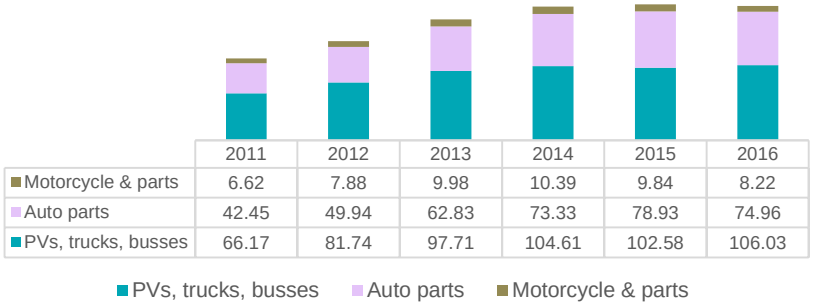
	2011	2012	2013	2014	2015	2016
Motorcycle & parts	30.63	28.98	31.72	35.15	32.57	29.06
Auto parts	269.75	288.46	312.86	312.75	313.47	311.55
PVs, trucks, busses	738.38	830.25	937.13	982.75	1,084.17	1,019.96

Source: Japan Automobile Manufacturers Association (JAMA)

Production & Export/ Domestic Ratio



Automotive Imports to Mexico (USD bn)



	2011	2012	2013	2014	2015	2016
Motorcycle & parts	6.62	7.88	9.98	10.39	9.84	8.22
Auto parts	42.45	49.94	62.83	73.33	78.93	74.96
PVs, trucks, busses	66.17	81.74	97.71	104.61	102.58	106.03

Source: Japan Automobile Manufacturers Association (JAMA)

Description

- Exports form a large part of the Japanese automobile industry comprising around 48% of the vehicles produced in Japan
  - Auto parts accounted for USD 312 bn of exports from Japan in 2016 while imports of auto parts only accounted for USD 75 bn
- As of 2016, imports of automobile and automobile parts added up to USD 189 bn while exports added up to USD 1,360 bn
  - Vehicle units, excluding motorcycles and motorcycle parts accounted for USD 1020 bn in 2016, while imports accounted for only USD 106 bn

Japan's automotive players, present in India

OEMs in India

TOYOTA

HONDA

ISUZU

YAMAHA

NISSAN

HINO

LEXUS
EXPERIENCE AMAZING

Suppliers in India

MITSUBA
MITSUBA Sical India Private Limited

AIS
Asahi India Glass Ltd.

MITSUBISHI ELECTRIC
Changes for the Better

KEIHIN

AISIN
member of TOYOTA group

NICHIAS

F.C.C. RIKO

HI-LEX

u-shin

DENSO

Koyo

MUSASHI

UNO MINDA
NK MINDA GROUP
THINK. INSPIRE. FLOURISH

NHK

NISSIN

Nidec

YAZAKI

OEMs/ Suppliers not in India

SUBARU

TOPY

DAIHATSU

MITSUOKA

VeilSide

TOYO TIRES
driven to perform

Grant Thornton | An instinct for growth™

The Japanese automotive industry is almost equally divided into domestic consumption and exports. Domestic demands remains relatively constant due to low interest rates, a stable economy and a strong automotive industry

Japan Automotive Industry

Drivers/Trends	Description	Impact
Fall in Sale of Used Vehicles	▪ In 2016, the use of used motor vehicles fell by 0.5% from 2015 to a total of 6.8 mn units ▪ Sale of PVs dropped from 5.62 mn units to 5.61 mn units and sale of used trucks dropped from 1.07 mn units in 2015 to 1.05 mn units in 2016	▪ ***Aftermarket sales*** *are expected to* ***reduce*** *with the reduction is the sale of used vehicles and the increase in sales of electric or clean vehicles*
Increase in the Sale of "Clean Vehicles"	▪ Sale of "clean vehicles" have increased at a CAGR of 38% between 2008 and 2016 to go from 0.19 mn units in 2008 to 1.44 mn units in 2016 ▪ Clean vehicles include clean diesel vehicles, fuel cell vehicles, electric vehicles, pug-in hybrids, hybrid vehicles ▪ 35% of all vehicles registered in Japan in 2016 are clean vehicles	▪ ***Sale of "Clean Vehicles"*** *is expected to* ***increase*** *in Japan,* ***cannibalizing*** *the sale of traditional* ***ICE engines***
Focus on Disruptive Technology	▪ OEMs like Toyota are gradually investing in disruptive technology, like increasing the production of fuel cells for Fuel Cell Electric Vehicles (FCEVs) and increasing its capacity to manufacture high-pressure hydrogen tanks	▪ *Since India is perceived as a* ***low cost manufacturing hub*** *it will be over looked as a sourcing hub for high value, technological auto parts*
Increase in the Sale of Smaller Cars	▪ A survey conducted by the Japan Automobile Manufacturers Association (JAMA) indicated a "downsizing" trend, i.e. a shift to smaller models for both first time and replacement passenger car purchasers	▪ ***Stable growth rate of PVs****, especially* ***smaller PVs***
Low Interest Rates	▪ Low interest rates have ensured that domestic demand for cars, especially smaller cars has increased gradually over time ▪ New car sales, over the last 10 months through August 2017 have grown by 8.1% driven primarily by the sales of small vehicles	▪ *Sale of* ***small PVs*** *is expected to* ***increase***
Uncertainty Over Trade with US	▪ The US recently imposed at 25% tariff on steel and 10% tariff on aluminum products from Japan. Japan is considering countermeasures if not granted an exemption from these tariffs	▪ *With Japan reducing its imports from the US,* ***India*** *could be looked as an* ***alternative provider*** *for the same products*

Source: GT Primary & analysis, Press Releases

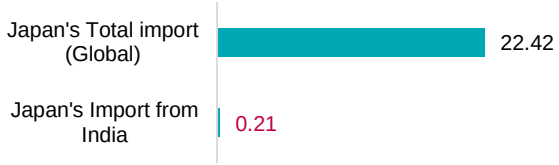
Japanese suppliers use the best cost model where they look at countries as low cost hubs. Japanese companies are looking to collaborate with local players in their respective countries by bringing in their technology and R&D and using their resources to help either address their local demand or use the country as a hub for exports to other countries

Challenge	Description	How are Players Reacting
High Production Costs	Due to high labor costs, producing products that do not require a lot of technology is not feasible in Japan	▪ Japanese suppliers are looking to collaborate with companies from low cost manufacturing countries in order to reduce their cost to manufacture the product
Stagnant Domestic Demand	The sale of automobiles in Japan has remained relatively constant over the past 5 years. Between 2015 and 2016, PV sales fell by 0.8%	▪ Japanese OEMs and auto part manufacturers are looking for JVs and acquisitions with companies across the world. Countries like China, India, USA and EU form the target market for Japanese companies while looking to expand their sales and global footprint
Cultural Gap with Foreign Partners	Japan is known to follow the best cost model. Countries like India, China, Indonesia and Thailand all offer low cost manufacturing opportunities for Japanese companies. However, there are large cultural gaps between Japan and these countries that needs to be mitigated	▪ Japanese OEMs and suppliers are now spending significant amounts of time in vendor development for countries like India and China ▪ They send Japanese people to conduct workshops in the respective countries so as to acquaint them with the Japanese culture and mitigate any cultural differences that might be prevalent
Cost Reduction	Auto component manufacturers in Japan are seeing significant downward pressure on pricing from OEMs	▪ Best cost model: Japanese auto component manufacturers are looking at different countries that can provide the best mix of low cost products with the desired quality. As labor costs increase in China, manufacturers are now looking at alternative sources

Source: GT Primary & analysis

India's share in Japanese imports of components stood at 0.95% in 2017 (of USD 22 bn) providing significant opportunity for improving export share. China accounts for the largest share of imports into Japan followed by Thailand and Vietnam. The category imported most into Japan are wiring sets and other wiring sets

Japan India Export Import Trade: Auto Components (USD bn, 2016-17)

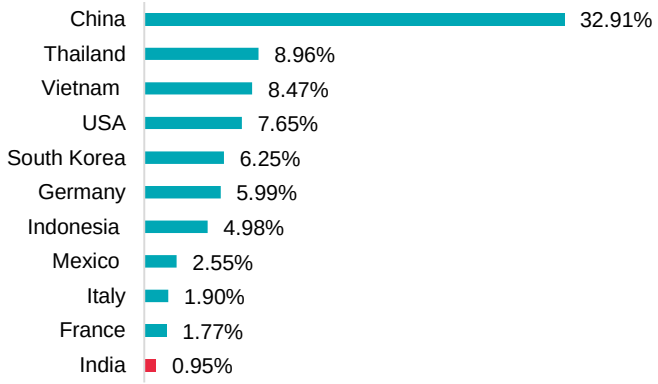


Source: GT Analysis

Description

- The Indian auto Component Sector exported products worth 0.21 bn to US in 2016-17
- The total imports of auto components into Japan globally including India in 2016-17 is estimated at USD 22.42 bn

Japan: Top importing countries (2016-17)



Source: GT Analysis

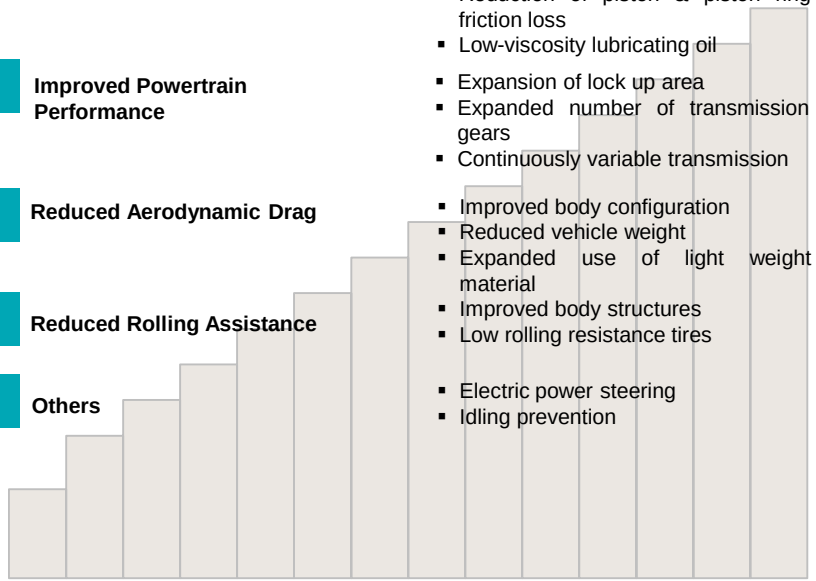
Description

- Over 60% of the auto component imports into Japan come in from Asia.
  - A third of the imports into Japan come in from China followed by around 8.9% and 8.5% coming in from Thailand and Vietnam
  - The US accounts for only 7.7% of imports into Japan
- The top imported category into Japan are ignition wiring sets and other wiring sets that constitute to around 18% of that total imports of auto component products into Japan

Source: GT Primary & analysis, Trademap

Maturity of the industry in terms of Technology & Best Practice

Technological Area	Concentration for advancements
1 Improved Engine Efficiency	▪ Direct fuel injection ▪ Variable mechanisms ▪ Downsized engine supercharging ▪ Reduction of piston & piston ring friction loss ▪ Low-viscosity lubricating oil
2 Improved Powertrain Performance	▪ Expansion of lock up area ▪ Expanded number of transmission gears ▪ Continuously variable transmission
3 Reduced Aerodynamic Drag	▪ Improved body configuration ▪ Reduced vehicle weight ▪ Expanded use of light weight material ▪ Improved body structures
4 Reduced Rolling Assistance	▪ Low rolling resistance tires
5 Others	▪ Electric power steering ▪ Idling prevention



Source: GT Primary & analysis ; FIA

Best Practice – International Collaborations in Growing Markets

- Japanese OEMs and auto component suppliers have been expanding globally through acquisitions and JVs
- As a practice Japanese companies look for local companies in countries where they can offer technology and innovation coupled with the strengths of the local company to either:
  - Address the local demand for the country
  - Use the country as a manufacturing hub for export to other countries
- Typically royalties repatriated to the parent company in Japan range from 4-5% of total revenues earned in local country

TOYOTA

- Toyota entered India in October 1997 as a JV with the Kirloskar Group
- The Kirloskar Group owns 11% of Toyota Kirloskar India
- In May 2018, Toyota sold a total of 13,113 units in the domestic market

MARUTI SUZUKI

- Maruti Suzuki was formed in February 1981 with Suzuki entering the Indian market as a minority stakeholder
- As of December 2017, Suzuki holds 56.21% of Maruti Suzuki
- In March 2018, MSIL sold a total of 148,582 units in the domestic market

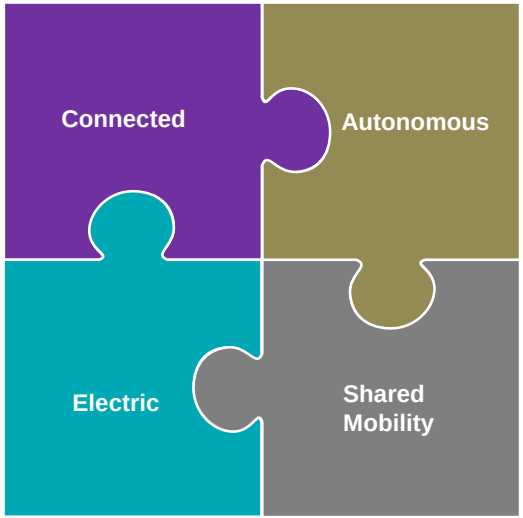
- Motherson Sumi Systems Limited (MSSL) was established in 1986 as a JV between Samvardhana Motherson Group and Sumitomo Wiring Systems of Japan
- Today Sumitomo holds around 25% of MSSL
- For FY 17, MSSL had consolidated revenues of INR 42,000 cr

Subros

- Subros was founded in 1985 as a JV between the Suri family, Denso and Maruti Suzuki
- For FY 17, Subros had revenues of INR 1,751 cr

The government first introduced incentives and subsidies for electric vehicles in 2009. Since then there has been a large rise in the adoption of eco-friendly vehicles. In 2016, 35% of new car registrations were eco-friendly vehicles

- The revenue in the connected car market of Japan in 2016 amounted to USD 976 mn. In 2018 this revenue increased to USD 1.3 bn
- This revenue is forecasted to increase by a CAGR of 14% to reach USD 2.1 bn by 2022
- As of 2018, connected hardware is the largest segment and accounts for USD 1.2 bn
- Currently the connected car penetration is at 13.2% and is expected to reach 32.3% in the next 4 years
- Japan has the 5th position globally in the connected car market after United Kingdom and ranks 6th in the user penetration



- The market size for the autonomous vehicles in Japan is forecasted to show a rapid increase by 2022 in order to deal with the shortage of drivers
- The number of ADAS (Advanced driver-assistance systems) sold in Japan increased from 1.45 mn in 2014 to 2.85 mn units in 2015. It is expected that this number would increase to 12.31 mn by 2022
- Major mnCs like Softbank has invested $2.25m in General motors for the autonomous car program

- The number of electric vehicles registrations in Japan increased from 10,467 in 2015 to 15,299 in 2016. The total stock of the electric vehicles in Japan since 2009 - 2016 was 151,250 which was the third largest after China and the United States
- The top selling models of the electric vehicles in Japan are Nissan leaf, Mitsubishi Outlander (PHEV), Toyota Prius (PHV) and Mitsubishi i-MiEV
- Various subsidies and incentives are offered by the government to promote the sale of electric vehicles example: new vehicles are exempted from the acquisition tax.
- Even though the registrations of electric vehicles increased from 2015-2016, the Japanese government is trying to adopt and promote the hydrogen fuel cell vehicles instead of plug in electric vehicles.

- The amount of ride sharing users in Japan in 2016 were 3.8 mn. In 2018, this number increased to 5.4 mn. It is forecasted that the number of ride sharing users would increase by a CAGR of 10.7% to reach 7.0 mn by 2022
- The revenue for ride sharing market in 2017 was USD 560 mn which is expected to increase by a CAGR of 15.9% to reach USD 1.0 bn in 2022
- The second segment of the shared mobility is the car sharing/rentals. The number of car sharing users in Japan in 2017 were reported to be 2 mn. The number is expected to increase by a CAGR of 3.9% and reach 2.5 mn in 2022
- The revenue for car rental market in 2017 was USD 649 mn which is expected to increase by a CAGR of 6.1% to reach USD 862 mn in 2022
- The major ride sharing companies in Japan are Uber, Lyft or Bla Bla Car

Source: GT primary & secondary analysis

Maturity of the industry : Export Incentives

The reason for such huge amount of exports in japan is the export policies created by the government. Various policies introduced to improve exports are as follows:

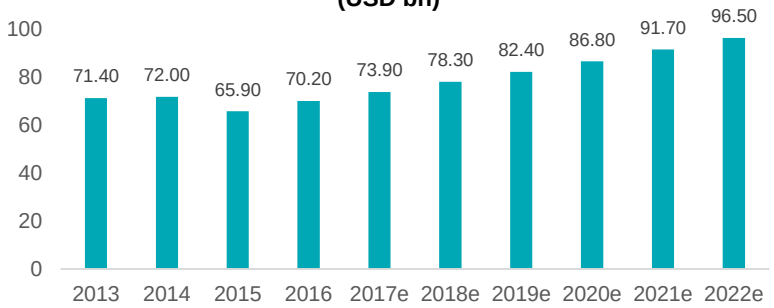
Export promoting tax system – The Japanese government exercises a policy of import tariff refund. As per this, the import duties imposed on imports of raw materials and intermediate goods by producers are footed by the government. The duty on raw material used in special export of goods may be cut down, excused or refunded.

Letter of credit - It refers to a letter issued by a bank to another bank in a different country to serve as a guarantee for payments made to a specified person under specific conditions. This document has increased the sale of Japanese products like automobiles and computers to countries all over the world.

EXIM Bank – The EXIM bank provides a loan to Japanese companies and foreign companies in Japan. This institution offers loans to Japanese companies in the form of deferred payment exports, pre shipment credit, term loans for export production, overseas investment finance and financing for the export market. It offers overseas buyer's credit to foreign companies interesting in purchasing form japan.

The demand for Japanese aftermarket products is lower in Japan as it is in countries like China and Taiwan, owing primarily to the fact that the quality of vehicles in relatively higher in Japan than it is in China or Taiwan

Japan Automotive Aftermarket Value (USD bn)

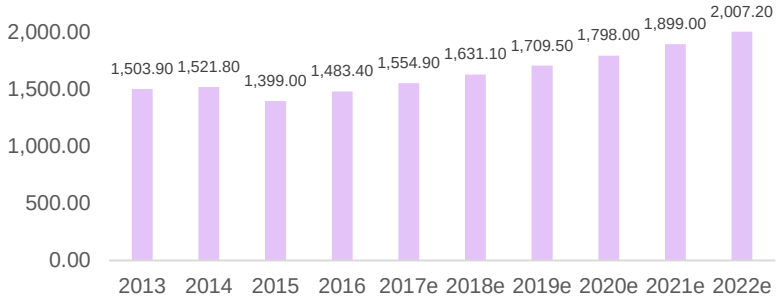


Source: Marketline

Description

- The Japanese automotive aftermarket grew by 5.2% in 2017 to reach a value of USD 74 bn
  - The CAGR for the period from 2013 to 2017 was 0.9%
  - In comparison, the Taiwanese and Chinese aftermarkets will grow at CAGRs of 6.3% and 13.7% respectively
- The demand for aftermarket products is lower in Japan as compared to countries like China and Taiwan as the quality of vehicles is very high in Japan therefore the demand for replacement components and repairs are lower than in other countries like China and Taiwan
- The aftermarket segment in Japan is expected to grow at a CAGR of 5.5% through 2022 to reach a value of USD 97 bn

Japan Automotive Aftermarket Volume (mn units)

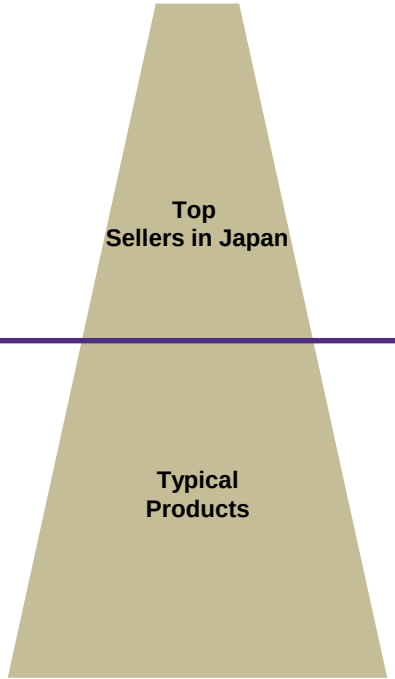


Source: Marketline

Description

- Volumes grew at a CAGR of 0.8% between 2013 and 2017 to reach a total of 1.5 bn units in 2017
- The sectors volume is expected to increase to 2.0 bn units by the end of 2022 representing a CAGR of 5.2% for the same period
- The global demand for Japanese parts and components will continue to encourage the growth within the sector as automotive aftermarket players will have to diversify and develop their product offerings due to distruptive technology

Online and Traditional retailers deal in wide variety of components; product width and depth is critical for supplying components to aftermarket sellers in Japan



Top Sellers in Japan	AUTOBACS SEVEN	BHF	UP GARAGE	AISIN
Typical Products	▪ Tires & wheel ▪ Audio visual ▪ Oil ▪ Batteries ▪ Car accessories	▪ Sheet metal ▪ Tires and Wheels ▪ Car electronics ▪ Oil products ▪ batteries	▪ Tires ▪ Wheels ▪ Navigation Systems ▪ Tune Up Parts ▪ Seats and head units	▪ Water Pumps ▪ Fan Clutch ▪ Oil Pump ▪ Fan Blade ▪ Clutch Cylinder

Mexico
Country deck

Executive Summary

- Instead or targeting the OEMs in Mexico, Indian Tier I component suppliers should look to supply small to medium components to Tier I suppliers in Mexico, as the local suppliers base in Mexico imports a large amount of raw materials
- Aftermarket products is a good opportunity as almost 50% of the aftermarket products in Mexico are supplied by China and Taiwan
- 76% of total demand is for imported processes which depicts tremendous opportunities for foreign companies
- Significant opportunities lie across the stamping, foundry, forging, machining, semi-conductors, and plastic injection capability processes

Opportunity

Short & Medium Term

- Focus on aftermarket products as the majority of the aftermarket products are supplied by China & Taiwan
- Indian Tier I suppliers should look to supply small to medium components to Tier I suppliers in Mexico

Medium- Long Term

- Collaborate with Mexican auto component manufacturers through alliances and joint ventures to help develop the local supply chain and supply to Mexican OEMs and Tier I suppliers and also opening a gateway to the rest of the Americas, especially South America

Strategy to increase export in the Mexican market

Summary

- Mexico is a large export hub primarily because of the governments instilled commercial openness over the years
- Apart from NAFTA and 10 other FTAs, the government is constantly striving to expand its global connectivity, now with the TPP and Pacific Alliance

Best Practices & Technology

Competitors to India


USA


China


Japan

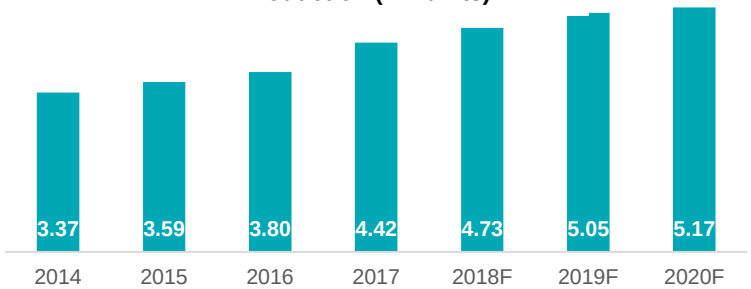

South Korea


Canada


Brazil

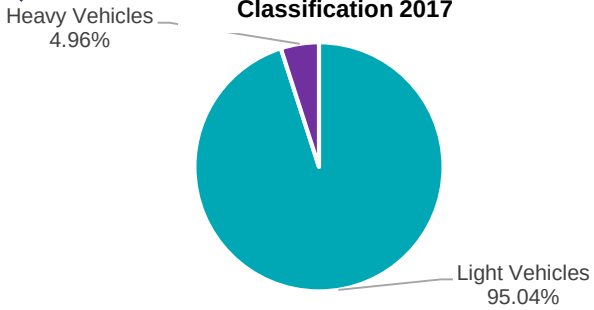
Mexico is the 7th largest market for vehicle production globally in 2017; it is the 2nd largest country in NAFTA vehicle production accounting for 4.2 mn vehicles produced

Mexico Automotive Market: Vehicle Production (mn units)



Source: Society of Automotive Analyst
Note : Light vehicles include cars, pickups, SUVs and Vans. Heavy vehicles include trucks and busses

Automotive Production: Classification 2017



Source: Society of Automotive Analyst

Description

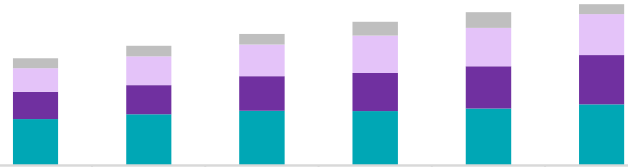
- Mexico is the 7th largest market for vehicle production globally in 2017; it is the 2nd largest country in NAFTA vehicle production accounting for 4.4 mn vehicles produced
  - Automotive Sector contributes to 18% of the manufacturing GDP
  - The automotive production is expected to reach 5.2 mn units by 2020
- 2017 registered an all time high record for vehicle sales
  - 83% of the production is export based
  - US registered a 9.4% increase in Light Vehicle Exports of 2.3 mn units in 2017 despite uncertainty surrounding NAFTA Deal
  - Exports to Europe spiked 45.2%, driven by demand in Germany where 96,753 cars; Shipments to Asia also increased significantly, up 38.1% on 2016 figures; exports to Canada, also grew but by a more modest 8.5%
- In 2017, the Mexican automotive industry employed 839,571 workers (incl. vehicle assembly & auto parts production), which represented an increase of 6.7% compared to 2016

Description

- Light vehicle segment dominate the Mexican automotive market accounting for over 95% of the total market in 2016-17
  - Heavy vehicles account for ~5% of the total production
- ICE & Hybrid powertrain are is expected to dominate the Mexican vehicle production market with over 90% share in the production
  - Hybrid and EVs in domestic Mexican market is miniscule
    - e.g. 2017 sales of hybrid and electric cars totaled 5,040 vehicles
- The powertrain strategies will be largely dependent on the OEMs strategy governed by conditions in their home country especially US which is the largest export market for Mexico

The Mexican automotive market is predominantly an export oriented market, where 82% of the auto and auto parts produced are exported

Automotive Exports from Mexico (USD bn)



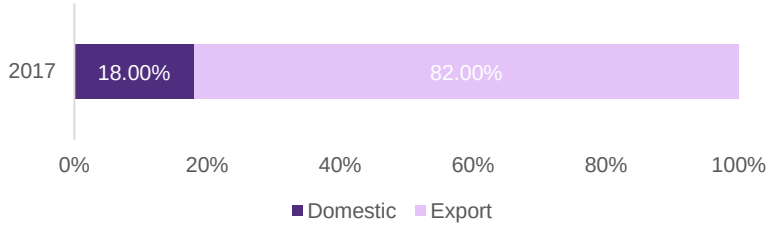
	2011	2012	2013	2014	2015	2016
Tractors	6.03	6.49	6.39	8.31	9.41	5.90
Delivery trucks	14.30	17.30	19.10	22.70	23.20	24.70
Vehicle parts	16.40	17.60	20.90	23.00	25.60	29.90
Cars	28.10	31.10	33.20	33.00	34.50	37.00

Source: Society of Automotive Analyst
Note : Motor Vehicles include Cars, Pickups, SUV's, Trucks & Vans

Automotive Imports to Mexico (USD bn)

	2011	2012	2013	2014	2015	2016
Tractors	0.28	0.37	0.42	0.41	0.37	0.36
Delivery trucks	1.86	2.06	2.18	1.98	2.02	2.30
Vehicle parts	17.60	18.80	20.60	22.70	23.40	25.80
Cars	7.17	7.62	8.46	8.56	9.48	11.40

Production & Export/ Domestic Ratio



Description

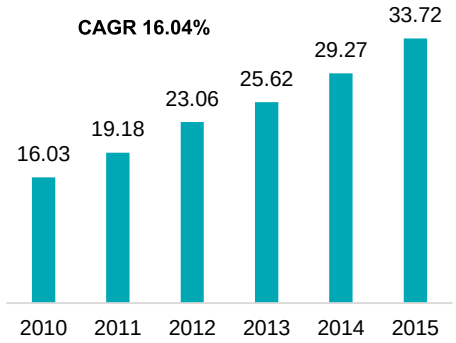
- The Mexican automotive market is predominantly an export oriented market, where 82% of the auto and auto parts produced are exported
  - The largest export market for Mexico is the US which accounts for almost 80% of the auto and auto parts exported
- Automotive vehicles account for ~15.36% of Mexico's exports, while vehicle parts account for ~6.8% of total exports from Mexico
- Cars form the largest chunk of exports from Mexico, accounting for USD 37 bn of the exports from Mexico in 2016
  - Vehicle parts accounted for USD 30 bn followed by delivery trucks at USD 25 bn
- Vehicle parts are the largest imported product into Mexico as of 2016, accounting for USD 26 bn, half of which comes in from China and Taiwan
  - These products are primarily brake parts, suspension parts, engine parts and filter parts

Mexico is the fifth largest producer of auto parts in the world with a value of USD 33 bn as of 2015. The Auto Parts industry in Mexico is one of the main contributors to the value added of the manufacturing sector as a whole, with a share of 11.7% in 2015

