

# Rubber Auto Components: A review of India's Trade Position

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**ABSTRACT:** : Indian auto component industry is gaining momentum on rising vehicle demand and has been emerged as global hub for sourcing auto components. It has also registered CAGR of 11.3 percent during 2009-2016 for exports. Value of export has increased from USD 5.1 billion in 2009 to USD 10.8 billion in 2016, due to buoyant end-user market, adequate liquidity and favorable government policies. This study comprises 14 tariff lines of Rubber Auto components under chapter 40. To identify market opportunities and trade competitiveness, data has been collected from 2001 to 2015 and major tools such as shift share analysis, Traditional method, Trade intensity index and balance of payment are applied. As per results, Europe and Asia both have proved their significant contribution in India's trade. Due to major trade agreements (NAFTA, ASEAN) Mexico, USA and Vietnam have scored high shift share results and traditional method further explore some new markets in EU namely Germany, France, UK and Poland for dynamic trade destinations. Proportion of individual investment over share of world i.e. trade intensity index discloses Saudi Arabia as an attractive partner. Apart from that, some Middle East growing markets Egypt and Qatar can also be preferred for trading purpose as production capacity expansion and cost effective operations increases export volumes for auto components.

**Key Words:** Shift share, CAGR, BOP

## Introduction

Indian automobile industry registered robust growth in the last decade due to production of vehicles. Similarly, auto component industry has witnessed significant contribution to manufacturing and national GDP. It has been considered as an engine of Make in India program and it is one of the pivotal sectors of manufacturing base of India. Indian auto component industry has grown with CAGR of 7 percent in last one decade and reach at USD 39 billion in 2015-16 from USD 19 billion in 2005-06. However, during the last three years this industry has not invested more due to volatility in global demand. The auto component industry is categorized into tier I, tier II, and tier III firms. Tier I firms are large in size and owns high end research and development centre to carry out innovation.

Automotive mission plan 2026 has set ambitious targets for the auto component industry, both in terms of turnover and exports i.e. USD 194 billion and USD 74 billion respectively. With increasing Vehicle Park in the country the aftermarket and imports have also shown growing trend in figure 1 which itself is a good sign. The export has been increased from USD 3 Billion in 2006 to USD 11 billion in 2016. In the last 10 years, Indian suppliers are actively participating in global value chain and also developing world class capabilities and becoming prominent global players.

Recent regulations that facilitate 100 percent foreign direct investments will attract more investments in this sector. Favorable government policies such as Auto policy 2002, automotive mission plan 2006-2016 have helped auto component industry to reach heights.

Figure 1: Trend in Turnover with Export, Import & Aftermarket



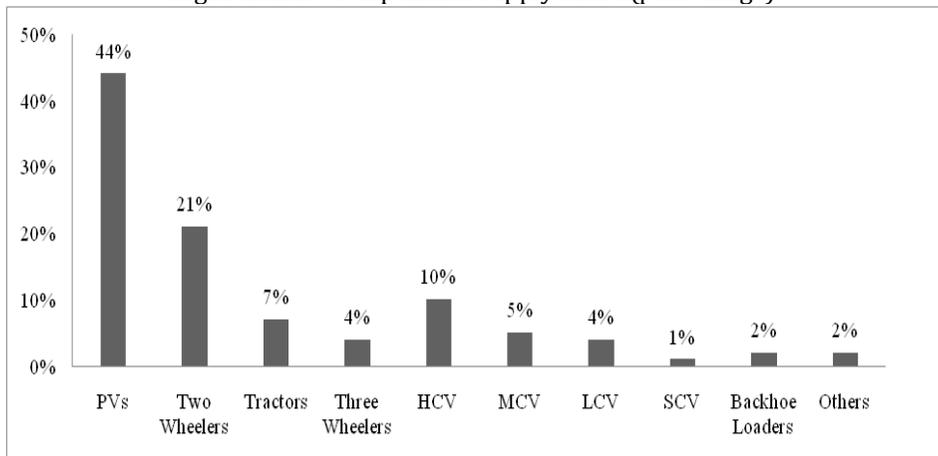
Source: AMP 2016-26

Auto component industry is one of the major sectors in India which contributes 3.5percent in India’s GDP and have 4percent export share in total export. More than 1.50 million people are currently engaged in this sector and it is expected that additional 3.50 million people will be required in future to achieve its targets.Europe, North America and Asia are the regions where India contributes its maximum share rather than South America, Africa and Australia.

