Asia-Pacific Research and Training Network on Trade
Working Paper Series, No. 37, July 2007

Changing Features of the Automobile Industry in Asia: Comparison of Production, Trade and Market Structure in Selected Countries

Biswajit Nag *
Saikat Banerjee*
Rittwik Chatterjee*

* Biswajit Nag, Saikat Banerjee and Rittwik Chatterjee are associate professor, assistant professor and research fellow, respectively, at the Indian Institute of Foreign Trade (IIFT), New Delhi, India. This paper owes to the original research report prepared for IIFT on this topic. The views presented in this paper are those of authors and do not necessarily reflect the views of IIFT, ARTNeT members, partners and the United Nations. Any remaining errors are the responsibility of the authors. The authors may be contacted at biswajit@iift.ac.in

Executive Summary

The global automotive industry, increasingly characterized by global mergers and relocation of production centers to emerging developing economies, is in the grips of a global price-war. The industry is subject to imperfect competition which has resulted in too much of everything — too much capacity, too many competitors and too much redundancy and overlap. The industry is concerned with consumer demands for styling, safety, and comfort; and with labor relations and manufacturing efficiency. In this context, the study examines the growth patterns, changes in ownership structures, trade patterns and role of governments of selected Asian countries (viz. China, India, Indonesia and Thailand) in the automobile sector.

Thailand is a major automobile exporting country from Asia. The sector is mainly driven by Japanese FDI. Chinese automobile sector is growing very fast and is poised to make its dent in the international trade arena very soon, with a particularly strong position in the component sector. India, on the other hand, is consolidating its position with strong domestic and external demand. The Indonesian automotive industry is essentially an assembly industry dominated by the major Japanese car manufacturers, but also increasing its exports.

The developing countries studied are making efforts to develop their automobile sector through different paths with direct and indirect influence of government through innovative policies and trade liberalization programmes. Government policies towards investment liberalisation brought significant benefits to the selected countries as private players stepped in with modern technology and FDI started pouring in mainly through the hands of Japanese automobile majors.

Different countries adopted different policies to handle the overcapacity problem in the sector. Chinese has promoted consolidation of the industry through mergers and acquisition while Indians sought overseas market. In both these countries, government policies have been towards development of the indigenous automobile sector through strengthening the national players while Thailand focused entirely on the export market through Japanese companies. Domestic players in Indonesia remained as partners to MNCs in assembling activities.

Protection in automobile sector earlier was mainly through high tariffs, import bans on Completely Build Units (CBU), local content use condition, and restriction on private investment and other regulatory restrictions. Protection in component sector did not work well in general as it helped only the basic components sector to grow domestically in these countries, with most of the critical components still being imported. Thailand has aimed to plug the gaps in the component sector through a focused investment promotion scheme. India is also making an effort to develop indigenous component sector through giving focus in R&D and tightening the IPR regime and thereby inviting big players to step in the critical component sector leaving the basic components in the hands of SMEs. China, on the contrary, is increasing its comparative

advantage in the basic component sector through further reduction in cost. For vehicles, it is still focusing on the consolidation of the domestic sectors and improving the technological as well as managerial capabilities of the sector in general.

Specialization in automobile sector is increasingly becoming segment specific as each of these countries is finding its niche. China is specalising in components, India in two wheelers and small vehicles, Thailand in pick-up trucks and passenger cars and Indonesia in utility vehicles. Thailand is exporting to developed countries and strengthening its position in ASEAN. Indonesia is also increasing its trade relation with ASEAN. India is concentrating on Middle East and south Asia beside traditional developed country destinations. With the gradual opening up of the component sector, now the challenge is for individual governments to support the development of domestic critical component and sub-system suppliers through, interalia, improvement in the investment environment, stronger patent regimes and incentives for R&D.