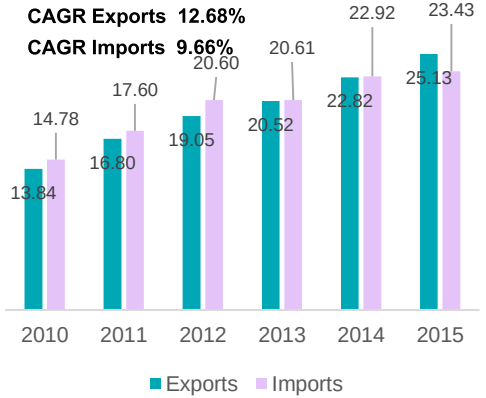
Description

- The Auto Parts industry in Mexico is one of the main contributors to the value added of the manufacturing sector as a whole, with a share of 11.7% in 2015
- Recent investment announcements in auto component suppliers are expected to boost the segment further and enhance the importance of the auto parts industry in Mexico
- Ford, in 2015, invested USD 2.5 bn for construction of a new manufacturing facility for Engines and commissioning of Transmission systems
- In 2015, the engines segment was was the largest auto segment in the auto parts industry, and transmission system was the third largest
- Of the top 100 global auto parts suppliers, 91 have plants in Mexico, one of which is a Mexican company, while remaining are not in Mexico and are primarily Chinese companies

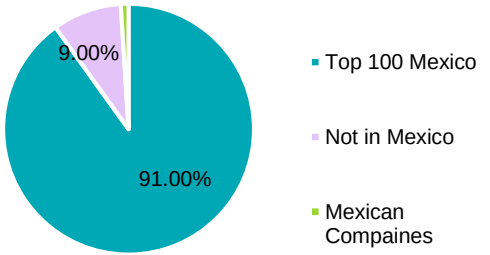
Auto Parts Production Value (USD bn)



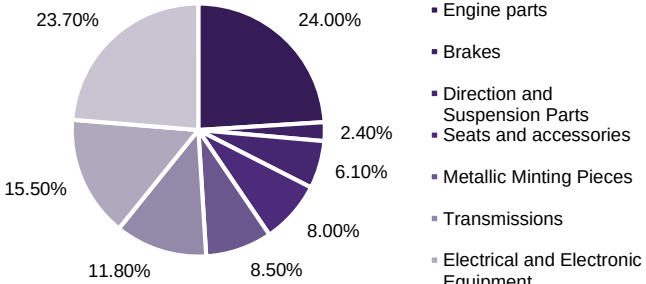
External Trade (USD bn)



Top 100 Global Part Suppliers

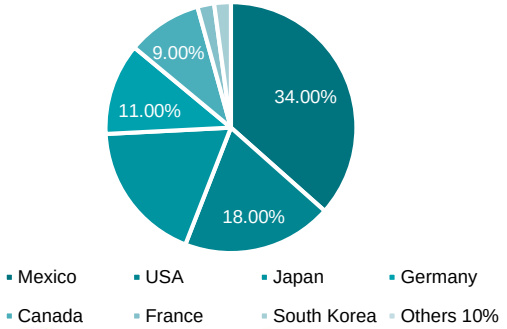


Auto Parts Production Value by Type, 2015



Source: Industria Nacional de Autopartes (INA)

Origin of Suppliers



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The Mexican automotive industry has traditionally been perceived as a low-cost manufacturing base over the past years due to its geographic location and low-cost labor. The endeavor now is to change this perception to one that will be driven by investments in technology and R&D

Mexico Automotive Industry

Drivers/Trends	Description	Impact
Geographic location Low cost manufacturing hub Free trade agreements	▪ OEMs and auto part suppliers gradually shifted their production from US, Europe and Asia into Mexico primarily because of the cost-competitive advantage and geographic location ▪ This coupled with the North American Free Trade Agreement (NAFTA) and the other 10 FTAs that Mexico has with countries across the globe gives them a free-market access to almost 50 distinct nations across the world	▪ *Mexico **exports 80**% if its automotive production to over **100 countries**, with 73% of that going to the US and Canada alone* ▪ *The current figure of **3.6 mn** vehicles produced is expected to **increase by 45% to nearly 5 mn** vehicles by 2020*
Entry of OEMs that produce premium vehicles	▪ A shift in the investment trend in Mexico has emerged with OEMs announcing plans of setting up new plants that would produce premium vehicles in Mexico ▪ Audi, Mercedes-Benz, BMW have all announced bn-dollar investment intentions into Mexico in the coming years ▪ Audi's procurement department has publicly declared that the company has a target of 90% of auto parts regional content by 2020	▪ *This implies **larger investments** from OEMs and suppliers **into R&D** in Mexico* ▪ *More companies are looking at Mexico as a **potential location for R&D and design** rather than just a location for a low cost manufacturing hub*

Diversifying export base	▪ According to the Asociacion Mexicana de la Industria Automortiz (AMIA) exports to Argentina, Chile and Puerto Rico have increased in relation to last year
	  ▪ Although North America still accounts for 80% of the exports from Mexico, exports to other countries continue to grow.
	  ▪ China now accounts for 8-10% of total exports from Mexico
		▪ ***Reduced dependency on North America**, primarily the US for the export of its products, keeping in mind the uncertainty of NAFTA due to the current administration*

Tier I suppliers importing raw materials for production
Shift in training programs for skill development
	▪ There has been a strong boom in the automotive industry over the last few years in Mexico, but supply of skilled manpower has not been enough
	  ▪ To address this, the industry is collaborating with local and foreign universities to revamp the curriculum
	  ▪ This new curriculum is intended to get the human capital 'industry ready' by inculcating a larger mix of practical training in school to accompany the classroom training
		▪ ***Inadequate skilled labor** resulting in **low productivity***

Source: GT Primary & secondary analysis

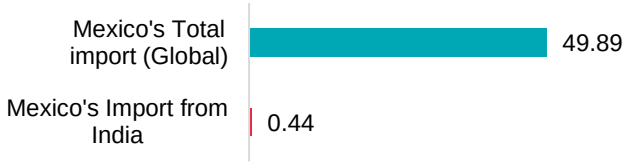
Mexico Supplier Challenges – Mexican automotive suppliers, especially the Tier II and III suppliers do not invest in technology and innovation and suffer from a lack of development of a local supplier base

Challenge	Description	How are Players Reacting
Lack of Investment in Technology & Innovation	Investment in R&D in Mexico is one of the lowest in the developed world. Public sector investment is only 0.6% of GDP, whereas countries with similar GDPs, like South Korea invest at least 4.1% of their GDP in R&D	▪ Smaller suppliers are actively looking for partnerships with foreign companies to ensure an efficient transfer of knowledge and technology. They are also looking at the government for funding for R&D in order to continue innovating ▪ There is also intense lobbying to reinstate a previously repealed fiscal incentive of up to 30% in income tax deductions for companies to invest in R&D ▪ Large international suppliers bring their technology from the parent company and use it to develop products in Mexico
Inadequate Internal Logistics	Production of vehicles is at around 3.5 mn vehicles annually and this figure is expected to increase to 5 mn units by 2020. 90% of these vehicles are exported, which will put tremendous pressure on the current logistics capabilities of Mexico. The growth in the number of automobiles impact the internal logistic capabilities of Mexico and could result in bottlenecks that will further result in delays in delivery time	▪ Mexican auto component suppliers are lobbying with the government of Mexico to improve the logistical infrastructure so as to be capable to deal with the expected increase in demand
Local Supplier Base Development	A significant amount of raw materials and components are imported into Mexico rather than be sourced from the local markets. This hampers the development of the local market, especially the Tier II & III suppliers	▪ Tier II & III suppliers tend to not risk their own capital. They look for foreign support in terms of investments and knowledge transfers or certifications. For example, in Japan, larger companies are investing in local players and teach them how to get certified. These companies even get financial support from the banks

Source: GT Primary & analysis

India's share in Mexican imports of components stood at 0.89% in 2017 (of USD 50 bn) providing significant opportunity for improving export share; rising costs in US have forced US OEMs and suppliers have set up plants in Mexico due to low local labor costs, high labor productivity & established supply chain making it a regional and global export hub for components and platforms to meet local demand in US and globally

Mexico India Export Import Trade: Auto Components (USD bn, 2016-17)

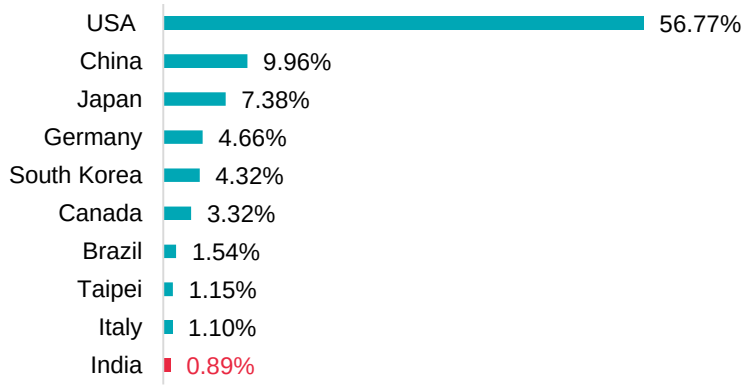


Source: GT Analysis

Description

- The Indian Auto Component Sector exported products worth 0.44 bn to Mexico in 2016-17
- The total imports of Auto components into Mexico globally including India in 2016-17 is estimated at USD 49.89 bn

Mexico: Top importing countries (2016-17)



Source: GT Analysis; Figures in %

Description

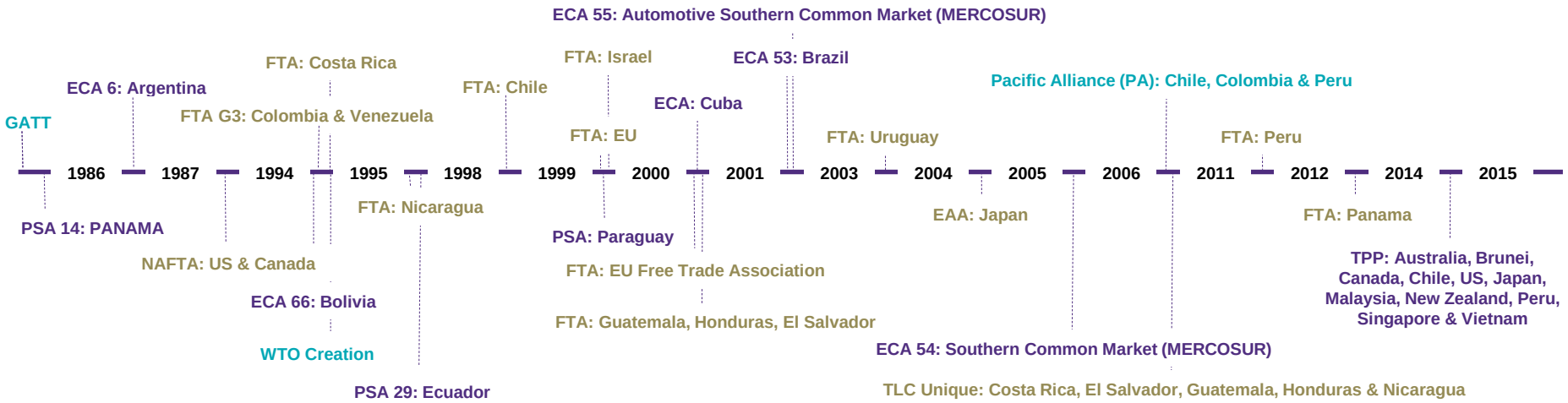
- The US was the largest importer of Mexican auto parts importing more than half of the auto parts exported from Mexico. China was the second largest importer accounting for almost 10% followed by Japan (7.4%) and Germany (4.7%)
  - NAFTA is the reason why exports to the US are so large. Many US OEMs and auto components suppliers have invested in Mexico due to its lower labor cost and use it as a low-cost manufacturing hub and a base for source from for the requirements

Best Practice – Trade Agreements

Description

- Mexico has a network of 10 FTAs with 45 countries, 32 Reciprocal Investment Programs and Protection Agreements (RIPPAs) with 33 countries, 9 trade agreements (Economic Compensation and Partial Scope Agreements) within the framework of the Latin American Integration Association (ALADI) and is a member of the Trans-Pacific Partnership Agreement (TPP)
- In addition, Mexico is an active member in multilateral and regional organisms and forums such as the World Trade Organization (WTO), the Asia-Pacific Economic Cooperation (APEC), the Organization for Economic Cooperation and Development (OECD) and the ALADI

Trade Agreements



Multilateral & Regional Partnerships, Agencies & Forums

Economic Complementation & Partial Scope Agreements

Free Trade Agreements

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Maturity of the industry : Export Incentives

A brief look at Mexico's most impactful strategy for export expansion (post recession):

- Mexico is one of the countries that has accepted majority of the free trade agreements. This implies that the exporters in Mexico reap the benefits of minimum taxes in about 45 countries. Mexico has 10 FTAs
  - North America Free Trade Agreement- With respect to this agreement, importing and exporting cars to USA is completely tariff free and because USA is Mexico's number one importer this saves manufacturing companies an enormous amount.
  - EU Free Trade Agreement- This agreement allows the trade between Mexico and Europe to be at privileged rates. The export is not completely tariff free but allows discounts
  - Japan Mexico Free Trade agreement- This agreement was enforced in 2005, it completely waived off tariff on goods and services exported and imported however this agreement was revised to low tariff rates on certain segments of the economy

- **Promotion of the national economic development (PROMEXICO)** - This policy allows the exporting firms to receive support in the form of additional funds by the government of Mexico. The government provides funds in all stages of production be it infrastructure or innovation

- Imported goods intended for production are charged at an extremely low tariff rate (0%-5%) according to the SRP policy. This policy is enforced to facilitate easy manufacturing

- Similar to the SRP policy, Mexico follows Import duty drawback which entitles the importer of goods to a full reimbursement if the same goods are eventually exported

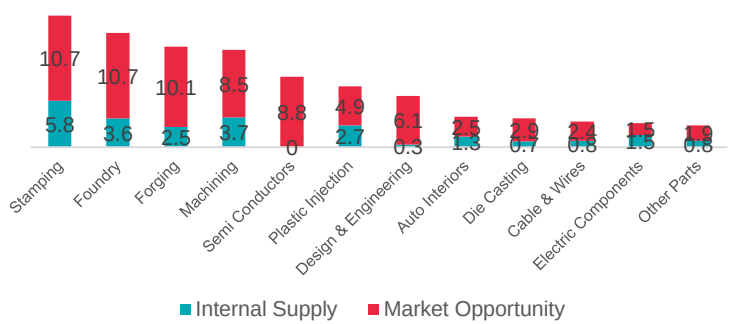
- **IMMEX (Maquila Program**) – Maquiladora is a special factory present on a zone with varying rules compared to common manufacturing zones. These zones provide companies with incentives such as tax and government incentives only if the all products are exported. This allows cross border temporary import of goods and services and the export of the then finished product. IMMEX provides manufacturers with zero rates for VAT (otherwise 16%), additional assistance from foreign trade banks, and avoiding tax payments on domestic purchases

Mexico has attracted large amounts if FDI, primarily in the OEM segment followed by Tier I suppliers. However, there are large opportunities across the Tier II & III segment especially focusing on linking the terminal and auto parts sectors in the case of Tier II & III suppliers

FDI in Mexico, by OEM (USD mn)

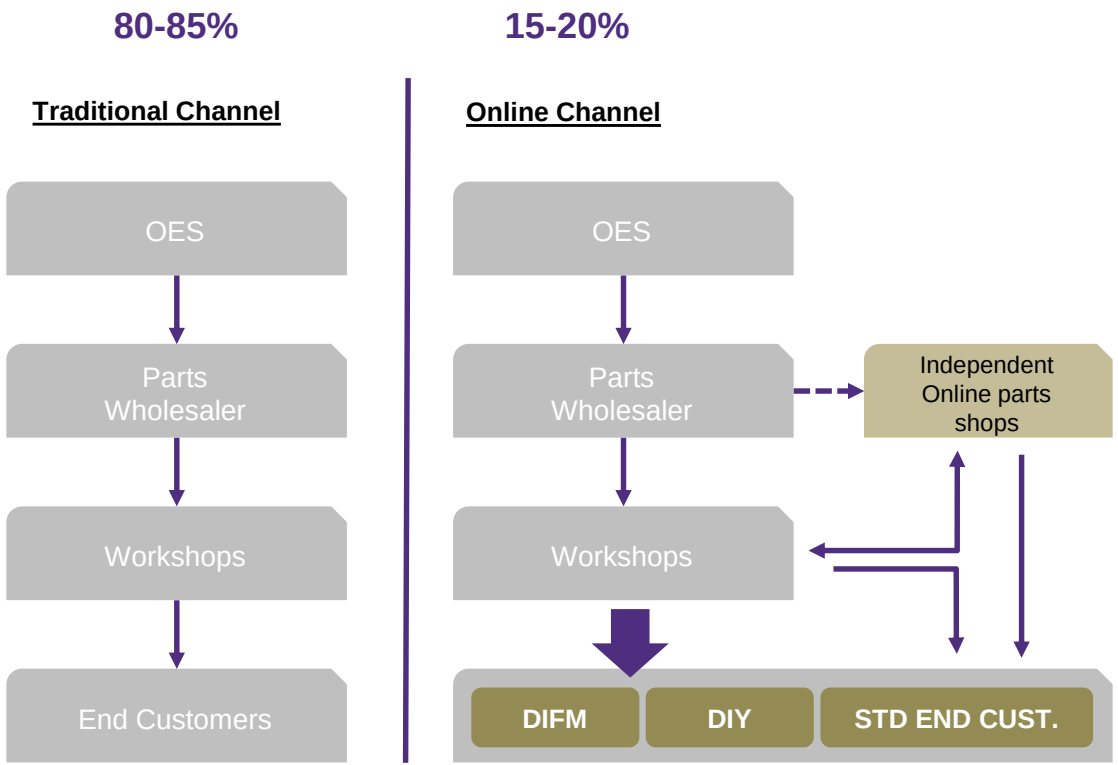
Company	2007-11	2012	2013	2014	2015	2017	Accumulated
Daimler Trucks	871						871
GM	4910	420	691	5000			11021
Volkswagen	1603		720		1000		3323
Ford	3000	1300		2500			8400
Fiat/ Chrysler	550		1264			1600	1814
Nissan	600	2000					2600
Honda	500		470				1270
Mazda		1300	200	100			1520
Audi							1300
BMW				1000			1000
MB-Infiniti				1240			1240
Kia Motors							1000
Toyota					1000		1000

Opportunities for FDI (USD bn)



- FDI in the Automotive sector and Auto parts accounted for 20% of the total FDI in Mexico. Cumulative FDI in the Auto sector stood at $19.8 bn in 2011-2015 period
- While OEMs are the largest foreign investors in Mexico, followed by Tier I suppliers, there lies a large potential for investment in the local suppliers base, especially the Tier II & Tier III auto component suppliers
- 80% of the auto industry supply chain is covered in the graph above and shows significant potential for opportunities across stamping, foundry, forging, machining, semi-conductors, design engineering, etc.

80-85% of the Mexican aftermarket sales are through traditional channels like the brick and mortar stores. E-Commerce although present in Mexico, accounts for only 10-15% of sales. This percentage isn't expected to change drastically over the next few years because of the large amounts of different brands and platforms in the Mexican automotive market



Workshops (B2B)

- Workshops have technical know-how to buy online as well as the required equipment (tools, lift, diagnostic systems) to assemble even complex parts

DIFM (B2B2C and B2C2C)

- "Do-it-for-me" customers, who purchase parts online but have them installed:
  - **B2B2C:** at a professional workshop with commercial purpose
  - **B2C2C:**by an acquaintance outside working hours/without commercial purpose (gray market)

DIY (B2C)

- "Do-it-yourself" customers, who have the technical knowledge and interest to maintain and upgrade cars themselves

Standard end customers (B2C)

- Standard end customers without technical know-how, who buy simple parts

Source: GT Primary & Secondary data analysis

Mexican automotive aftermarket players and their product offerings

Top Sellers in Mexico	Advance Auto Parts	eBay Motors	CarParts.com	Mobivia
	AutoZone	GPC	Goodyear	Norauto
Typical Products	▪ Brakes ▪ Headlights ▪ Clutch ▪ Seat covers ▪ Shock absorbers ▪ Tires ▪ Wiper Blades ▪ Battery ▪ Wheel nuts ▪ License plate ▪ frames ▪ LED lights ▪ Strobe lights ▪ Door handles ▪ Floor mats ▪ Gear shift knob ▪ Seat belts ▪ Dash covers ▪ GPS systems ▪ Alarms	▪ Motors ▪ Lubricants ▪ Disc pads ▪ Filters ▪ Tires ▪ Battery ▪ Sensors ▪ Ignition filters ▪ Brake pads	▪ Tires ▪ Rubber related chemicals	▪ Accessory ▪ Lubricants ▪ Floor Mats ▪ Tyres ▪ Wiper Blades ▪ Exhausts ▪ Clutch ▪ Suspension ▪ Shock absorbers ▪ Batteries ▪ Bulbs ▪ Fuel additive ▪ Boosters ▪ Tire renovator ▪ Bolts ▪ Nuts ▪ Tires ▪ Rims

Poland
Country deck

Executive Summary

- The used car market, vehicle age & common vehicle availability in Poland & India provides opportunities in the aftermarket sector
- Focus on Petrol and Diesel based offerings for suppliers in Poland

Opportunity

Short Term

- Focus on aftermarket products for the platforms: Fabia, Octavia, Tuscon, Yaris, Superb

Medium Term

- Join EACN Network to gain access into Poland and neighbouring countries
- Tap OEM Solaris to gain access into Polish Market; Collaborate with local suppliers (act as Tier II)
- Collaborate with regional aftermarket franchise chains

Long Term

- Acquisitions and Greenfield ventures should be explored for technology development, & establishing base for EU Strategy due to low cost nature of Market

Strategy to increase export to the Spanish market

Summary

- Automotive is a priority sector for Poland. The Government has strong focus on developing SMEs by way of

1. Providing tax incentives for boosting exports for SMEs either by way of investment costs or personnel costs relaxation when investing in SEZ
2. Tax incentives for new Technologies: Small and medium-sized enterprises receive a tax credit of up to 75% of investment costs for investing in new technologies

Best Practice

Competitors for India

Germany

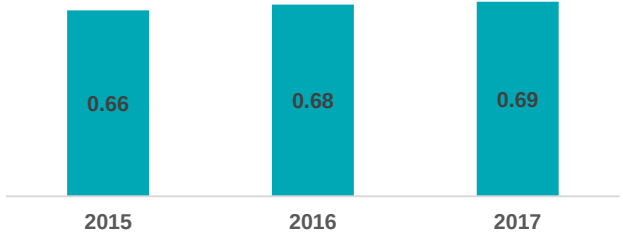
Italy

China

Czech Republic

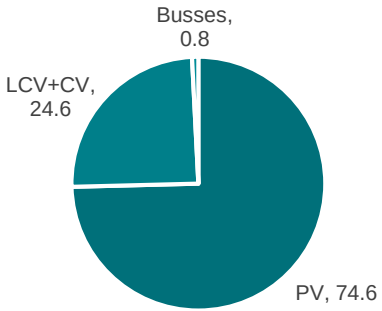
Polish Automotive production was estimated at ~0.7 mn vehicles in 2017; Passenger Car segment dominate the production with ~75% share; share of Diesel Cars is on a decline compensated by rise in car registrations across Petrol and Hybrid segments

Polish Automotive Market: Vehicle Production (mn Units)



Source: PZPM

Automotive Market Segmentation (2016)



Source: PZPM, Figures in %

Description

- Automotive is the 2nd largest industrial sector in Poland accounting for 11% of GDP after Agriculture
  - Automotive production was estimated at 0.69 mn vehicle in 2017 (including PV, CVs & Buses)
- Passenger vehicle segment dominate the production with ~75% share followed by LCV & CV segment accounting for ~25% share
- The Polish market has attracted numerous OEMs over the last decade
  - Car production in Poland concentrates in two industrial hubs: Upper Silesia (Fiat and Opel facilities), and the Greater Poland region (VW)
- The Polish Automotive industry like other European markets indicate a trend of moving away from Diesel Engines
  - In 2016, Diesel car registrations fell by 2% to 31.6% over 2015 while the registrations of Petrol based cars went up by 19.2% in 2016, estimated at 64.3%
  - Hybrid and Electric cars accounted for 2.4% & 0.1% share in the registrations

Automotive Sector is a priority sector for the Polish Economy as it is the 2nd largest sector in Poland after Agriculture; Increased government incentives, investment focus and local investments by OEMs to drive jobs and local consumption in-turn driving growth in the Automotive sector; increased used car import and age to drive aftermarket and component demand

Polish Automotive Industry

Drivers	Description	Impact

Economic Performance & Government Incentivization in priority sectors	▪ The Polish economy is predicted to grow at 3.7% in 2019 and 3.5% in 2020 driven by strong private consumption & investments
	▪ Increased Government Incentives for priority sectors (incl. Automotive), low labor costs to drive global investments into Poland
	  ▪ E.g.. MASP 2014-20 grant & extension to 2023 to drive further investments;
	  ▪ EU Cash Grants – Poland is the largest awardee of the EU funds; EUR 82.5 bn has been allocated for various operational programme to be distributed among defined beneficiaries, including companies
		▪ *Increased economic performance and governments focus on priority sector (including Automotive) to boost investments, jobs into the Auto Sector and drive industry growth*
		▪ *Increased private consumption to drive vehicle demand*

Strong fundamentals for used car	▪ Poland had over ~1.6 mn used cars in 2016; ; used car imports in 2016 were 20% more than new car registrations over 2015 (9,52,100 units in 2016) ▪ The size of the used car fleet which has been ageing for many years is mainly increased as a result of imports, dominated by over a decade old cars ▪ Average age of used cars is ~13.6 years	▪ *Used car vehicles to drive demand for replacement parts in aftermarket sector* ▪ *Demand for components to also get a boost due to increased aging and maintenance requirements*
Nascent but evolving EV Market	▪ Polish Government has set a stringent target to have 1 mn EVs backed by creation of 6000 charging points across the country ▪ The government has set up a Low Emission Transport Fund and decided to invest US 1.44 bn by 2027 ▪ New EV registrations accounted for ~1068 cars in 2016 as compared to 569 in 2015 ▪ EV adoption in public transportation is expected to reach 10% by 2020 ▪ Poland will be home to Europe's largest lithium-ion battery factory, poised to fill growing demand for electric vehicle (EV) components Korea's largest chemical company, Seoul-based LG Chem, is spending USD 1.63 bn on the EV battery plant in Kobierzyce – while creating 729 jobs	▪ *Increase Government focus on EV adoption backed by incentives and investments to drive EV demand in future across Private and Public fleets*

Source: PZPM, Ministry of Energy – Poland

The autonomous vehicle technology in Poland is at a nascent stage with government currently focusing on framing a policy for testing and deployment of autonomous vehicles; Ride sharing is also in its early stages of evolution with a few private players operating fleets- most recently with local government of Wroclaw entering the public transportation system

Autonomous Vehicles Landscape

- Poland's Autonomous Industry is at a nascent stage
- In 2017, the Government passed a draft bill for the development and deployment of infrastructure for EVs as well as legal issues relating to autonomous driving in the form of "Electromobility & alternative Fuels"
  - The bill has proposed an amendment of the road transport act of Poland for defining autonomous vehicles and their testing on public roads
- Jaworzno is a city in southern Poland west of Krakow and near the border with Slovakia. City authorities have signed a letter of intent with Comtegra and the Polish Ministry of Transport to begin mapping the entire city so that autonomous cars can operate. Jaworzno has created a special legal framework for the city that supports the operation of autonomous cars and trucks, most of which will be powered by electricity. Comtegra will be responsible for developing legal, technical, and organizational guidelines to ensure the safety of the roads designated as acceptable for autonomous vehicles

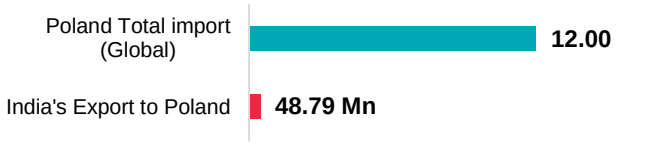
Shared Mobility

- Ride sharing market in Poland is also at a nascent stage
- Traficar is the largest provider of car sharing service and provides services across Kraków, Warsaw, Wrocław, Poznań, Gdańsk, Gdynia, and Sopot in Poland.
- Ridecell Inc. has partnered with Skoda Poland to under "Omni Car Sharing" brand – the company service allows consumers to pick up and drop off Skoda vehicles at parking stations throughout the Warsaw metropolitan area
- Local governments in Wrocław and Warsaw have decided to launch a municipal car-sharing system. Poland's first municipal electric car rental company, Vozilla, was started in 2017, with 190 passenger cars and 10 vans, as part of a public-private partnership; the company has 1,00,000 registrations for car sharing

Source: Secondary Sources

India's share in Polish imports stood at 0.41% in 2017 (USD 12 bn) providing significant opportunity for improving export share; sheer presence of European, Japanese, American and Korean OEMs, close proximity with Germany and other low cost EU nations where most suppliers and OEMs have established relationships makes it easy for OEMs to source products in Poland for the assembly of domestic and export purpose

Poland India Export Import Trade: Auto Components (USD Bn, 2016-17)

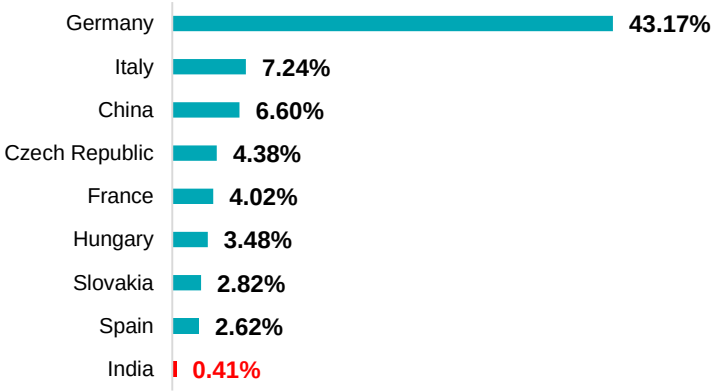


Source: GT Analysis

Description

- The Indian Auto Component Sector exported products worth USD 48.79 mn to Poland in 2016-17
- The total imports of Auto components in Poland globally including India in 2016-17 is estimated at USD 12 bn
  - India's share in the total imports of Polish imports stood at 0.41%

Poland: Top importing countries (2016-17)



Source: GT Analysis; Figures in %

Description

- Germany, Italy, & China accounts for ~56% of the total import markets for Poland
- EU as a region accounts for over 65% share of Poland's import
  - Primarily due to large presence of European Car manufacturers in Poland such as VW, Sacnia, Man, Fiat to name a few
- Poland is home to 16 OEM manufacturing plants
  - European car manufactures have over ~50% market share that calls for increased production demand for component into Poland

The local government in Poland is helping SMEs by giving tax incentives on investment in new technologies and also investment in SEZs for boosting exports in the form of investment allowance; Automotive sector is a 'priority' sector for Polish economy

Tax Incentives for Investment in SEZs

- Poland has 14 SEZs spread across Northern and Southern region.
- For investments of at least EUR 100,000, enterprises benefit from investment allowances on either the investment costs (costs for land and buildings only enter the calculation base with 5% and 40%, respectively) or the personnel costs of newly hired employees over two years.
- While large enterprises can only apply an allowance of 30% to 50% (depending on the zone), medium-sized enterprises are entitled to an additional 10% and small enterprises to an additional 20%.
- In order to be eligible for the allowance, activities must be carried on for at least 3 years without changing ownership and new jobs must be created and kept for this period.