Like many other auto component industry across the globe, the Indian auto components industry is also fragmented and approximately 70 to 80percent are small and medium enterprises. It is estimated that around 8000 ancillary units exist in India both in organized and unorganized sector. Despite fragmented industry, Indian auto Component industry is one of the vital sectors of Indian economy and in its manufacturing sector. The industry is growing at good pace and credibility of auto components in global market but there are still some challenges to scale up operations for small component manufactures that face constraints in raising capital, attracting talent and accessing technology.

Organized sector produced more than USD 21 billion worth of auto components for domestic vehicle industry out of which 65 percent are produced for passenger vehicles (PVs) along with two wheelers. Commercial vehicle segment namely, Heavy commercial vehicle, Medium commercial vehicle, Light commercial vehicle and Small commercial vehicles represent 20 percents supply share. In addition, Tractors, Three wheelers, Backhoe and others have only 15 percent share as per fig. 2

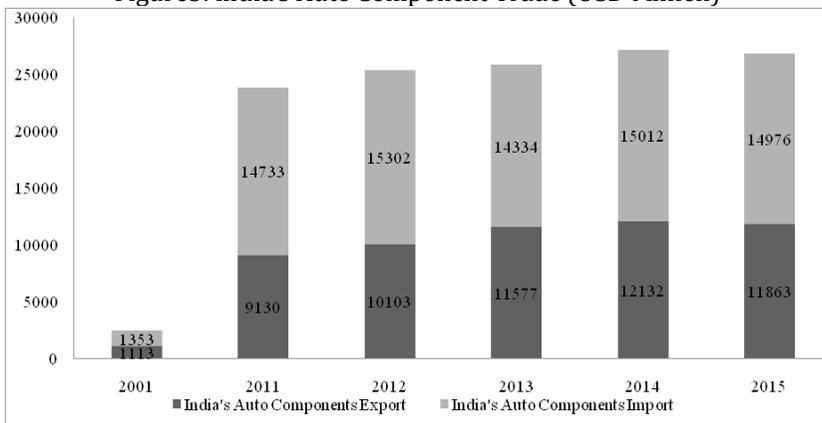
Figure2. Auto components supply share (percentage)



Source: acma

In the last decade, many Indian suppliers evolved themselves to become part of global value chains either by exports or investing in some other country. Fig. 3 depicts that in 2001, Indian auto components trade was USD 2.4 billion and in last 15 years it has been reached at USD 27 billion .The compound average growth rate of the auto components trade stood at 19percent over a period of 15 years. Despite this optimistic picture from the perspective of India, contribution of India in global auto components trade is just 1.3percent therefore, India should leverage this opportunity to become a global leader.

Figure3. India’s Auto Component Trade (USD Million)



Source: Trade Map

As per ACMA statistics, India exports more than 60percent auto components to developed countries such as Europe and North America. While identifying top preferences, from where India usually generates revenue are USA, Germany, Turkey and UK whereas Africa, New Zealand and Australia share ranges from 2 to 3 percent only. In terms of import, Asia alone contributes 59 percent followed by Europe with 31 percent. Other major countries such as North America and Africa have minimum share of 8 and 1 percent respectively.

Auto Components trade is not in favor of India and registered a trade deficit of USD 3110 Million in 2015. All relevant chapters including chapter 40 have a trade deficit as it has USD 682 million of import which is also more than its export of USD 374 million. In the initial phase of market identification, it is most important to focus on traditional markets and competing nations. ITC data as per chapter 40 of rubber components USA, Germany, UK and Australia are the major markets for export. On contrary, USA, Japan, Germany, Korea and China are the countries from where India is sourcing rubber auto components.

### **Review of literature**

PalapanKampan (2017) determined relationship between price of oil, natural and synthetic rubber. Pearson correlation test found a strong positive relationship between Brent crude and Thai ribbed smoked sheets. However, a moderate positive relationship was found between Brent and synthetic rubber. Apart from it, no significant correlation was found between rainfalls in Thailand and natural rubber price whereas, environmental issues clearly affected rubber farms. A survey also suggested that rubber farmers can improve livelihoods best through collective purchase and use of new technologies.