Table of Content

I. Introduction 4
II. Changing Structure of Global Automobile Industry: 5
  II. I Growth of Automobile industry: 5
  II. II. Economics of Automobile Industry: 8
    II.II.I Production: 9
    II.II.II Supply Chain: 10
    II.II.III Pricing: 12
    II.II.IV International Trade: 14
III. Methodology: 16
IV. Brief Review of Automobile Industry Growth in Selected Countries 18
  IV.I China: 18
  IV.II India: 18
  IV.IV Indonesia: 19
  IV.III Thailand: 20
V. Production and Market Structure: 20
  V.I: China 21
  V.II: India 22
  V.IV: Indonesia 24
  V.III: Thailand 26
VI. Dynamics of Trade 28
  VI. I China's automobile Trade 29
  VI.II India's automobile Trade 31
  VI.III Indonesia's automobile Trade 33
  VI.III Thailand's automobile Trade 35
VII. Tax and Tariff Structure: 36
VIII. Epilogue 38
  VIII.I: Comparison of Policy Framework 38
  VIII. II Focusing more on Trade 40
  VIII. III: Identifying Niches and Future Challenge 41
References 44
Appendix – HS Codes Relevant to Automotive Sector 46

I. Introduction

Automobile industry is a symbol of technical marvel by human kind. Being one of the fastest growing sectors in the world its dynamic growth phases are explained by nature of competition, product life cycle and consumer demand. Today, the global automobile industry is concerned with consumer demands for styling, safety, and comfort; and with labor relations and manufacturing efficiency. The industry is at the crossroads with global mergers and relocation of production centers to emerging developing economies.

Due to its deep forward and backward linkages with several key segments of the economy, the automobile industry is having a strong multiplier effect on the growth of a country and hence is capable of being the driver of economic growth. It plays a major catalytic role in developing transport sector in one hand and help industrial sector on the other to grow faster and thereby generate a significant employment opportunities. Also as many countries are opening the land border for trade and developing international road links, the contribution of automobile sector in increasing exports and imports will be significantly high. As automobile industry is becoming more and more standardized, the level of competition is increasing and production base of most of auto-giant companies are being shifted from the developed countries to developing countries to take the advantage of low cost of production. Thus, many developing countries are making serious efforts to grab these opportunities which include many Asian countries such as Thailand, China, India and Indonesia.

The rising competition and increasing global trade are the major factors in improving the global distribution system and has forced many auto-giants such as General Motors, Ford, Toyota, Honda, Volkswagen, and Daimler Chrysler, to shift their production bases in different developing countries which help them operate efficiently in a globally competitive marketplace. During the second half of the 1990's, the globalization of the automotive industry has greatly accelerated due to the construction of important overseas facilities and establishment of mergers between giant multinational automobile manufacturers. Over the years, it is being observed that Asia is emerging as a global automotive hub. Exports of automobiles including components from Asia are also increasing by leaps and bounds. Asia has become the major consumer as well as supplier of automobiles.

At this juncture, the study makes an attempt to evaluate the growth pattern, changes in ownership structures, trade pattern, role of government etc. in automobile sector of selected Asian countries (viz. China, India, Indonesia and Thailand). The objective of the study is to understand the dynamics of Indian automobile sector in comparison to the same sector in other selected Asian countries. Thailand is a major auto exporting country from Asia. The sector is mainly driven by Japanese FDI. Chinese automobile sector is growing very fast and is poised to make its dent in the international

trade arena very soon with its strong position in component sector. India, on the other hand is consolidating its position with strong domestic and external demand. The Indonesian automotive industry is essentially an assembly industry, dominated by the major Japanese car manufacturers is also coming up in post-liberalization period and increasing its exports.

Japan and Korea Rep already have developed automobile industry. Hence, comparison with these two countries may not be worthwhile. Selected four are developing countries and making an effort to develop the automobile sector through different paths. The paper will compare the alternative strategies for the growth of automobile industry in these selected countries.

II. Changing Structure of Global Automobile Industry:

II. I Growth of Automobile industry:

The production of automobiles in volume began in the early 1890s, in Western Europe. The USA started the production of both electric and gas automobiles by 1896. In 1903, Ford stepped in. The price of cars reduced from USD 850 in 1908 to USD 360 in 1916. The great depression and the World Wars saw a drop in sale; but the 1950s and 1960s were the glorious era for automobiles (driven by Ford, GM and Chrysler). Production reached 11 million units in 1970. Industry specialists indicate that international business in the automobile industry dates back to the technology transfer of Ford Motor Company's mass-production model from the U.S. to Western Europe and Japan following both World Wars I and II. This gives rise to two important trends. The first one is that, the advancements in industrialization led to significant increase in the growth and production of the Japanese and German automotive markets. The second important trend was that due to the oil embargo from 1973 to 1974, the export of fuel efficient cars from Japan to the U.S.