Tax Incentives for New Technologies

- Small and medium-sized enterprises receive a tax credit of up to 75% of investment costs for investing in new technologies
- The credit must not exceed 70% of the sales value of the products produced with the new technology. Lower percentages may apply depending on the size of the company and the project location. The technology needs to be new and sufficiently innovative (must not have been used for more than five years globally).
- The maximum credit is PLN 4 mn (~EUR 950,000) and the project must not involve investments of more than EUR 50 mn. SMEs are defined according to the definition by the European Commission.

Key Component categories were mapped in line with parameters chosen based on discussion with Spain based OEMs and Suppliers with an objective to assess where and how Indian suppliers can make in-roads into Polish market

Components	Polish Demand			Buyer Segment			Competitive Intensity	Synergies in line with Indian Industry Capability
	0-3 yrs	4 – 7 yrs	8-10 yrs	Tier I	OEMs	Aftermarket	Poland + Germany	
Traditional Body, Panels & Stamping	H	H	M	Y	Y	-	H	H
ICE & Components	H	H	M	Y	Y	-	H	H
Frame	H	H	H	Y	Y	-	H	H
Drive Axles	H	H	H	Y	Y	Y	H	H
Wheels & Tyres	H	H	H	Y	Y	Y	H	H
Brakes	H	H	H	Y	Y	Y	H	H
Steering	H	H	H	Y	Y	-	H	H
Suspension & Components	H	H	H	Y	Y	Y	H	H
Fuel System (Petrol + Diesel Engines)	H	H	M	Y	Y	Y	H	H
Climate Control/ HVAC	H	H	H	Y	Y	-	H	M
Seats	H	H	H	Y	Y	Y	H	M
Interior & Accessories	H	H	H	Y	Y	Y	H	M
Infotainment System	H	H	H	Y	Y	Y	H	L
Battery	H	H	H	Y	Y	Y	H	L
Electronics	H	H	H	Y	Y	Y	H	L
ADAS/ Sensors	M	H	H	Y	Y	Y	H	L
Electric drivetrain	M	H	H	Y	Y	-	H	L
Exhaust	H	H	M	Y	Y	Y	H	L

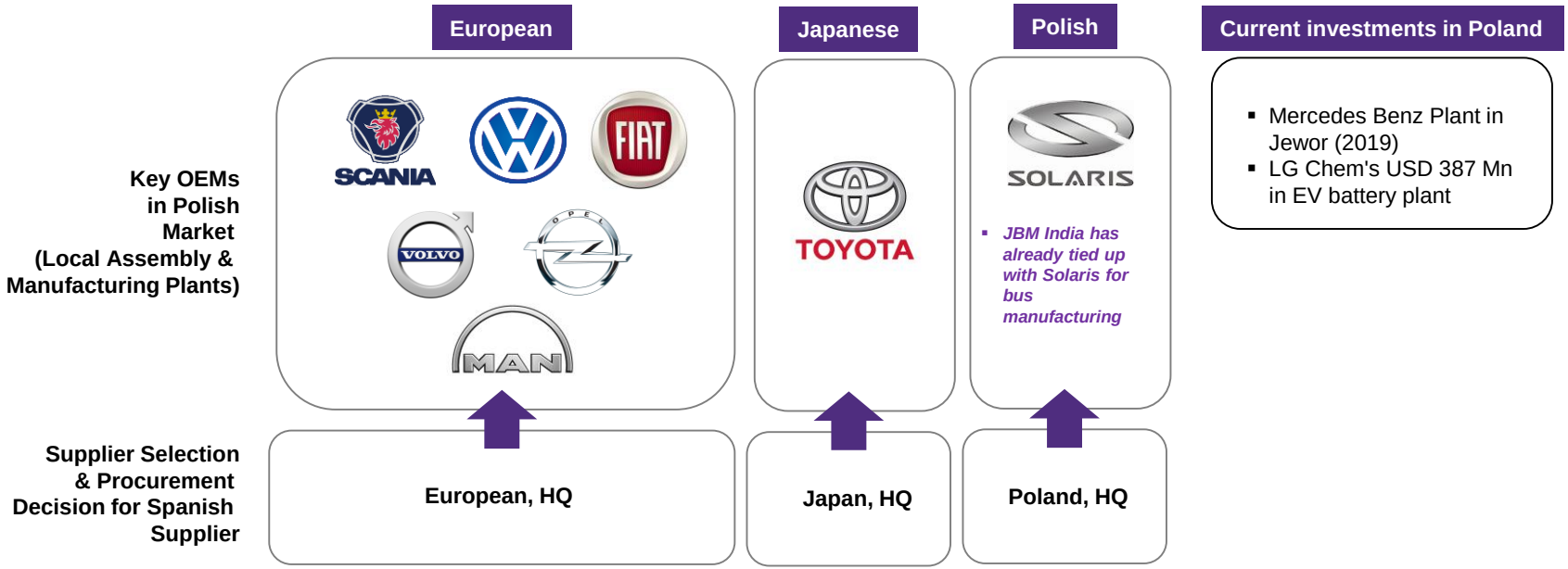
High
Medium
Low

Description

- **High Synergy Segments:** Indian suppliers have existing capability to develop and supply traditional but essential components such as Body panels, ICE components, body Frames, Axles, Brakes, Steering & suspension, Wheels & Tyre & Fuel systems to Tier I suppliers as well as OEMs. Poland being a low cost country is a natural rival for such components
- **Medium Synergy Segments**: Segments such as HVAC, Climate Control, Seating and Interior and Accessory are mapped under medium synergy as Indian suppliers will have to build and invest in capacity for supplying such products to Spanish market. Poland as a market is a natural rival for such components
- **Low Synergy Segments:** Indian suppliers don't have capability across Electronics, Electrical, ADAS and Sensors, Exhaust Systems, Battery Development to cater to Polish demand. China, America and Germany are natural competitors to India for such segments

Source: Primary Interactions with Spanish OEMs and Tier I

Decision for vendor sourcing by key OEMs is made through Global Procurement Offices located in parent companies making it difficult for suppliers to target OEMs directly as it is governed by parent company relationships and demonstration of operations, supply chain efficiencies backed by right quality and pricing



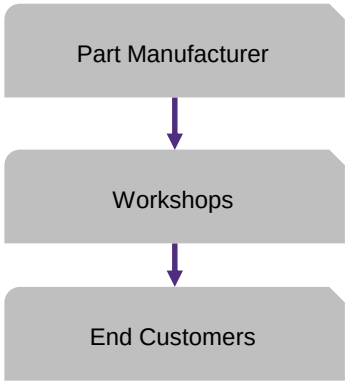
OEMs decision on vendor selection & sourcing is dependent on parent company relationship, logistics and supply alignment with parent company, cost competitiveness and price efficiencies.

Preferred Option for Indian Supplier for Polish Entry

- **Foreign OEM – Most Difficult**
- **Polish OEM– Feasible (Act as Tier II)**
- **Local Tier I – Feasible (Act as Tier II)**

Polish Aftermarket is considered mature, dominated by Distributors with Franchisee outlets and Independent retailers for auto spare parts

Channel



Key Players

- **Inter Cars**
- **Groupauto Polska**
- **Moto Profil**
- **Fota S.A**
- **Inter Team**
- **Auto Partner**
- **Hurtownia Motoryzacyjna Gordon**
- **Hart Automotive**
- **Auto Land**

The Polish aftermarket is dominated by Distributors & Franchisee outliers and Independent suppliers.

The Polish independent aftermarket (IAM) consists of Manufacturers of parts and equipment selling through either independent distributors. These distributors will then sell to either franchised repair facilities, independent garages or to “fast-fit” installers

Source: GT Primary & Secondary data analysis

Aftermarket Segment – Local presence, investment in export capacity, working capital management, financial risk management, product assortment and strong B2B marketing efforts are key to entering aftermarket sector in Poland

Segment	Key Platforms produced in Spain & also Produced & Sold in India	Imperative	Segment
▪ Batteries ▪ Springs/ Shock Absorber ▪ Air mass flow sensors / EGR valves / Ignition coils fuel pumps / sensors / throttle bodies ▪ Power Steering Pumps/ Vacuum pumps/ CV joints/ Drive Shafts ▪ Clutch/ Clutch Cylinder/ Bearing Couplings ▪ Radiators/ Condensers/ Heaters/ Intercoolers ▪ Timing kits ▪ Brake Drums/ Discs ▪ Wipers ▪ Bulbs ▪ Rubber & metal suspension Parts	**Skoda** • Octavia • Fabia • Superb **Volkswagen** • Passat **Toyota** Yaris **Hyundai** Tuscon **Market Shares (2017)** ▪ European: 60% ▪ Japanese: 23% ▪ Korean : 10% ▪ American: 7%	1. Aftermarket Supplier relationships 2. Investments in local warehouse establishment/ leasing 3. Better working capital management & financial management (currency fluctuation risks) 4. Dedicated local representative for marketing and sales 5. Investment in Capacity for exports 6. Dedicated capacity for aftermarket 7. Strong Marketing efforts (B2B) 8. Dedicated Aftermarket Division	Tier I,2 & 3 Suppliers

Source: Primary Interviews

Department of Heavy Industry
Ministry of Heavy Industries & Public Enterprises
Government of India

Russia
Country deck

Executive Summary

- The used car market, vehicle age and common availability of platforms across Russia and India provide opportunity for the aftermarket sector; subject to efficiencies in lead times & delivery and local awareness
- Focus on CNG based technologies for the Russian market
- Focus on developing OEM relationships with Russian OEMs & Alliances (Derways, Autovaz & GAZ) to make inroads into Russian OEM market

Opportunity

Short Term

- Focus on aftermarket products for the platforms :
- Ford Ecosport; i20, Rapid, Octavia, Duster, Vento, Polo, Creta etc.

Medium Term

- Tap Russian Alliance to gain access into Russian OEM Market; Collaborate with local suppliers (act as Tier II/ 3s)
- Development of Coating Technologies for cold markets

Long Term

- Acquire regional aftermarket franchise chains
- Demonstrate innovation & solution capabilities to Global R&D & Purchase Offices of OEMs
- Acquire local suppliers in Russia

Strategy to increase export in the Russian market

Summary

- Russian Government due to Ruble Devaluation & WTO Agreement compliance, have focused on a dedicated Export Strategy for Russian Automotive Industry by development of "Strategy for Development of Automotive Exports 2017"
- Implementation through EXAIR to support Russian exporters by way of grants and subsidy to Banks to cover lending risks, Russian Exporters for Insurance cover & attractive taxation & holidays for exports

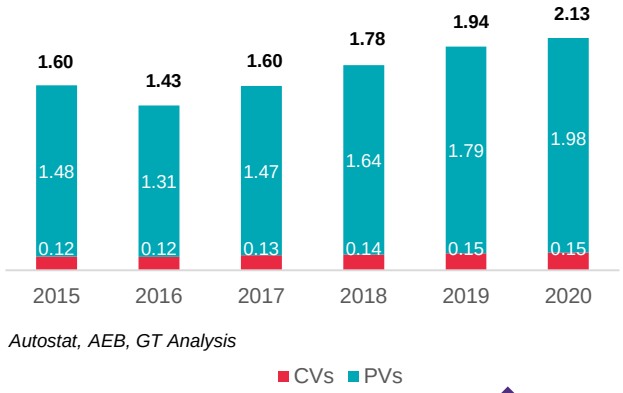
Best Practice

Competitors for India

- Germany
- China
- Japan
- South Korea
- USA

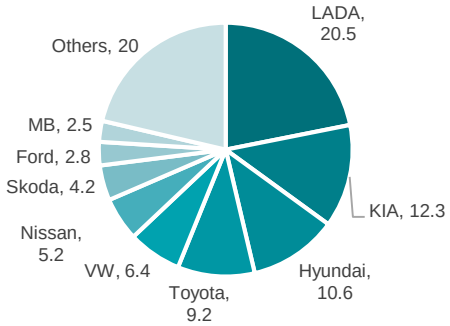
The Russian Automotive market is the 5th largest in Europe accounting for ~1.8 mn units in vehicle production; expected to grow to 2.1 mn units by 2020; PVs dominate with over 90% market share

Russian Automotive Market: Vehicle Production (mn Units)

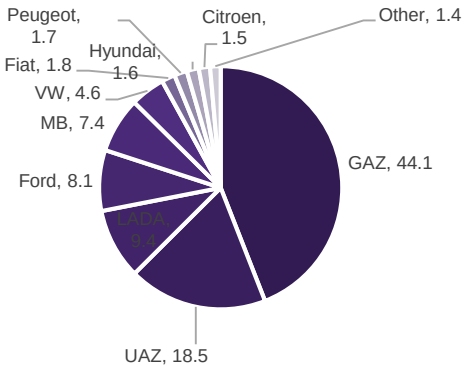


Source: Autostat, AEB, GT Analysis

PV Segment 2017: Player Market Shares (%)



CV Segment 2017: Player Market Shares (%)



Description

- The automotive sector in Russia generates contributes to ~1.2% of the nation's total GDP
- Russia's auto market ranked fifth in Europe in 2016 and 2017, behind Germany, the UK, France and Italy
  - The domestic vehicle market in 2017 was estimated at ~1.78 mn units (PV+ CVs) registering a growth of 12% over 2016-17
    - PV dominate the market with over 90% market share in 2017
  - The growth was largely attributed to low number of vehicles per capita (350/1000 persons) aging car fleet (>12 yrs) and the recovery of basic macroeconomic indicators: oil prices, GDP, real household income, consumer activity & lower interest rates on auto loans
- Passenger Vehicles:
  - LADA dominate the Russian PV market with 20% market share followed by Korea's KIA and Hyundai with over 20% combined share in 2017
- Commercial Vehicles
  - The market is dominated by Russian OEM GAZ & UAZ with a combined share over 50% in 2017

The Russian Automotive market is expected to reach 2 mn units by 2020 on the back of increased government focus on boosting automotive production and exports thorough subsidy support, reduction of auto interest rates and specific policies on boosting exports; presence of Asian used cars provides opportunities for aftermarket demand in Russia

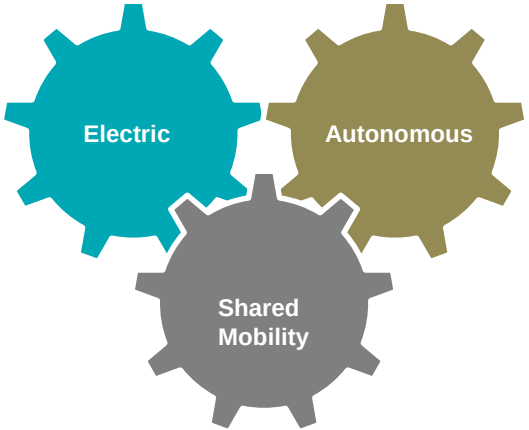
Russian Automotive Industry

Drivers	Description	Impact
Economic Performance & Reforms	▪ The Russian economy is predicted to grow between 1.5% to 1.8% within 2018-20 (IMF). ▪ Increased focus of Russian Government through policy reforms for reducing interest rates on auto loans and car leasing, the fleet renewal program and subsidies for government purchases of motor vehicles ▪ Government policy aimed at stimulating exports through approval of "The Strategy for the Development of Automotive Exports" in August 2017 to boost Russian Auto and Component Export through subsidy	▪ ***New Vehicle registration across ICE powertrain to*** *touch 2 mn mark by 2020* ▪ ***Increased investments by Asian, European manufacturers*** *on boosting local capacity to serve domestic and export demand* ▪ ***Component demand*** *to witness increased demand on account of increased production*
Decreasing interest rates for car purchase	▪ Reduction of interest rates from 16% to 8% over past three years to boost auto purchase demand in Russia ▪ The success of Asian OEMs in Russia implies rich opportunities for automakers that offer models that fit the needs and budgets of Russian consumers	▪ *Decreased auto interest rates to* ***increase consumer spending on new and used car*** *purchase in Russia*
Strong fundamentals for used car	▪ Russia has over 10 mn used cars in 2017 that are dominated by platforms across Korean, French, Japanese make; projected to grow to 30 mn by 2025 ▪ Average age of used cars is 10-15 years	▪ *Used car vehicles to drive up demand for replacement parts in* ***aftermarket sector***
Nascent but evolving EV Market	▪ Small but growing EV market: Only 82 EVs were sold in 2017, pushing the country's total to 1,771 registered at the end of the year; ▪ EV positioned as top strategic priority in the area of technological innovation as per "Russian Automotive Industry Development Strategy through 2025" document ▪ 53 operational e-charging stations in Moscow, the largest EVs market in Russia, but plans by electric grid company MOESK call for totals to increase to more than 150 in 2019 ▪ Increase spending by government to replace Moscow's bus fleet to electric by 2020	▪ *Demand for EV to grow on account of increasing consumer consciousness and increased government focus & support*

Source: GT Primary & analysis; Autostat

The market for Electric Vehicles is estimated at a little over 1000 vehicles in mid 2017; there is a strong focus on developing the sales of EVs by the local government; Shared Mobility is a developing concept with Moscow and St. Petersberg accounting for over 5000 cars for car sharing; Few local players like Yandex & BMG are investing in Autonomous vehicle & their testing

- Russian EV market is small. A total of 95 new electric cars were sold in Russia in 2017, and the total number of electric cars in the country in mid-2017 amounted to 1,133 vehicles; Moscow and Moscow Region accounted for almost 1/3rd of the share; ~367 vehicles
  - Several Russian OEMs are experimenting with development of EVs (e.g.. Lada Ellada, Yo-mobil)
- Strong government focus to boost domestic sales of electric vehicles (EVs) from fewer than 100 units in 2017 to nearly 100,000 units by 2025 – or 4-5% of overall vehicle sales; Eurasia Economy Union (EEU) revealed a plan to almost entirely exempt OEMs from paying custom duties on automotive components for EV assembly in Russia
  - Govt. is allocating RUB 4.5 bn (US 71 mn) to directly support domestic demand, by subsidizing interest rates on loans for EV buyers



- Autonomous vehicles in Russia is at a very early stage.
- Several OEMs are developing and testing autonomous vehicle for mass transportation purpose
  - eg; Matryoshka is an autonomous bus currently being tested built by BMG.
- The Central Scientific Research Automobile and Automotive Engines Institute (NAMI) with KAMAZ have also developed a prototype for a self-driving bus called the Shuttle
- Companies like Yandex are looking for opportunities for developing Autonomous vehicles and components

- The concept of car sharing in Russia dates back to 2013 in Moscow and St. Petersburg city
- Car-sharing fleet in the Moscow in 2017 is estimated at ~3,000 cars. In the rest of Russia, car-sharing totals more than 2,700 cars
  - Key players in car sharing space include: Delimobile, Car5, YouDrive, AnyTime and BelkaCar
- Increase adoption rate: In Moscow more than 300,000 customers used car-sharing rides From September 2015 to May 2017, the number of car-sharing trips undertaken by exceeded 1.3 mn in Moscow

Source: GT primary & secondary analysis

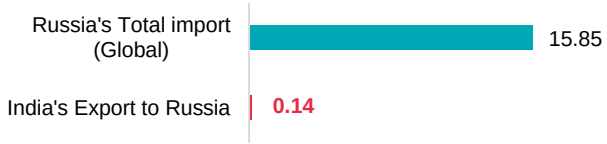
As Russia witnesses influx of foreign OEMs setting up assembly plants in Russia, there is a greater need for Tier II & Tier III supplier dependency; smaller players are faced with challenges relating to Technology upgradation, capacity issues to meet demand from OEMs in Russia; most smaller players are import dependent who assemble child parts to supply to larger Tier Is

Challenge	Description	Impact	How are players reacting
Lack of Tier II & 3 Suppliers	Due to the economic volatility, smaller Russian suppliers have either seized operations or sold off their business and exited the market	▪ Foreign OEMs find it difficult to find a robust supplier base in Russia thereby making it challenging to set up operations in Russia. Although, there has been an influx of foreign OEMs in Russia that are catering to local and export market (European, Japanese, Korean), OEMs are investing in local supplier development programs to build supply chain and component availability required to meet international standards. There is a greater demand for Tier II & 3 suppliers in Russia	▪ OEMs are focusing on building industry consortiums and having a shared supplier base to address capacity issues; some OEMs are also focusing on building dedicated supplier base through investments e.g. Mercedes Benz Mercedes-Benz hosted a supplier forum designed to entice local supply to the new plant it is building near Moscow. The plant is set to build the E-class sedan in 2019, followed by SUV models. The carmaker's purchasing executives met with around 100 suppliers ▪ Russian Govt. has introduced Special Investment Contracts (SPIC) aimed at giving tax breaks against local investment by OEMs – Russian government will approve tax breaks on a car by case basis; this is in line with Russia's WTO compliance on preferential regime w.r.t custom duties which is due to end in 2018
Technological gap required by foreign OEMs	Inability to meet technological standards required by foreign OEMs (Non Russian OEMs)	▪ Most of the existing Russian supplier have been supplying to Russian OEMs therefore, foreign OEMs find it difficult to find products required for their platforms and hence need greater handholding for component development and supply	
Capacity for meeting demands	Inability to meet export demand due to limited capacity	▪ Russian auto component supplier face capacity issues. The demand by the current OEMs required larger production and supply of components to meet export demand	

Source: GT Primary & analysis, Autostat

India's share in Russian imports stood at 0.89% in 2017 (of USD 15.85 bn) providing significant opportunity for improving export share; sheer presence of Korean, European and Korean OEMs, close proximity with China, Japan where most suppliers and OEMs have established relationships makes it easy for OEMs to source products in Russia for assembly for domestic and export purpose

Russia India Export Import Trade: Auto Components (USD bn, 2016-17)

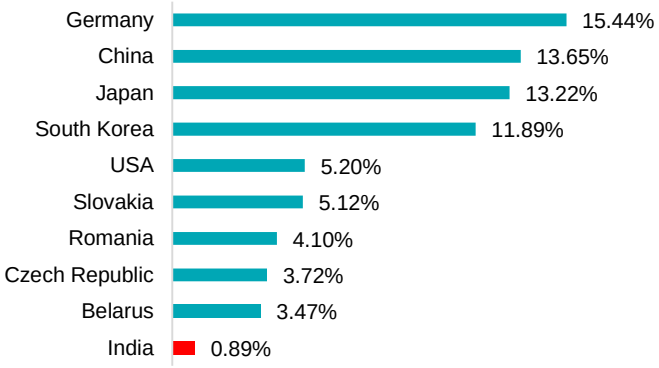


Source: GT Analysis

Description

- The Indian Auto Component Sector exported products worth 141 mn to Russia in 2016-17
- The total imports of Auto components into Russia globally including India in 2016-17 is estimated at USD 15.98 bn
  - India's share in the total imports of Russian imports stood at 0.89%

Russia: Top importing countries (2016-17)



Source: GT Analysis; Figures in %

Description

- Germany, China and Japan & South Korea dominate the Russian import markets with over 50% combined share

- **VW Group:** Operates a full cycle production plant in Russia at Kaluga manufacturing, Tiguan, Polo, Skoda Rapid platforms. They also have contract for vehicle assembly with GAZ Russia to assemble Skoda and VW platforms in Nizhny Novgorod plant; VW also supplies engines to GAZ Russia;
- **Mercedes Benz:** is building 3 new plants in Russia in Solnechnogorsk region; key suppliers include NAMAK, ZF, Thysenkrupp that have plants in China and Russia
- **Hyundai:** Operates a full cycle production plant in Russia with 15,000 vehicle production capacity in Saint-Petersburg and in the Leningrad region with key suppliers coming from Korean suppliers namely Deawon, Donghee, Doowon, Sejong, Shinyoung, NVH, Sungwoo Hitech, Yura and Il Tube; KIA's RIO platform is also produced in the same plant as Hyundai's

Russian Export Policy – The Russian Government has implemented several measures and policies to promote exports of Russian Made Automobiles and Components overseas; the Strategy for Development of Automotive Exports focusses on providing subsidies for logistics costs, loans and leases, insurance premium as MDA grant to name a few.

Area	Policy/ Institution	Description
Export Focus	Strategy for Development of Automotive Exports (August 2017)	The policy calls for a number of new monetary and non-monetary measures to supplement the subsidies that have been in place since 2016 for logistical costs and certification and homologation expenses. The base scenario envisages a total of some RUB 89.6 bn in support through 2025. Subsidies will be provided for preferential loans and leases, for compensation of the EXIAR insurance premium, for participation in international exhibitions and for development of the dealership and service network. According to the strategy, these measures will help the auto industry raise its total exports to USD 4.9 bn by 2025. The Russian Government is also considering adding an export factor to its criteria for subsidies to auto companies.

Source: Ministry of Trade, Russia

Export Incentives – The Government of Russia through EXAIR offers products for banking institutions that give loans and insurance to exporters helping them cover the risk of lending for export businesses

Area	Description
EXAIR – Russian Export Center Group	EXIAR was established as a specialized state institution to support exports through the provision of a range of export credit and investment insurance products. It is Russia's national export credit agency (ECA)

Products & Services

Offering	Stakeholder	Description of Offerings
Buyer Credit Insurance	**Banks & Financial Institutions**	An insurance product designed to cover a Russian or international bank against the risk of a default on a loan provided to an overseas borrower (the buyer or buyer's bank) to pay for goods, work or services exported from Russia under contract. The policy holder is the Russian or foreign bank financing the foreign borrower
Confirmed LC Insurance		This insurance product is designed to cover the risk of non-payment under a letter of credit (including with financing) which is confirmed by a Russian bank. Policies cover banks adding their confirmation to a letter of credit guaranteeing payment for goods (work or services) exported from Russia under contract. The insured portion for commercial risks related to non-fulfilment of the borrower's obligations under a loan agreement is 70% of the credit amount. The insured is the Russian or foreign bank that adds its confirmation to a letter of credit issued by an overseas bank (often the buyer's bank)
Export Factoring Insurance		An insurance product designed to cover the factor against the risk of non-payment by foreign counterparties. The insured party is the Russian bank financing the Russian exporter. The bank is also a member of the credit and insurance support programme for SMEs
Working Capital		Working capital financing insurance is designed to protect a Russian bank from the risk of a default on a loan provided to a Russian exporter (a small or medium-sized enterprise) to fulfil an export contract. For SMEs, a lack of funds is one of the main barriers to engaging in foreign trade. The loan financing is upto 80% of export contract. The borrower here is an SME (as defined in Federal Law No. 209-FZ dated 24 July 2007) or other company with an annual trade turnover of up to RUB 2 bn

Source: EXAIR Russia

Export Incentives – The Government through EXAIR offers specific products for Russian exporters as well as protecting Russian investor money overseas through Insurance based products

Products & Services

Area	Stakeholder	Description of Services
Supplier Credit insurance	**Russian Exporters**	This product is intended to protect Russian exporters (as well as banks financing them) from the risk of non-payment by the foreign buyer. Policies cover single deliveries of goods made on credit terms.
Short Term Receivable Insurance		This insurance product is designed to cover the risk of non-payment under a letter of credit (including with financing) which is confirmed by a Russian bank. Policies cover banks adding their confirmation to a letter of credit guaranteeing payment for goods (work or services) exported from Russia under contract. The insured portion for commercial risks related to non-fulfilment of the borrower's obligations under a loan agreement is 70% of the credit amount. The insured is the Russian or foreign bank that adds its confirmation to a letter of credit issued by an overseas bank (often the buyer's bank)
Investment Insurance	**Russian Investors investing overseas**	This product is intended to protect Russian investors against the loss of investments caused by political events. Insurance policies cover overseas investments made as an equity participation as well as shareholders loan. Upto 95% of the investment amount is covered under this.

