

Trade Liberalisation and International Production Networks in Asia: Experience of Indian Automotive Sector¹

Study by

Biswajit Nag
Indian Institute of Foreign Trade
B-21 Qutab Institutional Area
New Delhi-110016
INDIA
biswajit@iift.ac.in

¹ This document is issued without formal editing. This paper is prepared as an input under ARTNeT Initiative, aimed at building regional trade policy and facilitation research capacity in developing countries. The opinions, figures and estimates are the responsibility of the author and should not be considered as reflecting the views or carrying the approval of the United Nations, ARTNeT or author's employer. Any remaining errors are the responsibility of the author.

Preface

Acknowledgements:

Mr. Sudam Maitra, ED, Supply Chain, Maruti Suzuki

Mr. A. S. Puri, Senior General Manager, Tata Motors

Mr. Ram Natarajan, ED, SKH Metals

Mr. Lalit Sardana, Manager Marketing, SKH Metals

Mr. Sanjeev Ahuja, GM, Sigma Corporation

Mr. Sugata Sen, Director, Society of Indian Automobile Manufacturers (SIAM), New Delhi

Ms. Rinki Verma, SIAM, New Delhi

Mr. Paltu Sana, Deputy Director, Automotive Component Manufacturers Association (ACMA), New Delhi

Mr. R. S Ratna, Professor, WTO Centre, IIFT

Mr. V. L. Kantha Rao, Director, Ministry of Commerce

Mr. Debdeep De, Lecturer, IIMT, Gurgaon

Dr. Mia Mikic, TID, ESCAP

Dr. Yann Duval, TID, ESCAP

Dr. Dionisius A Narjoko, Professor, Centre for Strategic and International Studies, Jakarta

Dr. Raymond Atje, Professor, Centre for Strategic and International Studies, Jakarta

Dr. Archanun Kohpaiboon, Professor, Thammasat University, Bangkok

Dr. Bala Ramasamy, Professor, China Europe International Business School, Shanghai

Dr Khondaker Golam Moazzem, Research Fellow, Centre for Policy Dialogue, Dhaka

Table of Contents:

I. Introduction

II. The Evolution of Indian Automobile Industry

III. The Indian Automotive Market

IV. Policy Framework Surrounding the Indian Auto Sector

V. India's Trade in Automobile and Components

VI. Free Trade Agreements: Indo-Thai FTA and Expansion of Toyota's IPN

VII. Empirical Analysis as a measure of involvement in IPN: The Intra-Industry Trade Index

VIII. Indian Automotive Industry: Looking for an International Supply Chain

IX. International Production Network: Case of Maruti Suzuki and Tata Motors

X. Do RTAs matter for IPNs?

List of Tables:

Table 1: Basic Customs Duty structure for Automobiles

Table 2: Car Sales in India (2007-2008)

Table 3: India's Export and Import to/From Thailand

Table 4: Group IIT of the Products between India and Select Economies (2007-08)

Table 5: Indian OEMs going Global

Table 6: Indian Component Makers' Recent Acquisitions

List of Figures:

Figure 1: Regional Automotive Clusters

Figure 2: Autocomponent Industry Production

Figure 3: Investment in Autocomponent Industry

Figure 4: Domestic Market Share of the Major Vehicles Classified by Type

Figure 5: Trend in Export of Automobiles from India

Figure 6: Trends in Export of Automobiles from India

Figure 7: Trends in Import of Automobiles from World

Figure 8: Trend in Export of Autocomponents from India

Figure 9: Trend in Import of Autocomponents from World

Figure 10: Month wise export and import of Transport Equipments (2008)

Figure 11: Inventory and SCM Model for Maruti-Suzuki and TATA Motors

Figure 12: Direction of Trade of India's Automobile sector

References

Appendix

I. Introduction

Globalization refers to the universal phenomenon of technological, economic, and cultural change, as brought about by expanding facilities for intercommunication and interdependency between traditionally different cultures. The 1991 policy statement brought a major shift in India from controlled policy to liberal one. Imports/Exports were made free from most of the restrictions. The next one and half decade of Indian experience is a story of perpetual increase of growth emanating from strong policy overture and unleashed potential of entrepreneurship. Innovation, ability to take risk and coping up with the need of the globalised world is the driving force of today's Indian economy. Indian automobile industry has also evolved in a similar fashion to cater the rising consumer demand in the country and eventually has started satisfying global customers.

The Indian automotive industry is one of the world's fastest growing automotive industries growing at a Compounded Annual Growth Rate (CAGR) of approximately 17 per cent over the last five years². It is now the eleventh largest manufacturer of passenger cars, fourth largest manufacturer of commercial vehicles and the second largest manufacturer of two-wheelers in the world. It now produces 13 times more cars than it did 20 years ago (World Bank, 2005). . India is among the top 10 countries to design, develop and mass produce its own car. The automotive industry in India has thus undergone a transition from a few auto manufacturers, virtually non-existent auto components makers and low quality auto ancillary producers to the big league of global auto manufacturers, competitive component manufacturers and emerging ancillary producers. Some studies have revealed that earlier the Indian automotive industry was not competitive enough for the global market due to inferior quality, lower labour productivity and high cost of raw materials in India (Prodoshnath et al, 2006). However, globalisation, like the other markets has made the automotive market very competitive and brought the profit margins to a very low level. Component suppliers are the strength of the emerging automobile industry. Indian automobile component industry is relatively labour intensive by global standards and is in a transition stage as a low cost base for exporting labour intensive products (Saripalle, 2005). It is transforming itself from a low volume, fragmented market into an internationally competitive industry having advantage in skill oriented labour intensive components. Indian component suppliers have displayed a growing capability to cater to the engineering and production needs of the some of the world's biggest auto companies as many of the automobile majors are now outsourcing several components from India. The manufacturing costs in India are 25 to 30 percent lower than its western counterparts. Despite its growth, the share of Indian exports in global auto-component market is very small. The dynamics of the industry is undergoing a tremendous restructuring and tierisation. The various technological and non-technological innovations have been brought in by the industry to capitalize on the opportunities.

Following the de-licensing by the government of the auto industry in 1993, the automobile industry witnessed rapid transformations with the entry of many global players into India in the 1990s, making the domestic market increasingly competitive. Hyundai has succeeded in emerging as the second most important car manufacturer after Maruti Udyog Ltd. (MUL)³ in a very short period. The arrival of these MNEs has boosted the components sector. The situation is accentuated due to liberalization of investment and import regime. Hyundai has set up a 100 percent subsidiary firm (its largest investment outside South Korea) in 1998. It initially brought about 14 South Korean component suppliers to the Hyundai plant, to supply components that are not available in Chennai. Hyundai has about 70 major component suppliers; of these, only 14 are Korean joint

² Source: SIAM, 2008

³ Maruti was set up in collaboration with Suzuki. It remained as a joint venture (JV) company for long time. Recently Suzuki bought the Indian stakes converting Maruti into a wholly owned subsidiary of Suzuki.

ventures and the rest are mainly Tamil Nadu-based firms. Previously, Suzuki also set up several JV suppliers around Maruti factory in Gurgaon who used to receive advice from Suzuki in absorbing new technology and improving production efficiency. With the liberalization of policies and high growth of domestic demand, several other MNCs such as Toyota, Honda, Ford etc. have also entered Indian market. Some of them have full production facility and some still imports major components and assemble them here. As the import duties on used vehicles and new 'completely built units' (CBU) remained very high (100% and 60% respectively), companies find setting up production facility or importing cars in 'completely knocked down' (CKD) forms and having an assembly plant in India is more cost effective. Tariffs on components have come down from 35% in 2001-02 to mere 10% in 2008-09 with the possibility of going down further in near future. This has not only increased the production possibilities of cars but also fueled international trade of components. Export and import of components have experienced almost similar growth pattern since 2000 (Nag et al, 2007)⁴. The change of policy infused new life to the component sectors as many OEMs are increasingly buying from domestic component manufacturers. Efficiency of Indian ancillary sector has also given them the opportunity to export or in other ways help them increasingly get integrated to global supply chain of automobile industry. Though in comparison to countries like China and Thailand, India is far behind, the catching up is worth studying. In this context, the study proposes to analyse the changing pattern of supply chain in Indian automobile sector vis-à-vis trade liberalisation. How far regional trade agreements can potentially help the component sector to get integrated with other countries will also be studied. To understand the dynamics of the sector, Indian automobile policy and market structure has been briefly touched upon. The study is based on the inputs from company surveys, interviews with nodal persons in the companies and site visits as well. The choice of the companies is quite heterogeneous in nature which includes among others OEMs, JVs and MNCs on one hand and Tier 1 suppliers and SMEs who are in the ancillary sector on the other. Discussion with the policy makers of both Govt and think tanks were carried out to bring out a conclusive dimension to the study.

A. Industry Structure, Market Scenario and Policy Environment

II. The Evolution of Indian Automobile Industry

While the automotive industry in India started developing in the 1940s, distinct growth rates started only in the 1970s. Cars were considered ultra luxury products, manufacturing was strictly licensed, expansion was limited and there was a restrictive tariff structure. The decade 1985 to 1995 saw the entry of Maruti Udyog in the passenger car segment in collaboration with Suzuki of Japan, and Japanese manufacturers in the two-wheeler and commercial vehicle segments. After economic reforms took place in India in 1991, it is only in the mid-1990s, that the automotive industry started opening up. Thus, the mid-1990s are characterized by the entry of global automotive manufacturers through joint ventures in India. Till the 1990s, the automotive industry in India was primarily dominated by Maruti Suzuki, Tata Motors, Hindustan Motors and Premier Padmini in the passenger car segment. Ashok Leyland, Tata Motors and Mahindra & Mahindra dominated the commercial vehicle segment while Bajaj Auto dominated the two-wheeler segment. After the year 2000, further policy changes were introduced and focus on exports was increasingly getting importance. Following that, the Core Group on Automotive Research & Development (CAR) was set up in the year 2003 to identify priority areas for Research and Development (R&D) in India⁵. Turnover of the automotive industry in the year 1998–1999 was Rs. 360 billion and the industry provided employment to over 10 million people directly and indirectly. The contribution of the

⁴ Refer to Table 8 of page 29

⁵ Ministry of Heavy Industries and Public Enterprises, 2006

automotive industry to the GDP during the same period was 4 per cent rising from 2.77 per cent recorded in the year 1992–1993⁶.

Thus the Indian automotive industry has been one of the key drivers of the economy, experiencing robust growth over the years. Overall domestic sales have been growing at 9 per cent CAGR over the past five years. All sections of the industry have been growing – passenger vehicles at 14 per cent CAGR, commercial vehicles at 17 per cent, two-wheelers at 8 per cent, and three-wheelers at 7 per cent. Domestic vehicle sales in 2007-08 stood at 9.6 million units, including 7.2 million two-wheelers, 1.5 million passenger vehicles, 0.5 million commercial vehicles, and 0.4 million three-wheelers.⁷ Exports of vehicles have been growing even more rapidly, at a five year CAGR of 27 per cent. The key drivers have been two-wheelers and commercial vehicles. Overall exports of vehicles in 2007-08 were 1.2 million units (SIAM, 2008).

The size of the Indian market has given the auto industry the scale it needs to further expand its export efforts. On the demand side, India is one of the largest markets for small cars in the world, with more than 8 million households that can afford cars in the \$5,000 to \$8,000 range. With the introduction of cars like the Nano, and similar vehicles being developed by players such as Toyota, Renault, and Suzuki in the \$2,500 to \$5,000 range, the number of households that can afford a car will triple. That market already supports a well-established engineering talent pool and a large supplier base that can engineer and manufacture cars suited for export to other emerging markets. The favourable demographics has led to OEMs like Suzuki and Ford who are looking at India as a key R&D centre for their global operations. The Indian market not only offers scope for innovation, but in many ways mandates players to come out with innovative products to penetrate the market. India's auto component industry is well-placed to support growth in the automobile market. India has a strong supplier base that provides the entire range of components. Scaling up further to meet the international demand is no more a distant possibility for the growing Indian automobile sector.

Following Thai model⁸, India must encourage investment in niche area (such as small cars) and actively promote small-car R&D by encouraging universities to participate in the development of new auto technologies, components, and materials, and by investing in testing labs that could be shared among OEMs and Tier 1 suppliers. Compared with Western countries, India still has a relatively underdeveloped supplier base, and without strong suppliers, it will be much more difficult for OEMs in India to design and build the new products needed to win in the export market. The government can help local suppliers increase both their capabilities and their capacity by encouraging exports, providing capital to build globally efficient scale, and offering incentives to invest in new technologies. It could further develop the local supplier base by encouraging foreign companies looking to do business in India to enter into joint ventures and partnerships with local companies.