Earlier due to low fuel prices, US was producing ‘muscle cars’ but after the oil price shocks US had to compete with Europe and Japan who succeeded in producing fuel efficient cars. For the first time, design, marketing, prices, customer satisfaction etc become important in the automobile market. By 1982, Japan became the world leader in US market. The potential growth opportunities led to global overcapacity in automobile industry. 1990s observed the merger and acquisition (M&A) and formation of strategic alliances to tackle this overcapacity problem.

Increasing global trade also act as a major factor for rising growth in world commercial distribution systems, which has also increased the global competition amongst the automobile manufacturers. Japanese automakers have instituted innovative production methods by modifying the U.S. manufacturing model. They are also capable

of adapting and utilizing technology to enhance production and increase product competition.

There are three major trends of world automotive industry, which are discussed briefly bellow:

Global Market Dynamics - The world's leading automobile manufacturers continue to invest into production facilities in emerging markets in order to reduce production costs and therefore rise in profits. These emerging markets include Latin America, China, Malaysia and other markets in Southeast Asia.

Establishment of Global Alliances – Now-a-days, there is trend of joint venture in global automotive industry. Most of the giant automobile manufacturers are merging with each others. The big three U.S. automakers (GM, Ford and Chrysler) have merged with, and in some cases established commercial strategic partnerships with other European and Japanese automobile manufacturers. The Chrysler Daimler-Benz merger, were initiated by the European automaker in order to strengthen its position in the U.S. market. Overall, there has been a trend by the world automakers to expand by merging with other giant automotive companies in overseas markets[*].

Industry Consolidation - Increasing global competition amongst the global manufacturers and positioning within foreign markets has divided the world's automakers into three groups, the first group being GM, Ford, Toyota, Honda and Volkswagen, and the two remaining group manufacturers attempting to consolidate or merge with other lower group automakers to compete with the first group companies[†]. Diagram1 provides a snapshot view of this.

World automotive industry, in its early stages of development, was concentrated mainly in hands of developed countries like U.S., Japan etc. But as automobile industry become more and more standardized, the production base of most of auto-giant companies was shifted from the developed countries to developing countries. Standardization makes production more profitable in developing countries due to low cost of labor. That's why countries like Thailand, China today are the main production base for many multinational automobile companies, and that explain why this study is concentrated only on selected countries in Asia. Table 1 below compares basic features of automobile industry in three major markets in the world.

Table 1: Comparison of Basic Features in Three Major Automobile Market

Characteristics	US Market	European Market	East and South East Asian Market
Contribution to	Motor vehicle	The automotive industry represents	In Japan industry represents 13 %

[*] http://www.loc.gov/rr/business/BERA/issue2/industry.html

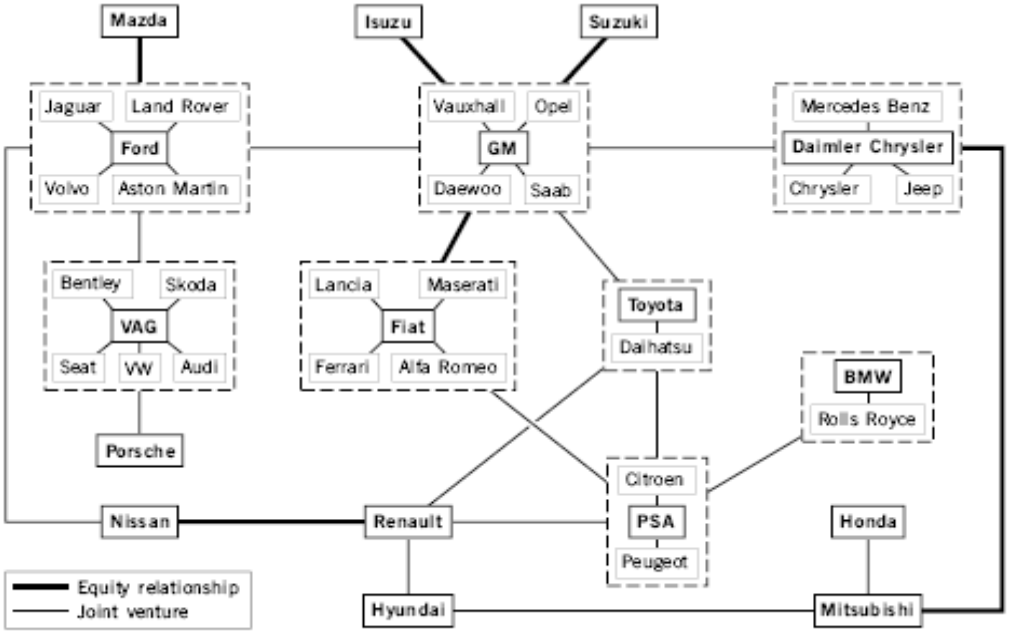
[†] 1st Group Company Mergers - Volkswagen-Lamborgini; BMW-Rolls Royce
2nd Group Company Mergers - Chrysler-Mercedes Benz; Renault-Nissan-Fiat
3rd Group Company Mergers - Mazda-Mitsubishi; Kia-Volvo