Manojkumar (2015) found that Indian auto component industry has been passing through rapid changes and driven by global competition. It has been growing at 20 percent per annum since 2000 especially influenced by reforms of liberalization. Indian has also become international outsourcing destination for automotive components as major players like Hyundai, Toyota and Volvo have huge demand for Indian auto components.

Lalit and Jaspreet (2015) selected a sample of fifty auto component manufacturing units from North India to highlight some business practices, strengths and constraints of small medium auto component units. Further, the study reported important parameters such as adherence to delivery schedule, specified quality, new product development, cost reduction and customization that influence the growth of this sector. On contrary, some important constraints such as power shortage, non availability of finance and high cost of raw material restricted growth of this sector.

VeluryBhasker (2013) highlighted the phenomenal growth pattern in Indian auto component industry. Industry has transformed into global market as it has expanded from local to worldwide. He also analyzed that ACMA has a significant role towards contribution to GDP and for its global recognition. All efforts are being made pertaining to foreign direct investment and exports earnings in order to fulfill mission 2006-16 and automotive five year plan 2012-17.

Khusroo&Asadulla (2013) describes the issues and challenges in Indian auto components industry with reference to India- Thailand FTA which came in 2003. Results showed that few companies benefited but in general Indian component manufacturers have not attained any significant gain. As a result, developing countries are making efforts to develop auto component sector. Hence, the challenge is to sustain by supporting domestic players, improving investment environment, patent regime and research & development programs.

Vijay Bhasker (2013) studied the growth pattern of Indian component industry relating to investments and Foreign Direct Investment in Equity inflows, drawing comparison with the development of Indian automobile industry. The auto component Manufacturing Association has significant role in global recognition and also positive impact on GDP. As per Automotive mission plan 2006-16, vision 2020 and Automotive sector five year plan 2012-17 this industry has huge potential to grow in local and world market.

Kumarswamy, Mudambi and Tripathy(2012) analyzed auto component industry in India after liberalization. During the period 1992-2002 they described how domestic supplier firms continue to perform, as market liberalization progresses, through catch up strategies aimed at integrating with the industry's global value chain. According to the results, domestic supplier firms need to adapt their strategies from catching up initially through technology licensing, joint ventures and also develop strong customer relationship with downstream firms.

Sachin & Chaudhari (2010) analyzed that auto industry is successful while component sector is in its gloom despite of hard efforts of survival. The responsible factors are lack of technology and skilled labor, high cost

of production and government policies. In result, Indian component industry has been facing lot of challenges in domestic and global market.

Saripalle (2007) analyzed the differences in the export behavior of domestic and multinational firms in Indian auto components industry. Although all selected firms had same labor cost, any difference in export performance could arise due to higher productivity of labor. This paper found that in case of multinational firms, cheap labor not only increased productivity but also leads to comparative cost advantage in exports.

On the other hand, domestic firms are still competing for low wage cost rather than productivity of labor.

Angela, Guillaume & Soledad (2005) developed an improved shift share methodology and estimated the trade competitiveness during the 1995-2002. They also considered geographical and regional dimensions of selected countries. During this phase, the strong demand for elaborated products has benefited the developed countries and disadvantaged most of the south, especially least performing countries. African and Middle East countries accumulate both unfavorable regional and geographical specializations. The EU recorded best performance by maintaining its market share in domestic market and on the contrary, market share lost by U.S. and Japan.

Daniel (2000) evaluated some widely acceptable techniques for the analysis of regional economies. Analysis of variance and other theoretical methods are also discussed in detail. The purpose of this paper was to demonstrate the usefulness of two probabilistic forms of shift share model. Shift share provides a major advance level over traditional accounting based methods because it allows the researcher to quantitatively test hypotheses about particular region or sector.

RaphaelKaplinsky(2000) studied the effect of trade policies on automobile and component sector in inward oriented economies. In initial result of trade policy reforms, a sharp increase in trade deficit was found in automobile and component sector. A survey of major auto assemblers and comparative review of automobile sector in Brazil and India suggested that the future of South African industry is not good unless corrective action is taken. Later, a number of policy responses are discussed identifying both the relevant stakeholders and policy instruments.