⁶ Ministry of Heavy Industries and Public Enterprises, 2000

⁷ SIAM, 2008

⁸ Despite its relatively small economy, Thailand is the second-largest market for pick-up trucks in the world, and the largest exporter of such vehicles. Thailand promotes investment consistently.

III. The Indian Automotive Market

The India automotive sector has a presence across all vehicle segments and key components. In terms of volume, two wheelers dominate the sector, followed by passenger vehicles. The industry had few players and was protected from global competition till the 1990s. After government lifted licensing in 1993, with the arrival of global players, the sector has become highly competitive.

Automobile manufacturing units are located all over India. These are, however, concentrated in some pockets such as Chennai and Bangalore in the south, Pune in the west, the National Capital Region (NCR, which includes New Delhi and its suburban districts) in the north, Jamshedpur and Kolkata in the east and Pithampur in the central region. Following global trends, the Indian automotive sector also has most auto suppliers located close to the manufacturing locations of OEMs, forming regional automotive clusters. Broadly, the three main clusters are centered around Chennai, Pune and the NCR. Figure 1 provides a summary view of automobile clusters in India.

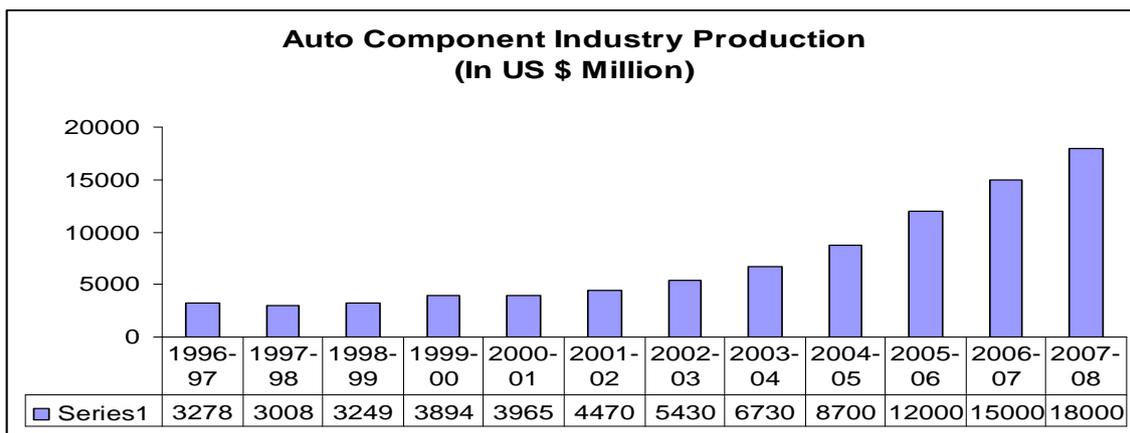
Figure1: Regional Automotive Clusters:



Source: “Global Competitiveness of Indian Auto Component Industry & Its Sustainability”, ACMA, 2008

The Indian automotive component industry is highly fragmented. There are nearly 6,400 players in the sector, of which only about 6 per cent are organised and the remaining 94 per cent are small-scale, un-organised players (KPMG Report, 2006, pp6). In terms of value added, however, the organised players account for nearly 77 per cent of the output in the sector. The value addition of the Indian autocomponent industry is shown below. From the figure 2 it is evident that the production has increased significantly over the years rising to US\$18000 million in 2007-08 from around US\$ 4000 in 2000-01.

Figure2: Autocomponent Industry Production



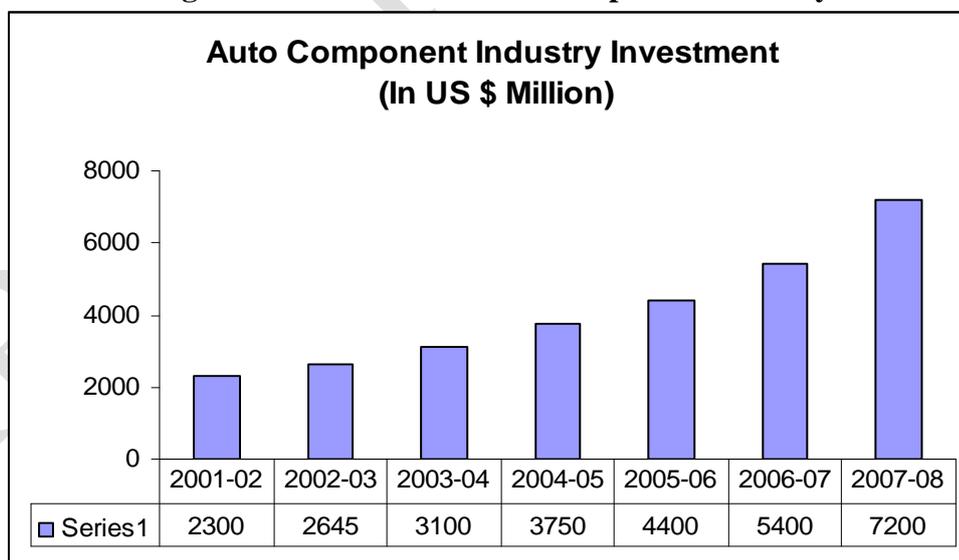
Note: Estimated value for 2007-08

Source: ACMA

http://acmainfo.com/docmgr/Industry_Statistics_Graphs/Industry_Statistics_Auto_Components_08.xls

The autocomponent industry is gaining its significance. Though globally it is not very prominent due to the demographic and maintenance of environmental standards, the industry has attracted a huge investment and thus poses an important position in the domestic market. The investment in the auto-component industry is shown below in Figure 3. From the figure it is evident that the investment has increased by more than three times during the period 2000-01 and 2007-08. Big players like Toyota invested in recent times around US\$ 197 million in India to supply transmission system, gear boxes, axles, propeller shafts and aluminum pressure die casting products both for Indian and foreign market .

Figure 3: Investment in Autocomponent Industry



Note: Estimated value for 2007-08

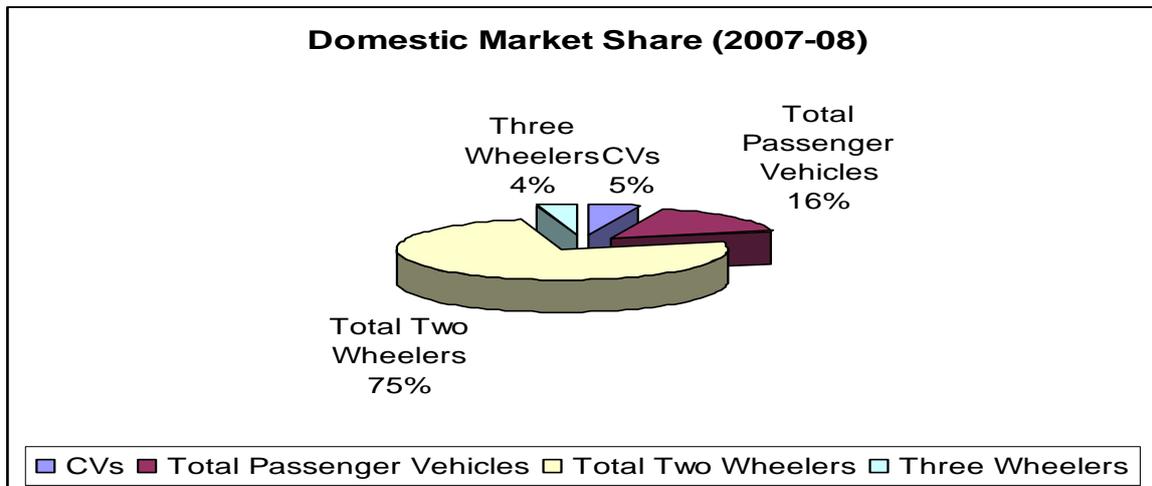
Source: ACMA, 2008

http://acmainfo.com/docmgr/Industry_Statistics_Graphs/Industry_Statistics_Auto_Components_08.xls

The domestic automotive market is largely diverse with demands in all kinds of vehicles ranging from two wheelers to commercial vehicles. Of late, the demand for the multi utility vehicle is also increasing. The figure below depicts the domestic market share of the different types of

vehicles. From the figure it is evident that the market share for the two wheelers is the highest in domestic market (75%) followed by passenger vehicles (16%).

Figure 4: Domestic Market Share of the Major Vehicles Classified by Type



Source: SIAM, 2008

<http://www.siamindia.com/scripts/industrystatistics.aspx>

IV. Policy Framework Surrounding the Indian Auto Sector

The Indian auto policy has generally been in line with the prevailing industrial policy framework. During the British regime, India had no auto industry to begin with and all the automobiles were imported from the global auto manufacturers such as General Motors and Ford Motors. In the 1940s, Hindustan Motors and Premier Motors were established by Indian entrepreneurs, by importing know-how from General Motors and Fiat respectively. In the 1950s, a few other companies such as Mahindra and Mahindra, Ashok Motors (with Technical Collaboration with Leyland Motors) and Bajaj Auto entered the market for commercial vehicles and two-wheelers. Most of them either imported auto-components or produced them in-house, till mid-1950s, when India launched import substitution programme. This development, followed by the L.K. Jha Committee's recommendations in 1960 to develop an indigenous ancillaries sector, resulted in the evolution of a separate auto-component sector. From being a highly protected segment pre-1980s, the auto-component industry in India has gradually emerged as an important industrial sector. Till 1991, the Phased Manufacturing Programme (PMP), under which domestic OEMs had to increase the proportion of domestic inputs over a specific time period, had laid foundation for the Indian auto-component sector. Over the years the sector became quite confident to face competition from abroad. The Government of India has recognised the automotive industry as key to sustaining economic growth in the country, and has, over the years, come out with a series of policy initiatives to support growth in the industry. These range from providing excise duty, concessions to tax incentives for investments in the sector, incentives for promoting R&D, and measures for export promotion and reduction of import duties for components. Apart from central government, several state governments also have focused on attracting investments in the auto sector.

The reforms of 1991, followed by the entry of global OEMs and Tier-1 suppliers in India, paved the way for expansion of range, technologies and number of auto-component manufacturers. This led to a major transition in the Indian auto industry, wherein the vehicle manufacturers started outsourcing most of their components from the autocomponent manufacturers. Ever since the delicensing of passenger car segment in 1993, the Indian auto industry has grown bigger, with new international players entering the market. Since 2000, there have been many significant policy

developments such as removal of Quantitative Restrictions (QRs) on auto imports and permission for 100 per cent FDI in the sector. Financial liberalisation enhanced credit availability to consumers and this, in turn, led to a boost of auto loans in India, which has been a key driver of demand for automobiles.

Auto policy, 2002, stresses on the need to provide direction to the growth and development of the auto industry in India which finally led to reduction of duties in the auto-component sector to a large extent and the automobile sector to some extent and extension of R&D incentives to the auto sector. R&D thrust by the government can be inferred from the increased R&D budget allocation for this sector. In 2005-06, a few major policy developments relevant for the auto sector took place. Implementation of VAT has taken place in a few states. Euro III emission norms have been introduced in 11 metro cities and at the same time, the Euro II norms have been implemented in rest of the cities. These norms have been delayed for the diesel vehicles due to the unavailability of fuel. Therefore, the government decided to implement these norms in phased manners in selected northern states. As a result of this, automobile producers had to improve their technology which in turn had an impact on the component sector too. Finance Bill 2006 reduced excise duty of motor vehicles to 12.5 per cent against 15 per cent before and import duty of raw materials to 5-7.5 per cent against 10 per cent before and has given a thrust to the development of infrastructure, which is the key factor influencing auto industry, both as a driver of demand and as a facilitator of enhancing competitiveness in manufacturing of auto products.

The accession to the UNWP (United Nations Working Party) 29 -1998 is another important decision taken by the Indian Government in 2005-06. This agreement is a significant step towards the global integration of the Indian auto industry. A great deal of progress has been made on bilateral and regional trade agreements. Automobile industry is expected to get its due benefit when these agreements will be operational with full throttle. In this context, we must note that few components have been put in the Early Harvest Scheme (EHS) of India-Thailand FTA. India's exports to Thailand in gear boxes (one of the EHS products) have increased significantly in post FTA situation. Import of other auto component in EHS such as pistons showed a slow rising trend. However, opinion has been made by major stakeholders that Indian component manufacturers are still not in a position to compete with their counter parts from East and South East Asia. As a result, some auto-components (such as engines, etc) may remain in the negative list of India-ASEAN FTA. The industry has identified 77 items to be put in the negative list for all the proposed bilateral and regional agreements India is currently negotiating. Some items proposed for the negative list include two-wheelers in the range of 75-250 cc engine capacity, petrol and diesel engines for all vehicles and all commercial vehicles, etc. Strict rules of origin (RoO) have also been proposed. The industry is in favour of product-specific RoO with ASEAN countries for the auto sector as there is a high probability of products from Korea, Japan and China coming into India through the ASEAN region. The industry's proposals have been supported by the ministry of heavy industries in the Auto Mission Plan released in end 2007⁹.