Economy	production represents over 5 % of the U.S. private sector GDP in 2002	approximately 9 % of the EU manufacturing sector	of its total manufacturing output and 10 % of employment. South Korea is exporting 41 % of its total motor vehicle production, with roughly 35 % of the exports going to the U.S. It contributed around 3.7% to GDP in 1999.
Industry Characteristics	Organisational and technological change is the key characteristics of the US industry. Of late, steps are taken to increase its global presence by expanding global alliances and seeking greater collaboration with other U.S. automakers. Productivity is more than EU but less than Japan.	The European automotive market is comprised of a concentrated and sophisticated global network, which includes joint-ventures, cooperatives, productions and assembly sites. Like USA, over capacity, intense competition and investment for technology are general features. The industry is driven by MNCs mainly located in Western Europe. However, the growing production is noted in the Czech Republic, Hungary, Poland, Slovenia, Slovakia and Turkey.	East Asian market is mainly driven by Japanese FDI. Apart from this, state sponsored initiatives are observed in Korea Rep., China, etc. These countries are making attempt to develop indigenous auto-industry base. Others are driven by MNCs. Profitability in the industry is relatively more than EU
Market Share	Ford, GM and Chrysler makeup approximately 76 % of U.S. passenger vehicle production, while Japanese automakers, Toyota, Honda, Nissan, Mitsubishi, Subaru, Isuzu represents 18 %, and European automakers, BMW and Mercedes (division of Daimler-Chrysler) make up nearly 2%.	The EU's largest automotive producer is Germany estimated at 30 % of EU's total production, followed by France at 19 % and Spain at 17 %, and the United Kingdom at 10 % The largest automakers producing multiple brands, such as General Motors, Ford, Daimler Chrysler, Volkswagen, Fiat and Peugeot Citroen. There are also independent automakers, such as Porsche, BMW and Bertione.	In Japan Toyota, Honda, Nissan, Mazda etc dominate the market. In Korea Rep, Hyundai acquired Kia and Asia Motors in 1999, and sold 10 % of its equity to DaimlerChrysler in 2000; Daewoo purchased 52 % equity in Ssanyong in 1998; and GM purchased 42 % equity of Daewoo; and in 2000, French automaker Renault purchased Samsung Motors. In ASEAN region, Toyota, Hyundai, Suzuki, GM are major players.
Demand Pattern (Domestic and export)	The US producers mainly produce for domestic market and to some extent for Canadian market. Canada is the largest market for U.S. vehicle exports with subsidiaries of U.S. automakers accounting for most of the imports. The US big Three continues to invest in Canadian market.	Consumer demand is the driving force for industry in EU. More models, shorter life-cycle is the key of demand pattern which is similar to USA. New EU members show an increasing demand and many Companies shifting some of their production base to these countries. EU is gaining through exporting high value services such as design and engineering. Europe's bus and truck market is stronger than Asia dominated by players like Volvo, Scania and Mercedes.	Asian market is growing relatively slowly but steadily in post-financial crisis period. Asia's three core markets are Japan, Korea and China. South East Asian markets are also growing rapidly. The compound average growth rate in ASEAN countries is expected to be in the order of 10 to 20 percent until 2010; 10 percent in India; and only 4 percent to 8 percent in PRC; Korea; or Taiwan ,China. In 2010, Japan's demand will be around 1/3rd of total East and SE Asian demand. Korea, Thailand play major part in exporting vehicles. AFTA is expected to increase the regional

			export market.