## Methodology

### Need of the study

Despite the growth in domestic market and exports, the contribution of Indian Auto Components export in global exports is just 1percent. Low share in global exports shows significant opportunity for the Indian auto component industry to increase in near future. Prime focus of the study is to know how the industry can leverage new opportunities apart from the traditional markets or vice-versa. There are many new growing emerging markets from where India can gain its share and generate revenue.

### Scope & Objectives

This study examines market opportunities for Rubber Auto Components under chapter 40 which comprises 14 tariff lines. On the basis of trade performance and selected measures top 10 countries are selected and further, to disclose the comparative advantage and disadvantages of various markets, data has been collected from 2011 to 2015.

1. To identify market opportunities in efficient markets/countries through their comparative advantage and disadvantages.
2. To examine nations/countries, having strong domestic demand for their appropriate base.
3. To evaluate India's trade position with some competitive countries.

### Tools & Techniques

To understand the global opportunities and trend in transactions various tools have been applied. There detail is as follows:

- Shift Share analysis: This method is widely used to determine the change in a particular variable due to change in national, economical and regional factors. It helps to identify those economies which have competitive advantage over larger/ developed economies. The formula is:

$$e_i^{t+n} - e_i^t = NS_i + IM_i + RS_i$$

The change in variable "e" of an industry "i" between two years  $t$  and  $t+n$  is distinct through national growth effect, industry mix effect and local share effect.

$$NS_i = e_i^t(G)$$

$$IM_i = e_i^t(G_i - G)$$

$$RS_i = e_i^t(g_i - G_i)$$

The opening and closing values of the variable are  $e_t^t$  and  $e_t^{t+n}$  respectively. The total percentage change in variable is defined as  $G$ , while the national and regional/local percentage change are  $G_i$  and  $g_i$  respectively.

- Traditional technique: This method can be used to restore markets, which have strong base or demand for respective product. Based on different product category, some economies are identified which fulfill their demand through imports.
- Trade Intensity Index: It is used to determine the share of one country's export to its partner over share of world export going to the same partner country. It is calculated as:

$$T_{ab} = (X_{ab}/X_{at}) / (X_{wb}/X_{wt})$$

Here,  $x_{ab}$  and  $x_{wb}$  are the values of "a" country's export and world export to country "b" and where  $X_{at}$  and  $X_{wt}$  are country "a" total export and total world export respectively.

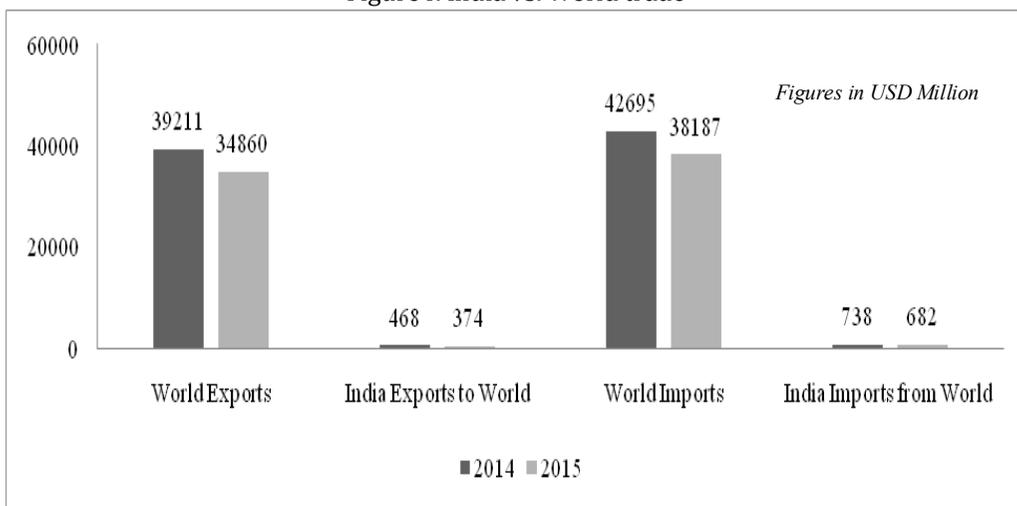
- Balance of Trade: A method which examines trade position of countries with reference to their total expenditure and total revenue. There may be trade deficit when imports are higher than export or trade surplus in vice-versa.