Source: EXAIR Russia

SEZs & Incentives – The Russian Government offers several tax exemptions for companies setting up a deemed export unit in Russia for export purpose

Overview

- Russia has ~26 SEZs divided into 4 key categories
  - Manufacturing, Technology & Innovation, Tourism & Recreation, and Port & Logistic
- SEZs are established for a period of 49 years. Although originally slow to take off, many of the Technology & Innovation SEZs boast advanced infrastructures, and more than 400 investors – including foreign investors as of 2016

Benefits

- Maximum profit tax rate reduced
  - 2% (for Manufacturing and Port Special Economic Zones);
  - 0% until 2018 for Technology & Innovation and Tourism & Recreation Special Economic Zones.
  - Property tax exemption for ten years;
  - “Free customs zone”;
  - Reduced regressive social contribution rates for Technology & Innovation SEZs (effective until 1 January 2018)
  - 14% on annual remuneration up to RUB 718k (approx. USD 10k);
  - 12% on annual remuneration between RUB 718k and RUB 796k (approx. USD 10.7k);
  - 4% on annual remuneration exceeding RUB 796k
  - Accelerated depreciation (Manufacturing and Tourism SEZs only)
  - VAT exemptions for Port & Logistic Zones

Source: Federal Taxation Services, Govt. of Russia

R&D Incentives – The Government through EXAIR offers specific products for Russian exporters as well as protecting Russian investor money overseas through Insurance based products

Overview

- The Russian government offers tax incentives first introduced in 2009 to encourage R&D efforts leading to companies' increased domestic business growth

Benefits

- Companies conducting eligible R&D activities can apply for a 150% super deduction of qualifying costs to reduce profits tax/increase deferred tax assets
- Application of the R&D tax incentive may lead to the reduction of profits tax in the amount of 10% of qualifying costs
- Qualifying costs include labor costs, R&D contractor expenses, depreciation of equipment used for R&D, and other relevant expenses, with limitations.

Requirements

- For companies from various industries conducting eligible R&D activities
- R&D expenditures must relate to the development of new products, the improvement of production processes, or the development of new services
- A contractor performing R&D for a third party cannot claim the incentive
- Eligible "R&D activities" must be included in a government-approved list

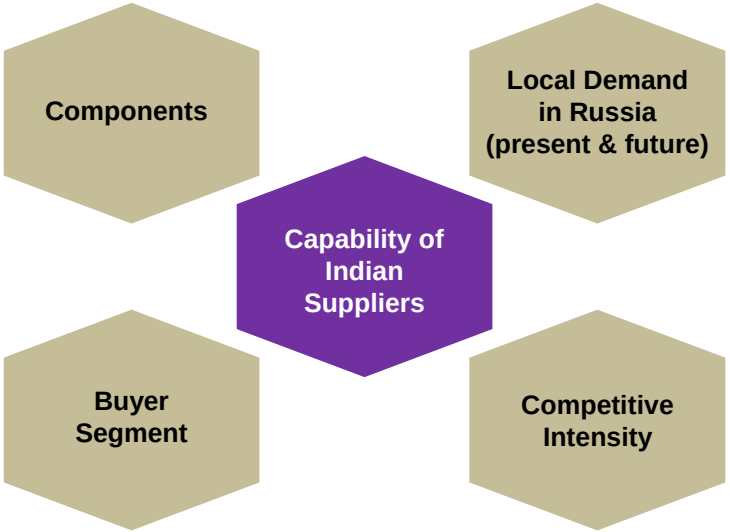
Source: Federal Taxation Services, Govt. of Russia

We took into consideration 5 key elements across broad Component requirement in Russia, Demand growth for such components, Competitive intensity, segment appeal and existing capability of Indian suppliers to supply products required by Russian customers in short, medium to long term based on extensive discussions with Russian OEMs & Suppliers

Assess capability and maturity of Indian supplier for producing & supplying such components required in Russian market based on detailed discussion with experts, local OEMs is India & Russia and component manufacturers in Russia

Broad components based on detailed discussion with experts, local OEMs in Russia & India and component manufacturers in Russia

- Broad components that are traditionally been exported by Indian suppliers into Russia
- Components that are imported into Russia



Demand for broad segments as expected to grow in short, medium and long term in line with industry trends based on detailed discussion with experts, local OEMs is Russia and component manufacturers in Russia

Assess who are likely buyers of such components across OEM, Tier I and Aftermarket category based on detailed discussion with experts, local OEMs & component manufacturers in Russia

Assess India's competitive advantage as a country against China, S. Korea, Japan that dominate the Russian import based on detailed discussions with experts, local OEMs & component manufacturers in Russia

Key Component categories were mapped in line with parameters chosen based on discussion with Russia based OEMs and Suppliers with an objective to assess where and how Indian suppliers can make in-roads into Russian market

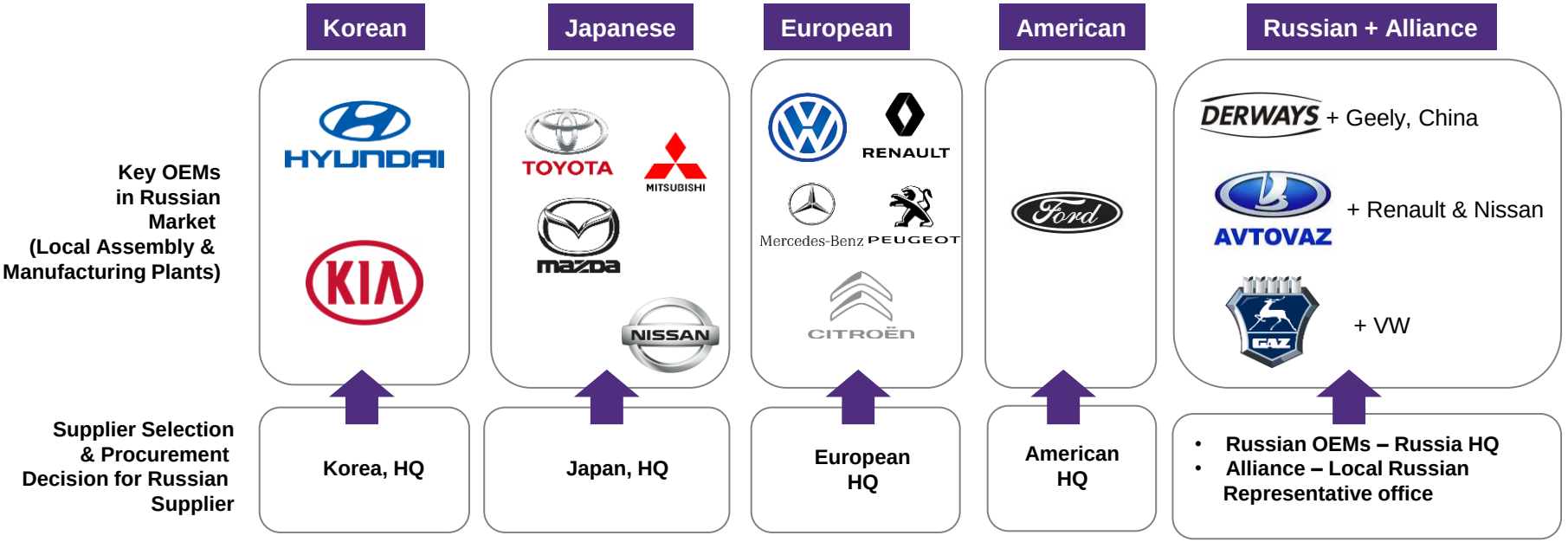
Components	Russian Demand			Buyer Segment			Competitive Intensity	Synergies in line with Indian Industry Capability
	0-3 yrs	4 – 7 yrs	8-10 yrs	Tier I	OEMs	Aftermarket	China, S Korea, Europe	
Traditional Body, Panels & Stamping	H	H	M	Y	Y	-	H	H
ICE & Components	H	H	M	Y	Y	-	H	H
Frame	H	H	M	Y	Y	Y	H	H
Drive Axles	H	H	M	Y	Y	Y	H	H
Wheels & Tyres	H	H	H	Y	Y	Y	H	H
Brakes	H	H	M	Y	Y	-	H	H
Steering	H	H	M	Y	Y	Y	H	H
Suspension & Components	H	H	M	Y	Y	Y	H	H
Fuel System (CNG based Technology + Euro 5)	H	H	M	Y	Y	-	H	H
Climate Control/ HVAC	H	H	H	Y	Y	-	H	M
Seats	H	H	H	Y	Y	Y	H	M
Interior & Accessories	H	H	H	Y	Y	Y	H	M
Infotainment System	H	H	H	Y	Y	Y	H	L
Battery	L	L	M	Y	Y	-	H	L
Electronics	M	M	M	Y	Y	Y	H	L
ADAS/ Sensors	M	M	M	Y	Y	-	H	L
Electric drivetrain	L	L	M	Y	Y	-	H	L
Exhaust	H	H	M	Y	Y	Y	H	L

High
Medium
Low

Description

- **High Synergy Segments:** Indian suppliers have existing capability to develop and supply traditional but essential components such as Body panels, ICE components, body Frames, Axles, Brakes, Steering & suspension, Wheels & Tyre & Fuel systems to Tier I suppliers as well as OEMs. China, S. Korea & Russia is a natural rival for such components due to closer proximity to Russia & OEMs & Tier I local plant presence
- **Medium Synergy Segments**: Segments such as HVAC, Climate Control, Seating and Interior and Accessory are mapped under medium synergy as Indian suppliers will have to build and invest in capacity for supplying such products to Russian market. China, S. Korea & Russian companies as a market is a natural rival for such components due to closer proximity to Russia & OEMs & Tier I local plant presence
- **Low Synergy Segments:** Indian suppliers don't have capability across Electronics, Electrical, ADAS and Sensors, Exhaust Systems, Battery Development to cater to Russian demand. Europe, Japan, China are natural competitors to India for such segments as most of the technologies are sourced from such countries by local Russian OEMs

Decision for vendor sourcing by key OEMs is made through Global Procurement Offices located in parent companies making it difficult for suppliers to target OEMs directly as it is governed by parent company relationships and demonstration of operations, supply chain efficiencies backed by right quality and pricing



OEMs decision on vendor selection & sourcing is dependent on parent company relationship, logistics and supply alignment with parent company, cost competitiveness and price efficiencies.

Preferred Option for Indian Supplier for Russia Entry

- **Foreign OEM – Most Difficult**
- **Russian Alliance – Feasible (Act as Tier I or 2)**
- **Local Tier I – Feasible (Act as Tier II)**

OEMs & Tier I Segment – Local presence through alliances (with Russian OEMs & Tier Is), investment in export capacity, R&D capability and is a pre-requisite for market play across OEMs and Tier I segment in Russia

Segment	Market play: Pre-Requisites	Imperative	Segment
Traditional Body Panels & Stamping **ICE & Components** **Frame** **Drive Axles** **Wheels and Tyres** **Brakes** **Steering** **Suspension and Components** **Rubber & Plastic Components** **Fuel Systems (CNG Technology)**	1. JIT Requirement from OEMs & Tier I suppliers: high risk of assembly line disruption in case of shortage 2. High degree of supply chain alignment with OEMs & Tier I suppliers 3. Local Presence (Supply & Manufacturing) – preferably manufacturing as per customer discussions 4. Large volume perpetual contracts to improve margin play 5. Export capacity to meet overseas customer demand at right time and cost	1. Local presence is a must (manufacturing/ warehousing) 2. Higher risk taking ability 3. Dedicated local representative 4. Investment in Capacity for exports **5. Coating technology for markets with sub zero temperatures**	Tier I,2 & 3 Suppliers
Climate Control/ HVAC Components & systems **Seating and Components** **Interior & Accessories**	1. JIT Requirement from OEM and Tier I: high risk of assembly line disruption in case of shortage 2. High degree of supply chain alignment with OEMs and Tier I suppliers 3. Local Presence (Supply & Manufacturing) – preferably manufacturing as per customer discussions **4. High Design Capability (interior and accessory segment)**	1. Local presence is a must (manufacturing & warehousing) 2. Higher risk taking ability 3. High Design Capability and R&D Investment (3D and CAD capabilities)	Tier I & Select Tier II Suppliers
Infotainment Systems **Battery & Fuel Cells** **Electronics** **ADAS/ Sensors** **Electric Drivetrain** **Exhaust**	**1. High R&D Capability & Investments** **2. Long gestation period for prototype commercialization** 3. Software integration and solution bundling capability 4. Local Presence and high engagement levels with OEMs and Tier I from Design phase through driven by parent companies for projects across markets	1. High R&D Investments (Software Design, Software and Component Integration) 2. Demonstration of solution rather than products 3. High financial appetite for risk	Tier I Suppliers

Source: GT Primary & Secondary data analysis

High
Medium
Low

Synergies in line with Indian Industry Capability

Tyres, Suspension & Oil segment dominate the sales with accounting for 1/3rd of the total market share; used car demand has witnessed a growth lately due to devaluating Russian Ruble estimated at 5.2 mn units in 2016;

Russia Aftermarket

Top Segments

- Tyres – 12.4%
- Suspension - 10.7%
- Oil & Lubes – 7.5%

Source: Autostat

Russian Used Car Market

Used Cars in Russia (2016)

- VIO – 5.19 mn cars
- Average Age – 10-15 yrs

Top Brands

- Russian - Lada
- Japanese – Toyota & Nissan
- American – Ford

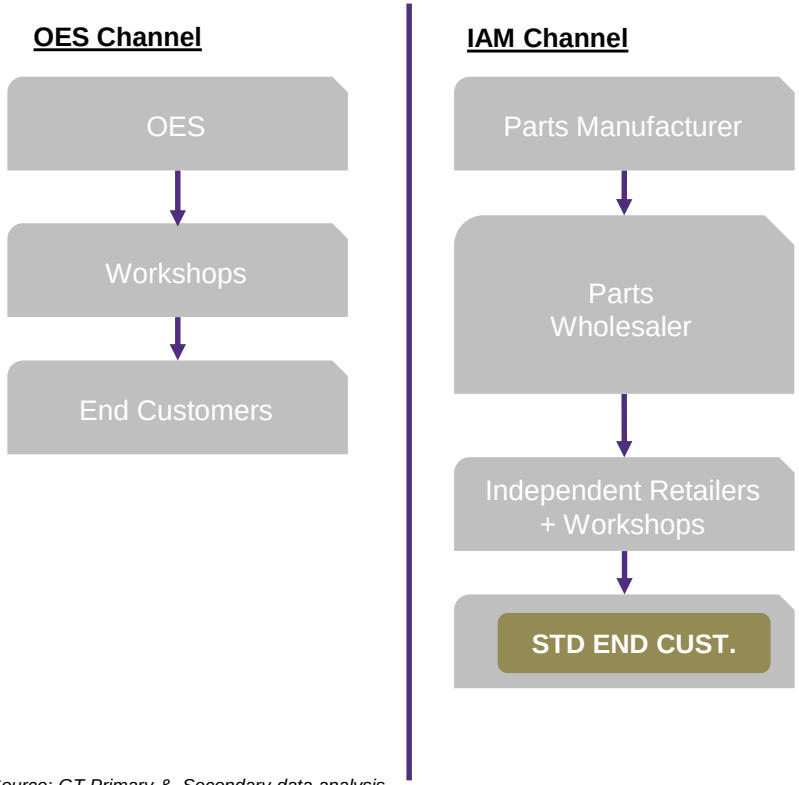
Source: Autostat & Primary Interactions

Primary Insights

- The aftermarket sector in Russia is dominated by Chinese made products
- It is an attractive sector and a potential opportunity for Indian suppliers subject to meeting quality and packaging
- Supply to OEMs is an essential pre-requisite for supplying to aftermarket segment; suppliers from China, Korea and Turkey are active in supplying spare parts to Russian aftermarket sellers

Source: Primary Interactions: AUTOSTAT

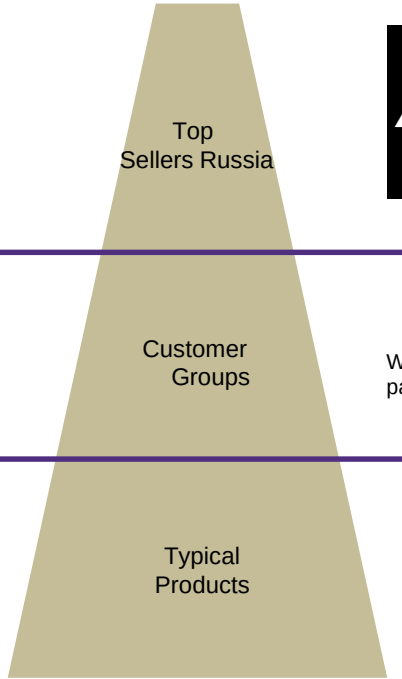
Russian Auto Component market is governed by a combination of traditional distribution but also e-tailing, although in small numbers; the physical locations serve installer shops as 2 step distribution system



- While the market is dominated by traditional offline distributors - what is fast becoming the most important distribution segment in Russia is an amalgam of wholesale distributor channel with the e-tailing channel.
- These distributors, both independent and members of European buying groups, rely on e-tailing to cover the great variety of vehicles in Russia, though in low volumes.

Source: GT Primary & Secondary data analysis

Traditional & Online sellers deal in wide variety of components; the spares are required for instant fittings through workshops hence availability becomes critical; creation of consignment warehouse for timely delivery becomes critical for both traditional and online supply by any supplier



Top Sellers Russia	**Auto49 & Bi-Bi** **exist.ru** **Auto Distribution International (Belgium)**	**GroupAuto (France** **Shate-Em (Belarus Custom Free Boarder)**
Customer Groups	B2B Workshop mechanics, parts managers	STANDARD CUSTOMERS Standard End Customers
Typical Products	▪ Brake ▪ Disc Pads ▪ Clutch ▪ Shock absorbers ▪ Tyres	▪ Industrial Lubes ▪ Battery ▪ Spark Plugs ▪ Wiper Blades ▪ Styling Accessories

Tyres **Consumable & Accessory**

Rubber Parts **Mechanical Parts**

Source: GT Primary & Secondary data analysis

Aftermarket Segment – Local presence, investment in export capacity, working capital management, financial risk management, product assortment and strong B2B marketing efforts are key to entering aftermarket sector in Russia

Segment	Key Platforms produced in Russia & also Produced & Sold in India	Imperative	Segment
▪ Brake ▪ Disc Pads ▪ Clutch ▪ Shock absorbers ▪ Tyres ▪ Industrial Lubes ▪ Battery ▪ Spark Plugs ▪ Wiper Blades ▪ Styling Accessories ▪ Covers and Accessories	Hyundai • Creta • Elantra Nissan - Xtrail - Terrano Toyota - Camry Ford • Mondeo • Ecosport • Fiesta BMW • X3, X5, X4 X6 Renault • Duster • Kaptur • Logan Volkswagen • Polo • Tiguan • Rapid • Octavia Audi • Audi A6 • Audi A8 Mitsubishi • Outlander	1. Investments in local warehouse establishment/ leasing 2. Better working capital management & financial management (currency fluctuation risks) 3. Dedicated local representative for marketing and sales 4. Investment in Capacity for exports 5. Dedicated capacity for aftermarket 6. Strong Marketing efforts (B2B) 7. Leveraging IPO relationships in India for aftermarket supply in Russia	Tier I,2 & 3 Suppliers

Source: GT Primary

Slovakia
Country deck

Executive Summary

- PV and respective component imports of highly integrated products from supporting markets such as Germany and Korea is expected to increase in the future
- Various OEMs and global suppliers will be setting up plants in the country due to strategic logistic advantage
- Majority of aftermarket parts market is controlled by distributors in the country
- Significant opportunities for In-car connectivity, especially in the car hardware and software integration

Opportunity

Short Term

- Tap into after-market distributors for PV in the country such as Rhiag, Stahlgruber and Trost for platforms of Skoda, Kia and VW

Medium Term

- Consortium of Indian Suppliers need to pitch with Indian OEM (TATA or Mahindra) in order to cater to the entire region

Long Term

- Set up subsidiaries in Slovakia to cater to developed EU markets such as Germany, France & Italy

Strategy to increase export in the market

Summary

Mature technologies such as:

- ***Motorcycle Cornering Lights***
- ***Aeromobile***
- ***Adaptive Front Lighting systems***
- ***Variable Compression Rods***

Best Practices & Technology

Competitors to India

Germany

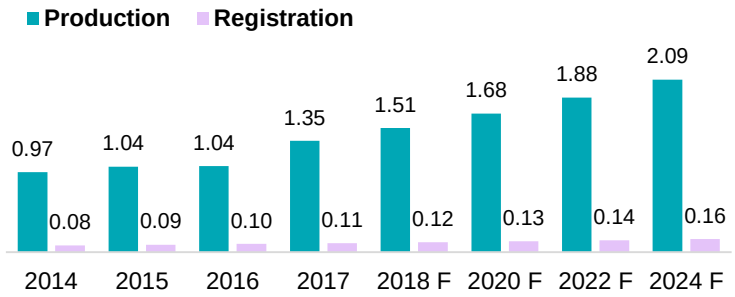
South Korea

Czech Republic

France

Slovakia has the potential to become one the largest PV players globally with production growth rates increasing at a CAGR of 11.6%

Slovakia Automotive Market: Vehicle Production (mn Units)

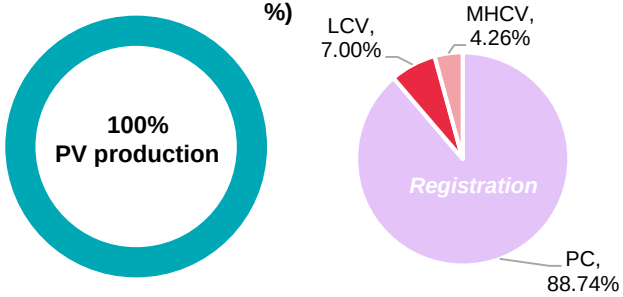


Source: European Automobile Manufacture Association

Description

- Slovakia is the world's largest car producer in terms of car produced per capita with 178 cars produced per 1000 inhabitants in 2016.
- The car market is growing at significant CAGR of 11.6%, reaching almost 2.1 mn units by 2024 in terms of production.
- Registration of cars increased at a CAGR of 9.7% (2014-2017) and is expected to reach 0.16 mn units by 2024.
  - The Slovakian automotive industry contributes to 44% of the countries total industrial production, with 95% of the production being exported to Eastern Europe countries
- The Automotive industry generated over 300,000* jobs in 2016 including designing, engineering, manufacturing, and supplying parts and components to assemble, sell and service new motor vehicles.

Slovakia Automotive Market: Classification (In %)



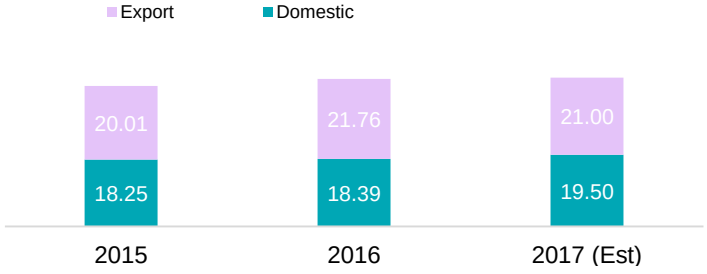
Source: European Automobile Manufacture Association

Description

- 89% of the domestic market registrations is for passenger cars while 11% is for commercial vehicle. The auto sector in the country is completely PV focused
  - VW Slovakia in Bratislava is the only plant in the world producing five car models. In 2016 Volkswagen's 12,300 local employees produced 385,450 cars
  - KIA Motors Slovakia in Zilina employs 3,590, and produced 339,500 cars in 2016. The plant also produces its own engines. PSA Slovakia in Trnava employs 4,200, and produced 315,050 cars in 2016
  - Jaguar Land Rover (JLR) in Nitra has a projected annual production capacity of 150,000 vehicles
- More than 50% of the domestic market is controlled by Skoda, Volkswagen, Hyundai with key platforms being Rapid, Octavia, Vitara, and Golf

Slovakia caters to be an export hub for developed EU markets with 60% of production being exports; Localization rate due to greenfield investments in the country is approximately 60%

Slovakia Auto Parts Industry Growth Trend (USD bn)

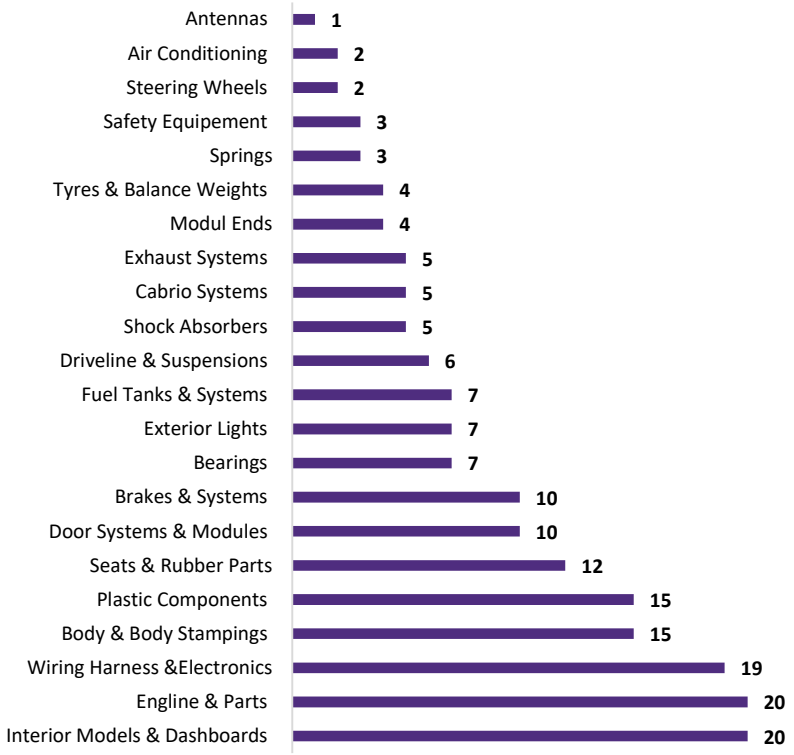


Source: Statistical office of Slovak Republic

Description

- The Slovakia auto component market stood at USD 38 bn in 2015, growing at a CAGR of 2.2%. Out of the total, export sales attributed to 60% of the total market
  - In 2016 there were over 340 Tier I and Tier II auto suppliers, providing parts and subassemblies to clients throughout Europe
  - Automotive production directly employs 129,000 people, while the total number of people employed in the automotive industry is approximate 300,000
  - The further development and localization of auto suppliers should decrease car component imports in the future
  - Multiple OEM have also developed their own captive component plants such as Hyundai and Kia in order to achieve backward integration
  - Out of the top 40 largest suppliers in Slovakia, only two have a local country of origin

Number of Key Auto-Component Suppliers on the basis of product offerings



Growing economic indicators, along with increasing FDI in the sector and attractive labor cost indicates the country's potential to become a auto-hub for the future

Slovakia Automotive Industry

Drivers	Description	Impact
Emerging Economy	▪ The Slovakian economy is on the rise with Gross Domestic Product growing year on year (3.6% in 2016 vis a vis 3.5% in 2015) ▪ The automotive industry is one of the pillars of Slovakia's economy, accounting for 13% of its gross domestic product and 35 % of its exports.	• *Increased economic performance to drive vehicle demand and consumption* ↑
High FDI – Attractive Investments	▪ The Slovak Government has been proactive in its dealings with large investors such as VW, PSA and Kia, offering tailored infrastructure solutions and attractive incentives. JLR received USD 130 mn in government incentives as part of their USD 1.4 bn investment, an ▪ This approach, linked with persuasive reforms such as a flat tax and a user-friendly corporate tax system, has been an added advantage	• *Potential hub for investment from Indian suppliers to set up base in Europe* ↑
Attractive Cost of Labour	▪ Slovakia is the third most competitive country in terms of labor cost, in EU after Lithuania and Latvia. The average rate in 2016 was EUR 10.3 per hour in comparison to EUR 44.2 of Belgium and EUR 38.8 of Germany. ▪ Further, the country has invested heavily in the technical dual vocational training (over 100 institutes in the country) which makes it an attractive country with a skilled workforce	• *With more suppliers setting up manufacturing units in the country, the localization of auto suppliers should gradually decrease car component imports in the future* ↓
After Market Potential for the future	▪ The average life of overall vehicles is 11.37 years, with diesel average age of 6.05 year and gasoline average age of 13.05 years. The purchase ratio of new to old car is 3:2 in the country	• *Aftermarket is still at a nascent stage and has potential to grow in the future* ↑
Infrastructure-Logistic Advantage	▪ In spite of the developing infrastructure in the country, the infrastructure for exports especially in EU is a key driver of growth as deliveries can be fulfilled in 36-48 hours to neighboring countries ▪ Further, Slovakia's favorable geographic location includes proximity to 12 automobile manufacturing plants within the Slovak and Czech Republics, Poland and Hungary	• *Strategic location in Europe due to which exports is expected to increase in the future* ↑
Regulation Support	▪ Multiple OEMs and auto suppliers in the country have started to shift to electric motors and powertrains due to the new Euro VII standards which have to be complied by 2020 ▪ Further, EV subsidies and incentives (up to USD 5,500) are expected to increase EV penetration from the current nascent stage	• *EV market especially for the PV segment is expected to increase in the future* ↑

Source: GT Primary & secondary analysis, SARIO

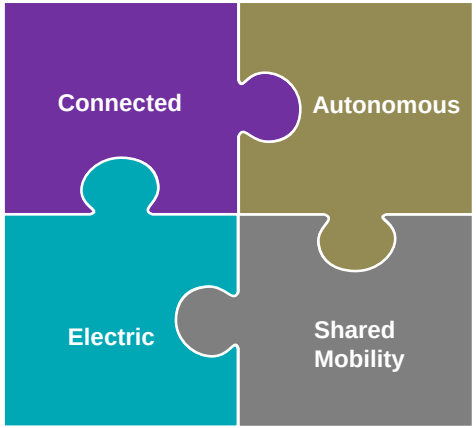
Shortage of Skilled workforce along with specialized skill set has forced the government to create a viable employment process for overseas personnel

Challenge	Description	Players Reacting
Large Gap between Labor Requirements to fulfill demand vs actual availability	With high concentration of plants in selected hubs, it is estimated that the automotive industry will require approximately 14,000 workers by 2020. Lack of expertise has been reported in the auto industry including the production of instruments and tools, blacksmithery, foundry, new materials processing and machining. It is becoming difficult to recruit experienced electronic and technical engineers, machinery and tool engineers, CNC machines and robots operators, technologists, designers, quality controllers, lacquerers, power press operators, logisticians, purchasers and maintenance personal. Lastly, fluency in English or at least one foreign language is another requirement in the industry. *Hiring and retaining skilled labor is becoming increasingly challenging in these multiple regions due to the following:* ➢ *VW's entry into the Bratislava region was followed by that of a number of suppliers, which boosted the capital's regional economy. VW employs about 10,000 people at this facility. High demand for workers to staff the manufacturing operations at the plant and the supplier parks has created a daily workforce migration from up to 100 kilometers away.* ➢ *The operations of PSA in Trnava and Kia in Zilina are likely to exert further pressure on labor availability, resulting in higher wages and more difficult conditions for smaller component manufacturers in establishing new operations.*	1. Multiple OEM have already started hiking wages in the country due to multiple strikes by trade unions. • Recently, French car maker Peugeot's Slovak unit has agreed with trade unions on a 7.7% wage hike in 2018 • While in June 2017, VW cooperated with 6-day work strike and accepted a 14.4% increase in wages 2. Due to the pressure mounted by industry players, the government has also initiated the process of simplifying procedures and allowance of employment from overseas. ***The dual education scheme followed by the requalification and import of workers from abroad will generate new labor***

Source: GT Primary & analysis, Industry Reports

Connected hardware in the country is expected to increase significantly in the future while the trend of electrification will be slow; existing OEMs will need to import technology from their respective home-base

- In 2016, the revenue in the connected car market of Slovakia was estimated to be USD 13 mn and increased to USD 17 mn in 2018.
- The connected car market has shown an upward trend since the past few years and it is forecasted that the revenue would increase by a CAGR of 16.2% to reach USD 31 mn by 2022.
- Connected Hardware, the markets largest segment has a market volume of USD 16 mn as of 2018. Currently the connected car penetration is at 3.9% and is expected to increase by a CAGR of 43.3% to reach 14.9% in 2022.
- The segregation for the various segments in the connected cars market is given below (2018):



- The concept of autonomous technology is very new to Slovakia. Autonomous feature in cars has not hit the road yet.
- All technology and R&D developments with respect to autonomous has been outsourced by a handful of suppliers/ OEMs who are foreign based such as Germany, South Korea and France.