Sources: Prepared from various websites which include:
http://www.eurofound.europa.eu/emcc/publications/2004/ef0427en.pdf,
http://www.loc.gov/rr/business/BERA/issue2/industry.html
Key Indicators on the competitiveness of the EU'S automotive Industry, Memo 05/7, Brussels, January 2005, etc.

Diagram 1: Restructuring Status of Automobile Industry in 2000



Source: Dicken, P. (2003) *Global Shift: Reshaping the Global Economic Map in the 21st century,* Fourth Edition. London: Sage Publications.

II. II. Economics of Automobile Industry:

Today's global automotive industry is full of opportunities and risks which are everywhere — in emerging and mature markets alike. However, profitable growth is becoming more difficult to achieve due to challenges prevailed from the supply chain to the retail environment. Currently, the automotive industry has too much of everything — too much capacity, too many competitors and too much redundancy and overlap. The industry is in the grips of a global price-war.

II.II.I Production:

Today, the large car manufacturers has a production facility in the different markets and from each platform a car is produced for that market as well as for exports to other markets. Big players in automobile industry do not have just one big factory which exports its products to all other countries. In addition, the products are not identical in each different market. It may have the same technical platform, but the design and the options and features differ between countries. They are different because the demands of customers differ between countries. For example, in South America, incomes are lower than in Western Europe and customers need more affordable cars. In the USA the customers want more space in the car, and that's an important factor for a car to be successful there. On the contrary, small cars are quite popular in India. It is not possible to be in the high volume market and to send the same cars to every market all over the world. So car makers are researching what their customers want and changing the car for each market otherwise they will loose customers. More and more CKD (completely knocked down) cars are being produced for some countries in smaller volumes. That is often the case if there are barriers to exporting cars to particular countries, and they are only being sold in smaller volumes. With larger markets, where sales of particular models are high, companies really need their own plant which has its own suppliers of parts.

Due to sharp competition and changing customer demand, product development process advances have been more significant than changes in product architecture. Product cycles continue to grow shorter as more companies adopt the simultaneous engineering approach pioneered by Japanese automakers[‡]. At the same time, advances in Computer-Aided Design (CAD) and Computer-Aided Engineering (CAE) tools are being used to replace physical prototypes and testing processes. Now, major players (in post M&A situation) take greater responsibility for product design and allow production base to get shifted to advantageous location for low cost. However, still due to lack of standardization, number of tiers at the supply chain is not reduced. Moreover, when design is replicated with modification for physical product development, several domestic issues need to be taken into consideration. These are mainly legal liability, and regulatory procedures. Furthermore, there is a technological move towards modules, i.e. self-contained functional units with standardized interfaces that can serve as building blocks for a variety of different products. Modularization is expected to reshape the entire supply chain in automobile industry as component designs will gradually get shifted to supplier companies. This is expected to reduce cost significantly and increase efficiency. However, IMVP (International Motor Vehicle Programme at MIT) found that cost saving is still elusive. The absence of a clear cost advantage for modules, combined with the inherent technical difficulties of changing the highly integral product architecture of an automobile, has reduced the probability of successful modularization. Nevertheless, a number of factors could still accelerate the move towards modularity, including automaker efforts to shift investment risk to suppliers, the increasing use of information

[‡] John Paul MacDuffie & Fred Moavenzadeh (2001)

technology within vehicles, and the possibility that consumers will show a strong interest in built-to-order vehicles.

Box1: Adopting Passenger cars for Indian Market

Because of the widespread use of chauffeurs in cars of all sizes in India, passenger car manufacturers have to pay particular attention to rear passenger space and roof height. The design brief for the Indica small car, produced by India's leading vehicle manufacturer, Telco, specified that the rear seat space should match that in the Hindustan Motors Ambassador model, used by the government and big companies. Thus, the Indica is substantially wider and longer than small cars in Europe. Similarly, when Ford redesigned the Fiesta for the Indian market, it stretched the floor-plan design by 40mm in order to increase rear seat space (the model is sold as the Ikon in India).
Source: John Humphrey & Olga Memedovic, UNIDO, 2003

According to (Friedlaender, et al., 1983) consumer look at production only from 'make' and 'model' point of view but in reality, automobile production is dependant on layers of supplier driven outputs for final assembly. Many automobile companies concentrate on assembling activities only and some have long vertical chains. The industry has long planning horizon and high fixed cost associated with new car design. The degree of scale economies in the industry is very much associated with the flexibility of the technology to constantly produce different models from same platform. Some of the major technological issues which are important currently are increasing energy efficiency, competency of internal combustion engine (ICE), reducing the weight of vehicles, incorporating high-tech safety features, etc. (Monteiro (2001)). On one hand the effort of standardization is reducing cost but new challenges on the other as mentioned above is fuelling the cost of production.