**Findings**

In this industry majority of players are small & medium enterprises and some are from unorganized sectors. In India many small companies do not aware about export procedure and many companies are unable to make strategies and gain advantage of trade agreements across the globe. Today, more than 385 Trade agreements are active in world and even India is quite active and signatory of more than 15 trade agreements with individual countries & regional trade blocks. Therefore, with some analytical tools we will try to explore markets for trade of auto components.

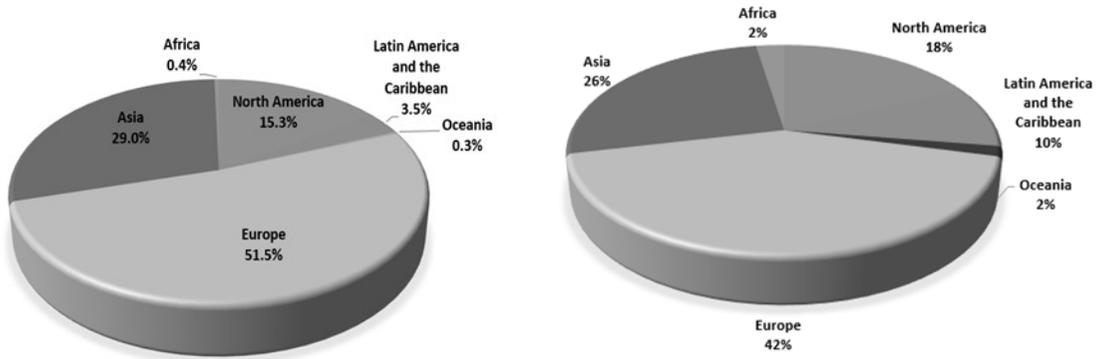
Fig.4 depicts that global auto components trade dropped by 12 percent from USD 82 billion in 2014 to USD 73 billion in 2015. Apparently India's trade also registered a decline of 14 percent in the year 2015 as in 2014 trade was USD 1206 million followed by import and export which came down to 1056 million in 2015. Further, India contributes only 1.44 percent in world trade for rubber auto components which is extremely low.

Figure 4. India vs. World trade



Source: compiled from Trade Map

European region is one of the largest contributors of rubber auto components followed by Asian region as disclosed through fig. 5. Africa, Oceania, Latin America and North America are the trade deficit regions and imported USD 12 billion of rubber components i.e. 32 percent of world import in 2015. Further in terms of imports, Europe is again leading followed by Asia and North America whereas Latin America, Africa and Oceania have least share in imports.

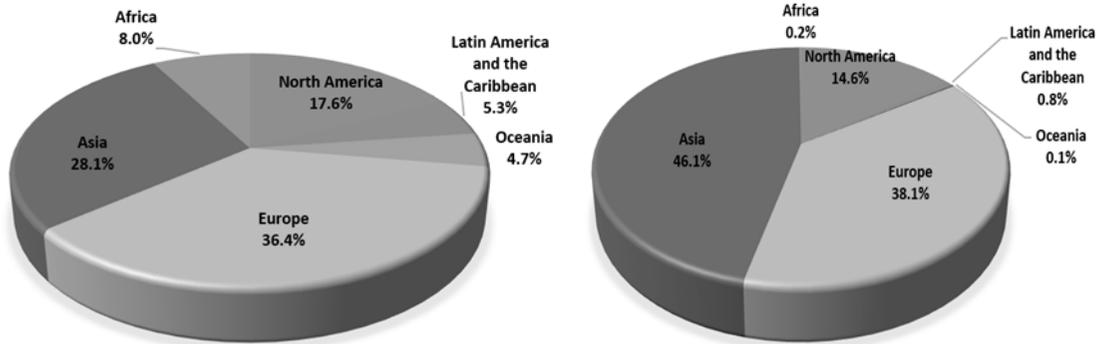


Source: Ibid

Figure5.Region wise Global Export & Import

Europe and Asia are the two main regions where India has exported USD 241 million worth of rubber auto components i.e. 65 percent of total exports in 2015. India prefers to import from Asia and European region as their share is 46 and 38 percent respectively. Hence, Africa, North America, Latin America and Oceania are least attractive regions in terms of trade prospective.