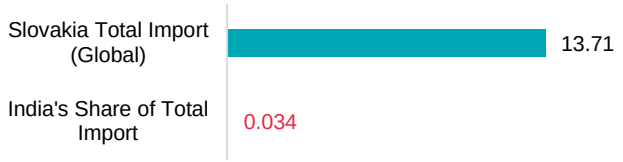
- The Slovak car manufacturing industry produces about 6,000 electric and hybrid cars annually, including the Volkswagen e-up!, Touareg Hybrid, and the Audi Q7 e-tron, the first plug in diesel hybrid in the world. In December 2016, 815 green cars (out of which 40% were plug-in hybrids) represented 0.1% of all cars on Slovakia's roads.
  - The low interest in green cars is due to their relative high price, a limited charging station network, longer charging times and electricity price which is occasionally higher than gas.
  - In order to increase interest in green cars the Slovak Ministry of Economy allocated EUR 5.2 mn (USD 5.52 mn) to support electric and hybrid car purchases.
  - As of November 2016 electric car purchase is subsidized by EUR 5,000 (USD 5,300) and hybrid cars are subsidized by EUR 3,000 (USD 3,188).

- The amount of ride sharing users in Slovakia in 2016 were 0.2 mn. In 2018, this number increased to 0.3 mn. It is forecasted that the number of ride sharing users would increase by a CAGR of 9.3% to reach 0.4 mn by 2022
- The revenue for ride sharing market in 2017 was USD 22 min which is expected to increase by a CAGR of 12.2% to reach USD 37 mn in 2022
- The second segment of the shared mobility is the car sharing/rentals. The growth in this segment has been stagnant.
- The number of car sharing users in Slovakia in 2017 were reported to be 0.1 mn. It is expected that the car sharing users would remain constant even by 2022.
- The revenue for car rental market in 2017 was USD 11 mn which is expected to increase by a CAGR of 4.6% to reach USD 13 mn in 2022. The major ride sharing companies in Slovakia are Taxify and Carpool Slovakia.

Source: GT Primary & analysis, SARIO, Media Articles

Slovakian auto component imports are expected to decrease on account of more international suppliers establishing plants in the country

Slovakia Import Trade: Auto Components (USD bn, 2016-17)

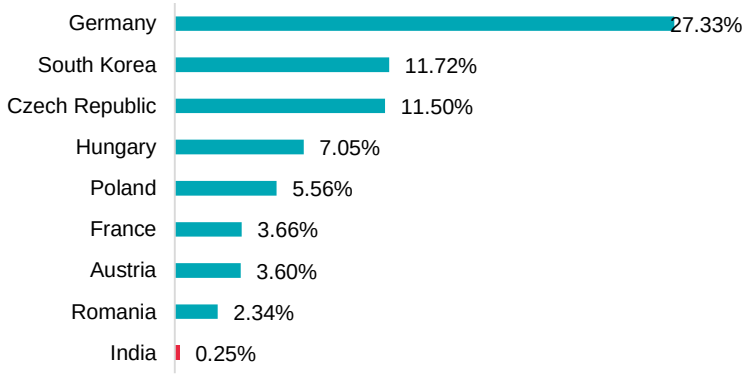


Source: GT Analysis

Description

- The Indian Auto Component Sector exported products worth USD 0.041 bn to Slovakia in 2016-17
- The total imports of Auto components into Germany globally including India in 2016-17 is estimated at USD 13.71 bn.

Slovakia: Top importing countries (2016-17)



Source: GT Analysis; Figures in %

Description

- Germany, South Korea and Czech Republic dominate the Slovakian imports with a total share of approximate 50%
  - Majority of German and French OEMs such as VW, Audi, PSA as well as auto component suppliers such as Bosh, ZF, Faurecia, etc. have set up manufacturing plants or acquired counter parts in Slovakia or Czech Republic
  - Korean leaders such as Hyundai and Kia have established car, engine and transmission plants in the Czech Republic and Slovakia as well
- EU countries account for ~75% of the Slovakian imports with South Korea being the only Asian country with considerate market share
  - India accounts for 0.3% of import share primarily supplying products across Casting, Forging, Engine Components, Braking, Gearbox, Ignition & Wiring related parts

Technology Maturity with respect to recent Research & Development in Slovakia

Technological Area	Description	Impact on Component
1 Motorcycle cornering light	In order to increase the safety of the driver, ZKW has manufactured an adaptive motorcycle cornering light in which the cut-off line on the road always remains straight. In the model, the low beam is generated by a xenon projection module and reflected by a motor-operated mirror.	A swivelling lens in the xenon module compensates as the front of the vehicle, and the headlight along with it, lifts during acceleration or dips while braking. The incline is also mapped during cornering, and the light beam automatically adapts to the specific tilt angle thus resulting in a straight cut off line.
2 Aeromobil 4.0/5.0	It is an exclusive prototype which amalgamates the features of a car and an airplane which is power-driven by an internal combustion boxer engine with a FADEC control unit. The engine provides supplementary power along with the altitude capability by using the cutting edge turbocharging technology. Moreover, the weight of the engine has been significantly reduced in order to improve fuel efficiency. A power of 224 kW is provided to the propeller through bespoke transmission when operating in flight mode, while on the road, the prototype is powered by a hybrid electric engine.	
3 Adaptive Front lighting System(Light beam)	The AFS technology adapts to different driving conditions which ensures the driver's safety. For example: as the speed of the vehicles rises, the light beam's range and intensity increases, thus improving the reaction time.	In the case of bad weather, less light is emitted into the area directly in front of the vehicle, in order to reduce reflections on puddles. Moreover, the light beam adjusts according to the steering wheel to deliver an enhanced view.
4 Variable Compression Rod	The FEV Group and Hilite International are partnering to develop and manufacture a two-stage, variable compression ratio (VCR) connecting rod. The partners say the goal of this collaboration is to leverage synergies in the development of the product and devise a cost-efficient solution for serial production.	The VCR technology meets the challenges of downsizing and the associated increase in combustion pressure by enabling optimal adjustment of the compression ratio at any time. FEV says the two-stage VCR connecting rod it developed is already being used in multiple demonstration vehicles. The company also has prototypes for heavy-duty and large engines

Source: Company Annual Reports, Industry Reports

South Korea

Country deck

Executive Summary

- China supplies the largest quantity of imports to South Korea. As labour costs in China increase, India can be viewed as an alternative source for procurement. Products that can be exported from India to South Korea include cylinder blocks, cylinder heads, aluminium die casting and forging engine parts, child parts, rubber components, bush inserts, seat belts, chassis covers & pipes
- Sale of aftermarket products from local dealers is expected to rise. Indian suppliers can provide aftermarket parts for the mid-small size Hyundai and Ssangyong vehicle platforms

Opportunity

Short & Medium Term

- Focus on supplying aftermarket parts to local dealers in South Korea
- Platforms that could be targeted include mid-small size Hyundai and Ssangyong cars

Strategy to increase export in the USA market

- Establish partnerships and collaborations with South Korean companies to help develop technology

Summary

- Development of local supplier base where 90% of the materials required are supplied by the domestic market
- This includes the backward integration of OEM with T1 suppliers and the backward integration of Tier I suppliers with Tier II and III suppliers as well

Best Practice

Assets/ Companies available for sale/ JV

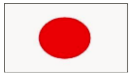
NVGI

- Produces and sells natural gas vehicle components and systems for heavy duty vehicles worldwide – ***Is under restructuring as of Dec 2017***

*Valid as of June 30 2018

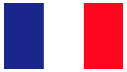
Competitors to India


China


Japan


Germany

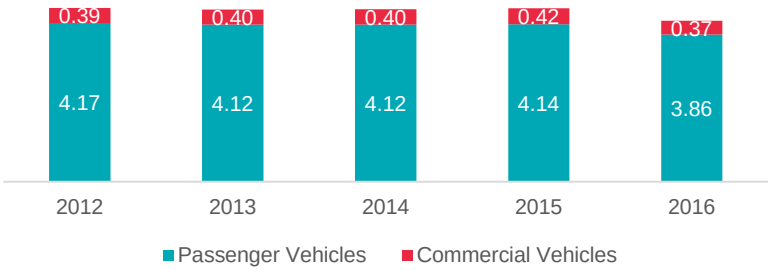

USA


France


Mexico

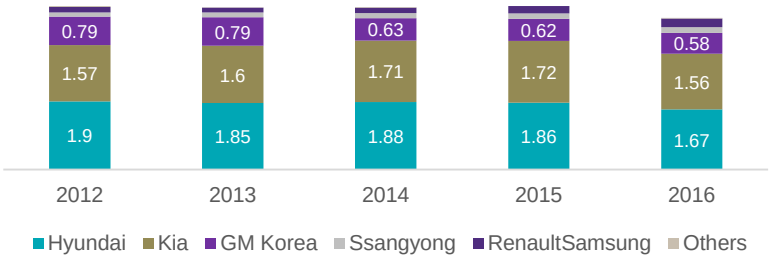
In 2017, South Korea was one of the six largest counties for automotive manufacturing. It is one of the most important sectors of the economy, contributing over 10% to the nation's GDP every year

South Korea Automotive Production (mn units)



Source: Korea Automobile Manufacturers Association (KAMA), primary interviews

Automotive Production & Sales by OEM (mn units)



Source: Korea Automobile Manufacturers Association (KAMA)

Description

- In 2017, South Korea was one of the six largest counties for automotive manufacturing. It is one of the most important sectors for the economy, contributing over 10% to the nation's GDP every year
  - Around 90% of the auto parts to OEMs in South Korea are sourced from local auto part manufacturers. The remaining 10% of the products are imported from countries like China, Japan, Germany and USA
- The South Korean automotive manufacturing industry had total revenues of $63.4bn in 2016, representing a compound annual growth rate (CAGR) of 3.8% between 2012 and 2016
- Industry production volumes declined with compound annual rate of change of -1.2% between 2012 and 2016, to reach a total of 4.23 mn units in 2016
- Cars make up the bulk of the production comprising of around 91% of the total production in Korea

Description

- Hyundai is the largest producer of vehicles in Korea accounting for around 40% of the market share in Korea
  - The market is dominated by the sales of sedans which constitute around 60% of the market share in 2016
  - SUVs constitute around 34% of domestic PV sales followed by CDV (car derived vans) sales of 6.5%
  - Medium sized vehicles accounted for 36% of the market followed by large, small and mini sized vehicles accounting for 27%, 25% and 13% of the market respectively
- The second largest producer of vehicles is Kia accounting for 37% of the market in 2016 followed by GM Korea, Ssangyong and RenaultSamsung

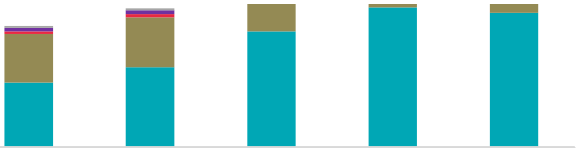
The South Korean automotive market is largely an export oriented market, where 61% of the auto and auto parts produced are exported

Automotive Exports from South Korea (USD bn)

	2012	2013	2014	2015	2016
Motorcycles	0.05	0.06	0.04	0.03	0.03
Tractors	0.57	0.54	0.73	0.90	0.66
Delivery trucks	2.31	2.19	2.23	1.91	1.84
Vehicle Parts	19.20	21.00	21.50	20.40	25.50
Cars	42.60	43.50	45.30	41.90	40.10

Source: Korea Automobile Manufacturers Association (KAMA)

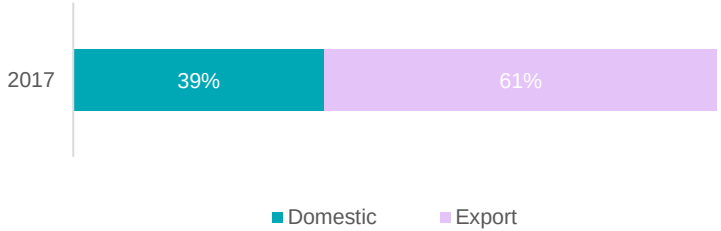
Automotive Imports to South Korea (USD bn)



	2012	2013	2014	2015	2016
Motorcycles	0.12	0.12	0.18	0.23	0.23
Tractors	0.25	0.27	0.33	0.22	0.43
Delivery trucks	0.19	0.23	0.36	0.35	0.67
Vehicle Parts	3.40	3.50	3.48	3.43	4.47
Cars	4.55	5.63	8.14	9.83	9.45

Source: Korea Automobile Manufacturers Association (KAMA)

Production & Export/ Domestic Ratio

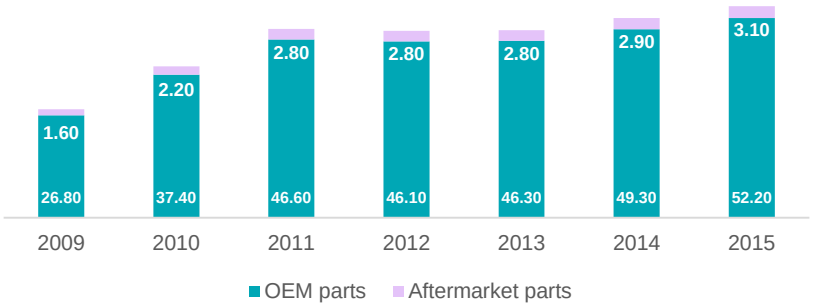


Description

- The South Korean automotive market is largely an export oriented market, where 61% of the auto and auto parts produced are exported
  - Cars are the highest exported product from South Korea followed by vehicle parts
  - The US is the largest export destination for Korean auto part products importing a total of USD 6.8 bn in 2016, followed by China and Mexico importing a total of USD 5.6 and USD 1.7 bn respectively
  - India imported a total of USD 0.94 bn of auto parts in 2016
- While the exports from South Korea of vehicles and auto parts accounted for USD 68 bn to the rest of the world, imports accounted for USD 15 bn, of which cars comprised of USD 9.5 bn

South Korea is the 6th largest auto part exporter in the world accounting for 6.3% of world trade at USD 26 bn in 2016. The top importers of South Korean auto parts are US, China, Mexico, Czech Republic and Japan

Auto Parts Value for OEM & Aftermarket (USD bn)

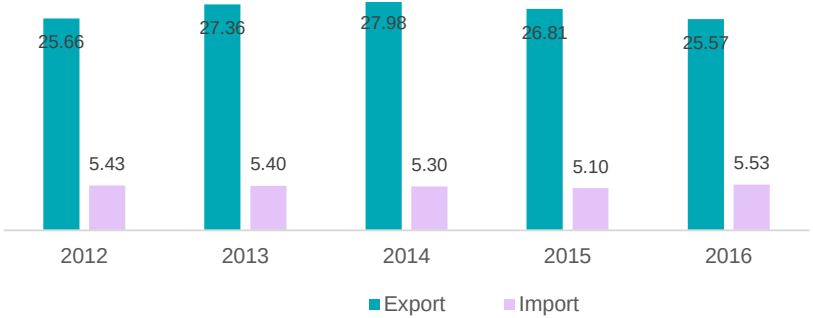


Source: Korea Automobile Manufacturers Association (KAMA), KOTRA

Description

- In 2017, South Korea was ranked as the 5th largest country for auto parts manufacturing after China, Japan, US and Germany
  - South Korean Auto Parts industry has grown over the years because of innovative engineering, precise assembly lines, high quality products and exceptional supply-chain organization
- Although Korea's auto parts industry has competitive module and system unit part technologies, it strives to domestically produce core parts and unit parts, including sensors and auto semiconductors, respectively.

Auto Parts Import/ Export(USD bn)



Source: Korea Automobile Manufacturers Association (KAMA), KOTRA

Description

- South Korea is ranked as the 6th largest vehicle parts exporter in the world, representing 6.3% of world trade at USD 25.6 bn in 2016
  - The top 5 countries to which South Korea exports vehicle parts include the US (27%), China (22%), Mexico (6.3%), the Czech Republic (4.2%) and Japan (3.5%)
- Major parts exported include auto parts, transmissions, brake and brake parts
  - The Auto parts Import industry is relatively smaller in South Korea and had reached USD 5.5 bn in 2016

South Korean automotive players, present in India

OEMs in India

HYUNDAI

KIA MOTORS

KIA may roll out cars from India plant in second half of 2019

SSANGYONG

Mahindra acquired 70% stake in 2013

DAEWOO

Tata bought 100% stake in 2004

Suppliers in India

HYUNDAI MOBIS

MVH KOREA

HYUNDAI WIA

HANON SYSTEMS

HYUNDAI DYMOS

Mando

HS 효성전기주식회사 HYO SEONG ELECTRIC

LUK INA FAG

SCHAEFFLER GROUP

Suppliers not in India

DAEDONG SYSTEM

HYUNDAI POWERTECH

DAEWON

The South Korean market is export oriented and self sufficient with only 10% of the local requirement being imported from foreign countries. Auto component suppliers follow the best cost model to source from abroad and with increasing labor costs in China, India could be seen as an alternative option

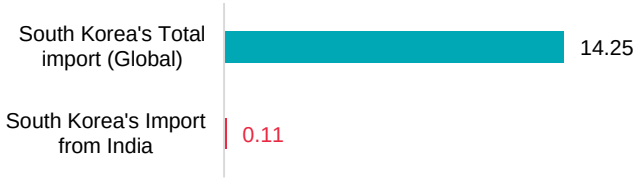
South Korea Automotive Industry

Drivers/Trends	Description	Impact
FTAs and International Collaborations	▪ The Korean government has already established around 16 FTAs with countries across the world ▪ As of 2016, there were 4 FTAs under negotiations and an additional 4 FTAs were pending to be signed	▪ *As a major exporter of auto and auto parts, FTAs will ensure a **larger number of exports** from Korea that will drive the requirement of auto and auto parts in Korea*
Prominent Local Supplier Base	▪ 90% of the sourcing of auto parts by OEMs in Korea is done from local auto part manufacturers ▪ As of 2016, Hyundai, Kia and GM Korea had 300+ local suppliers	▪ *Only 10% of the auto parts required are imported* ▪ *South Korean OEMs base their sourcing on the best cost model. India could be viewed as an alternative to China as our labor costs are lower than that of China*
Increasing Costs to Source from China	▪ China is the largest supplier of auto parts to South Korea due to its proximity, cultural integration and low cost of labor. However, with the increase in labor cost in China, OEMs in South Korea are now looking at alternatives to China	
Increasing Adoption Rates for EVs and Autonomous Vehicles	▪ The government has introduced various incentives and subsidies to promote the sale of EVs ▪ Investments worth USD 140 mn will be made in developing support policies for the development of electric and hydrogen vehicles over the next 5 years ▪ The government has allocated USD 25 mn in 2017 for the development of autonomous vehicle infrastructure	▪ *HEV have increased from 19,371 units in 2011 to 83,762 units in 2017 representing a **28% CAGR** while EVs have grown from 281 units to 13,724 units representing a **CAGR of 91%** over the same period* ▪ *Due to this there has been **a decline in the sales of ICE engines** which is detrimental to Indian suppliers as Indian suppliers are largely not equipped to manufacture parts for EVs or autonomous vehicles*
Government Push to Sell Aftermarket Auto Parts	▪ The government is promoting the sale of aftermarket auto parts rather than parts from the OEM ▪ Under the new policy, drivers who are covered by own damage car insurance will receive 25 percent cash back from insurance companies when they buy aftermarket auto parts, instead of those made by the original equipment manufacturer (OEM).	▪ *The **demand for aftermarket products** that are of the same quality as OEM aftermarket products is **expected to increase***

Source: GT Primary & secondary analysis

India's share in South Korean imports of components stood at only 0.77% in 2017 (of USD 14 bn) providing significant opportunity for improving export share; rising labor costs in China, which is the highest supplier of automotive components to South Korea could force South Korea to look at India as an alternative

South Korea India Export Import Trade: Auto Components (USD bn, 2016-17)

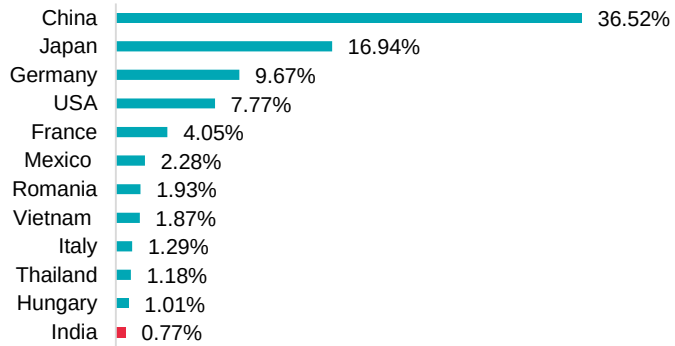


Source: GT Analysis

Description

- The Indian Auto Component Sector exported products worth USD 109 mn to South Korea in 2016-17 which accounted for only 0.77% of the total imports of auto components into South Korea
- The total imports of Auto components into South Korea globally including India in 2016-17 is estimated at USD 14.25 bn

South Korean: Top importing countries (2016-17)



Source: GT Analysis; Figures in %

Description

- South Korea is a highly self sufficient industry for raw materials for the auto component sector
- Only 10% of the requirement is imported from abroad out of which the high value products are usually imported from Japan, Germany and USA that contribute to around 17%, 10% and 8% of the total imports respectively
- China is the largest suppliers of auto components to South Korea supplying more than 36% of their imports

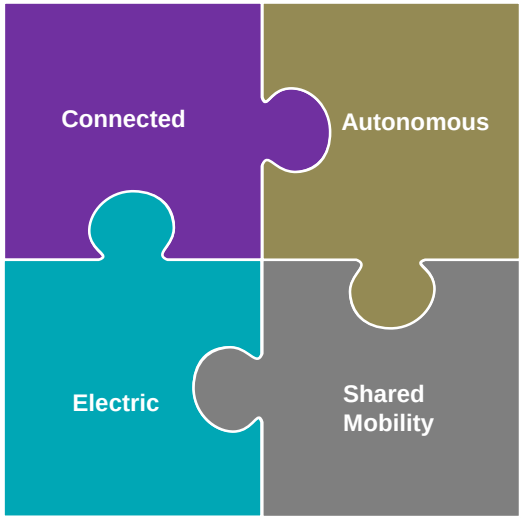
The government first introduced incentives and subsidies for electric vehicles in 2011. Since then there has been a 91% and 28% CAGR growth for EVs and HEVs respectively. The government has also pushed for the development of connected and autonomous cars by the opening of K-City which will be a town dedicated to autonomous vehicle testing

- In 2018, the revenue generated from the connected car market in South Korea amounts to USD 613 mn
- Revenue is expected to grow at a CAGR of around 8% from 2018-2022 resulting in the market size of USD 833 mn in 2022
- The level of penetration of connected cars is around 23% as of 2018 and is expected to grow to over 50% by 2022
    - Connected hardware is the largest sub-segment within connected cars accounting for USD 571 mn in 2018

- South Korea first announced an incentive program for electric vehicles in 2011, with subsidies and benefits available initially in 5 regions, that gradually expanded to 15 regions in 2015
- In 2011, a total of 281 EVs and 19,371 HEVs were sold. As of 2017, a total of 13,724 EVs and 83,762 HEVs were sold representing a CAGR of 91% and 28% respectively
- Incentives to purchase an EV in South Korea include:
    - Purchase subsidy from the central government
    - Purchase subsidy from the state government
    - Reduction of individual consumption tax
    - Reduction of educational tax
    - Reduction of acquisition tax
- Over the next 5 years that government has also planned to invest USD 140 mn in the development of the infrastructure required to develop EV and HEVs. This includes:

- Battery density improvement systems
- Cooling and heating systems
- Electric power conversion devices
- Lightweight car bodies
- High output power driving systems
- Multi stage transmission driving systems

Source: GT primary & secondary analysis



- Hyundai already has Level 2 Smart Sense Technology, ad advanced driver assistance system that includes smart cruise control
    - It plans to release highly autonomous vehicles by 2020 in line with government targets and develop fully autonomous vehicles by 2030
- The government also announced the opening of K-City, a 79 acre town built to test self driving cars in real road environments
- The Ministry of Trade, Industry & Energy plans to invest USD 75 mn over the next 5 years to develop the infrastructure for self-driving car systems which includes:

- High resolution cameras
- Radar sensors
- Vehicle external communication modules
- Vehicle position measuring modules
- High precision 3D digital maps
- Driver monitoring
- Self driving integrated controllers
- Recording systems for self driving cars

- The amount of ride sharing users in South Korea in 2016 were 3.3 mn. In 2018, this number is expected to increase to 4.1mn. It is forecasted that the number of ride sharing users would increase by a CAGR of 7.2% to reach 5.0 mn by 2022
- The revenue for ride sharing market in 2017 was USD 467 mn which is expected to increase by a CAGR of 10% to reach USD 734 mn by 2022
- The second segment of the shared mobility is the car sharing/ rentals. The number of car sharing users in Korea in 2017 was reported to be USD 1.1 mn. The number is expected to increase and reach USD 1.2 mn in 2022.
- The major car rental companies in Korea are Lotte Rentacar, AJ Rentacar and Hyundai Capital while the ride sharing companies are Uber and Lyft.