In India, safety standards in 1991, the first state emission norms came into force for petrol vehicles and in 1992 for diesel vehicles. From April 1995, fitting of catalytic converters in new petrol-driven passenger cars was mandated in the four metros and unleaded petrol was also introduced. From April 2000, unleaded petrol is available in the entire country. As for road safety, numerous awareness programmes are arranged all over the country, since 2000-10 is a safety decade.

In developed countries, lead was phased out from petrol over a period of more than 10 years, while in India this was achieved in just six years. The time gap between the introduction of

⁹http://economictimes.indiatimes.com/Auto_Components/Autocos_list_77_items_for_FTA_negative_list/articleshow/1525471.cms

norms in Europe and India is narrowing down gradually. Euro I was introduced in the EU in 1983, while the same was introduced to India in 1996. Euro II was introduced in the EU in 1996-97. Bharat Stage-II norms, which are the Indian counterparts of Euro II, have been introduced for smaller passenger vehicles (Gross Vehicle Weight < 3.5 tonnes) in 2000, and for heavier vehicles (Gross Vehicle Weight > 3.5 tonnes) from 2001 in National Capital Region of Delhi. For Mumbai, Chennai and Kolkata, these standards were extended to different months in 2001. Later, these norms were extended to the rest of the country in phases by 2005. However, for some categories of vehicles such as two-wheelers and three-wheelers, new generation norms are yet to be announced. Bharat Stage-III norms have been implemented in many Indian states in phases¹⁰.

In 2006, a Draft of Automotive Mission Plan Statement was released by the Ministry of Heavy Industries, in consultation with industry.¹¹ The Government of India has drawn up an ambitious Automotive Mission Plan 2016, with the following vision statement: *“To emerge as the destination of choice in Asia for the design and manufacture of automobiles and automotive components. The output of India’s automotive industry will be US\$ 145 billion, contributing to 10 percent of India’s GDP, and providing employment to 25 million persons additionally by 2016”*. This document provides special emphasis on small cars, MUVs, two-wheelers and auto-components. Measures suggested include setting up of a National Auto Institute, upgrading infrastructure, cutting the duties of raw materials and fiscal incentives for R&D.

In August 2006, the Working Group on Automotive Industry in the Ministry of Heavy Industries has brought out a report for the Eleventh Five Year Plan. This document stresses on the need of speeding up the move towards VAT in the states. Labour regulations, paperwork involved in government-related transactions, internal trade barriers, infrastructure bottlenecks, raw materials, human capital, increasing interest rates and threats due to FTAs are, as mentioned in this document, barriers to competitiveness. This report notes that the effective levy is lower for a Counter-Vailing Duty (CVD) than excise duties locally, because of the fact that excise is made after including the post-manufacturing expenses in the price, while imported Completely Built Units (CBUs) have the advantage of being levied the CVD before post manufacturing expenses. In addition, the document recommends various other measures such as upgrading human resources, mandatory inspection and control and retirement of vehicles based on road-worthiness.

Financial Bill for 2007-08 has very few measures that affect the auto sector. Cut in import tariffs of commercial vehicles to 10 per cent is expected to induce further competition in the Indian commercial vehicles (CVs) sector. Since CVs are required in the development of infrastructure, duty reduction on CVs may give a boost to infrastructure. Increase in total tax burden is certain to occur now, because of the increase in education cess from 2 per cent to 3 per cent of total taxes. Extension of R&D incentives for five more years, reduction of Central Sales Taxes (CST) and increased infrastructural expenditure are positive features of the budget, for auto sector.

The decline in tariff rates in auto-components is accompanied by a rapid growth of this sector, though many had feared that lower protection could harm this sector. However, they differ across segments. Its demand is partly driven by drop in prices owing to customs and excise cuts in autocomponents and excise cuts in automobiles, though there are other factors driving production such as rapid income growth and the resultant demand expansion. The table below provides the tariff phasing out schedule over the years. It is clear from the table that the tariff phasing out for the

¹⁰ McKinsey (2005). Vision 2015 for the Indian Automotive Components Industry, Automotive Component Manufacturers Association of India and McKinsey and Company.

¹¹ Automotive Mission Plan 2006-16, Ministry of Heavy Industries & Public Enterprises, Govt. of India, Dec. 2006

components is much higher than that of the automobiles. Currently the debate is centered around the import tariff of vehicles which has not come down for sometime. Some experts feel the rationalization of import duties, particularly on cars and motorcycles, should be undertaken in a phased manner and only after ensuring that Indian automobile companies get a comparable access to global markets. Hence, Indian automobile industry has come a long way from a protected regime to a liberal environment. However, industry and government feel that it still requires some amount of protection for securing the stability. For which, strategic protections in the form of higher tariff in few segments, stricter RoO, etc are in place which will also get relaxed in a phased manner.

Table1 : Basic Customs Duty structure for Automobiles

		Hs code	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
Used Vehicle	MUV	8703	105	105	105	105	100	100	100	100
	Car	8703	105	105	105	105	100	100	100	100
	2 Wheelers	8711	105	105	105	105	100	100	100	100
	3 Wheelers	8703	105	105	105	105	100	100	100	100
New CBU	MUV	8703	60	60	60	60	60	60	60	60
	Car	8703	60	60	60	60	60	60	60	60
	2 Wheelers	8711	60	60	60	60	60	60	60	60
	3 Wheelers	8703	60	60	60	60	60	60	60	60
CKD & Components	MUV	8703	35	30	25	20	15	12.5	10	10
	Car	8703	35	30	25	20	15	12.5	10	10
	2 Wheelers	8711	35	30	25	20	15	12.5	10	10
	3 Wheelers	8703	35	30	25	20	15	12.5	10	10
CV		8702/04	35	30	25	20	15	12.5	10	10

Source: Prepared by author from information available in SIAM

B. Trade Dynamics, FTA and Data Analysis

V. India's Trade in Automobile and Components

Growth of Indian automotive industry is driven by domestic demand. India's share in world trade is quite small. International sales of vehicles have been increasing gradually. India has ambitious plans to achieve US\$ 35 billion in exports by 2016¹². The government is taking measures to facilitate growth in the industry through development of automotive clusters that will serve as a base for automotive companies to produce and export from their manufacturing facilities.

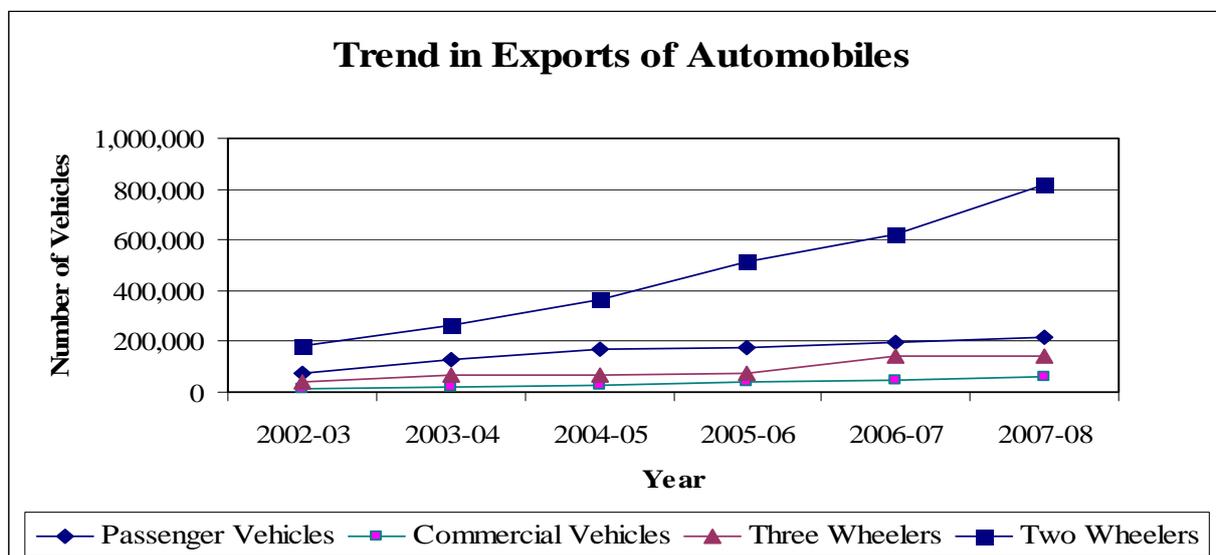
The industry is gaining worldwide recognition with a steady increase in the rate of growth of exports. Automotive exports crossed the US\$ 1 billion mark in the year 2003–2004, and increased to US\$ 2.76 billion in the year 2006–2007. The industry exported 15 per cent of its passenger car production, 10 per cent of commercial vehicles production, 26 per cent of three-wheelers production and 7 per cent of two-wheelers production in 2006–2007¹³. The key exporters for passenger cars are Maruti Suzuki, Tata Motors and Hyundai Motors, the key exporter for MUVs is Mahindra & Mahindra and the key exporters for two-wheelers are Bajaj Auto and Hero Group. India exports mainly two wheelers followed by small passenger cars. In 2007-08, it has exported more than 800,000 two wheelers and more than 200,000 cars (See Figure 5). In terms of values, India's major gain has been in the passenger car segment since 2002. (see Figure 6). Slow growth is observed in commercial vehicle segment. Though in terms of numbers, India's exports of two

¹² Automotive Mission Plan 2006-16, Ministry of Heavy Industries & Public Enterprises, Govt. of India, Dec. 2006

¹³ Ministry of Heavy Industries and Public Enterprises, 2008

wheelers experienced a jump, it is not fetching large export income as value wise export growth in this segment is much less than the value of car exports. Key destinations of exports are the west European countries, SAARC members, Middle East and North America.

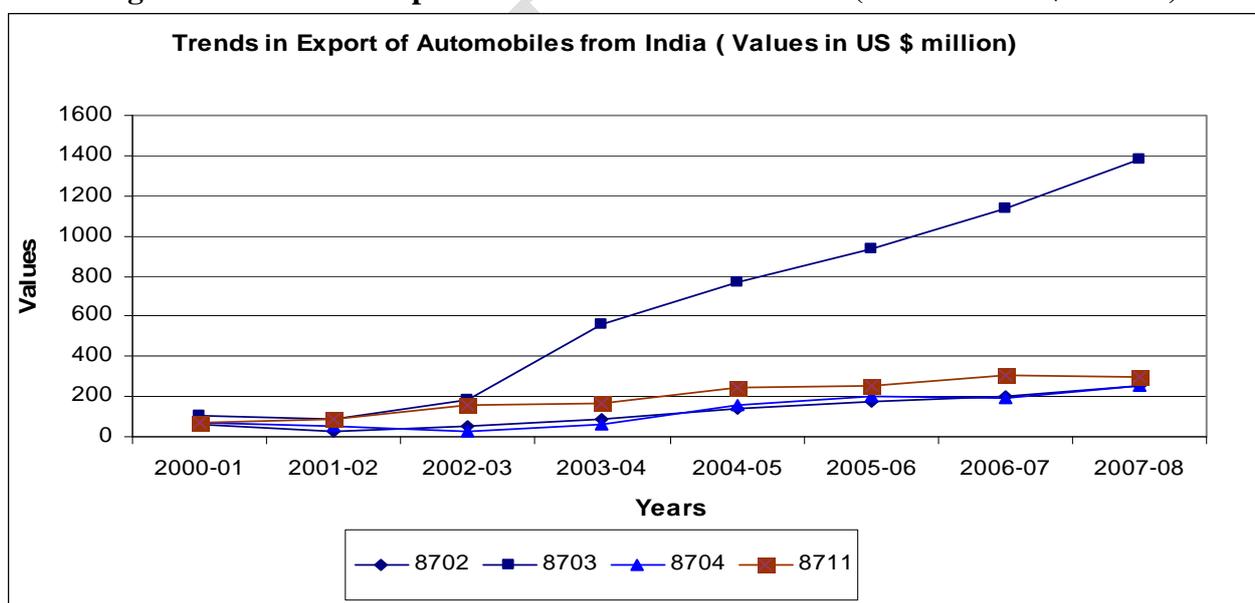
Figure 5: Trend in Export of Automobiles from India



Source: SIAM, 2008

<http://www.siamindia.com/scripts/industrystatistics.aspx>

Figure 6: Trends in Export of Automobiles from India (Values in US \$ million)



Source: Based on India Trades, CMIE.