Figure6. Region wise India's Export & Import



Source: Ibid

A shift share analysis discloses the change over time in a particular variable due to major factors such as national, industrial and regional one. Here, Shift share analysis has identified top ten prominent countries as these are the big importers of rubber components and all have attained positive results with impressive index. USA, Mexico and Canada have large imports as per Table 1 which also shows that these countries have huge demand. Majority of top five competing nations are taking the advantage of trade agreements whereas India is nowhere in the list of top trading partners. Therefore, India must explore low based countries over the other developed markets.

Table: 1  
 Shift Share Analysis

Sr. No.	Importers	Figures in USD Million: 2014	Figures in USD Million: 2015	Shift Share Result	Competing countries
1	United States of America	5446.67	5284.41	31.36	Mexico, China, Canada, Japan, Germany
2	Mexico	2039.15	2114.00	18.60	USA, China, Japan, Germany, France
3	Vietnam	434.36	491.53	5.71	China, Japan, Korea, Thailand, Taiwan,
4	Hungary	601.39	578.35	4.09	Germany, Czech Republic, Poland, Italy, Turkey
5	Canada	1620.42	1491.06	3.83	USA, China, Mexico, Japan, Germany

6	Qatar	66.11	82.92	1.99	UK, Germany, France, USA, Japan
7	Egypt	168.81	145.83	1.84	Japan, China, Germany, Italy, USA
8	Czech Republic	1104.96	1003.55	1.36	Germany, France, Korea, Slovakia, Poland
9	Saudi Arabia	159.93	162.07	1.29	USA, Germany, UAE, China, UK
10	Singapore	449.02	379.99	1.15	USA, China, Malaysia, Indonesia, Japan

Source: Compiled from ITC database

According to Traditional method, while comparing current data with previous one, a similar trend has been found in toptenimporters. Table 2 identifies those countries which were not recognized in shift share analysis. Further, this evaluation discloses six new countries which have strong demand for respective products such as Germany, China, France, UK, Poland and Japan. As a result, U.S.A, Germany and China stand first, second and third respectively.

**Table: 2**  
**Traditional Method**

Sr. No.	Importers	Figures in USD Million 2014	Figures in USD Million 2015	Competing countries
1	United States of America	5446.67	5284.41	Mexico, China, Canada, Japan, Germany
2	Germany	4453.30	3816.68	Poland, Italy, Czech Republic, France, Turkey
3	China	4024.51	3358.67	Japan, USA, Korea, Germany, Thailand
4	Mexico	2039.15	2114.00	USA, China, Japan, Germany, France
5	Canada	1620.42	1491.06	USA, China, Mexico, Japan, Germany
6	France	1525.87	1327.22	Germany, Italy, Poland, Spain, Belgium
7	United Kingdom	1344.96	1222.88	Germany, USA, China, France, Poland
8	Czech Republic	1104.96	1003.55	Germany, France, Korea, Slovakia, Poland
9	Poland	1128.55	990.91	Germany, Italy, France, Czech Republic, Turkey
10	Japan	1041.27	945.16	China, Thailand, USA, Korea, Philippines

Source: *ibid*

Table 3 examines India's trade competitiveness with some identified countries as per previous methods. Share of selected countries in export over share of world export defines trade intensity index. Based on the indexing, Saudi Arabia, Singapore, UK, Poland, Japan and Canada have TII more than 1.00 which itself insignificant.

**Table: 3**  
**Trade Intensity Index**

Figures in USD Million						
Sr. No.	Country	Export to India at 6 digit level	Export to India at 2 digit level	World export to India at 6 digit level	World total export to India at 2 digit level	Trade Intensity Index
1	Saudi Arabia	9.68	49.27	162.07	2221.09	2.69
2	Singapore	5.99	13.40	379.99	1319.04	1.55
3	United Kingdom	25.62	90.71	1222.88	5245.78	1.21
4	Poland	10.37	30.55	990.91	3211.46	1.10
5	Japan	4.15	17.58	945.16	4246.02	1.06
6	Canada	8.24	32.79	1491.06	6173.00	1.04