South Korean Supplier Challenges – South Korean suppliers continue to look for reducing costs by looking abroad for sourcing products

Challenge	Description	How are Players Reacting
Cost Reduction	Auto component manufacturers in South Korea are seeing significant downward pressure on pricing from OEMs	▪ Best cost model: South Korean auto component manufacturers are looking at different countries that can provide the best mix of low cost products with the desired quality. As labor costs increase in China, manufacturers are now looking at alternative sources for procurement
High Production Costs	Due to high labor costs, producing products that do not require a lot of technology is not feasible in South Korea	▪ South Korean suppliers are looking to collaborate with companies from low cost manufacturing countries in order to reduce their cost to manufacture the product
Cultural Gap with Foreign Partners	South Korea is known to follow the best cost model. Countries like India and China all offer low cost manufacturing opportunities for South Korean companies. However, there are large cultural gaps between South Korea and these countries that needs to be mitigated	▪ South Korean OEMs and suppliers are now spending significant amounts of time in vendor development for countries like India and China ▪ They send Japanese people to conduct workshops in the respective countries so as to acquaint them with the Japanese culture and mitigate any cultural differences that might be prevalent ▪ South Korean OEMs and suppliers are now looking at India and other low cost manufacturing hubs that can provide the best mix of low cost products with the desired quality. As labor costs increase in China, manufacturers are now looking at alternative sources for procurement

Source: GT Primary & analysis

Maturity of the industry in terms of Technology & Best Practice

Product Category	Concentration for advancements
1 **Braking Systems**	▪ Electric Parking Brakes ▪ Active Hydraulic Boost Gen 3 Braking Systems
2 **Suspension Systems**	▪ Electronic Control Suspensions
3 **Driver Assistance Systems (DAS)**	▪ Highway driving assist systems ▪ Autonomous Emergency Braking ▪ Parallel & Perpendicular Parking Assist
4 **Powertrain**	▪ Automatic Transmission Control Systems ▪ Electrical Parts like sensors and actuators
5 **Air Conditioning Systems**	▪ Smaller & Flatter HVAC Systems ▪ Electric Compressors ▪ Electronic Pumps & Valves

Best Practice – Local Supplier Base

- The auto industry in South Korea largely follows backward integration where the OEMs have either set up their auto component suppliers or they have captive plants that provide them with auto components
  - Hyundai and Kia are large shareholders of companies like:
    - Hyundai Powertech
    - Hyundai Mobis
    - Hyundai Wia
    - Hyundai Dymos
- These companies serve as auto component suppliers to Hyundai and Kia
- There are around 850 auto component suppliers in South Korea out of which around 330 auto component manufacturers are suppliers to Hyundai and Kia
- The remaining 500 auto component manufacturers supply parts to companies like Ssangyong, GM Korea and Renault Samsung
- The integration is not only limited to the OEM investing into the Tier I's but also extends with the Tier I's investing into the Tier II's. Strengthening of the home industry, has made it a preferred supplier as well

Shareholding of Hyundai Powertech

Hyundai Motor Company 37.58%	Kia Motor Company 37.58%	Hyundai Mobis 24.84%

South Korea took 7 years to implement the backward integration strategy and they are now fully equipped and only procure 10% of their requirements from overseas
The industry in South Korea underwent consolidation at all levels starting from Tier I to Tier III
This was done to develop the strong quality competitive base and emerge as self sufficient global competitive players

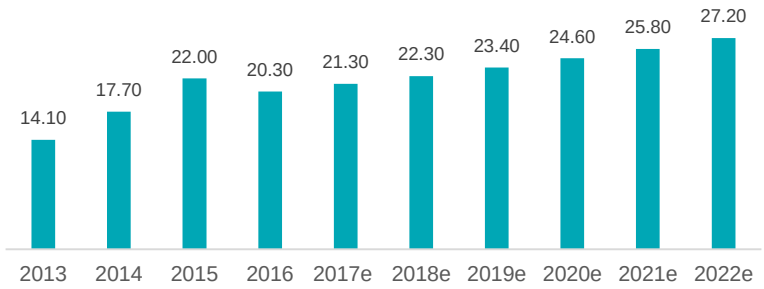
Source: GT Primary & analysis ; FIA

Maturity of the industry : Export Incentives

- Korea Trade Insurance Corporation works as an export credit agency that focuses on promoting trade and overseas investment of enterprises in South Korea. Some of the benefits that they offer are:
  - **Post-shipment export credit guarantee** – Post Shipment credit is a kind of loan provided by a financial institution to an exporter or seller against a shipment that has already been made
  - **Medium and long-term export credit insurance (supplier credit) –** Medium term credit insurance provides protection to exporters against the risk of foreign buyer non-payment when extending credit terms of one to five years and up to USD 10 mn
  - **Medium and long-term export credit insurance (buyer credit)** – The Insurance of Buyer's Bank Credit enables the commercial bank to insure the collection of receivables against commercial and political risks arising from the loan contract concluded with the foreign buyer/foreign bank
  - **Exchange rate risk insurance** – An exchange insurance is a commitment by means of which the client and the Bank are mutually obliged to exchange an amount of foreign currency at a fixed price at a future date
  - **Overseas investment insurance (investment financing)** – Insurance scheme covers risk factors overseas investment projects like foreign financial investment, exported goods investment or investment on foreign services
  - **Export bond insurance** – Contract or the export bond insurance protects exporters from losses caused by a customer calling a contract bond (usually a bank guarantee) that was furnished to secure the exporter's contractual obligations to the customer
  - **Overseas natural resources development fund insurance –** It is the credit support provided by bank for natural resources development projects on the premises of limited recourse or non-recourse. Credit is based on earnings generated from the project itself, combined with such instruments as insurance and third party guarantee and credit upgrade measures
- The corporation also provides other insurance schemes such as the Foreign Exchange Risk insurance to protect from currency fluctuation risk, export credit insurance, overseas debt collection service and product reliability insurance.
- Free Trade Zones (FTZ's): Activities in the FTZ's are exempted from import tariffs and get the benefit of tax reliefs. Thus, Korean goods entering the FTZ's (which are exported good from Korea) are entitled to duty drawback

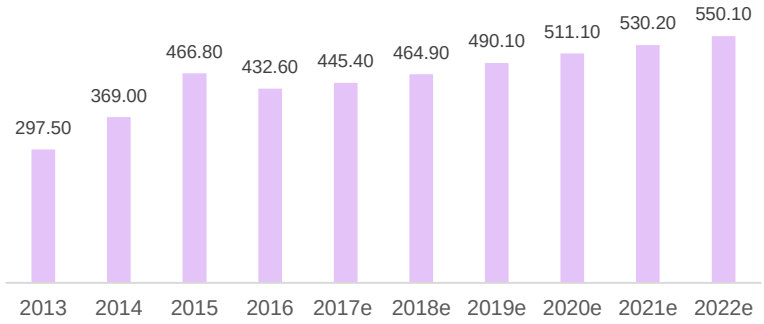
In South Korea consumers tend to rely on OEMs for their aftermarket products and their after-sale services, therefore the sector remains competitive amongst suppliers

South Korea Automotive Aftermarket Value (USD bn)



Source: Marketline

South Korea Automotive Aftermarket Volume (mn units)



Source: Marketline

Description

- The South Korean automotive aftermarket sector is expected to generate total revenues of USD 21 bn in 2017, resulting in a CAGR of 10.8% between 2013 and 2017
- South Korea's high level vehicles production is a key contributing in promoting the growth of the aftermarket sector
- The projected growth of the aftermarket sector is expected to decelerate with an anticipate CAGR of 5% from 2017 through 2022 to reach a value of USD 27 bn by 2022
    - In comparison, the Thai and Indian sectors will grow at a CAGR of 9.4% and 12.6% to reach respectively values of USD 3.9 bn and 36.3 bn

Description

- Volumes grew at a CAGR of 10.6% between 2013 and 2017 to reach a total of 445 mn units by 2017
- The sector volume is expected to rise to 550 mn units by the end of 2022 representing a CAGR of 4.3% during the same period

Online and Traditional retailers deal in wide variety of components; product width and depth is critical for supplying components to aftermarket sellers in Japan

Top Sellers in South Korea	MICHELIN	Alibaba.com	HYUNDAI MOBIS	Mando
Typical Products	▪ Tyres	▪ Disc Pads ▪ Clutch ▪ Pumps &Parts ▪ Motors ▪ Bearings ▪ Welding rods and wires	▪ Airbags ▪ Brake systems ▪ Headlights ▪ Carriers ▪ Bumpers	▪ Shock absorbers ▪ Suspension struts ▪ Shelf levelizers ▪ Gear systems ▪ Intermediate shafts

Spain

Country deck

Executive Summary

- The used car market, vehicle age & common vehicle availability in Spain & India provides opportunities in the aftermarket sector
- Focus on LPG & CNG based offerings for suppliers in Spain in addition to ICE
- Local vehicle manufacturer SEAT should be tapped for getting entry into OEM market in Spain (~7.5% market share)

Opportunity

Short Term

- Focus on aftermarket products for the platforms Ford Ecosport; i20, Rapid, Fabia, Vento Polo etc.

Medium Term

- Tap OEM manufacturer SEAT to gain access into Spanish Market; Collaborate with local suppliers (act as Tier II)
- Acquire regional aftermarket franchise chains

Strategy to increase export to the Spanish market

Long Term

- Demonstrate innovation & solution capabilities to Global R&D & Purchase Offices of OEMs

Summary

Best Practice

- OEMs & Suppliers invest 4% and 2% in R+D+i projects
- Use of AGVs for meeting JIT component requirement
- Voice picking for improving reliability and tractability of logistics processes for warehouse management
- Additive manufacturing technologies for increasing robotization and use of verification tools like Poka-yokes & Gebartis

Competitors for India


Germany


France

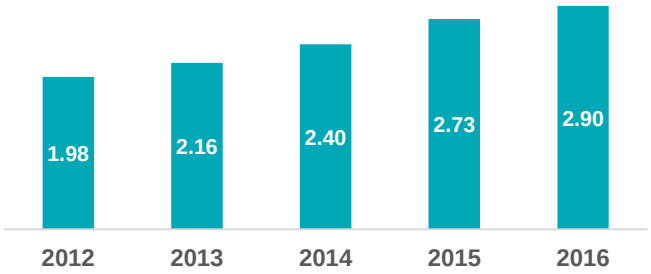

Morocco


Italy


Hungary

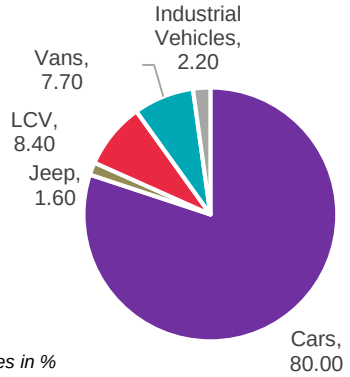
Spain is the 8th largest producer of automobiles globally & 2nd largest by volume in the EU after Germany; produced 2.9 mn vehicles with 84% of the production catering to export demand; PVs dominate the market with 80% share

Spanish Automotive Market: Vehicle Production (mn Units)



Source: ANFAC

Automotive Market Segmentation (2016)



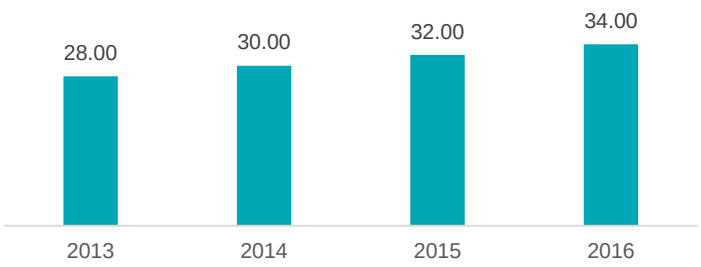
Source: ANFAC; Figures in %

Description

- Spain is the 8th largest manufacturer of automobiles globally and 2nd in the European Union after Germany
  - The sector contributes to 10% of the Spanish GDP and generates 9% employment of the total workforce
  - The market is estimated at 2.9 mn units in production volume in 2016
  - Passenger Car Segment dominate the market with 80% share which is followed by Light Commercial Vehicles and Vans with 8.4% & 7.7% share respectively
- 84% of the total production is exported
  - Germany, France and UK are the 3 key markets for automotive exports from Spain within the EU region
  - Other key countries of exports include: Turkey, Israel, Mexico, Chile, Poland, Switzerland, Japan and Canada
- There are ~19 OEM manufacturing plants in Spain: Key manufacturers include: Mercedes Benz, PSA, IVECO, Nissan, Ford, GM, VW & Renault Automotive Sector
- Expenditure in R&D&I is one of the highest among all industries in Spain, supported by an outstanding Network of Universities and 34 Technology Centers with activities in the Sector
- High investment in professional training by Car Manufacturers

The Spanish Auto Component industry registered a turnover of ~ EUR 34 bn in 2016 with over 57% of the value focused on exports; The sector invests ~4% of the turnover into Research, Design and Innovation aimed towards Weight Reduction, Electrification, Connected & Automated Driving related technologies

Spanish Auto Parts Industry Growth Trend (bn Euro)

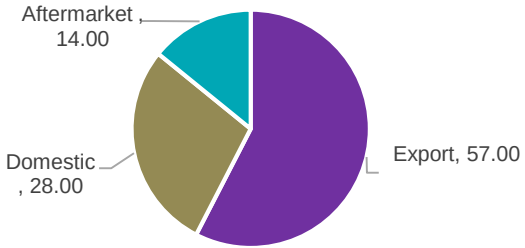


Source: SERNAUTO

Description

- The Spanish auto parts manufacturing industry consists of over 1000 suppliers with annual revenue of ~EUR 34 bn in 2016
  - The sector generates over 3,43,500 jobs
- The Sector in line with the Strategic 2020 plan for EU, has a focused investment in R&D&I (Research & Development & Innovation) with 4% dedicated investments aimed towards:
  - Weight Reduction: through the development and Application of new materials e.g. high steel module, light metal alloys (Al, Mg) & polymeric, composites)
  - Electrification: through progressive introduction of electrical functions to reduce CO2 emissions and improve the energy efficiency

Spanish Auto Parts Industry Classification (%)



Source: SERNAUTO

Description

- The Spanish Auto Component market is highlight export focused in line with the Automotive market
  - Exports accounted for ~57% of the overall turnover
  - Domestic sales of components accounted for ~30% followed by the aftermarket sector that accounted for 14% share
- Key clusters in Spain include
  - Castilla y Leon (22%); Catalunia (19%); Aragon (15%); Galacia (15%) & Novarra (11%)
- The sector attracts ~3% of investments in Research, Development and Design by Auto Component Suppliers in Spain

The Spanish Automotive market will be key in driving the country's economic performance, on the back of the increased government focus on boosting automotive production and exports through subsidy support & focus on creating high value addition products through R&D&I incentives in line with EU 2020 plan

Spanish Automotive Industry

Drivers	Description	Impact

Economic Performance & Reforms	▪ The Spanish economy is predicted to grow between 2% to 3% in 2018-19 (IMF) on the back of increased domestic consumption, investments & exports
	▪ High focus on R&D&I supported by government subsidies, infrastructure creation & incentives, academia collaboration & job creation
	  ▪ e.g.; Horizon 2020 – 2800 mn Euro for R&D&I projects with over 2438 companies
	  ▪ Lower labor costs to attract more investments from global auto players to set up plant in Spain (30% lesser than Germany & France)
		▪ *Increased economic performance to drive vehicle demand and consumption along with export contributing to overall economic performance*
		▪ *Increase focus on R&D&I incentive to drive automotive and automotive component production*

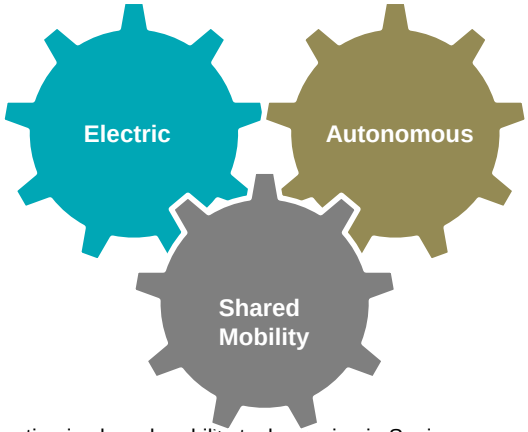
Strong fundamentals for used car	▪ Spain had over ~22 mn used cars in 2016 that are dominated by platforms across European, American and Korean make; ▪ Average age of used cars is ~12 years	▪ *Used car vehicles to drive up demand for replacement parts in aftermarket sector*

Nascent but evolving EV Market	▪ Increased Government focus for EV and AFV adoption in Spain through
	  ▪ MOVALT 2018 has allocated EUR 20 mn for purchase of EV and Gas fueled cars
	  ▪ MOVEA 2017 plan for incentives towards alternative fuels incl. LPG, Hydrogen & EV
		▪ *Demand for EV to grow on account of increasing consumer consciousness and increased government focus & support*

Source: GT Primary & analysis

The Spanish Automotive market backed by increased Government focus on cleaner technologies and investments in R+D+i by OEMs, Government & Suppliers; LPG, Hybrid and EVs are key focus to move away from traditional Deiseal engines; Shared mobility space is witnessing increased OEMs focus and investment; Autonomous is at a nascent stage in the trial phases

- Innovation and strong industrial growth has meant that local factories are producing vehicles with all kinds of engine technology, besides the lowest emission petrol and diesel systems. Vehicles are now also produced with gas propulsion systems (both LPG and CNG), as well as electric cars, hybrids
- Hybrid and electric cars made up 2.6% of new vehicle licenses in 2016: a total of 35,765 cars
  - Spain has ~1,600 public charging stations and ~4,547 charging points as of 2016
- In 2016, sales of electric vehicles (cars, commercial and industrial vehicles and buses) recorded a total of 4,746 registrations
- Increased incentivization in the form of MOVALT 2018 & MOVEA 2017 to drive further demand



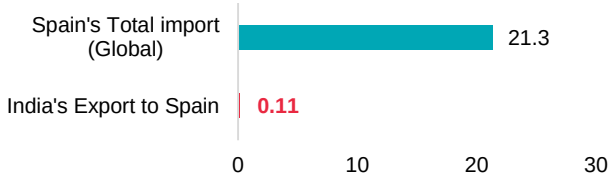
- Spain's approach for Autonomous technology development is propelled by strong investments in R&D&I initiatives along with push from Spain's Director General of Traffic
- The vision is to reduce road fatalities by 50% which in 2015 was estimated at ~1700
- Vision Zero – setts an aggressive target for Zero Fatalities, Injuries, Congestions and Emissions by 2020
- Key initiatives include
  - PPP: Barcelona Board Cooperative and Automated Driving for developing, testing & attracting investments for such technology development through Catulina Living lab
- The Spanish government is working on changes to the general vehicle regulations that would allow testing of autonomous vehicles with a driver on board
- Intel subsidiary Mobileye and Spain's Directorate General of Traffic (DGT) have agreed to collaborate to reduce road accidents and prepare Spain's infrastructure ecosystem and regulatory policy for the driving of autonomous vehicles. As part of the agreement, Mobileye and the DGT will promote the benefits of the adoption of ADAS for municipal and private fleets to support improved road safety across Spain. The collaboration to promote adoption will include joint research to determine the magnitude of safety improvement driven by the performance and accuracy of Mobileye 8 Connect.

- The Shared mobility space is dominated by OEMs investing in shared mobility technologies in Spain
- PSA launched EMOV where they deployed 500 Citroën C-Zero 4-seater electric vehicles in Madrid for cleaner mass transportation
- Daimler's Car2Go has 166,000 subscribers to its fleet of 500 battery-powered Smart cars in Madrid
- BMWs MINI launching a trial peer-to-peer program in Spain. At first, it will be available only in the Madrid metropolitan area and it will allow customers to share their cars with family and friends. is designed for a fleet of up to 500 vehicles. Owners of current MINI models produced since March 2018 will be invited to participate, and their vehicle will be equipped or retrofitted with a MINI Sharing Module that enables access and engine start via smartphone.

Source: GT primary & secondary analysis

India's share in Spanish imports stood at 0.50% in 2017 (of USD 21.3 bn) providing significant opportunity for improving export share; sheer presence of European, American Japanese and Korean OEMs, close proximity within the EU, established supply chain and infrastructure makes it easy for OEMs to source products in Spain for assembly for domestic and export purpose; Spain is a gateway market for EU exports due to low labor costs as compared to more matures European market like Germany

Spain India Export Import Trade: Auto Components (USD bn, 2016-17)

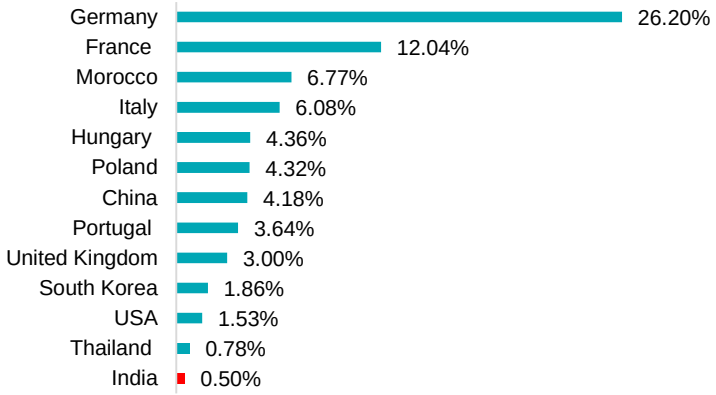


Source: GT Analysis

Description

- The Indian Auto Component Sector exported products worth USD 106 mn to Spain in 2016-17
- The total imports of Auto components into Spain globally including India in 2016-17 is estimated at USD 21.3 bn
  - India's share in the total imports of Spanish imports stood at 0.5%

Spain: Top importing countries (2016-17)



Source: GT Analysis

Description

- Germany, France, Morocco and Spain accounts for 50% of the total import markets for Spain
- EU as a region accounts for over 70% share of Spain's import
  - primarily due to large presence of European Car manufacturers in Spain such as VW, Citroen, Fiat, Mercedes Benz, Volvo
- Spain is home to 19 manufacturing plants across 7 key OEMs present
  - European car manufactures have over 70% market share that calls for increased production demand for component into Spain
  - Japanese manufacturers (Nissan, Suzuki, Subaru, Mazda & Mitsubishi) has over 15% market share followed by America Ford with 6% share and Korean Hyundai with 5.2%

Spain is home to foreign OEMs and Tier I manufacturers that are focused on meeting export demand globally; meeting quality standards is a pre-requisite; in line with the EU 2020 Strategy, OEMs and Suppliers are focusing on increased adoption of digital technologies to reduce costs and improve productivity, quality and overall efficiency of the business process

Challenge	Description	Impact	Best Practice
Developing Digitization Capabilities	Suppliers are forced to meet the OEM demands that are mainly export focused; hence process efficiency through digitization becomes critical	▪ OEMs and Suppliers focus in investments across R&D&I to ensure processes are aligned with OEMs, processes are efficient and quality of product is not compromised	▪ *Focus on developing internal logistics processes through Industry 4.0 Automation. Suppliers are integrating assembly line in their plant through Automated Guided Vehicles, using an "easybot" system for the automatic supply of "just in time" components. This system, makes it possible for the assembly line to be continuously supplied with the material necessary for the assembly of vehicles using AGVs without the direct intervention of any operator.* ▪ *Suppliers are also using "voice picking" to improve the reliability and traceability of the logistics processes in warehouse management. This technology allows the personnel in charge of preparing orders to receive and confirm instructions in real time through a system that converts the orders generated by the company's ERP into voice commands that the user receives through mobile devices or other type of peripheral terminals.*
Light weighting Technology	Suppliers are forced to develop capability for light weighting in line with OEM & emission requirements	▪ Suppliers are focusing on integration of Additive Manufacturing to develop light weighting technologies, improving manufacturing cycle & reducing costs	▪ *Additive manufacturing in projects developed in the field of automotive, robotization and process improvement, as well as in the development of verification tools (Poka-yokes / Gabarits) and new materials applied to the automotive industry. Suppliers are introducing metallic additive manufacturing technologies, to reduce the weight of the final piece by up to 25% compared to conventional production systems* ▪ *Suppliers are developing capabilities across 3D Printing to manufacture special tools as well as the improvements that are obtained by applying this technology in the development of parts unique or short series*

Source: GT Primary & Secondary Insights

R&D Incentives – The Spanish Government offers grants to promote local companies for R&D projects through focused financing to develop capability

Area	Description
Center for Industrial Technology Development (CDTI)	▪ The Centre for the Development of Industrial Technology (CDTI) is a Public Business Entity, answering to the Ministry of Economy and Competitiveness, which fosters technological development and innovation activities of Spanish companies. It is the entity that channels the funding and supports applications for national and international RDI projects of Spanish companies

Products & Services

Area	Description
R&D Project Grants	Research and Development projects are business projects of an applied nature for the creation and significant improvement of a production process, product or service submitted by one single company or by a group of businesses Grants for Individual Companies for projects duration of 12-36 months • Min fundable budget: EUR 175000/ - Grants for Natinoal Cooperation R&D Projects for project duration of 12-36 months • The minimum fundable budget will be around EUR 500,000, with a minimum budget of around EUR 1750,000 International Technological Cooperation Projects for individual companies/ consortiums for 12-36 months duration • The minimum fundable budget is around EUR 175,000. In the case of projects run by a consortium or an EIG, the minimum budget for the project will be around EUR 500,000.

Area	Description
National Innovation Company (ENISA)	Finances SMEs up to EUR 1.5 mn with participative loans at a very competitive interest rate and where no-guarantee is required

Source: ICEX, Spain, CDTI, ENISA

Export Incentives – Spain has double taxation agreements with 93 nations globally thereby making it easy for companies to export support with tax neutrality regime

Tax Incentives for Internalization

- Participation Exemption system: dividends or profit participations from business activities carried out internationally through subsidiaries or branches and the gains obtained from the transfer of these securities are tax exempt in Spain, if the Spanish company holds a participation of at least 5% in the non resident company
- Favorable tax regime for non-resident employees assigned to Spain (inbound expatriates): fixed rate of 24% (up to maximum of EUR 600,000)
- Goodwill amortization. Goodwill can be amortized with the maximum annual limit of one-twentieth their amount
- Neutral tax regime for restructuring operations: In order to facilitate corporate reorganizations the Spanish tax system provides for a well-established special regime based on the principles of non-intervention by the tax authorities and tax neutrality
- Spain has Double Taxation Agreements with 93 countries. Spain has a significant Network of Double Taxation Agreements, particularly with countries in Latin America. Under these treaties, residents in foreign countries are taxed at a reduced rate, or are exempt from Spanish taxes on certain items of income they receive from sources within Spain. 6. Special Tax Regime applicable to Holding companies:. Foreign Securities Holding Companies (in Spanish, ETVE)

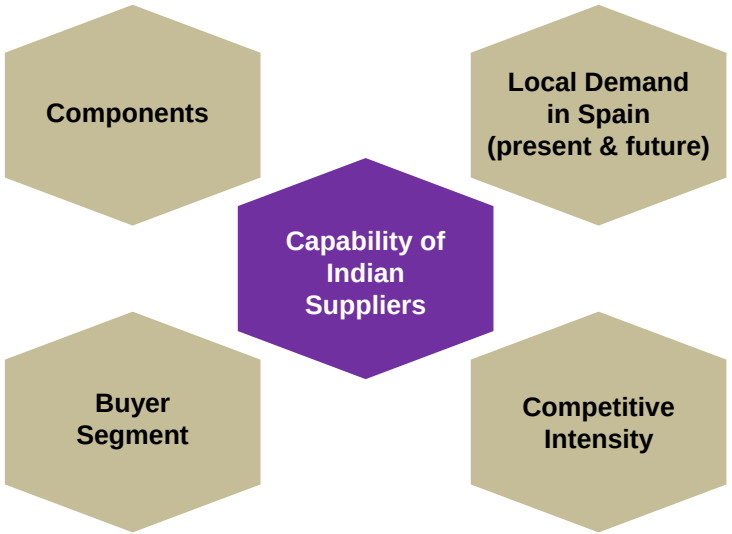
Source: ICEX, Spain

We took into consideration 5 key elements across broad Component requirement in Spain, Demand growth for such components, Competitive intensity, segment appeal and existing capability of Indian suppliers to supply products required by Spanish customers in short, medium to long term based on extensive discussions with Spanish OEMs & Suppliers

Assess capability and maturity of Indian supplier for producing & supplying such components required in Spanish market based on detailed discussion with experts, local OEMs is India & Spain and component manufacturers in Spain

Broad components based on detailed discussion with experts, local OEMs in Spain & India and component manufacturers in Spain

- Broad components that are traditionally been exported by Indian suppliers into Spain
- Components that are imported into Spain



Demand for broad segments as expected to grow in short, medium and long term in line with industry trends based on detailed discussion with experts, local OEMs is Spain and component manufacturers in Spain

Assess who are likely buyers of such components across OEM, Tier I and aftermarket category based on detailed discussion with experts, local OEMs & component manufacturers in Spain

Assess India's competitive advantage as a country against Spain that is a low cost market catering to OEM demand across the region

Key Component categories were mapped in line with parameters chosen based on discussion with Spain based OEMs and Suppliers with an objective to assess where and how Indian suppliers can make in-roads into the Spanish market

Components	Spanish Demand			Buyer Segment			Competitive Intensity	Synergies in line with Indian Industry Capability
	0-3 yrs	4 – 7 yrs	8-10 yrs	Tier I	OEMs	Aftermarket	Spain + China + Europe, US	
Traditional Body, Panels & Stamping	H	H	M	Y	Y	-	H	H
ICE & Components	H	H	M	Y	Y	-	H	H
Frame	H	H	H	Y	Y	-	H	H
Drive Axles	H	H	H	Y	Y	Y	H	H
Wheels & Tyres	H	H	H	Y	Y	Y	H	H
Brakes	H	H	H	Y	Y	Y	H	H
Steering	H	H	H	Y	Y	-	H	H
Suspension & Components	H	H	H	Y	Y	Y	H	H
Fuel System (CNG based Technology)	H	H	M	Y	Y	Y	H	H
Climate Control/ HVAC	H	H	H	Y	Y	-	H	M
Seats	H	H	H	Y	Y	Y	H	M
Interior & Accessories	H	H	H	Y	Y	Y	H	M
Infotainment System	H	H	H	Y	Y	Y	H	L
Battery	M	M	H	Y	Y	Y	H	L
Electronics	H	H	H	Y	Y	Y	H	L
ADAS/ Sensors + Software (ECM Tuning)	M	H	H	Y	Y	Y	H	L
Electric drivetrain	M	H	H	Y	Y	-	H	L
Exhaust	H	H	M	Y	Y	Y	H	L

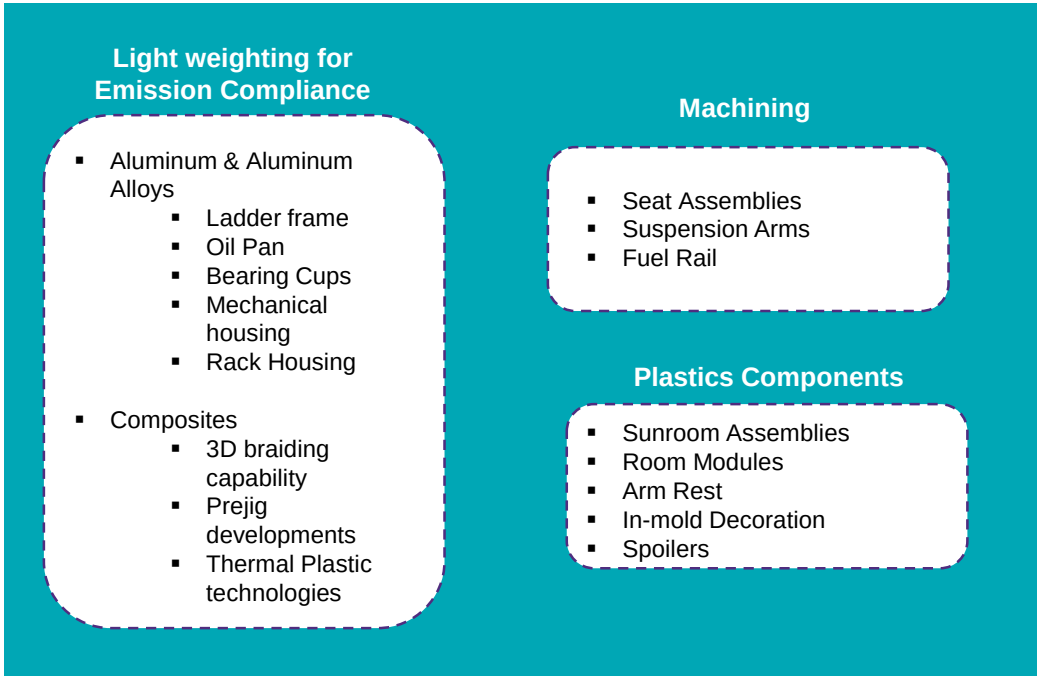
High
Medium
Low

Description

- **High Synergy Segments:** Indian suppliers have existing capability to develop and supply traditional but essential components such as Body panels, ICE components, body Frames, Axles, Brakes, Steering & suspension, Wheels & Tyre & Fuel systems to Tier I suppliers as well as OEMs. Spain being a low cost country is a natural rival for such components
- **Medium Synergy Segments**: Segments such as HVAC, Climate Control, Seating and Interior and Accessory are mapped under medium synergy as Indian suppliers will have to build and invest in capacity for supplying such products to Spanish market. Spain as a market is a natural rival for such components
- **Low Synergy Segments:** Indian suppliers don't have capability across Electronics, Electrical, ADAS and Sensors, Exhaust Systems, Battery Development to cater to Spanish demand. China, America and Germany are natural competitors to India for such segments