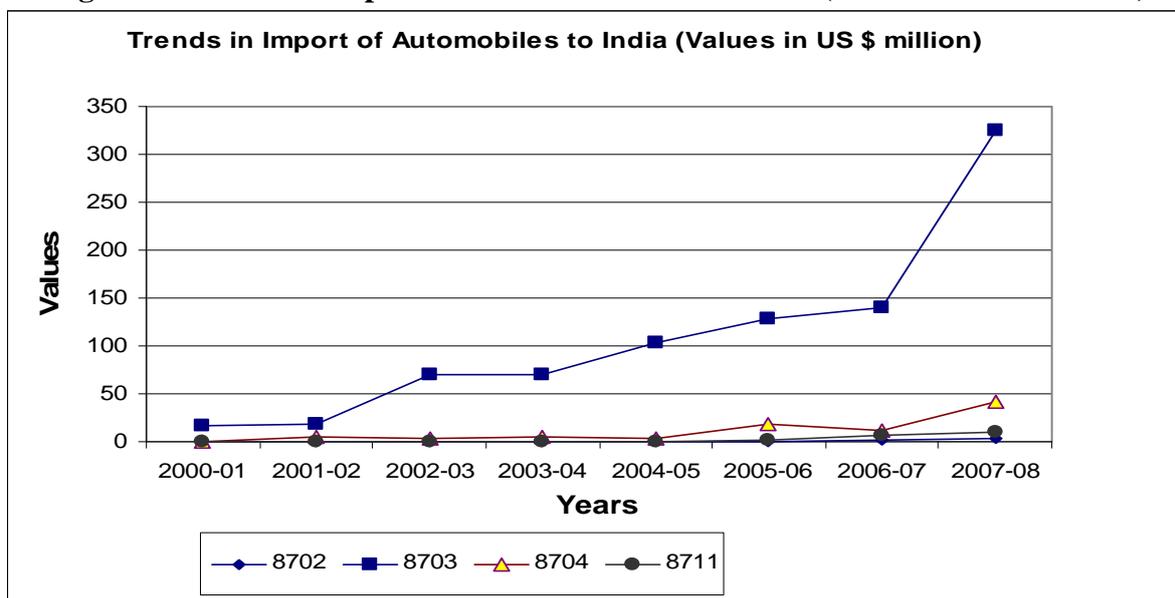
Note:

- 8702 Public-transport type passenger motor vehicle
- 8703 Motor cars & other motor vehicles for transport of persons (excl of 8702) including racing cars etc
- 8704 Motor vehicles for transport of goods
- 8711 Motorcycles (including mopeds) and cycles fitted with auxiliary motors

Figure 7 below depicts the trends in import of automobiles from world in value terms. It is seen from the figure that the import for motor cars for the transport of persons is highest followed

by the by the motor vehicles used for the transport of public goods. As India's GDP is growing so is the purchasing power. As a result of this, import of passenger cars has gone up significantly in recent past. However, export figures are much higher than the import in this segment.

Figure 7: Trends in Import of Automobiles from World (Values in US \$ million)



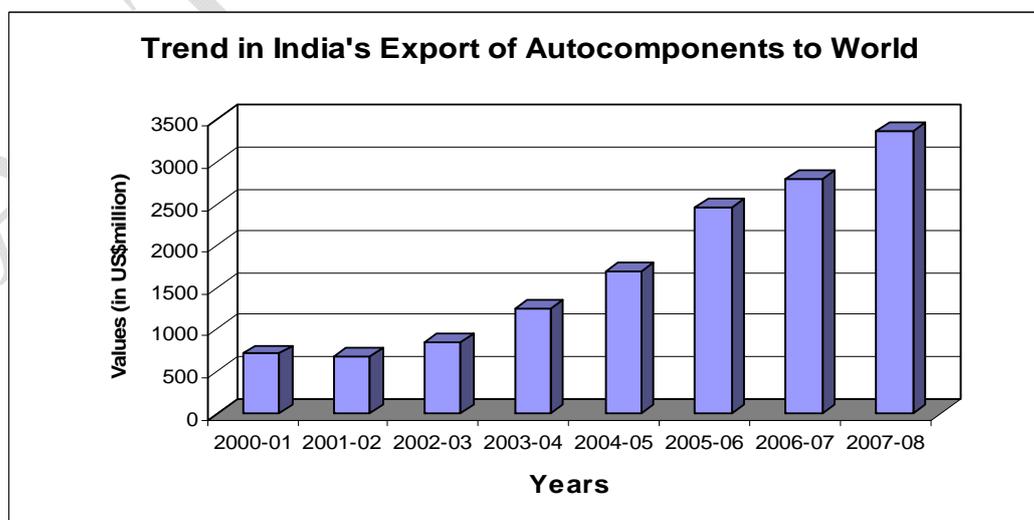
Source: Based on India Trades, CMIE.

Note:

- 8702 Public-transport type passenger motor vehicle
- 8703 Motor cars & other motor vehicles for transport of persons (excl of 8702) including racing cars etc
- 8704 Motor vehicles for transport of goods
- 8711 Motorcycles (including mopeds) and cycles fitted with auxiliary motors

Similarly auto-component exports have also surged ahead as described in the figure below. Though there are still some barriers in terms of access of updated technological skills, regulation of safety, maintenance of environmental standards, etc. the export figures of the autocomponent sector show that the sector is developing at a rapid pace especially since 2004.

Figure 8: Trend in Export of Autocomponents from India



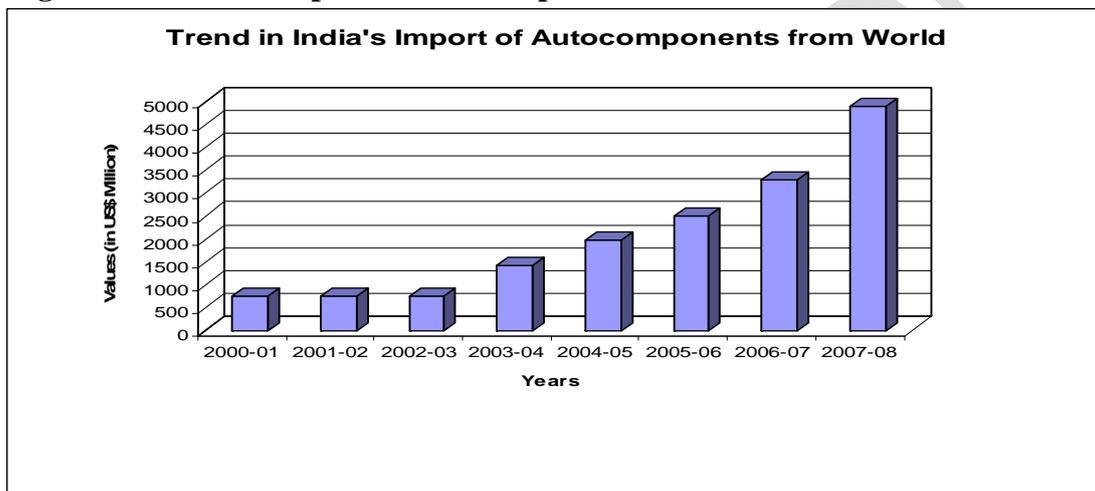
Note: Auto component products as defined by ACMA are considered.

Source: Based on India Trades, CMIE.

During 2007-08, India's total export of auto-components was around US \$3.3 billion (rose from mere US\$0.7 billion in 2000-01)¹⁴. The CAGR during the period 2000/01-2007/08 has been around 25%. India exports mainly chassis and body components, engine parts, metal parts etc.

Imports of component have experienced a similar pattern of growth. In 2007-08, India's import of components was around US\$ 4.9 billion. Import rose by CAGR of 30% during the period 2000/01-2007/8. large imports of components are mainly from Asian countries, EU and USA. India imports mainly critical components from Japan, Germany, etc. and non-critical components such as glass, products, locks etc from Thailand, China, etc. Body parts, engine, metal components are the major imported components. The large increase of exports and imports of components ensures a thriving automobile sector in India. The figure below suggests the increasing trend in imports of autocomponents in India from the rest of the world. For country wise detailed exports and imports are available in the Appendix A &B.

Figure 9: Trend in Import of Autocomponents from the World



Note: Auto component products as defined by ACMA are considered.

Source: Based on India Trades, CMIE.

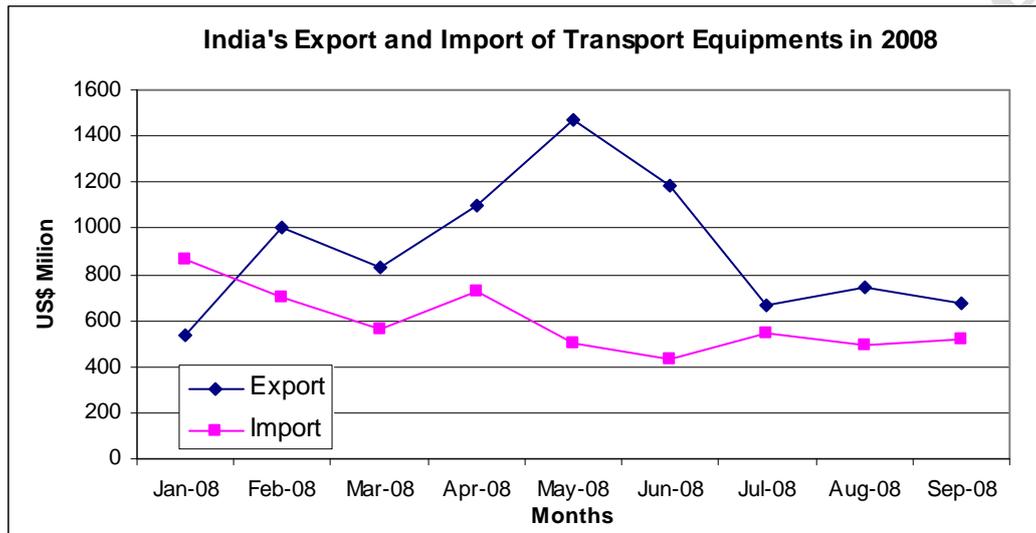
Like many other countries India is slowly moving towards overcapacity problem. One of the reasons of India's export orientation has been to tackle this overcapacity problem. As a result of this, the entire sector is not geared up equally for exports. The export growth reveals that vehicle export growth has been much higher than components. During 2001/2-2007/8, export of components grew by 25% where as export growth of vehicles was around 47%. India's major export destinations of automobiles and components are developed countries such as USA, UK, Germany and developing countries such as Middle East and SAARC members. ASEAN has still not yet been a major destination of Indian auto component products. Exports to South East Asian countries are minimal except Thailand where India exported components around US\$ 62 million in 2007/8. In case of vehicles, India exports motorcycles, passenger cars, tractors, vehicles for transporting more than 10 persons and vehicles for transportation of goods. (Nag et. al. 2007). On the other hand India imports substantially from Japan, China, Thailand etc. In 2007/8, India's import of components from Asia (excluding Middle East) was around US\$ 2.4 billion (US\$ 4.8 from World). From Japan it imported around US\$ 575 million and from China it was around US\$484 million. India's import from Thailand was around US\$ 234 million in 2007-08. India mainly imports critical components which are of high technology from Japan. India imports lot of

¹⁴ Auto component products as defined by ACMA are considered. For list of products refer to Appendix.

safety components also. However, China and Thailand is fast becoming major sourcing points of non-critical components such as metal parts, glass materials, locks, steering, brakes, clutches etc.

However, with the current financial crisis in place there is a slowdown in the auto sector. Though detailed data are still not available, aggregate trade data of transport equipments show that there is decline both in exports and imports in 2008. The decline in imports was gradual and slow. Exports were experiencing sharp rise till May 2008 and thereafter fell drastically. The market contraction in EU and USA are the major cause of declining exports of auto-components from India.

Figure 10: Month wise export and import of Transport Equipments (2008)



Note: Data based on Principal commodities as defined by DGCI&S

Source: *Data on Principal Commodities, India Trades, CMIE*

Going by the past three months small cars, mid sized cars and top end luxury cars were still holding out, whereas the executive segment has taken a big hit. Companies like Tata Motors, Maruti Suzuki, Hindustan Motors, Honda, and Ford were the ones in trouble whereas Skoda, and GM India were doing well. Hyundai was more comfortable as it always had an export market. Mr. Ravi Kant of Tata Motors pointed out that “Given the slowdown in the third quarter, our key objective was to match production with the demand of commercial vehicles to avoid build-up of inventory. So we took limited period closures at some of our commercial vehicles facilities. To that extent, capacity utilization has been less than normal, but it has served the important purpose of flexibly managing inventory in our efforts to maintain company’s profitability. At present, our plants are functioning normally. Whether in good times or bad, our effort always is to produce as per the market demand.”¹⁵ Thus with the global recession in place there is a slowdown of sales as there is widespread lack of liquidity despite the fact that the Indian economy is relatively insulated, with the Government’s strong system of checks and controls, the automobile sector being one of the important sectors in the economy has been hit by the slowdown.