7	United States of America	57.47	307.71	5284.41	27982.17	0.99
8	Hungary	1.02	3.52	578.35	1836.67	0.92
9	Germany	32.93	141.05	3816.68	14525.63	0.89
10	Egypt	5.22	38.06	145.83	899.19	0.85
11	France	9.84	61.94	1327.22	6644.31	0.80
12	Czech Republic	0.96	2.97	1003.55	2389.96	0.77
13	Qatar	1.86	11.38	82.92	329.67	0.65
14	China	4.53	29.63	3358.67	14157.61	0.64
15	Mexico	4.72	35.00	2114.00	6564.32	0.42
16	Viet Nam	2.45	20.68	491.53	1603.89	0.39

Source: *Ibid*

Table 4 reveals the position of trade in selected countries to identify the revenue deficit or surplus. Majority of selected countries have negative results. Countries like Mexico, USA, Canada and China have significant import of auto components and they are under trade deficit situation. This verifies the importance of traditional method where we identified France, Poland, Japan and Germany and these are having trade surplus as they might be doing value addition in auto components to export it further. Accordingly, India can plan for its extension and work on it to grow further or at least find a significant place in list of emerging economies.

**Table: 4**  
**Balance of Trade**

Sr. No.	Country	Figures in USD Million		
		Export Value-2015	Import Value-2015	Balance of Trade
1	Mexico	783.0	2114.0	-1331.01
2	United States of America	4427.7	5284.4	-856.67
3	China	2515.7	3358.7	-842.92
4	Canada	907.4	1491.1	-583.65
5	United Kingdom	859.0	1222.9	-363.85
6	Hungary	399.1	578.4	-179.27
7	Saudi Arabia	2.1	162.1	-159.95
8	Viet Nam	342.6	491.5	-148.96
9	Egypt	4.9	145.8	-140.90
10	Qatar	0.8	82.9	-82.09
11	Czech Republic	921.9	1003.5	-81.68
12	Singapore	358.5	380.0	-21.48
13	France	1483.0	1327.2	155.80
14	Poland	1576.3	990.9	585.35
15	Japan	2142.2	945.2	1197.01
16	Germany	5121.8	3816.7	1305.10

Source: *Ibid*

### Conclusion & Suggestions:

Growth pattern in export is a positive sign for auto component industry. To grow further, share of domestic manufacturers and aftermarket both have an essential role in today's competition. While comparing India's import with export, an optimistic picture has been found as exports were growing. Some favorable destinations

are also found such as USA, Germany, Turkey and UK but still there is a challenge to raise trade contribution globally and limit imports as well. Here it was also important to know our region wise competing nations along with traditional markets. Europe and Asia are the two major regions from where India prefers to trade whereas America and Oceania are the least attractive ones. As per shift share analysis, all selected economies have positive values that show the development prospective. USA, Mexico and Vietnam have attained high results and taking advantage of trade agreements.

According to traditional method, we found six new economies such as Germany, China, France, UK, Poland and Japan as these are also large importers of rubber auto components. India may opt for EU countries such as Germany, France, UK, Poland, and Czech Republic as average import duty is low on Chapter 40 auto components. Canada can also be considered because of duty advantage, most of its tariff lines attract 0 percent duty. On the contrary, China can be avoided at this juncture because of the high most favoured nation (MFN) rate. Saudi Arabia has been emerged as an attractive partner pertaining to this product category as per Trade Intensity Index. Out of 16 economies, 5 have got values close to one whereas, 10 economies have insignificant results but cannot be avoided because of their high demand and growth outline. On the basis of trade position, France, Poland, Japan and Germany can be considered as new market in addition to previous ones.

India has major treaty with manufacturing nations such as Thailand in ASEAN, South Korea, Japan and these nations have strong auto component industry as well. Furthermore, import duty on auto components is gradually declining under signed trade agreements which provided greater access to the Indian Market. This is one of the reasons that India auto components trade deficit is increasing every year. Additionally, a country like China has been taking advantage of low MFN as it is comparatively low than many other emerging markets. India is likely to produce more than 75 million units by 2026 as per automotive mission plan 2016-2026. Indian auto component industry is expected to grow 5 times more than its current level of USD 39 billion to USD 200 billion. For that purpose, this industry requires investment i.e. around USD 25 billion in the country. Direct employment of 3.2 million people can also be created through it.

There are many factors that actually help the Industry to achieve its targets such as more than 70 percent of population is below the age of 35 years who can be considered as potential buyers; Affordable vehicles are also one of the push factors to generate demand in India; Competition among present market players results into more innovations and last but not the least; Finance availability to manufacture more auto components so that domestic as well as global demand can be fulfilled.