Source: Primary Interactions with Spanish OEMs and Tier I

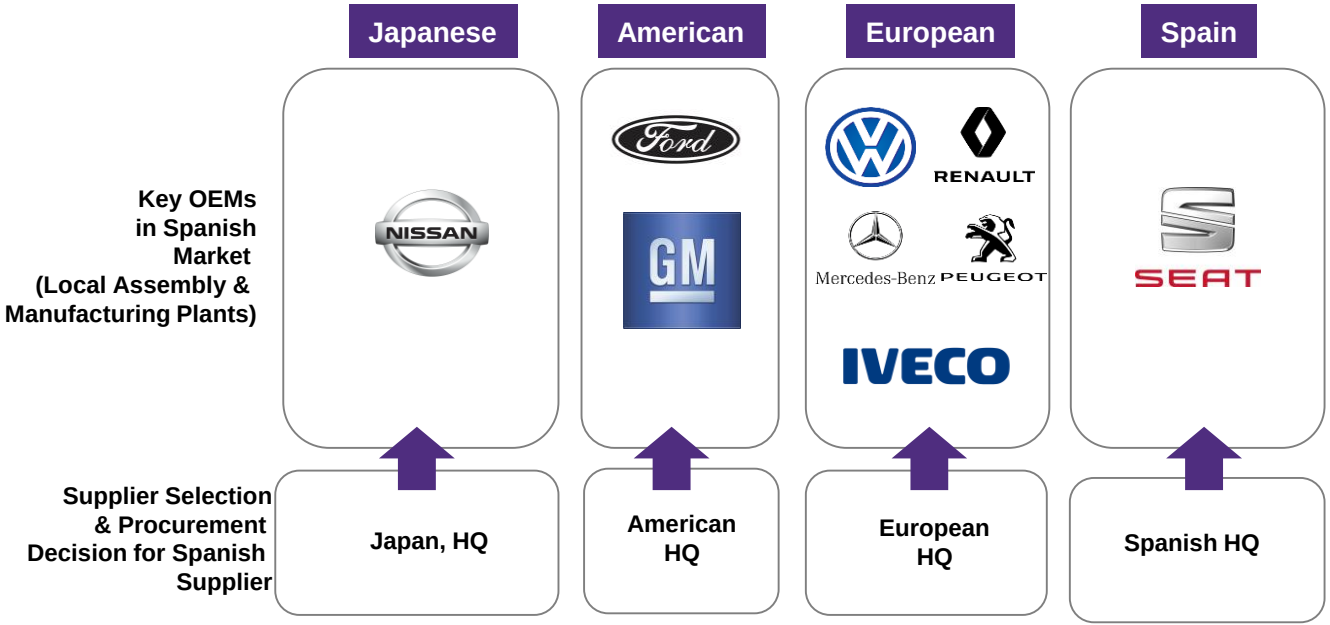
Some specific product segments where Indian suppliers can act as sub-contractors for local Spanish auto parts manufacturers



Indian Suppliers can act as Tier II / sub contractors for local suppliers

Source: Primary Interview

Decision for vendor sourcing by key OEMs is made through Global Procurement Offices located in parent companies, making it difficult for suppliers to target OEMs directly as it is governed by parent company relationships and demonstration of operations, supply chain efficiencies backed by right quality and pricing



OEMs decision on vendor selection & sourcing is dependent on parent company relationship, logistics and supply alignment with parent company, cost competitiveness and price efficiencies.

Preferred Option for Indian Supplier for Spanish Entry

- **Foreign OEM – Most Difficult**
- **Spanish OEM– Feasible (Act as Tier II)**
- **Local Tier I – Feasible (Act as Tier II)**

OEMs & Tier I Segment – Local presence through alliances, investment in export capacity, R&D capability and is a pre-requisite for market play across OEMs and Tier I segment in Spain

Segment	Market play: Pre-Requisites	Imperative	Segment
Traditional Body Panels & Stamping **ICE & Components** **Frame** **Drive Axles** **Wheels and Tyres** **Brakes** **Steering** **Suspension and Components** **Rubber & Plastic Components** **Fuel Systems (CNG Technology)**	1. JIT Requirement from OEMs & Tier I suppliers: high risk of assembly line disruption in case of shortage 2. High degree of supply chain alignment with OEMs & Tier I suppliers 3. Local Presence (Supply & Manufacturing) – preferably manufacturing as per customer discussions 4. Large volume perpetual contracts to improve margin play 5. Export capacity to meet overseas customer demand at right time and cost	1. Local presence is a must (manufacturing/ warehousing) 2. Higher risk taking ability 3. Dedicated local representative 4. Investment in Capacity for exports	Tier I,2 & 3 Supplier
Climate Control/ HVAC Components & systems **Seating and Components** **Interior & Accessories**	1. JIT Requirement from OEM and Tier I: high risk of assembly line disruption in case of shortage 2. High degree of supply chain alignment with OEMs and Tier I suppliers 3. Local Presence (Supply & Manufacturing) – preferably manufacturing as per customer discussions **4. High Design Capability (interior and accessory segment)**	1. Local presence is a must (manufacturing & warehousing) 2. Higher risk taking ability 3. High Design Capability and R&D Investment (3D and CAD capabilities)	Tier I & Select Tier II Suppliers
Infotainment Systems **Battery & Fuel Cells** **Electronics** **ADAS/ Sensors** **Electric Drivetrain** **Exhaust**	**1. High R&D Capability & Investments** **2. Long gestation period for prototype commercialization** 3. Software integration and solution bundling capability 4. Local Presence and high engagement levels with OEMs and Tier I from Design phase through driven by parent companies for projects across markets	1. High R&D Investments (Software Design, Software and Component Integration) 2. Demonstration of solution rather than products 3. High financial appetite for risk	Tier I Suppliers

Source: GT Primary & Secondary data analysis

High
Medium
Low

Synergies in line with Indian Industry Capability

Grant Thornton | An instinct for growth™

The Spanish Aftermarket sector was estimated at EUR 4.76 bn in 2016; European Cars dominate the used car market with over 60% share followed by American, Japanese and Korean brands; Tuning Market in Spain is an emerging aftermarket segment

Spain Aftermarket

Estimated market size (2016)

- Value: Euro 4.76 bn

Used Cars in Spain (2016)

- VIO – 22 mn cars
- Average Age – 12 yrs

Source: SERNAUTO

Spanish Used Car Market

European
- VW
- MB
- BMW
- AUDI
- Renault
- Skoda
- Mini

American
- GM
- Ford

Japanese
- Nissan
- Toyota
- Mazda

Korean
- Hyundai

Source: Primary + Secondary Analysis

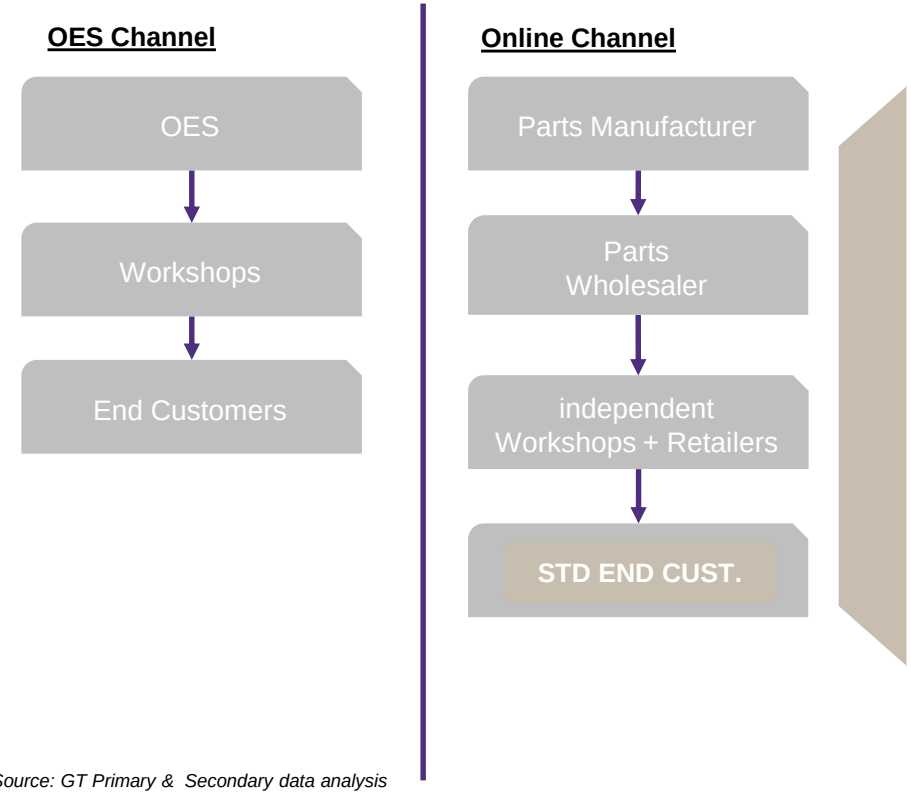
Primary Insights

- **Spanish aftermarket is dominated by independent retailer, workshops, repair shops**
  - **They account for over 60% of the total sales**
  - **Remaining 40% is through OES channel where OEMs have invested in developing aftermarket component base for their platforms available in Spain**

- **Some aftermarket players are moving away from traditional parts and focusing on more lucrative businesses such as "Tuning" Services Such as ECU Remapping, Chip Tuning & OBD Services, Remapping Services, Exhaust gas Recirculation related services; majority of components are being imported from US, China and Europe to cater to this emerging demand**
  - **Due to Euro price fluctuations**

Source: Primary Interactions + Secondary Sources

Spanish Aftermarket is considered mature with OES and IAM sales channel



- The structure of the Spanish aftermarket is considered to be mature and well developed. Like the U.S., the two primary channels for car repairs are either through manufacturer authorized service dealers (OES) or through independent aftermarket repair facilities.

- The Spanish independent aftermarket (IAM) consists of Manufacturers of parts and equipment selling through either independent distributors or program distribution group members. These distributors will then sell to either franchised repair facilities, independent garages or to “fast-fit” installers

Source: GT Primary & Secondary data analysis

Aftermarket Segment – Local presence, investment in export capacity, working capital management, financial risk management, product assortment and strong B2B marketing efforts are key to entering aftermarket sector in Spain

Segment

- Brake
- Disc Pads
- Clutch
- Shock absorbers
- Tyres
- Industrial Lubes
- Battery
- Spark Plugs
- Wiper Blades
- Styling Accessories
- Air Filters
- Intercoolers
- Turbos
- Full System Exhausts
- Testing Equipment (Dyno)

Key Platforms produced in Spain & also Produced & Sold in India

Volkswagen
- Polo
- Passat
- Tiguan
- Beetle
- Vento

BMW (All Classes)

AUDI (All classes)

Skoda
- Octavia
- Fabia
- Superb
- Yeti
- Rapid

Hyundai
- i10
- i20
- Sonata
- Elantra
- Tuscon

Renault
- Captur

Nissan
- Terrano

Ford
- Mondeo
- Ecosport
- Fiesta

Imperative

1. Investments in local warehouse establishment/ leasing
2. Better working capital management & financial management (currency fluctuation risks)
3. Dedicated local representative for marketing and sales
4. Investment in Capacity for exports
5. Dedicated capacity for aftermarket
6. Strong Marketing efforts (B2B)
7. Dedicated Aftermarket Division for tapping IAM network in Spain

Segment

Tier I,2 & 3 Suppliers

Source: GT Primary

Department of Heavy Industry
Ministry of Heavy Industries & Public Enterprises
Government of India

United States of America (USA)

Country deck

Executive Summary

- The used car market, vehicle age & common vehicle availability in US & India provides opportunities in aftermarket sector subject to timely delivery, pricing and quality & warranty compliance
- Significant opportunities across "in-cabin connected technologies" both across hardware and component design

Opportunity

Short Term

- Focus on aftermarket products for the platforms such as Ford Ecosport, Corolla, Camry, Elantra, Sonata, SantaFe, CVR, Accord

Medium Term

- Collaborate with local suppliers (act as Tier II) for classic products (Stamping & Forgings)
- Acquire regional Aftermarket franchise chains

Long Term

- Acquire start-ups around connected technologies and build solutions for US market; demonstrate innovation & solution capabilities to global R&D & purchase offices of OEMs

Strategy to increase export to the US market

Summary

- Sequenced In-Line Supply (SILS) is the practical implementation of a demand/event-driven, built-to-order manufacturing process
- SILS solved 3 problems, (a) providing a customized product for the customer without incurring excessive manufacturing expense; (b) rapidly identifying and correcting upstream errors, particularly in the paint shop; (c) compensating for inaccurate forecasts and schedules

Best Practice

Assets/ Companies available for sale/ JV*

WM Industries Corp

- Offers hybrid automobile vehicles, based in Fairfax, Virginia
- Filed for reorganizing under Chapter 11 in Feb 2018

Hodyon Inc

- Manufactures and distributes air-conditioning and climate control products for automobile industry and auxiliary power supply units
- Files for reorganizing under Chapter 11 in Feb 2018

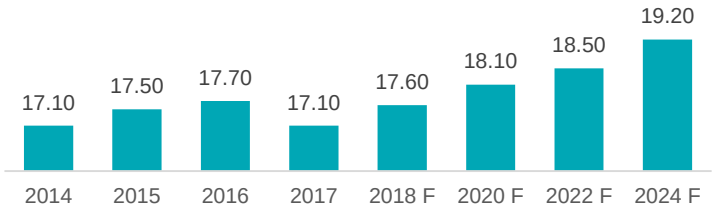
*Valid as of June 30 2018

Key Competitors for India

- Mexico
- China
- Japan
- Canada
- South Korea

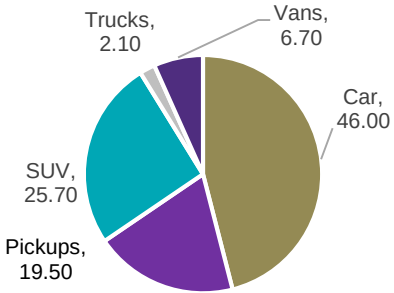
The US Automotive market is the 2nd largest market after China accounting for ~17.1 mn units in vehicle production; expected to grow to 19.2 mn by 2024; PVs, SUVs and pickups dominate with over 90% market share

US Automotive Market: Vehicle Production (mn Units)



Source: Society of Automotive Analyst
Note : Motor Vehicles include Cars, Pickups, SUV's, Trucks & Vans

US Automotive Market: Classification 2016 - 2017



Source: Society of Automotive Analyst
Figures in %

Description

- The United States is the world's second largest market for vehicle sales and production after China; contributes to ~3.5% of the GDP
  - The new vehicle production in 2017 stood at 17.1 mn vehicles (including light trucks)
  - 2017 witnessed a slight fall over 2016's 17.1 mn units due to GMs and Chrysler's bankruptcy filings coupled with natural calamities leading to lower uptake (Hurricane Harvey)
  - The market is expected to reach 19.2 mn units by 2024
- The US Automotive industry generated over 1.7 mn direct jobs in 2017 including designing, engineering, manufacturing, and supplying parts and components to assemble, sell and service new motor vehicles
  - People in these jobs collectively earn over USD 500 bn annually in compensation and generate more than USD 70 bn in tax revenues

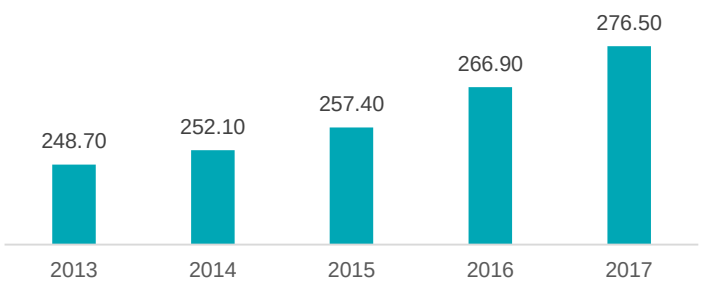
Description

- PV, pick-up and SUV platforms dominate the US automotive market collectively accounting for over 90% of the total market in 2016-17
  - PVs dominate the US vehicle industry accounting for ~46% market share followed by pickups with ~20% share and SUVs accounting for ~26% market share
- **Powertrain – 2025 prediction****
  - ICE & hybrid powertrain are expected to dominate the US market with over 80% of the market in coming 5 – 7 years.
  - Penetration of EVs are likely to be ~12% by 2025. EVs will be a combination of Plug in hybrid and pure electric powertrains. Pure electric powertrains in US is expected to be around 5% by 2025.

*** Wards Intelligence + GT Analysis + GT Primary* *** Center of Automotive Research & Bureau of Labor Statistics*

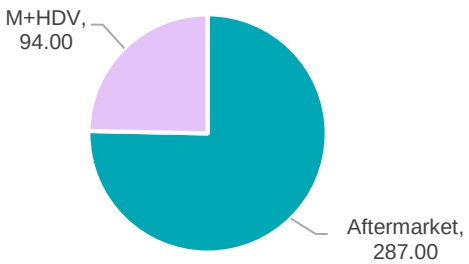
The US Auto Component market is estimated at USD 277 bn in 2017 dominated by OEM sales with 70% share; aftermarket segment including the M+HDV is estimated at ~USD 381 bn in 2017; backed by shifting consumer channel preferences, traditional brick and mortar players face heat from online ecommerce players selling aftermarket components online

US Auto Parts Industry Growth Trend (USD bn)



Source: AASA

US After Market Growth Trend (USD bn)



Description

- The US auto parts manufacturing industry consists of about 4,300 companies with combined annual revenue of about USD 277 bn in 2017
  - Contributes to 2.4% to the GDP of US
  - The sector generates over 870,000 jobs and is the largest sector of manufacturing jobs in the U.S
- The consumption of automotive parts and equipment is linked to the demand of new vehicles, where around 70% of US automotive parts production is for OEM products. The remaining 30% is for genuine dealer aftermarket segment
  - The products include transmissions, airbags, turbochargers, air-conditioning systems, ball bearings, filters, wheels, gears, tires, and several other auto parts and equipment

Description

- The U.S. automotive aftermarket is a USD 287 bn industry (2017) with a compound annual growth rate of 3.6% projected through 2020; the entire aftermarket, including medium and heavy-duty vehicles, is projected at USD 381 bn in 2017 and is projected to reach USD 421 bn in 2020
  - It includes 535,000 individual businesses consisting of independent manufacturers, repair shops, distributors, marketers and retailers
- The market traditionally had been dominated by the Top 4 brick and mortar companies selling auto parts through retail stores; AutoZone, Advance Auto Parts, O'Reilly Automotive & Genuine Parts
  - Traditional retail channels in accounted for 94% of auto parts replacement sales in 2013
- The industry is currently undergoing a transition where customers are beginning to purchase parts online; ecommerce car parts sales outpace brick and mortar estimated at USD 8.9 bn in 2017 (growth of 15% between 2017-18) ; expected to grow to USD 40 bn by 2020

Source: AASA, Auto Care Association, Hedges & Company

USA's automotive players, present in India

OEMs in India

FCA FIAT CHRYSLER AUTOMOBILES

Ford

GM

The company recently ceased domestic manufacturing and sales in India. However, it's assembly plant for exports is still operating in the country

Suppliers in India

BorgWarner

Cummins

FEDERAL MOGUL

TENNECO

LEAR CORPORATION

CooperStandard

DUPONT

nexteer AUTOMOTIVE

DELPHI Automotive Systems

TI Automotive

GOODYEAR

INTEVA PRODUCTS

TOWER INTERNATIONAL

DOW

metaldyne

DANA

AAM AMERICAN AXLE & MANUFACTURING

Visteon

Suppliers not in India

BRIDGEWATER INTERIORS

FLEX N GATE

GENTEX CORPORATION

The US automotive market will witness slow but steady growth in coming 5-7 years contributed to increasing interest rates leading to postponement of new vehicle purchase; demand for EV to witness a growth on account of increased Federal Incentives on new vehicle purchase; demand for auto components to witness growth

US Automotive Industry

Drivers/Trends	Description	Impact

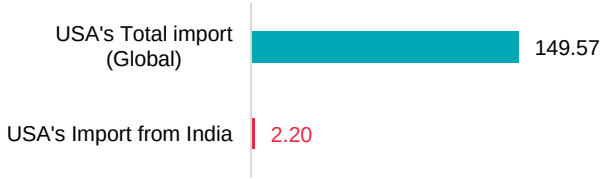
Economic Performance & Reforms	▪ U.S. gross domestic product to grow by 2.7 % in 2018 and 2.3 percent in 2019 up from previous estimates of 2.3 percent and 2.1 percent
	  ▪ Key drivers include robust external demand fiscal policy changes and slashing of corporate income tax from 2018 (35% to 21%)
	  ▪ Projected average employment growth around 180,000 jobs per month
		▪ ***New Vehicle registration across ICE and Hybrid powertrain to*** *grow at a slow rate as customer postpone new vehicle purchase; 2018 to witness most sales on account of replacement vehicles due to natural calamity (hurricane Harvey in US) (2,33 mn units in 2017 @ 9.4% growth)*

Increased interest rates for car purchase	▪ Average interest rate for new vehicle loans rose to 5.2 percent in February 2018; the highest in eight years,	▪ ***Light vehicle & SUV & Light Truck imports*** *to witness an increase in US from Mexico & Canada*
Strong fundamentals for used car	▪ VIO in US is estimated at over 280 mn cars in 2017 ▪ Average vehicle age is touching 12 years	▪ ***Component demand*** *to witness increased demand on account of increased accidental repairs*
Entry of Online e-Commerce giants into US Aftermarket	▪ Foray of Amazon into Aftermarket Segment in 2017 ▪ e-tail contribution to total aftermarket sales stood at ~ USD 7 bn in 2012 and expected to reach USD 14.9 bn in 2020; pure play e-tailer adding USD 1 bn topline pa ▪ Amazon has signed several exclusive supplier agreements with global brands such as Federal Mogul, Continental to name a few	▪ *Used car vehicles to drive up demand for replacement parts in* ***aftermarket sector***
Increased oil prices	▪ U.S. households will spend an additional USD 190 on gasoline in 2017, about 9% more than last year ▪ Fuel consumption is expected to tick upward to 9.6 mn barrels of gasoline per day, an increase of about 20,000 barrels from last year	▪ ***Demand for EV to grow*** *on account of increasing consumer consciousness and federal incentives on EV purchase*
Increased focus on EV powertrain migration	▪ US is the 2nd largest EV market after China with ~200,000 vehicles sold in 2017 dominated by 4 platforms namely Chevy Bolt, Tesla Model 3, Nissan Leaf & Toyota Prius	

Source: GT Primary & analysis, MEMA, AASA and press articles

India's share in US imports of components stood at 1.65% in 2017 (of USD 150 bn) providing significant opportunity for improving export share; rising costs in US have forced US OEMs and suppliers have set up plants in Mexico due to low local labor costs, high labor productivity & established supply chain making it a regional and global export hub for components and platforms

US India Export Import Trade: Auto Components (USD bn, 2016-17)

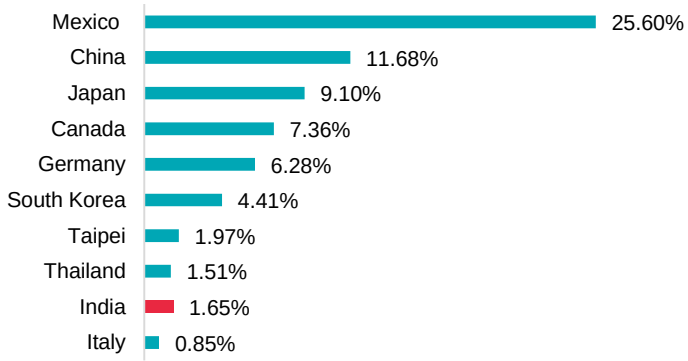


Source: GT Analysis

Description

- The Indian Auto Component Sector exported products worth USD 2.2 bn to US in 2016-17
- The total imports of Auto components into USA globally including India in 2016-17 is estimated at USD 150 bn

USA: Top importing countries (2016-17)



Description

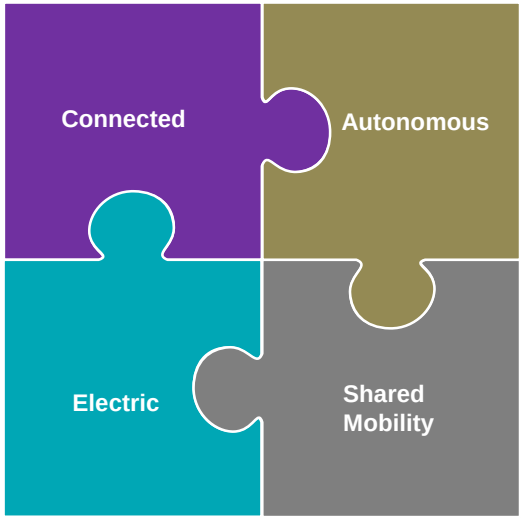
- Mexico dominates the US import markets with over 25% share followed by China (11.7%) and Japan (9.1%)
  - Mexico is home to US OEMs including GM, FCA & Ford who have moved their production facilities to Mexico on account of lower labor costs and supply chain efficiencies. American OEMs are using Mexico as regional export hub for Light Passenger Cars and also source significant components into US for meeting domestic demand by their local plant present in US; similar strategy is followed by Japanese, German, Korean origin such as Honda, BMW, Audi, VW, KIA, Hyundai & Nissan
- ASEAN countries account for ~35% of the US imports
  - India accounts for 1.65% of US import share primarily supplying products across Casting, Forging, Engine Components, Braking, Gearbox, Ignition & wiring related parts to Tier I suppliers in US and IPOs of OEMs present in India

Source: GT Primary & analysis, MEMA, AASA and press articles

The US automobile is undergoing a transition just like any other mature market; it is the 2nd largest market for EVs after China; American OEMs are increasing focus on building capabilities across Connected & Autonomous technologies and Shared Mobility Services; software technology acquisition is primarily from startup acquisition from Silicon Valley, Japan & Canada

- The connected cars scenario is USA is driven by Startups, Technology Companies and OEMs and Tier I companies collaborating and investing in technology across Safety, Driving and Parking related technologies
- OEMs and Tier I suppliers are making significant investments across Telematics, ADAS, Mobility Services & Infotainment
  - **e.g.. GMs acquisition of Cruise Automation**: Cruise built the first highway autopilot system that installs existing vehicle. It uses sensors and machine vision technology to keep the vehicles within the lane and maintain a safe distance from other vehicles
  - There will be significant opportunities across "in-cabin connected technologies" both across hardware and component design & software integration for suppliers

- US is the 2nd largest market for EV globally after China. 2017 registered a sale of ~200000 EVs
  - Top 5 models included - Tesla Model S (~27000 units), Chevrolet Bolt (~23,200 units), Tesla Model X (~21,300 units), Toyota Prius (~21,000 units) and Chevrolet Volt with (~20,300 units)
- The federal government and a number of states offer financial incentives, including tax credits, for lowering the up-front costs of plug-in electric vehicles
  - The federal Internal Revenue Service (IRS) tax credit is for USD 2,500 to USD 7,500 per new EV purchased for use in the U.S. The size of the tax credit depends on the size of the vehicle and its battery capacity.