¹⁵ Business India, March, 2009

Table 2: Car Sales in India (2007-2008)

(Figures in numbers)

Manufacturer	2007	2008	% change
Maruti Suzuki	71102	54875	-22.8
Fiat Palio, 500	2759	4252	54.1
Ford Fusion	1228	2363	92.43
Chevrolet Spark	26228	39765	51.61
Hyundai Santro, Getz, i10, i20	166960	210307	25.96
Maruti Alto, Wagon R, Zen, Swift, A- Star	502112	490636	-2.29
Skoda Fabia	752	6634	782.18
Tata India	142435	110361	-22.52
Total	842474	864318	2.59

Source: *Business India*, March, 2009

VI. Free Trade Agreements: Indo-Thai FTA and Expansion of Toyota's IPN

Add some intro with some more details on all fta signed by India and then identify those of consequence for car sector

India has signed a FTA in the recent years with Thailand in October 2003. This was to be operated through an "Early Harvest Scheme" (EHS), for which there are 84 products including fruits, vegetables, wheat, diamond and autocomponents identified over which an accelerated duty reduction formula, given below, was to be applied:

By 31st March 2004: 50% reduction from existing rates

By 31st March 2005: 75% reduction from existing rates

By 31st March 2006: 100% reduction from existing rates

Consequent to this FTA India's exports of helical springs, pumps, ball bearings and lighting equipment to Thailand have declined sharply over the years. The exports from India to Thailand have been good over these years, in gear boxes and parts of Spark-Ignition Internal Combustion Piston Engine (SIICPE). India's imports from Thailand have, however, increased in all these product categories over the years. India has a positive trade balance with Thailand only in Gear Boxes. This FTA has served well as an indicator that when India opens up trade with a country that is competitive in the auto industry, mutual gains are possible, since India is also competitive in certain segments such as in gear boxes, vis-à-vis Thailand. Following table describes the bilateral trade of two auto-components under Early harvest Scheme (EHS) between India and Thailand. The growth of gear box (HS 870840) is noteworthy. India is exporting more than US\$30 million consistently in each of the last three years which was not even US\$ 1 million in 2003-04.

Table 3: India's Export and Import to/From Thailand

(Auto components under Early Harvest Schemes)

(Value in Million US \$)

HS Code	Gear Box		Parts used for spark-ignition in engine	
	Export	Import	Export	Import
870840			840991	
Year	Export	Import	Export	Import
2001-02	0.01		0.44	0.01
2002-03	0.54		0.72	0.73
2003-04	0.33	0.01	0.89	6.8
2004-05	9.05	0.12	0.94	1.51
2005-06	31.53	1.35	2.05	2.52
2006-07	35.28	1.27	1.29	2.19
2007-08	30.24	0.75	0.32	3.06

Source: India Trades, CMIE

Since 2004, Toyota's Indian auto-component JV company Toyota Kirloskar Auto Parts (TKAP) situated near to Bangalore has started producing gear boxes for its assembly plants in different parts of the world including in Thailand. The rising export of gear box is due to this. TKAP joins a select group of Toyota manufacturing bases in the ASEAN region, South Africa and Argentina that together manufacture components and vehicles for supply to countries in Europe, Asia, and Central and South America. Called the IMV-Project by Toyota, this is an attempt at setting up an internationally coordinated production system by designating manufacturing bases in India and South-East Asian countries such as Thailand, Indonesia, Malaysia, the Philippines, and Vietnam. Hence, TKAP is truly a part of an international production network. However, it is difficult to prove whether the export growth of gear boxes is due to FTA or not as Toyota took decision of making India a sourcing platform around the same time though operation of the plant started some months later. The 100% export oriented unit of TKAP produces R-type gear box which get exported to Toyota worldwide. Toyota would look at sourcing automotive hardware such as forged parts, metal components and sub-assemblies from the Indian operations. Sourcing software from India could be another possibility that Toyota will explore. Toyota's plan is to increase the IPN in such a way that Toyota's production facilities in India and the ASEAN region will mutually complement one another. The plans also include stepping up the production capacity in Thailand for diesel engines and in Indonesia for gasoline engines. The new drive for IPN is an important strategy of Toyota. For example, Toyota Indonesia is specializing in multi purpose passenger vehicle (MPVs) and it is natural for Toyota to integrate the production system of MPVs (such as Innova) both in India and Indonesia. In this context, Indian import from Indonesia especially on critical components like engines and components thereof may increase in near future as a part of intra-company trade between the two Toyota set up in India and Indonesia. Moreover, company is planning to launch small cars in India with engines imported from ASEAN countries such as Indonesia or Thailand. The company seeks to gain from the free trade agreement that India is likely to sign with ASEAN countries allowing it to import the products at zero duty. However, other members of the industry feel engine components should remain in the negative list at least for the time being.

VII. Empirical Analysis as a measure of involvement in IPN: The Intra-Industry Trade Index

To understand the both-way trade of auto components, an attempt has been made to calculate intra-industry trade index (IIT) following Grubel-Lloyd method. The index values lie between 0 and 1. Higher the value higher is the extent of both way trade of similar products. We assume that when a component crosses the border for value addition, HS code of the product at disaggregated level may get changed but it remains within the same product category. For example, half made body parts goes to another location for value addition and then come back crossing the border again as body parts only (may have a different HS-code). Higher IIT provides a signal for existence of IPN among the trading nations. In this section, we have divided all 8-digit HS codes (as identified by ACMA) into few broader categories (as given in the Table 3 below). A group IIT¹⁶ has been calculated considering India's exports and imports with its selected trade partners (with

¹⁶ Following formula is used to arrive at the group level IIT, considering N observations (8-digit level export-import)

$$\text{in the group } IIT_{Group} = \sum_{i=1}^N \left(\frac{X_i + M_i}{\sum_{i=1}^N (X_i + M_i)} \right) X(GL_i) \text{ where } GL_i = 1 - \frac{|Ex_i - Im_i|}{Ex_i + Im_i} \text{ GL: Grubel Lloyd Index}$$

which India is involved significantly in auto components trade). This yields some interesting results. It is clear that IIT is high with western countries in several product groups. For example, it is high with USA in ignition parts (under HS 73) and in seats (under HS 94) is as high as 0.55 and 0.57 respectively. Similarly with Italy the value of IIT is quite high in rubber products (under HS 40) and metal products (under HS 73). In chasis and body parts (under HS 87) there is a high level of intra industry trade prevailing between India and Germany. Comparatively if we look at the Asian countries the value of IIT is significant with countries like Malaysia (in rubber products under HS 40 and metal parts under HS 73), Japan (locks for vehicles under HS 83), China (in brake lining products under HS 68), and Indonesia (in metal parts under HS 73). It is seen that the value of Group IIT is not so significant¹⁷ for Thailand across all autocomponents products. Highest IIT with Thailand is visible in products such as taximeters, tachometers, etc. The benefit of the EHS as mentioned in the Indo-Thai FTA has hardly been reaped as per the list which constitutes two autocomponents products. Thus it is seen that the Indian component manufacturers are more in trade with the western economies rather than the South and South East Asian countries. This raises the natural question the utility of FTA/PTA with the Asian countries and further raises the issue of the involvement of the autocomponents industry as a whole in the production networks. A counter argument may be raised that as there is no FTA with significant focus on auto-components (in which India is a party), IPN can not spread into India. Our survey and interviews show that Indian auto component producers have more JVs with Tier 1 suppliers from European and US companies and perhaps they will continue to do this for their global reach to automobile majors. In this context, FTA with South East Asian countries will increase India's imports only. Exports may not rise much unless some Asian MNCs develop JVs (such as Toyota Kiroloskar Auto Parts) with Indian players and procure components from here.

Table 4: Group IIT of the Products between India and Select Economies (2007-08)

(Values in US \$ million)

Name of the products (No. of products at 8-digit HS)	USA	Italy	UK	Germany	China	Japan	Thailand	Indonesia	Malaysia
Rubber products under HS 40 (13)	0.33	0.51	0.54	0.29	0.29	0.03	0.06	0.39	0.67
Brake lining products under HS 68 (5)	0.22	0.06	0.01	0.00	0.48	0.02	0.06	0.11	0.00
Glass materials under HS 70 (7)	0.05	0.19	0.03	0.00	0.00	0.09	0.00	0.10	0.13
Metal parts under HS 73 (13)	0.42	0.51	0.35	0.11	0.02	0.06	0.26	0.50	0.68
Locks for Motor vehicles under HS 83 (3)	0.02	0.36	0.44	0.00	0.00	0.54	0.03	0.53	0.00
Ignition and other parts under HS 84 (75)	0.55	0.46	0.38	0.14	0.19	0.08	0.02	0.21	0.26
Motor parts under HS 85 (33)	0.26	0.24	0.27	0.25	0.06	0.09	0.04	0.37	0.28
Chasis and Body parts under HS 87 (38)	0.21	0.40	0.14	0.62	0.14	0.12	0.26	0.72	0.27
Other equipments under HS 90 (5)	0.05	0.09	0.32	0.00	0.00	0.00	0.37	0.13	0.00
Instruments under HS 91 (1)	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seats under HS 94 (1)	0.57	0.00	0.00	0.00	0.00	0.00	0.18	0.07	0.00

Note: All the figures are calculated based on India's Export and Import data with the partner countries

Source: Data from India Trades, CMIE

¹⁷ It has been considered that the group IIT value below 0.4 is not significant

C. Qualitative Analysis: Based on Survey, Interviews and Discussions

This part of the study deals with various qualitative aspects which are deemed important to understand the issues related to IPN. Senior managers from OEMs, Tier I and Tier II suppliers were approached for detailed discussions. Inputs from automobile and auto-component producers associations were also proved useful for this purpose. Several government officials and researchers were also consulted to comprehend India's policy towards FTA and its impact on the industry. OEMs were mainly questioned on their global supply chain strategy, their views on competitiveness and its relation to procurement, whether they are getting benefitted from FTAs and what is their expectations. Follow up questions were designed for the component suppliers to track the supply chain. Probing was done to know how component manufacturers are developing collaborations with international players and whether FTA is important for them or not. Questions were also asked on current duty structure, non-tariff measures, technology absorption, risk sharing with OEMs and possibility of product diversification, etc. Industry associations guided us on the formation of policies, future direction and potentiality of Indian automotive industry, their views and lobbying strategy to influence government's policy towards FTAs. Government officials shared their ideas on negotiation strategy for FTAs. Following sections highlight the summary of the qualitative analysis of various issues pertaining to IPN.

VIII. Indian Automotive Industry: Looking for an International Supply Chain

The automobile industry has undergone significant changes in the context of globalisation, implementation of lean production and the development of modularisation have changed the relationships between automobile assemblers (OEMs) and their suppliers. Stiff competition among manufacturers resulted in more mergers and acquisitions. The challenges automobile manufacturers and suppliers face include improving quality, meeting cost reduction targets and developing time to market. Thus the organisations today are driven more towards greater product differentiation using cutting edge R&D, innovative sales and marketing approaches, and increasing focus on boosting efficiencies in manufacturing and supply chain. Hence, in the age global outsourcing, supply chain management (SCM) plays a crucial role.

SCM helps in demand forecasting; taking an order; giving an accurate promise date; sourcing and manufacturing the right goods; position inventory properly; pick, pack, and efficient transshipment; most importantly, SCM makes a world of difference to the manufacturers by maintaining a minimal finished goods inventory.

Supply chain management constitutes:

- a) Product flow
- b) Information flow
- c) Finance flow

The product flow is movement of goods from supplier to OEMs and also in case of any customer returns or service requirements. The information flow covers updating the status of the delivery as well as sharing information between suppliers and manufacturers. The finance flow encompasses credit terms, payment schedules and consignment and title ownership arrangements.

The Indian auto industry today has a global footstep. While most global OEMs and component majors are well established in India, Indian OEMs such as Tata Motors, Mahindra & Mahindra and TVS Motors and suppliers such as Bharat Forge and Sundaram Fasteners have a significant global presence.

Table 5: Indian OEMs going Global

OEM	Global Acquisition/JV/Subsidiary	Description
Tata Motors	Global JV with Fiat, Italy, 2006	MOU to manufacture passenger vehicles, engines and transmissions for the Indian and Overseas market
	Marco Polo, Brazil, 2006	Manufacture and assembly of fully built buses and coaches
	Hispano Carrocara, Spain, 2005	21% stake in leading bus/coach manufacturer
	Assembly plants in Malaysia, Spain, Ukraine and Russia	Assembly of CKDs exported to these countries.
Mahindra and Mahindra	Mahindra Australia, 2005	Branch Office and assembly operations.
	Stokes Group, UK, 2005	Autocomponent manufacturer
	JV with Renault France, 2005	Export focused JV with Renault for manufacture of Logan sedan which was launched in India in 2007
	Subsidiaries in Italy, South Africa and Uruguay	Assembly and autocomponents
TVS Motors	Proposed Columbian JV in which TVS Motors has 26% stake, 2006	Assembly of Scooters/ motorcycles from CKD units.
	Assembly plant in Indonesia	US\$ 55 million investment towards one of the world's largest two wheeler parts.