II.II.II Supply Chain:

Automobile companies have adopted a strategy of global perspective in their operation. Growth of transplants in 1990s led to a presence of all competitors in virtually every corner of the globe. By focusing on common platforms and interchangeable modules, companies are able to make faster and lower cost deployment of new solutions across the whole product range, while tailoring vehicles to a multitude of tastes and preferences of consumers in the world. Moreover, they can assure enough differentiation between products to cope with proliferation while maintaining scale efficiency and a proper management of brand equity (Lung et al. 1999). As a result, major automakers are now operating on a global scale. With new investments, firms are also trying to replicate supply chain structures, demanding suppliers to be present in the new regions where they are located, often near their plants.

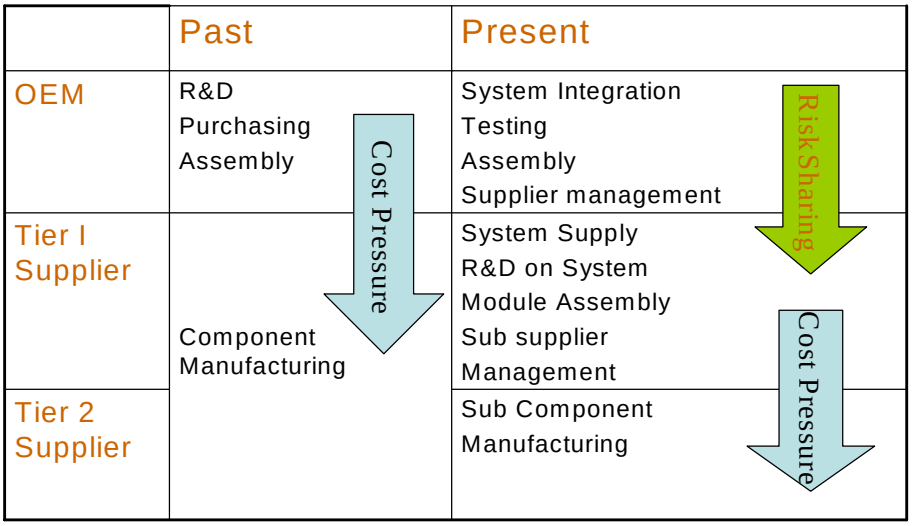
The supply chain of auto industry has completely changed over the years. Major OEM (original equipment manufacturer) players world-wide are increasingly focusing on basic design and assembly operations as well as servicing the after-sales market and prefer to deal with a smaller number of large suppliers. Consequently, the supply chain is morphing into sub-system integrators, component makers, and commodity players. The segregation is increasingly defined by 'risk sharing' which was earlier defined by only 'cost pressure'. Tier 1 suppliers (concentrating on system supply, module assembly and sub supplier management) are taking increasing risk from major players shifting the cost pressure to Tier 2 supplier who concentrate only on production of sub components.

Diagram 2 explains this more clearly. In general, suppliers can be divided into few groups such as Systems Integrator (capable of designing and integrating components, subassemblies), Global Standardized–Systems Manufacturer (specialist in design, development and manufacturing of complex systems), Component Specialist (produces specific component or subsystem for a given car or platform) and Raw Material Supplier.