- The Autonomous Vehicle market in US is dominated by Waymo (vehicle division of Alphabet, Google's Parent Company) – it is the first company to successfully deploy an autonomous vehicle on US roads
- GM has set up a dedicated assembly line for Cruise AV in Orion Michigan and Brownstone plant where the LIDAR modules are built & will be integrated at an investment of USD 100 mn upgradation in both the plants.
  - The company aims to sell it for commercial operations and not in the personal vehicle ownership segment through dealer network
- OEMs and suppliers such as Bosch are looking at Silicon valley startups. there are significant opportunities for suppliers who can build hardware components and partner with tech startups for software integration for such technologies

- Currently, China and the United States are the two largest markets for shared mobility, at USD 24 bn and USD 23 bn respectively
- There has been an increased focus by traditional OEMs in US to transform their business models from being a pure manufacturer of vehicles to "vehicle as a service"
  - e.g.**: Ford Motors USA launched "Ford Smart Mobility"'** a separate subsidiary for developing commercially ready mobility services and invest in promising mobility-related ventures; the company will look at design and build mobility services on its own, and collaborate with start-ups and tech companies

Source: GT primary & secondary analysis

US Supplier Challenges – Driven by increasing costs, OEMs are putting pressure on component suppliers to reduce costs; medium & large scale suppliers are focusing on rationalizing their product portfolio & investments for moving towards production and supply of higher value add products across powertrain, body & structural solutions while depending on LCCs to supply low margin products critical for supplying local OEMs

Challenge	Description	How are Players Reacting
Cost Reduction	Mid sized component manufacturers in US are seeing significant downward pressure on pricing from OEMs	▪ Technology adoption for to improve efficiency, reduce manual labor, and reduce waste through ERP, CAD Integration, 3D Printing and Analytics and Software integration in business processes ▪ Supplier Contracts: Mid sized auto components manufacturers in US are turning to progressive decrease contracts, in which suppliers agree to lower costs as volume increases. Some are increasing supplier efficiency with innovations like workplace automation and vendor portals, which integrate into the business ERP systems

Portfolio Prioritization	Mid sized companies are challenged meeting product requirements on account of Electrification and Connected cars rollout in US	▪ Local suppliers in US are looking at opportunities for rationalizing their product portfolio by focusing on solutions with higher innovation potential in line with OEMs focus on electric vehicles and digital connectivity such as
		  ▪ Powertrain – Motors and batteries
		  ▪ Body and Structural solutions – Stamping, Closures and Glass & Carbon Composites
		  ▪ Electrical and electronics – ECUs, Wiring and Sensors
		▪ Bigger Tier I suppliers are looking at acquiring startups and Software Firms for building future solutions (e.g. Bosch alliance with NVIDIA for AI)
		▪ Local US Tier Is and Suppliers are looking at sourcing opportunities across low Cost Countries for products such as
		  ▪ Body and Chassis – brakes, steering, axles and drivetrains and fuel systems
		  ▪ Interiors – Seats, Trim, Restraints, HVAC

Source: GT Primary & analysis

Maturity of the industry in terms of Technology & Best Practice

Technological Area	Concentration for advancements
1 Light weighting – Forged products	▪ Bimetalic axle preform development ▪ Weight reduction of forged parts in heavy truck vehicles
2 Energy Storage Devices	▪ Ultra Capacitators ▪ Advanced Batteries (electric vehicles & hybrids) ▪ Flywheels
3 Improved efficiency of ICE	▪ Stratified charge/ lean burn components ▪ Direct fuel injection
4 Advanced manufacturing	▪ Advanced forging/joining techniques ▪ Virtual manufacturing & complex visualization techniques for prototyping
5 Efficient electrical systems	▪ Power electronics ▪ Advanced electric motors ▪ Electric controllers for regenerative braking, power management, signal distribution)

Source: GT Primary & analysis ; FIA

Best Practice - Research & Technology

- USCAR (United States Council for Automotive Research) is a collaborative technology company of FCA US, Ford Motor and General Motors
- Its goal is to further strengthen the technology base of the U.S. auto industry through cooperative research and development

USCAR →

USDRIVE (United States Driving Research & Innovation for Vehicle efficiency and Energy sustainability)

This is a government – industry partnership in which the energy department, 5 energy companies, the OEMs and Tier I suppliers are members

Technical Leadership Councils (TLC's) are the strategic units for USCAR

- The TLCs manage USCAR's collaborative research and development portfolio, establish strategic objectives and ensure alignment of projects with partners' objectives

Examples

Fasteners Committee
Develop common USCAR fastener-related specifications; support industry groups with fastening expertise

Manufacturing Committee
To identify needs and collaborate on the development of advanced manufacturing technologies that improve competitiveness

Body structures/Stamping
Describe the components that have been adopted as standard among the USCAR OEMs when designing and constructing stamping dies and body assembly tools

Maturity of the industry : Export Incentives

A brief look at US most impactful strategy for export expansion (post recession):

NEI

Launched under the Obama presidency, NEI (National Export Incentive) has the most impactful strategy for the nation to expand exports. In general it focusses on connecting and preparing small to medium sized businesses, providing more access to export financing, removal of barriers for trade, and stronger enforcement of trade regulations. With the NEI total export value for vehicle export increased by 138% from 2009 to 2014.

- Export Financing
  - SBA (US Small Business Administration): focus on assisting exporters that are from small businesses. SBA aims at helping these businesses through counselling, export financing, outreach and training. It grew its lending power from USD 611mn in 2011 to USD 1.45 bn in 2015. SBA Export Express was launched under the Small Business Job Act of 2010 which provides a 90% guarantee loan up to USD 350,000 and 75% guarantee for loans up to USD 500,000
  - EXIM bank (Export Import Bank of the United States): provides funding through loans to all sized businesses. It aims at creating job opportunities through expansion of exports. In a nine month period in 2015, it provided more than USD 3 bn worth insurance and financing to only small-sized businesses

IC-DISC – Interest Charge Domestic International Sales Corporation

Introduced by the government to remove the charge of interest on deferred tax. With growing time, it started to provide permanent tax savings to those companies that provide US made products outside the country by converting ordinary income. With this, companies benefit from a 19.6% rate reduction for permanent tax rate

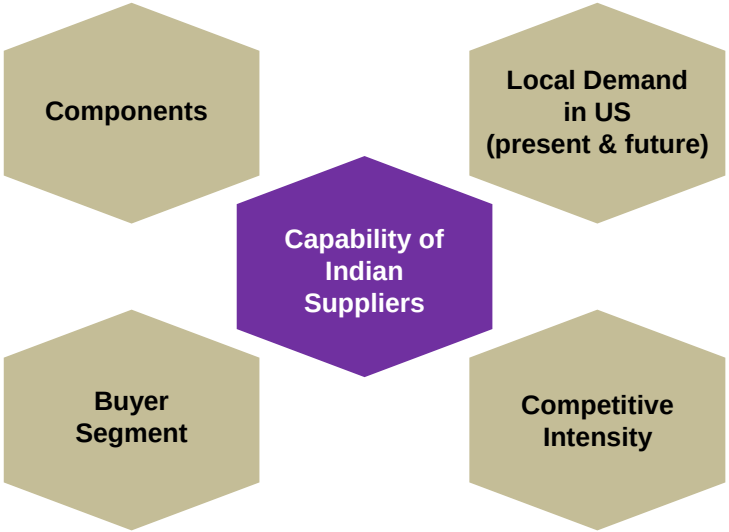
Foreign title passage – One somewhat hidden export tax incentive is the foreign title passage sourcing rules of Sections 862 and 863(b). Sales of products purchased in the U.S. (with title passing outside our borders) are treated as 100 % foreign sourced income, while sales of products manufactured in the U.S. (with title also passing outside the country) are generally treated as 50 % foreign sourced income liable. Those benefits may be realized by increasing the exclusions for any open tax years.

We took into consideration 5 key elements across broad component requirement in US, demand growth for such components, ccompetitive intensity, segment appeal and existing capability of Indian suppliers to supply products required by US customers in short, medium to long term based on extensive discussions with US OEMs & Suppliers

Broad components across ICE, Hybrid and Electric powertrains based on detailed discussion with experts, local OEMs is US & India and component manufacturers in US

- Broad components that are traditionally been exported by Indian suppliers into US
- Components that are imported into US

Assess capability and maturity of Indian supplier for producing & supplying such components required in US based on detailed discussion with experts, local OEMs is India & US and component manufacturers in US



Demand for broad segments as expected to grow in short, medium and long term in line with industry trends based on detailed discussion with experts, local OEMs is US and component manufacturers in US

Assess who are likely buyers of such components across OEM, Tier I and Aftermarket category based on detailed discussion with experts, local OEMs is US and component manufacturers in US

Assess India's competitive advantage as a country against Mexico that dominate the US import based on detailed discussion with experts, local OEMs is US and component manufacturers in US

Key Component categories were mapped in line with parameters chosen based on discussion with US based OEMs, Suppliers with an objective to asses where and how Indian suppliers can make in-roads into US markets

Components	US Demand			Buyer Segment			Competitive Intensity	Synergies in line with Indian Industry Capability
	0-3 yrs	4 – 7 yrs	8-10 yrs	Tier I	OEMs	AFM (DIFM)	US & Mexico & Canada	
Traditional Body, Panels & Stamping	H	M	L	Y	Y	-	M	H
ICE & Components	H	M	L	Y	Y	-	H	H
Frame	H	H	H	Y	Y	-	M	H
Drive Axles	H	M	L	Y	Y	Y	M	H
Wheels & Tyres	H	H	H	Y	Y	Y	H	H
Brakes	H	H	H	Y	Y	Y	M	H
Steering	H	H	M	Y	Y	-	M	H
Suspension & Components	H	H	H	Y	Y	Y	M	H
Rubber Components	H	H	H	Y	Y	Y	H	H
Fuel System	H	M	L	Y	Y	Y	M	H
Climate Control/ HVAC	H	H	H	Y	Y	-	H	M
Seats	H	H	H	Y	Y	Y	M	M
Interior & Accessories	H	H	H	Y	Y	Y	M	M
Infotainment System	H	H	H	Y	Y	Y	H	L
Battery/ Fuel Cells	M	H	H	Y	Y	Y	H	L
Electronics	H	H	H	Y	Y	-	H	L
ADAS/ Sensors	M	H	H	Y	Y	-	H	L
Electric drivetrain	H	H	H	Y	Y	-	H	L
Exhaust	H	M	L	Y	Y	Y	M	L

High
Medium
Low

Description

- **High Synergy Segments:** Indian suppliers have existing capability to develop and supply traditional but essential components such as Body panels, ICE components, body Frames, Axles, Brakes, Steering & suspension, Wheels & Tyre & Fuel systems to Tier I suppliers as well as OEMs. Mexico as a market is a natural rival for such components due to closer proximity to US and US OEMs and suppliers local plant presence.
- **Medium Synergy Segments**: Segments such as HVAC, Climate Control, Seating and Interior and Accessory are mapped under medium synergy as Indian suppliers will have to build and invest in capacity for supplying such products to US market. Mexico as a market is a natural rival for such components due to closer proximity to US and US OEMs and suppliers local plant presence.
- **Low Synergy Segments:** Indian suppliers don't have capability across Electronics, Electrical, ADAS and Sensors, Exhaust Systems, Battery Development to cater to US demand. US, Canada & Japan are natural competitors to India for such segments as most of the technologies are sourced from such countries

Source: GT Primary & Secondary data analysis

OEM & Tier I Segment – Local presence, investment in export capacity, R&D capability and financial risk taking ability is a pre-requisite for market play across OEMs and Tier I segment

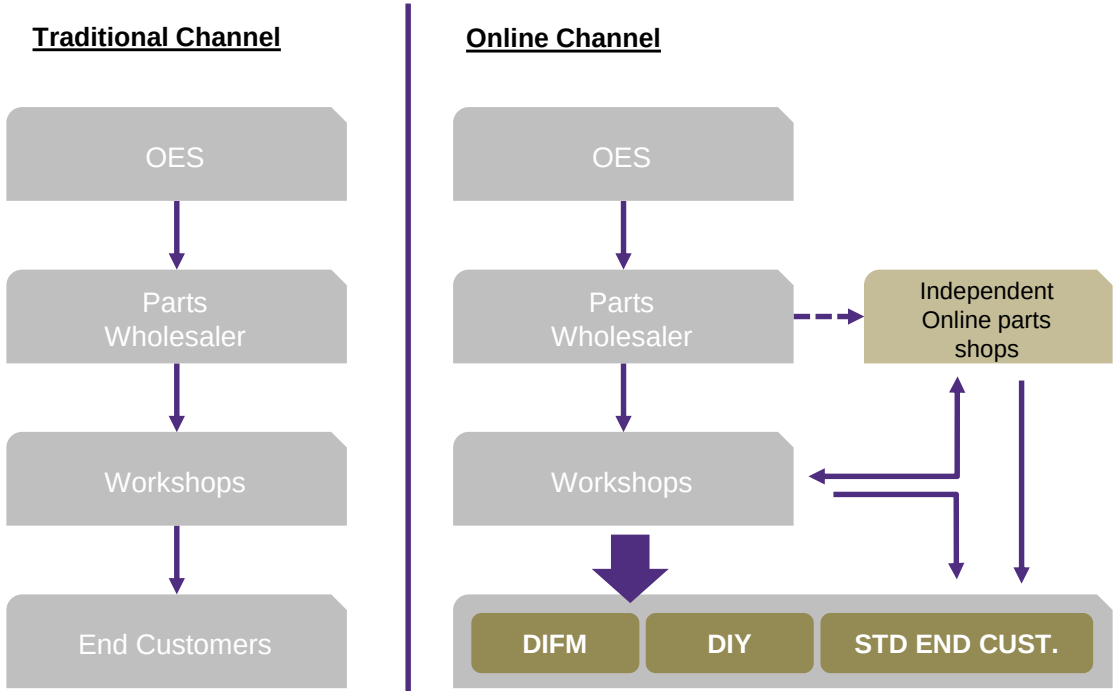
Segment	Market play: Pre-Requisites	Imperative	Segment
Traditional Body Panels & Stamping ICE & Components Frame Drive Axles Wheels and Tyres Brakes Steering Suspension and Components Rubber & Plastic Components Fuel Systems	1. JIT Requirement from OEM and Tier I – high risk of assembly line disruption in case of shortage 2. High degree of supply chain alignment with OEMs and Tier I suppliers 3. Local Presence (Supply & Manufacturing) – preferably manufacturing as per customer discussions 4. High Warranty risks and liability (Powertrain Components) 5. Large volume perpetual contracts to improve margin play 6. Export capacity to meet overseas customer demand	1. Local presence is a must (manufacturing/ warehousing) 2. Higher risk taking ability 3. Dedicated local representative 4. Investment in Capacity for exports	Tier I,2 & 3 Supplier
Climate Control/ HVAC Components & systems Seating and Components Interior & Accessories	1. JIT Requirement from OEM and Tier I – high risk of assembly line disruption in case of shortage 2. High degree of supply chain alignment with OEMs and Tier I suppliers 3. Local Presence (Supply & Manufacturing) – preferably manufacturing as per customer discussions 4. High Warranty risks and liability (Powertrain Components) **5. High Design Capability (interior and accessory segment)**	1. Local presence is a must (manufacturing & warehousing) 2. Higher risk taking ability 3. High Design Capability and R&D Investment (3D and CAD capabilities)	Tier I & Select Tier II suppliers
Infotainment Systems Battery & Fuel Cells Electronics ADAS/ Sensors Electric Drivetrain Exhaust	**1. High R&D Capability & Investments** **2. Long gestation period for prototype commercialization** 3. Software integration and solution bundling capability 4. High Warranty risks and liability 5. Local Presence and high engagement levels with OEMs and Tier I from Design phase	1. High R&D Investments (Software Design, Software and Component Integration) 2. Demonstration of solution rather than products 3. High financial appetite for risk	Tier I Suppliers

Source: GT Primary & Secondary data analysis

High
Medium
Low

Synergies in line with Indian Industry Capability

E-Commerce purchase for aftermarket components in US surpassed traditional brick and mortar purchases in 2017 with USD 8.9 bn and expected to grow to USD 40 bn by 2020; the sales have been primarily driven by DIFC customer segment who purchase parts online and have them installed



Source: GT Primary & Secondary data analysis

Workshops (B2B)

- Workshops have technical know-how to buy online as well as the required equipment (tools, lift, diagnostic systems) to assemble even complex parts

DIFM (B2B2C and B2C2C)

- "Do-it-for-me" customers, who purchase parts online but have them installed:
  - **B2B2C:** at a professional workshop with commercial purpose
  - **B2C2C:**by an acquaintance outside working hours/without commercial purpose (gray market)

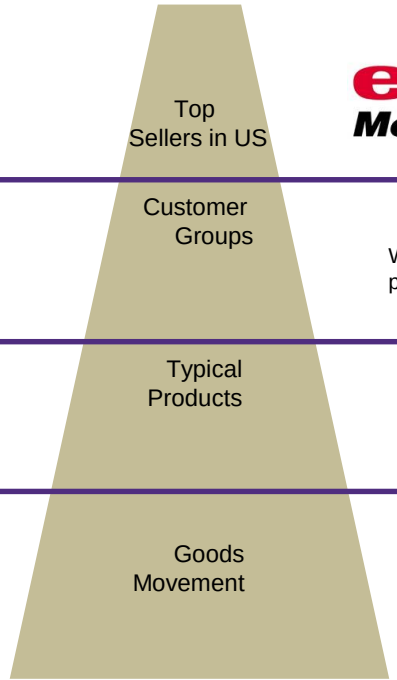
DIY (B2C)

- "Do-it-yourself" customers, who have the technical knowledge and interest to maintain and upgrade cars themselves

Standard end customers (B2C)

- Standard end customers without technical know-how, who buy simple parts

Online and Traditional retailers deal in wide variety of components; product width and depth is critical for supplying components to aftermarket sellers in US



Top Sellers in US				
Customer Groups	B2B	B2B2C	B2C	STANDARD CUSTOMERS
	Workshop mechanics, parts managers	DIFM	DIY	Standard End Customers
Typical Products	▪ Brake ▪ Disc Pads ▪ Clutch ▪ Shock absorbers ▪ Tyres	▪ Brake ▪ Disc Pads ▪ Filters ▪ Tyres	▪ Battery ▪ Filters ▪ Spark Plug ▪ Tyres ▪ Wiper Blades	▪ Accessory ▪ Lubricants ▪ Floor Mats ▪ Tyres ▪ Wiper Blades
Goods Movement	**FAST MOVING**	**MEDIUM MOVING**	**SLOW MOVING**	
	▪ Windscreen wiper blade ▪ Filter (oil, air, diesel, cabin) ▪ Bulb ▪ Tire ▪ Brake pad ▪ Brake disc ▪ Spark plug	▪ Battery ▪ Timing belt ▪ Headlight ▪ Lubricants ▪ Shock absorber ▪ Accessory belt, roller ▪ Alternator ▪ Seating Accessory ▪ Body part	▪ Exhaust Parts ▪ Clutch ▪ Starters ▪ Water Pumps	

Tyres **Consumable & Accessory**

Rubber Parts **Mechanical Parts**

Source: GT Primary & Secondary data analysis

Aftermarket Segment – Local presence, investment in export capacity, working capital management, financial risk management, product assortment and strong B2B marketing efforts are key to entering aftermarket sector in US

Segment	Market play: Pre-Requisites	Imperative	Segment
Driver Axles Wheels and Tyres Brakes & Components Suspension & Components Rubber Components Fuel Systems Accessories Electrical Components	1. High degree of supply chain alignment with Online and Offline Retailers 2. Strong distributor relationships 3. Local Presence (Supply & Warehousing) 4. Local Representative 5. Large volume backed perpetual contracts to improve margin play 6. Export capacity to meet overseas aftermarket customer demand 7. Strong Product Width and Depth required to better negotiation of margins and price	1. Investments in local warehouse establishment/ leasing 2. Better working capital management & financial management (currency fluctuation risks) 3. Dedicated local representative for marketing and sales 4. Investment in Capacity for exports 5. Dedicated capacity for aftermarket 6. Strong Marketing efforts (B2B)	Tier I,2 & 3 Supplier
Seating and Components Interior & Accessories			
Battery Exhaust Components	**1. High R&D Capability & Investments** 2. High degree of supply chain alignment with Online and Offline Retailers 3. Strong distributor relationships 4. Local Presence (Supply & Warehousing) 5. Local Representative 6. Large volume backed perpetual contracts to improve margin play 7. Export capacity to meet overseas aftermarket customer demand 8. Strong Product Width and Depth required to better negotiation of margins and price		Tier I Suppliers

Source: GT Primary & Secondary data analysis

High
Medium
Low

Synergies in line with Indian Industry Capability

Aftermarket Segment – Local presence, investment in export capacity, working capital management, financial risk management, product assortment and strong B2B marketing efforts are key to entering aftermarket sector in USA

Segment	Key Platforms produced/ sold in US & also Produced & Sold in India	Imperative	Segment
▪ Windscreen wiper blade ▪ Filter (oil, air, diesel, cabin) ▪ Bulb ▪ Tire ▪ Brake pad ▪ Brake disc ▪ Spark plug ▪ Battery ▪ Timing belt ▪ Headlight ▪ Lubricants ▪ Shock absorber ▪ Accessory belt, roller ▪ Alternator ▪ Seating Accessory	Toyota ▪ Corolla ▪ Camry Volkswagen ▪ Beetle ▪ Jetta ▪ Passat ▪ Tiguan Hyundai ▪ Accent ▪ Elantra ▪ Santa-Fe ▪ Sonata Ford ▪ Ecosport ▪ Fiesta Honda ▪ Accord ▪ CRV	1. Investments in local warehouse establishment/ leasing 2. Better working capital management & financial management (currency fluctuation risks) 3. Dedicated local representative for marketing and sales 4. Investment in Capacity for exports 5. Dedicated capacity for aftermarket 6. Strong Marketing efforts (B2B) 7. Leveraging IPO relationships in India for aftermarket supply in USA	Tier I,2 & 3 Supplier

Source: GT Primary

Glossary

AASA	Automotive Aftermarket Suppliers Association
2W	Two Wheeler
2x	Two Times
6300 T	6300 Ton
ADAS	Advanced Driver-assistance Systems
AFM	Aftermarket
AFS	Adaptive Front Lighting System
AGV	Automated Guided Vehicle
AI	Artificial Intelligence
Al	Aluminum
ALADI	Latin American Integration Association
AMIA	Asociacion Mexicana De La Industria Automortiz
AMP	Automotive Mission Plan
ANFAC	Asociación Nacional De Fabricantes De Automóviles Y Camiones
APEC	Asia-pacific Economic Cooperation
ARPU	Average Revenue Per User
ASDS	Ammonia Storage And Delivery System
ASEAN	Association Of Southeast Asian Nations
AZL	Aachen Center For Integrative Lightweight Production
B2B	Business To Business
B2B2C	Business To Business To Customer
B2C	Business To Customer
B2C2C	Business To Customer To Customer
BEV	Battery Electric Vehicle
BG	Bank Guarantee
Bn	Billion
CAD	Computer-aided Design
CAE	Computer-aided Engineering
CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditure
CAutoD	Computer-automated Design
CDTI	Centre For The Development Of Industrial Technology
CDV	Car Derived Vans
CFRP	Carbon Fiber Reinforced Polymer
CNC	Computer Numerical Control
CNG	Compressed Natural Gas
CO2	Carbon Dioxide
Cr	Crore
CV	Commercial Vehicle
DAS	Driver Assistance Systems
DGT	Directorate General Of Traffic
DIFC	Do It For Customer
DIFM	Do It For Me
DIY	Do It Yourself
EAA	Economic Association Agreement
EC	European Commission
ECA	Economic Complementation Agreements
ECA	Export Credit Agency
ECCP	European Cluster Collaboration Platform
ECM	Engine Control Module
ECU	Electronic Control Unit
EEU	Eurasia Economy Union
EGP	Enhance Globalization Program
EIG	Engineering Installation Group
ENISA	National Innovation Company
EPDM	Ethylene Propylene Diene Monomer Rubber
ERP	Enterprise Resource Planning
ESTACA	Ecole Supérieure Des Techniques Aéronautiques Et De Construction Automobile
ETVE	Foreign Securities Holding Companies
EU	European Union
EUR	Euro
EV	Electric Vehicle

Glossary

EXAIR	Export Insurance Agency Of Russia
F	Forecast
FADEC	Full Authority Digital Engine Control
FCA	Fiat Chrysler Automotive
FCEV	Fuel Cell Electric Vehicles
FDI	Foreign Direct Investment
FHEV	Full Hybrid Electric Vehicle
FTA	Free Trade Agreement
FTZ	Free Trade Zone
FY	Financial Year
GATT	The General Agreement On Tariffs And Trade
GDP	Gross Domestic Product
GM	General Motors
GOI	Government Of India
GT	Grant Thornton
GVA	Gross Value Added
HDP	Human Development Program
HEV	Hybrid Electrc Vehicles
HQ	Headquarters
HVAC	Heating, Ventilation And Air Conditioning
IAM	Spanish Independent Aftermarket
IATF	The International Automotive Task Force
IC-DISC	Interest Charge Domestic International Sales Corporation
ICE	Internal Combustion Engine
ie	That Is
ILK	Institute Of Lightweight Engineering & Polymer Technology
ILVS	In-line Vehicle Sequencing
IMF	International Monetary Fund
incl.	Including
INR	Indian Rupee
IOT	Internet Of Things
IPO	Initial Public Offerings
IRS	Internal Revenue Services
ISO	International Organization For Standardization
JAMA	Japan Automobile Manufacturers Association
JIS	Just In Sequence
JIT	Just In Time
JLR	Jaguar Land Rover
JV	Joint Venture
k	Thousands
KAMA	Korea Automobile Manufacturers Association
km	Kilometers
kW	Kilowatt
LC	Line Of Credit
LCC	Low Cost Countries
LCV	Light Commercial Vehicle
LiDAR	Light Detection And Ranging
LPG	Liquefied Petroleum Gas
M&A	Mergers And Acquisitions
MAPP	Manufacturers Against Product Piracy
MDA	Management Development Assistance Scheme
Mg	Magnesium
MHCV	Medium And Heavy Commercial Vehicles
MHDV	Medium And Heavy Duty Vehicle
MiEV	Mitsubishi Innovative Electric Vehicle
Mn	Million
MNC	Multi National Company
MSIL	Maruti Suzuki India Limited
MSSL	Motherson Sumi Systems Limited
NAFTA	North American Free Trade Agreement
NAMI	The Central Scientific Research Automobile And Automotive Engines Institute
NCR	National Capital Region

Glossary

NEI	National Export Incentive
NEVADA	Neutral Extended Vehicle For Advanced Data Access
NOx	Nitrogen Oxides
NTM	New To Market
NVGI	Noble Vici Group, Inc
OBD	On-board Diagnostics
OE	Original Equipment Manufacturer
OECD	Organization For Economic Cooperation And Development
OEM	Original Equipment Manufacturer
OES	Original Equipment Supplier
PA	Pacific Alliance
PC	Passenger Vehicle
PHEV	Plug In Hybrid Electric Vehicles
PHV	Plug In Hybrid Vehicles
PPM	Parts Per Million
PSA	Partial Scope Agreement
PV	Passenger Vehicles
QMS	Quality Management Systems
R&D	Research And Development
R&D&I	Research And Development And Innovation
RIPPA	Reciprocal Investment Programs And Protection Agreements
RUB	Russian Ruble
SBA	US Small Business Administration
SCR	Selective Catalytic Reduction
SERNAUTO	Spanish Automotive Equipment And Components Manufacturers
SEZ	Special Economic Zones
SILS	Sequenced In-line Supply
SME	Small And Medium Sized Enterprises
SPIC	Special Investment Contracts
SRP	Sectorial Relief Programs
SUV	Sport Utility Vehicle
T&C	Terms And Conditions
TLC	Technical Leadership Councils
TNC	Transportation Network Companies
TPP	Trans-pacific Partnership
TS	Technical Standard
UNECE	United Nations Economic Commission For Europe
USCAR	United States Council For Automotive Research
USD	United States Dollar
USDRIVE	United States Driving Research & Innovation For Vehicle Efficiency And Energy Sustainability
VAT	Value Added Tax
VCR	Variable Compression Ratio
VDA	German Association Of The Automotive Industry
VIO	Vehicles In Operation
VW	Volkswagen
w.r.t	With Respect To
WTO	World Trade Organization
ZDK	Central Association Of German Automotive Industry

Representative list of primary interviews - Overseas

Representative list of primary interviews - India

Caveats

This report is meant for the management of the Auto Component Manufacturers Association of India

- We have compiled this report on the basis of secondary data & primary research
- Grant Thornton's analysis and recommendations are based on various independent sources of secondary data and primary research. Hence, readers of this report are requested to apply caution and own judgment before relying or acting upon the contents of this report.
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- We have conducted primary interviews of end users associated with this industry. They have expressed their independent views and we have no means to validate their views.
- The fee for the preparation of this report is not contingent upon results reported.

Automotive Component Manufacturers Association of India

About ACMA

The Automotive Component Manufacturers Association of India (ACMA) is the apex body representing the interest of the Indian Auto Component Industry. Its membership of over 800 manufacturers contributes more than eighty five per cent of the auto component industry's turnover in the organized sector. ACMA is an ISO 9001:2015 Certified Association.

ACMA's charter is to develop a globally competitive Indian Auto Component Industry and strengthen its role in national economic development as also promote business through international alliances.

The Auto Component industry in India, with a strong positive multiplier effect, is one of key drivers of India's economic growth. The well-developed Indian auto component industry manufactures a wide variety of products including engine parts, drive transmission and steering parts, body and chassis, suspension and braking parts, equipment and electrical parts, besides others.

In FY 2017-18, the Indian auto-component industry registered a turnover of Rs. 3,45,635 crore (USD 51.2 billion) growing by 18.3 per cent compared to Rs. 2,92,184 crore (USD 43.5 billion) in FY 2016-17. The CAGR of the industry stood at 10 per cent over a period of six years.

The Indian auto component industry exports grew by 23.9 per cent to Rs. 90,571 crore (USD 13.50 billion) in 2017-18 from Rs 73,128 crore (USD 10.90 billion) in 2016-17, registering a CAGR of 11 percent over a period of six year. ACMA has played a pivotal role in supporting its members in export development and in discovering new market opportunities, currently the industry exports to more than 160 countries. With increasing vehicle parc in the country, the aftermarket in 2017-18 grew by 9.8 per cent to Rs 61,601 crore (USD 9.2 billion) from Rs 56,096 crore (USD 8.4 billion) in the previous fiscal.

ACMA's active involvement in trade promotion, technology up-gradation, quality enhancement and collection and dissemination of information has made it a vital catalyst for the component industry's development in India. Its other activities include participation in international trade fairs, sending trade delegations overseas and bringing out publications on various subjects related to the automotive industry.

ACMA is represented on a number of panels, committees and councils of the Government of India through which it helps in the formulation of policies pertaining to the Indian automotive industry.

For exchange of information and especially for co-operation in trade matters, ACMA has signed Memorandum of Understanding with its counterparts in Argentina, Brazil, Canada, Egypt, France, Germany, Hungary, Iran, Italy, Japan, Kazakhstan, Malaysia, Mexico, Nigeria, Pakistan, Russia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Taiwan, Thailand, Tunisia, Turkey, UK, USA and Uzbekistan.

Further information and data on the Indian automotive industry is available on the ACMA Website: www.acma.in

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