Source: Company Annual Reports

Apart from the large and growing domestic market, many OEMs are looking at India as a significant global sourcing hub for auto components - as well as specific products such as small cars. The manufacturing companies have adopted e-sourcing, which helped them to reorganise the purchasing process and supported the aggregated buying across business units compared to the traditional strategic sourcing process. The process reduces time spent on negotiating, accelerates information gathering and speeds up communication channels among buyers and sellers. Rapid surge in global sourcing of auto components has also become a challenge for manufacturers and suppliers although sourcing has reduced the cost of production substantially. Exports are playing an increasing role in India's automotive industry with manufacturers like Hyundai who has already made India the world source for the i10, Renault-Nissan using India as supply hub for small cars while Ford, Chevrolet, Honda, Toyota and VW are all investing in new capacity to supply local and overseas markets. The foreign sales of Indian automakers are also increasingly made through directly owned or joint venture based foreign operations, rather than exclusively through exports from Indian manufacturing facilities. Indian companies have bought capacity or made alliances with other automakers in East Asia, South America, Africa and Europe, TVS and Bajaj Auto have a strong presence in Asian and Latin American markets where there is strong demand for two-wheelers. Both companies recorded export growth of over 50 percent in 2006, and both companies have recently expanded manufacturing capacity in Indonesia. On the other hand, Indian auto component industry has become the hub of high quality, low cost products. The reforms adopted by the government have opened up tremendous opportunities for investment and technology transfer specializing niche technology and to complement their range of products with the world's latest and the best. India's low labor costs and high level of available management and engineering skills have maintained the competitiveness of domestic auto companies and made it an attractive location for direct manufacturing investors. So, there is a clear sign that Indian component industry is

growing up the value chain. There exists highly aggressive export driven component manufacturers and also large scale SMEs who produce basic components. However, India is still operating with low scale of production compared to China and yet to leverage upon its move to the higher strata of value chain. India does not have a clear policy towards formation of IPN. Gradual move towards liberalized policy in component sector shows a large increase of exports and imports of components. Companies are finding that current policy regime is more conducive than past to go for international collaboration and thereby indirectly connecting themselves to some forms of IPN.

Table 6: Indian Component Makers' Recent Acquisitions

Manufacturer	Acquisitions and investments abroad
Bharat Forge	<ul style="list-style-type: none"> • FAW Corporation in China- 52% (2006) • Imatra Kilsta, Sweden (2005) • CDP Aluminiumtechnik GmbH, Germany (2004) • Carl Dan, Germany (2004)
Amtek Auto	<ul style="list-style-type: none"> • Zelter GmbH, Germany (2006) • GWK, UK(2004) • Smith Jones Inc. USA (2002)
Sundaram Fasteners	<ul style="list-style-type: none"> • Peiner, Germany(2005) • Bleishtal Germany (2004)

Source: Company Annual Reports

IX. International Production Network: Case of Maruti Suzuki and Tata Motors

Since, mid 1990s there is a paradigm shift in the production process with many domestic as well as international players coming into play with the surge of globalization. The average life cycle of models of passenger cars are coming down significantly and product differentiation and customisation became key factors leading to the emergence of different new models of cars. In this context, the OEMs had to explore the choice of domestic consumers to remain competitive in Indian market. Hence, modification of supply chain strategy was inevitable and they need to do hard core price negotiation with suppliers passing more risk towards them. The need of setting up JV suppliers have come down as there are number of competitive and matured suppliers already present in the ancillary sector. Sometimes OEM brings the technology from parent country and develop the supply base through a commercial relationship locally. For example, in case of windshield glasses, a company like Maruti was proactive in bringing the technology of 'zone toughened' glass¹⁸. Along with that trade liberalization, opportunity has come to import even bigger components much cheaper from competitive sources. In India alone, between 2001-02 and 2008-09, tariffs on components and CKDs have come down from 35% to 10%. Tariff reductions are also common in other countries. In response to this, Suzuki developed a global sourcing policy and tries to procure components from its trusted suppliers all over the world through their footprints (e.g. Suzuki is procuring modules from Faurecia¹⁹ from its footprints in different countries). Earlier focus was on localization but of late, the policy has shifted to procuring from major Tier 1 suppliers of Suzuki through 'request for quotation'. As a result of this Tier 1 suppliers of Suzuki have the opportunity to supply components and modules to Suzuki plants located in different parts of the world. In this process, Suzuki is involved in developing its own international production network.

¹⁸ When got hit zone toughened glass leaves comparatively less scratch towards the driver side so that driver can drive the car to the nearest service station. It is expected that the technology will bring Maruti an edge over its competitors.

¹⁹ <http://www.faurecia.com/pages/products/modules.asp>

In Asia, the network is expected to increase the two way trade of components and modules among the countries where Suzuki's plants are located such as in India, Indonesia and China, etc. Due to the difference in the localization levels there has been limited export of cars in the past. However, Maruti was able to penetrate the small car market keeping in view the market reality²⁰.

Recently, it is observed that independent suppliers particularly those in Tier 1 are developing network with many automobile companies. For example, Delphi, Lumax are expanding their activities in India through green-field investment and have developed tie-ups with many companies such as Tata Motors, Maruti, Toyota, GM India etc²¹. Indian component manufacturers mainly have tie ups with Japanese or European players apart from Indian players. While expanding outside or exporting to other countries Indian companies always have to adhere to global standards. Though Indian component manufacturers have potentiality of supplying quality products efficiently due to slow transfer of technology, sometimes the full potentiality is not tapped. For this at times the Indian companies (particularly the Tier 1 suppliers) have go for joint venture for enhancing their export²². According to Sigma Corporation, in Asia big OEMs come forward to develop JV but in Europe there is already lot of powerful Tier 1 players. Developing tie-ups with them help Indian companies to supply to major global OEMs. On the contrary, Indian players remain partly constrained if the JV partner is an Asian OEM as they end up supplying to the parent OEM mainly with limited scope of supplying to others. As availability of best technology and developing network globally is an issue, SKH Metals feel that government intervention in terms of customer participation and transfer of technical know-how may be important for healthy and long life of Indian Tier 1 suppliers in the international market²³.

Looking at the market reality, Indian companies like Maruti had to revise its supply chain strategy like many other OEMs. To survive in the competitive world, Suzuki has focused on the 'lean production' system where thrust is given on the reduction of inventory cost and testing time. Globally, Suzuki pulls its supplier to be located near the plant. However, in country like India, some suppliers only assemble the final parts or modules at the plant located near to Maruti factory but produces components in relatively distant plants. Earlier, quality checks of all delivered components were done at Maruti factory only. Under the current system, quality checking systems are installed at the suppliers end and this generates reports which only go to Maruti electronically. The products produced would be based on three major parameters- critical parameter, major parameter and minor parameter. Accordingly, the products would be produced and the complete manufacturing would be controlled by a statistical process control chart which would be monitored and evaluated by Maruti through the generated reports. Thus the regulations of standards were centralized in the process of manufacturing. Maruti has devised the e-procurement system in which Just-in-Time delivery principle is used which entails that the products have to be supplied as soon as the demand is generated. On an average, the inventory stocks at Maruti are only of 2 hours. At the suppliers' assembly plant, it is of around two days. If the suppliers have production plant down

²⁰ Maruti Suzuki exports entry-level models across the globe to over 100 countries and the focus has been to identify new opportunity markets. At present, Latin America and Africa constitute new emerging markets where Maruti exports have increased at least by 60% in the last year (2007). The Company sold 53,024 units during 2007-08. This is the highest ever export volume in a year for the company, and marked a growth of 35 per cent over the previous year. (Source: <http://www.marutisuzuki.com/exports.aspx>)

²¹ For details refer to articles available in http://www.indiaautomotive.net/2008_06_29_archive.html on Lumax and Delphi.

²² Source: Discussion with Sigma Corporation (producing anti-vibration materials supplying to Indian OEMs such as Tata Motors in India and a huge export market in Europe particularly in Germany supplying to companies like GM, Ford, etc.). Company has joint venture partners from Germany. However now it is developing partnership with companies from other countries. For details go to www.sigmacorporation.com

²³ Source: Discussion with SKH Metals (producing Fuel Tanks, Exhaust Systems, Suspension Parts for Maruti). Company website: <http://skhmetals.com.wbplanus5.onlyfordemo.com/>

south or in the west (in other automobile clusters), transit requires around four days. Factoring in this, at the lowest level, stocks are kept for seven days only.

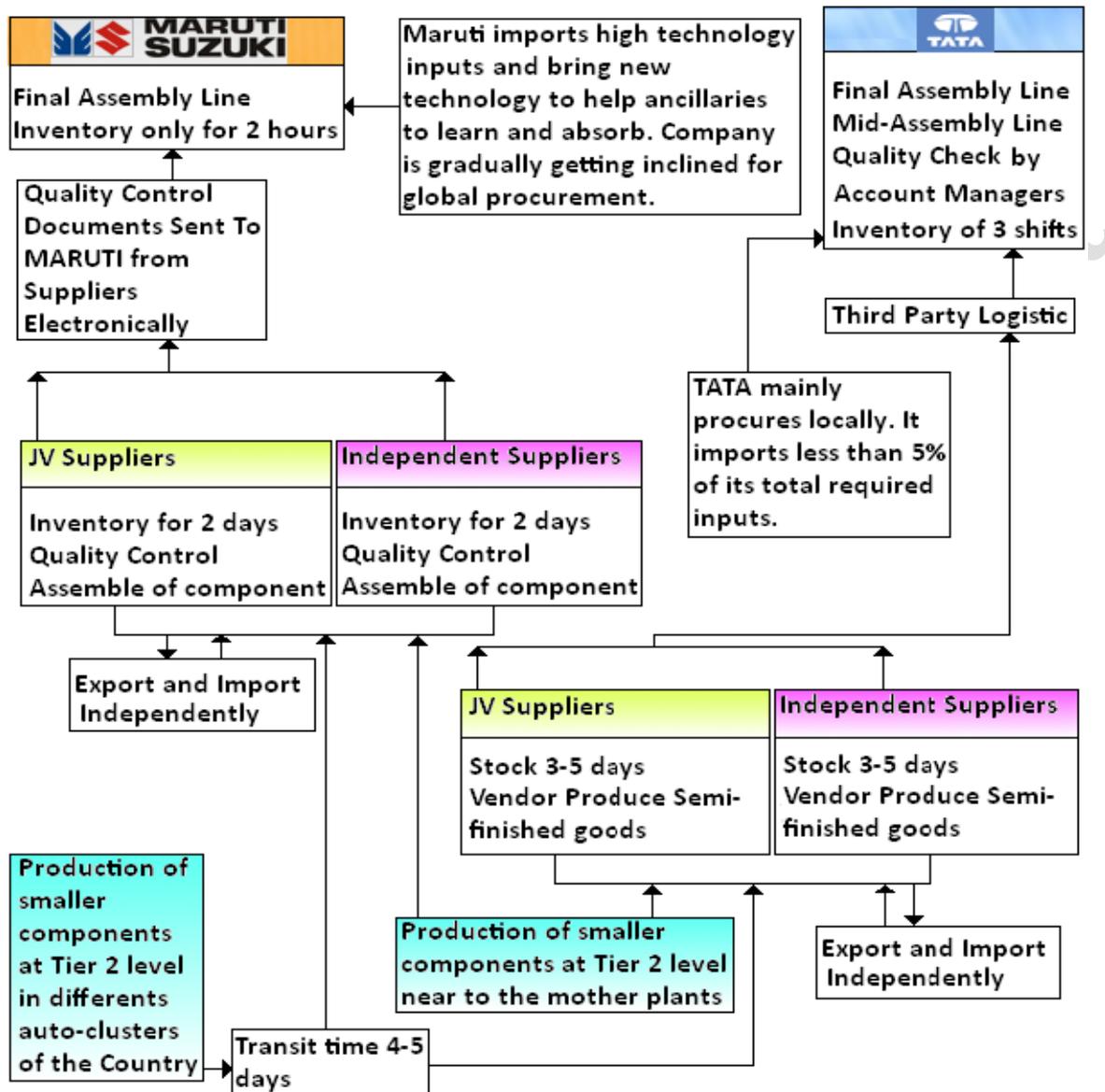
Moreover, Maruti in the process of procuring the parts from the Tier 1 suppliers does not depend only on one particular supplier. Normally there is a Request for Quotation (RFQ) raised by the company in procuring a specific component for a specific model. The lowest bid gets the order for that particular model. For example for manufacturing headlamps there may be three to four potential suppliers of Maruti. But final order goes to only one supplier. Hence, company has a strategy that specific to a particular model there is only one supplier to a particular component. For example, Lumax²⁴ is supplying headlamp to Maruti Swift. Thus it follows the Ford model (relying on one supplier) of procurement in a Toyota way (more than two suppliers).