Large domestic markets, increased purchasing power, infrastructural growth and systematic government policies are adding a momentum of progress in the Make in India initiative. It would definitely make India a favorite destination for global investment.

It would be a great challenge to manufacture automobiles along with auto components and emerge as global market supplier. Automobiles component manufacturing association and Government of India both are working together to upgrade and support small and medium auto component manufacturers.

## References:

- Asadullah and Syed Khusrroo. (2013). Issues and Challenges in the Indian Auto Component Industry with special reference to Indo Thailand FTA. *Indian Journal of Management Science*, 03, 10-21.
- Angela, Guillaume & Soledad (2005). *World Trade Competitiveness: A Disaggregated view by Shift-Share Analysis*. CEPII Working papers, 2005-23
- *Automotive Mission Plan (2006-2016)*. Ministry of Heavy Industries & Public Enterprises- Government of India
- Bhasker, V. (2013). *Indian Component Industry: A Decade of Growth and Way Forward*. *Research Journal of Management Science*, 02(03), 19-27
- Balassa, B. (1977). *Revealed Comparative Advantage Revisited: An Analysis of Relative Export Shares of the Industrial Countries*. *The Manchester School of Economic & Social Studies*, 45 (4), 327-44
- Batra, Amita and Khan. (2005). *Revealed Comparative Advantage: An Analysis for India and China*. India Council for Research on International Economic Relations (ICRIER), working paper , 168
- Chawananon, C. (2014). *Factors Affecting the Thai Natural Rubber Market Equilibrium: Demand and Supply*. *Asian Social Science*, 14(01)
- Daniel, C. (2000). *Shift Share Analysis: Further Examination of Models for the description of Economic Change*. *Socio- Economic Planning Sciences*, 34, 177-198
- Gazel, R. and Schwer, R.K. (1998). *Growth of International Exports among the states: can a modified shift-share analysis explain it?* *International Regional Science Review*, 21(2), 185-204
- *Government plans(2017)*: <https://www.ibef.org/industry/india-automobiles.aspx>  
Retrieved in April 2017

- 
- Kampan,P.(2017).Sustainability and Competitiveness of Thailand’s Natural Rubber Industry in Times of Global Economic Flux. Canadian Center of Science and Education,14(01)
  - Kaplinsky, R. & Justin, B. (2000). Globalization and Trade Policy Reform: Whither the Automobile Components Sector in South Africa? Sage Journals: Competition and Change, 04(02), 211-243
  - Kathuria, L. & Singh, J. (2015). Indian Auto Components Sector: A Perpetual Study of Small and Median Enterprises. Asia Pacific Journal of Management Research and Innovation, 11(04)
  - Kumar Manoj, R. (2015). A Study on the Challenges Faced by Automobile Component Exporters. Indian Journal of Applied Research, 05, 104-106.
  - Kumaraswamy, A., Mudambi, R., Saranga, H., Tripathy, A. (2012). Catch-up Strategies in the Indian Auto Component Industry: Domestic firm response to market Liberalization. Journal of International Business Studies, 43(4), 368-395
  - Markusen,A.R., Noponen,H., and Diressen,K. ( 1991). International trade, productivity and U.S. regional job growth: A shift-share interpretation. International Regional Science Review, 14(1), 15-39
  - MarketsandMarkets Research Private Ltd (2015). Rubber Molding Markets for Automotive Components& Sub Components- Global Trends & Forecast to 2020. Marketsandmarkets.com, AT 3944
  - Saripalle, M. (2007). Export Competitiveness in the Indian Auto Components Industry: Does Low wage cost matter. Madras School of Economics working Paper, 15
  - Sachin and Chaudhari, J.S. (2010). Indian Auto Component Industry: Challenges Ahead. International Journal of Economics and Business Modeling, 01, 01-11.
  - Siam (2006). The Indian Automobile Industry: Statistical Profile 2005-06. Society of Indian Automobile Manufacturers, New Delhi
  - Trade Map by ITC (2017): [www.trademap.org](http://www.trademap.org), data retrieved in March 2017
  - Viswanathan, P. (2008). Emerging Smallholder Rubber Farming systems in India and Thailand: A Comparative Economic Analysis. Asian Journal of Agriculture and Development, 5(2), 01-20