In contrast, Indian companies such as Tata Motors has set itself a goal of building low-cost cars. The company is more vertically integrated and follows the model of technology sharing along with risk sharing with its suppliers. It is linked with its suppliers with the formation of its own set up of segments from component manufacturing to the set up of final vehicle. Thus the nature of supply chain is different from that of Maruti. With the launch of its new product, Nano, the company will encourage entrepreneurs to have small assembly units. Tata Motors would train their people, and would oversee their quality assurance and would help them to develop satellite assembly operations for the company. It remains pro-active during the development process. It provides specification to supplier and carefully monitor the component development stage. Tata's relatively small team of engineers designed the car from the bottom up, choosing features as a function of the explicit needs of the target market, using non-traditional suppliers, and co-locating them with its own manufacturing. It calculates the cost backward for each model specific to a target market and fixes a target of direct material cost. Then it looks for best supplier who can supply consistently. In terms of procurement Tata creates its own village along with trusted suppliers (around 60 of them). Vendors are asked to send materials at knocked down form and Tata has many mid-assembly and feeder lines where these components are fitted. Tata uses a third party logistic system to ensure efficient delivery. Logistics company coordinates between vendors and final assembly line of OEM. The company keeps inventory roughly 3 times of a 'shift'. Thus Tata depends extremely on localized supply chain industry. More than 95% of its components are supplied by local players. It imports some specific items. In some cases, when it feels that domestic suppliers are jacking up the price, it imports to create a pressure on the domestic supplier. Tata has offices in countries like China, Thailand who works on stable and quality supply of components.

Hence, the essence of SCM solution lies in coordinating the flow of information and goods between the customers and the network of suppliers, manufacturers and distributors. A comparative framework of SCM model for Maruti Suzuki and Tata Motors is presented below.

²⁴ <http://www.lumaxlighting.com/> . For more news about Lumax read the article: "Lumax to expand capacity, set up three new manufacturing units in this fiscal" available in http://www.indiaautomotive.net/2008_06_29_archive.html

Figure 11: Inventory and SCM Model for Maruti-Suzuki and TATA Motors



Note: Discussion with company officials and Tier-I suppliers were extremely useful. However, usual disclaimer applies.

Source: Prepared by author

Both Maruti and Tata keep close track on the protection of their technical know how. Though it is always easier to monitor JV suppliers it is not so in case of independent suppliers. However, now JV suppliers are also allowed to supply other OEMs and export independently. Some of the JV players are able to go up the value chain and reached a position where they can differentiate similar products for different players. These players are now in a position to scale up their operation and increasing their product lines²⁵.

²⁵ Source: Discussion with SKH Metals : <http://skhmetals.com.wbplanus5.onlyfordemo.com/>

D: Conclusion

X. Do RTAs Matter for IPNs?

It has been observed that there is a rise in intra-regional trade in parts and components in East and South East Asia and auto component sector will follow the trend. But, the issue is when final demand is coming from other continents can the components sector grow? In EU and NAFTA, component trade is much influenced by domestic demand of final goods. In case of Asia, final goods demand is not coming from Asia (except Japan and Republic of Korea and to some extent in India and China) but from the EU and USA. It has been discussed that the export destination of the components manufactured in India are western economies whereas procurement of the autocomponents that is the imports of the auto component parts takes place from Asia. Though the successful implementation of the Free Trade Agreements within Asia and Pacific may boost the components trade but since the final demand is mainly from the US and European market the importance of the regional integration may be reconsidered. Obviously, FTA between Thailand and India has resulted in lowering of tariff of the specific components mentioned in Early Harvest Scheme but whether it has really promoted trade in components between the countries remains a cause of concern. In case of India-Thailand FTA few companies like Toyota was able to drive home the benefits but Indian component manufacturers in general have not got any substantial benefit.

China is a large exporter of components; it will reach close to its capacity soon. Non-wage cost is also increasing in China and weak IPR regime is a cause of concern. India is a natural choice for next destination of high investment in component sector. The country has already shown significant export growth of critical components. But, India and South Asia are still outside the regional groupings of East and South East Asian countries, which act as market access barriers. As business in component sector is based on low margin and high volume, further liberalization will definitely help countries to export more in the region. However, mere increase in exports does not necessarily mean that companies are directly part of IPNs. The paper finds that a special effort is required to connect players of each tier so that supply chain becomes smooth and till now IPNs are driven only by MNCs (such as Toyota's effort to produce and export gear box from India). SME exporters remain at the bottom of the value chain supplying to many players independently and sparsely connected with production networks. Unless investment and technology come from big players or MNCs, SMEs are not able to move up the value chain. As mentioned above, in case of India-Thailand FTA only companies like Toyota are able to reap the benefit through its JV setup TKAP in India.

In other possible FTAs, Indian companies are inclined to put many critical components (as many as 76²⁶) in the negative list with the apprehension that Chinese components may enter the country through South East Asia (even without having sufficient value addition). These 76 items have been identified as sensitive by ACMA, SIAM and UNCTAD²⁷. There has been reservation about possible rules of origin also. Auto component industry in India has made following suggestion on the preferential rules of origin.

- Change of Custom tariff classification at the 4 digit level (from import to export) PLUS

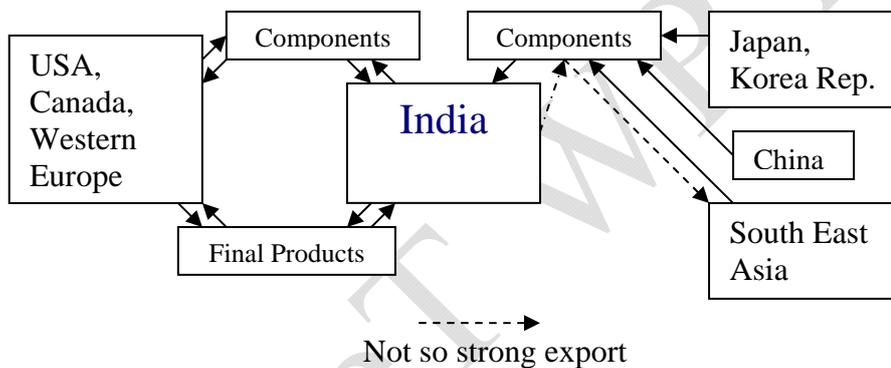
²⁶ Working Group on Automotive Industry Eleventh Five Year Plan (2007-2012): Ministry Of Heavy Industries & Public Enterprises; Department Of Heavy Industry; (August, 2006)

²⁷ *ibid.* pg. 19

- Value Addition (Transaction Value Build Down method) Minimum at 50%, (including value of sub-component import of parent assemblies) PLUS
- Non qualifying processes: Packaging, Re-packaging Polishing, finishing, mere assembly or disassembly, Inspection, Internal Transport, freight, anti-rust applications, oiling etc or a combination of the above.

From this analysis, it is clear that with the existing trend of trade of auto-components between India and Asian countries, India expects possible surge of imports only. India may not be able to export more from the SME segments to these countries. FTA with East and South East Asian countries may result into only a one way trade. While Industry is positive about SAFTA and PTAs like Chile, GCC, etc, and wants market access in neighbouring countries, it has serious reservations on FTAs with Thailand, BIMSTEC, ASEAN, China, Korea etc. Figure 12 below depicts that India is linked more strongly with Western countries for possible circular flow of final goods and components than with countries from East and South East Asia. It is mainly importing from them and hence, there is apprehension towards including components in FTA list with Asian countries.

Figure 12: Direction of Trade of India's Automobile sector



The study concludes that IPN must result into a two way trade of components so that both countries get benefit of increasing intra-industry trade. However, there is no guarantee that PTA/FTA will ensure that. Initial industry environment and efficiency level is necessary to reap the benefit of FTA otherwise it may result into only a one way trade. SMEs may not be in a position to integrate themselves with the production network which are mainly driven by MNCs. Technological collaboration is required and capability to go up the value chain with innovative management skills are necessary for a component manufacturer to enter into a production network. In case of India, its auto-component exports are more towards EU, USA and Canada. Technology absorption by domestic players is helping them to become efficient but they are not fully prepared to face the competition from South East Asia. Hence, there are reservations towards fully opening the component sector in India. Moreover, duties on components have come down in recent years in India and this unilateral liberalization seem to have provided some opportunities to foreign players to expand their operations in India. But till now most of them are looking for local suppliers rather than depending on imported components unless they can't be prepared in India due to absence of technology.

References:

1. ACMA (2006). Indian Automotive Component Industry: Engine of Growth Driving the
2. ACMA (2008): <http://www.acmainfo.com/#stat>
3. ACMA, 2008. “Global Competitiveness of Indian Auto Component Industry & Its Sustainability”.
4. Automotive Mission Plan 2006-16, Ministry of Heavy Industries & Public Enterprises, Govt. of India, Dec. 2006
5. http://economictimes.indiatimes.com/Auto_Components/Autocos_list_77_items_for_FTA_negative_list/articleshow/1525471.cms
6. <http://www.faurecia.com/pages/products/modules.asp>
7. http://www.indiaautomotive.net/2008_06_29_archive.html
8. <http://www.lumaxlighting.com/>
9. <http://www.marutisuzuki.com/exports.aspx>
Indian Manufacturing Sector
10. Khisty, V. (2004): Global competitiveness of Auto component manufacturers, an article from PhD Thesis, University of Pune, accessed from <http://www.kabulpress.org/World7.htm> on 23/01/2006
11. KPMG Report (2006): Automotive
12. McKinsey (2005). Vision 2015 for the Indian Automotive Components Industry, Automotive Component Manufacturers Association of India and McKinsey and Company.
13. Ministry of Heavy Industries and Public Enterprises (2006). Report of Working Group on Automotive Industry for the Eleventh Five-Year Plan, New Delhi.
14. Ministry of Heavy Industries and Public Enterprises (2008).
15. Nag B., S. Banerjee and R. Chatterjee, (2007). “Changing features of the automobile industry in Asia: Comparison of production, trade and market structure in selected countries”, Asia-Pacific Research and Training Network on Trade, Working Paper Series, No. 37.
16. Pradosh Nath et. Al. (2006): Status of Innovation: Automotive Industry of India, a Project Report, NISTADS, New Delhi.
17. Saripelle Mashuri (2005): Competing through cost versus Capabilities: organizational Transformation of the automobile industry, Department of Agricultural and Resource Economics, University of Connecticut.
18. SIAM, (2008): <http://www.siamindia.com/scripts/industrystatistics.aspx>
19. Sutton John (2004): The Auto-Component supply Chain in China and India- A Benchmarking study, London school of economics and Political Science, London February 2004.
20. World Bank Report (2005), India and the Knowledge Economy: Leveraging Strengths and Opportunities, Report No. 31267-IN, available on http://www.wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2005/05/20/000012009_20050520110005/Rendered/INDEX/312670IN.txt

Appendix A: Major Export Destination of Auto components Products

(Values in US\$ million)

Products in Autocomponents	European Union	USA	Asia (excl. Middle East)	Africa	Italy	Other European countries	UK	Germany	Thailand	Sri Lanka	Japan	China	Indonesia
Chasis and Body parts under HS 87	28.27	21.69	16.37	12.21	8.85	7.55	6.73	4.74	2.43	2.21	1.15	0.92	0.72
Ignition and other parts under HS 84	44.78	12.25	10.09	5.14	6.94	4.67	8.18	18.10	1.75	0.44	1.14	2.31	0.47
Metal Parts under HS 73	41.21	3.43	5.88	6.86	5.06	2.58	9.43	14.70	0.55	0.45	0.34	0.25	0.62
Motor Parts under HS 85	57.65	1.45	11.25	5.55	8.65	5.45	8.78	10.27	0.23	0.83	4.33	1.00	0.49
Brake lining products under HS	49.68	0.24	8.15	12.74	0.11	6.07	17.82	4.01	1.16	2.31	0.02	1.49	0.23
Rubber products under HS 40	41.32	0.54	7.56	6.26	9.59	5.27	10.19	11.71	0.27	0.46	0.62	2.21	0.32
Glass materials under HS 70	63.31	0.01	3.75	4.32	3.85	3.80	9.51	0.72	0.00	1.08	0.26	0.00	0.05
Locks for Motor vehicles under HS 83	34.87	0.28	10.33	3.87	1.94	0.09	6.27	14.94	0.28	0.46	4.98	0.00	0.00

Note: For List of products refer the Appendix

Source: Calculations Based on CMIE Database

Appendix B: Major Imports of Auto components Products from Different Countries

(Values in US\$ million)

Products in Auto components	Asia (excl. Middle East)	European Union	Japan	China	Germany	Thailand	USA	Italy	France	Austria
Chasis and Body parts under HS 87	66.10	18.32	16.76	10.87	7.68	3.24	2.57	2.45	1.60	1.02
Ignition and other parts under HS 84	33.70	50.50	8.84	7.31	29.30	6.88	7.90	6.80	2.47	0.36
Motor Parts under HS 85	48.10	29.64	8.40	13.69	13.08	4.15	11.97	3.75	4.20	0.22
Metal Parts under HS 73	49.69	35.41	9.50	18.20	17.15	2.31	9.01	5.07	2.71	0.70
Rubber products under HS 40	39.37	36.91	12.71	2.30	10.54	2.23	16.54	9.66	3.15	0.34
Glass materials under HS 70	58.95	20.50	3.32	31.91	8.12	2.91	7.60	1.98	0.96	0.12
Locks for Motor vehicles under HS 83	65.15	9.34	6.83	2.88	6.13	10.87	0.28	0.33	0.37	0.00
Brake lining products under HS 68	47.67	33.89	14.33	16.22	10.22	1.56	15.33	3.22	1.22	2.11
other equipments under vHS 90	7.64	15.81	1.49	2.01	8.13	1.46	54.07	0.19	4.34	0.10
Instruments under HS 91	90.00	4.00	6.00	0.67	1.33	0.00	5.33	1.33	0.67	0.00
Seats under HS 94	22.19	30.55	0.64	18.33	17.68	3.22	4.50	0.64	0.00	0.00

Note: For List of products refer the Appendix

Source: Calculations Based on CMIE Database

Appendix C**HS CLASSIFICATION OF AUTOMOTIVE COMPONENTS**

SI No.	HS Code	DESCRIPTION OF ITEMS
1	40051000	Compounded Rubber, Unvulcanised in Primary forms or in plantes, sheet or strip, Compounded with Carbon free Black or Silica.
2	40081990	Other
3	40082990	Other
4	40092100	Tubes, pipes and hoses of vulcanised rubber other than hard rubber without there fittings
5	40093100	Automotive hydraulic brake hose & Radiator hose
6	40094100	Vacuum brake hoses without fittings
7	40094200	Air hose
8	40103290	Endless transmission belts of a trapezoid al cross-section (v belts) whether or not grooved of a circumference exceeding 60 cms.but not exceeding 180 cms.
9	40103490	Other
10	40169320	Rubber rings (O Rings)
11	40169330	Rubber seals (Oil seals,etc.)
12	40169340	Gaskets
13	40169350	Washers
14	68129021	Packing joints
15	68129022	Asbestos gaskets
16	68131000	Brake linings & pads
17	68139010	Asbestos friction materials
18	68139090	Others
19	70071100	Toughened(Tempered) safety glass for vehicles
20	70071900	Other Tampered Safety Glass
21	70072110	Bullet Proof Safety Glass
22	70072190	Laminated safety glass for vehicles
23	70072900	Other Laminated safety glass for vehicles
24	70091010	Prismatic rear view mirrors for vehicles
25	70091090	Rear-view mirrors for vehicles
29	73181500	Other Screws and Bolts
30	73181900	Other
31	73182200	Other Washers
32	73182300	Rivets
33	73182400	Cotters & cotter pins
34	73182910	Circlips
35	73182990	Others
36	73201011	Leaf springs & leaves thereof for motor vehicles
37	73201020	Leaves for springs
38	73202000	Helical springs
39	73209020	Spring pins
40	73209090	Coil springs
41	73261910	Forged or stamped articles of iron or steel for automobiles & earth moving equipment
42	83012000	Locks of a kind used for motor vehicles
43	83023010	Curve drive stakes
44	83023090	Other mounting, fittings for motor vehicles
45	84073110	Engines for Motorcycles (Capacity <50cc)
46	84073210	Engine for Motorcycles(Capacity >50cc but <250cc)
47	84073310	Engine for Cars(Capacity >250cc but <1000cc)

NOT FOR CITATION WITHOUT PERMISSION

48	84073320	Engine for Motorcycles(Capacity >250cc but <1000cc)
49	84073390	Spark-ignition engines for others
50	84073290	Reciprocating piston engines for 3 wheelers
51	84073410	Engine of a cylinder capacity exceeding 1000 cc
52	84073490	Spark-ignition engines for others
53	84082010	Compression ignition IC piston engines of cyl. Capacity not exceeding 250cc.
54	84082020	Engines of cyl. Capacity exceeding 250cc
55	84099111	Valves, inlet & exhaust for use solely with spark ignition IC Piston engines
56	84099112	Pistons
57	84099113	Piston Rings
58	84099114	Piston assemblies
59	84099120	Fuel injection equipment excluding injection pumps
60	84099191	Other parts of petrol engines for m/vehicles
61	84099194	Parts of gas engines
62	84099911	Valves, inlet & exhaust for use diesel engines
63	84099912	Pistons for diesel engines
64	84099913	Piston rings for diesel engines
65	84099914	Piston assemblies for diesel engines
66	84099920	Fuel nozzles for diesel engines
67	84099930	Fuel injection equipment excluding injection pumps
68	84099941	Other parts of diesel engines for motor vehicles
69	84133010	Injection pumps for diesel engines
70	84133020	Oil pumps for I.C. Engines
71	84133030	Water pumps for IC Engines
72	84133090	Other
73	84148030	Turbochargers
74	84152010	Air conditioning units for buses
75	84152090	Air conditioning units of a kind used for persons in motor vehicles
76	84212300	Oil or petrol filters
77	84213100	Intake air filters for IC engines
78	84213990	Environment protection equipment for IC Piston engines, ie. Catalytic convertor
79	84821011	Ball bearing not exceeding 50 mm bore diameter
80	84821012	Ball bearing of bore diameter exceeding 50 mm but not exceeding 100 mm
81	84821013	Ball bearing of bore diameter not exceeding 100 mm
82	84821020	Other ball bearing (radia type) of bore diameter not exceeding not exceeding 50 mm
83	84821030	Other ball bearing (radia type) of bore diameter not exceeding exceeding 50 mm but not exceeding 100 mm
84	84821040	Of bore diameter exceeding 100 mm
85	84821051	Thrust ball bearing of bore diameter not exceeding 50 mm
86	84821052	Thrust ball bearing of bore diameter exceeding 50 mm but not exceeding 100 mm
87	84821053	Thrust ball bearing of bore diameter exceeding 100 mm
88	84821090	Other
89	84822011	Tapered roller bearing (radial type) of bore diameter not exceeding 50 mm
90	84822012	Tapered roller bearing (radial type) of bore diameter exceeding 50 mm but not exceeding 100 mm
91	84822013	Tapered roller bearing (radial type) of bore diameter exceeding 100 mm
92	84822090	Other
93	84823000	Spherical roller bearings
94	84824000	Needle roller bearings
95	84825011	Other cylindrical roller bearing (radial type) Of bore diameter not exceeding 50 mm
96	84825012	Other cylindrical roller bearing (radial type) Of bore diameter exceeding 50 mm but not exceeding 100 mm

NOT FOR CITATION WITHOUT PERMISSION

97	84825013	Other cylindrical roller bearing (radial type) Of bore diameter exceeding 100 mm
98	84825021	Thrust roller bearing of bore diameter not exceeding 50 mm or 2 inches
99	84825022	Thrust roller bearing of bore diameter exceeding 50 mm or 2 inches but not exceeding 100 mm or 4 inches
100	84825023	Thrust roller bearing of bore diameter exceeding 100 mm or 4 inches
101	84829900	Others
102	84831091	Crank shafts for heading no. 8407
103	84831092	Crank shafts for heading no. 8408
104	84831099	Other
105	84832000	Bearing housings, incorporating ball or roller bearings and those not incorporating ball or roller bearings and plain shaft bearings
106	84833000	Bearing housings, not incorporating ball or roller bearings; plain shaft bearings
107	84834000	Gears and gearing, other than toothed wheels, chain sprockets and other transmission elements presented separately; ball or roller screws; Gear boxes and other speed changers, including torque converters
108	84835010	Pulleys, Power transmission
109	84835090	Other
110	84836010	Flexible coupling
111	84836020	Fluid coupling
112	84836090	Others
113	84839000	Toothed wheels, Chain sprockets and other transmission elements, parts
114	84841010	Asbestos metallic packings & gaskets (excluding gaskets of asbestos board reinforced with metal gauze/wire)
115	84841090	Others
116	84842000	Mechanical seals
117	84849000	Other
118	85011011	Micro motor (Motors of an output not exceeding 37.5 W DC Motors)
119	85011012	Stepper motor (Motors of an output not exceeding 37.5 W DC Motors)
120	85011013	Wiper motor (Motors of an output not exceeding 37.5 W DC Motors)
121	85011019	Other (Motors of an output not exceeding 37.5 W DC Motors)
122	85011020	AC motor (Motors of an output not exceeding 37.5 W DC Motors)
123	85013111	Micro motor (Of an output not exceeding 750 W DC motor)
124	85013112	Stepper motor (Of an output not exceeding 750 W DC motor)
125	85013113	Wiper motor (Of an output not exceeding 750 W DC motor)
126	85013119	Other (Of an output not exceeding 750 W DC motor)
127	85013120	DC Generators (Of an output exceeding 750 W DC motor)
128	85013210	DC motor (Of an output exceeding 750 W but not exceeding 75 KW)
129	85103220	DC Generators (Of an output exceeding 750 W but not exceeding 75 KW)
130	85111000	Spark plugs (auto electricals)
131	85112010	Electronic Ignition magnetos
132	85112090	Others
133	85113010	Distributors
134	85113020	Ignition coils
135	85114000	Starter motors & dual purpose starter-generators
136	85115000	Other generators
137	85118000	Other equipments
138	85119000	Parts
139	85122010	Head lamps, tail lamps, stop lamps, side lamps, blinkers
140	85122020	Other Automobile lighting equipment
141	85122090	Auto bulbs & halogen bulbs
142	85123010	Horns
143	85123090	Others
144	85124000	Windscreen wipers, defrosters & demisters
145	85129000	Parts

NOT FOR CITATION WITHOUT PERMISSION

146	85392120	Halogen lamps for Automobile
147	85392940	Other for Automobile lamps
148	85438999	Other
149	85443000	Ignition wiring sets and other wiring sets of a kind used in vehicles, aircraft or ships
150	87060011	Chassis fitted with engines for tractors of engine capacity not exceeding 1800 cc
151	87060019	Chassis for tractors of engine capacity exceeding 1800 cc
152	87060021	Other chassis for Transport of not more than 13 persons including the driver
153	87060029	Other
154	87060031	Chassis fitted with engines, for the three wheeled vehicle
155	87060039	Other
156	87060041	Chassis fitted with engines, for the three wheeled motor vehicle
157	87060042	Chassis fitted with engines, for vehicle, other than petrol driven
158	87060043	Chassis fitted with engines, for dumpers covered in the heading 8704
159	87060049	Other
160	87060050	Chassis fitted with engines, for the motor vehicle of heading 8705
161	87071000	Bodies for vehicles of heading no. 8703
162	87079000	Bodies(including cabs) for motor vehicles of heading 87.01to 87.05(excluding 87.03)
163	87081010	Bumpers and parts thereof of tractors
164	87081090	Bumpers and parts thereof of other vehicles
165	87082100	Safety seat belts
166	87082900	Other parts and accessories of bodies including caps
167	87083100	Mounted brake linings
168	87083900	Other brakes and servo-brakes and parts thereof
169	87084000	Gear boxes
170	87085000	Drive-axles with differential, whether or not provide with other transmission components.
171	87086000	Non-driving axles and parts thereof
172	87087000	Road wheels and parts and accessories thereof
173	87088000	Suspension shock absorbers
174	87089100	Radiators
175	87089200	Silencers and exhaust pipes
176	87089300	Clutches and parts thereof
177	87089400	Steering wheels, steering columns and steering boxes
178	87089900	Other parts and accessories of m/vehicles
179	87099000	Parts
180	87141100	Saddles of motorcycles and other mopeds
181	87141900	Other parts and accessories of m/cycles/mopeds
182	87149100	Frame and Forks, and parts thereof for Motorcycles
183	87149290	Wheelrim and Spokets for Motorcycles
184	87149390	Other (Hubs, other than coaster braking hubs abd Hub brakes)
185	87149400	Brakes, including coaster braking hub brakes, and parts thereof
186	87169010	Parts and Accesssoies of Trailers
187	87169090	Other
188	90158030	Geophysical instruments
189	90291010	Taximeters
190	90291090	Other meters
191	90292010	Tachometers, Non-Electrical
192	90292020	Speedometers , Non-Electrical
193	91040000	Instrument panel clocks and clocks of a similar type for vehicles, aircraft, spacecraft vessels
194	94012000	Seats of a kind used for motor vehicles