Many companies (such as Volkswagen and Renault) feel that a mono-supplier strategy (such as in Ford) is not good but having limited number of large suppliers are of a better strategy. Ford pushes the supplier to own the tools, a strategy of pushing the risk associated with volume fluctuations onto the supplier rather than Ford. Suppliers will have to be concerned with their amortization schedule when quoting prices because payback for the investment in tools must be included in price (Veloso & Kumar 2002). On the contrary, Volkswagen and Renault, are satisfied with 2 suppliers in each region with an additional one having less responsibility but ready replace any of the existing supplier. Globally, these companies want their suppliers to invest near their plants or transfer their knowledge to local players. Companies bring the quality standards and price reduction condition while developing the contract with the suppliers. In general, contract length and overall value are related to price reduction targets that the supplier is able to commit to. For some of the assemblers, suppliers can also propose alternative designs that have the same economy results. The experience shows that magnitude of reduction per year varies from 2 to 8 percent due to achieving economies of scale. The competitive pressure in the industry is increasingly bringing the cost reduction targets as a major management decision of assemblers. Nowadays, major companies target cost reduction along with the design and models over a period of time. For example, German companies are targeting price reduction of 13% for the next generation model. Ford and Renault targets price reduction of 5-8% per annum and the figure is 13% for Toyota over 3 years (Veloso & Kumar 2002).

Diagram 2

Supply Chain Structure in Automobile Industry



Source: Society for Indian Automobile Association (SIAM), (2004)

The changes in the automobile companies' strategy have led to considerable restructuring in the components industry. In the 1990s, mergers and acquisitions created global mega-suppliers who became responsible for designing systems for vehicles. Mega-suppliers also in turn reorganized the rest of the value chain, managing the second-tier suppliers and developing supply systems in many different locations. The components industry is now increasingly concentrated in companies that can design and provide systems and sub-assemblies across different markets. Several supplier companies were created by assemblers. In fact, in-house component manufacturing division were given separate identities and encouraged to compete with other companies. For example, Delphi was created out of GM's component activities. Similarly, Visteon (formerly part of Ford), Magneti, Marelli (Fiat) and ECIA (formerly owned by Peugeot-Citroen and now fused with Bertrand Faure) were also created in the similar line. M&A activities among suppliers also became a common feature in 1990s. Lucas and Varity merged in 1996, T&N was taken over by Allied Signal; Bertrand Faure was acquired by ECIA. New global companies were created through the fusion of smaller manufacturers also[§].

In Asia-Pacific region, the growth of component manufacturers has taken a different route. Most of the Japanese producers followed a tight relationship with their suppliers (independent or quasi-independent). The existence of the *keiretsu* system (business affiliation) in Japan greatly facilitated such an arrangement. But other manufacturers especially Korean, Chinese and Indian gave lot of importance on price and quality while buying from number of trusted suppliers. As a result of this indigenous auto-component sectors are thriving in many Asian countries though some MNCs are also present.

II.II.III Pricing:

Pricing of automobiles is a complex issue as it is dependant on fixed cost, economies of scale, technology and other aspects. Competition and consumer demand also play important role in this. Currently, most of the automobiles companies consider price reduction as major strategic move for survival. For price reduction, companies need to take series of decisions at every stage of production and selling; starting from managing factors of production and supply chain to negotiation with dealers. Price is one of the factors that influences sales variability of products and services significantly. Companies require appropriate policies to be played intelligently for managing the series of decisions. Interestingly, reducing prices does not always generate profits. It should be in combination of other decisions regarding maintaining quality and marketing of the product. One undesired consequences of considering price reduction as the main means of obtaining customers, is attracting disloyal customers, who are attracted by the offer but do not see any other value in the company. Their life-cycle in the end is short, and they receive a much greater return from the company than the company can even make up the cost for obtaining them.

[§] For example, Autoliv Inc., formed by the merger of the Swedish company, Autoliv AB, and the Automotive Safety Products Group of the United States company Morton International

Many companies take strategy of different pricing policies for different product segments of the considering the expected value to the customers through the offered products. Companies develop innovative strategies to maximise profits without hurting customers. Pricing is adjusted to the qualities, purchase volume, development potential, loyalty and profitability factors.

As the fixed cost is very high, companies look for different models from same platforms and decide about the total output of each model. The wide range of outputs along with the degree of economies of scale drive down the average cost of production. If the auto makers are basing price on average costs, expected deviations in output in the short run (between model years) could significantly affect prices without any change in factor costs. Moreover, higher the fixed costs as a proportion of total costs, the more sensitive is short run marginal cost to changes in the costs of the of variable factors of production (for example sudden rise in prices of steel or rubber). Thus the low proportion of the variable costs in the auto industry would make short run marginal costs especially sensitive to variable factor price changes. If firms are short-run profit maximizers, prices should respond positively to changes in variable factor costs (Hoffer, et al. 1976).

Box2: Rising Factor Prices hit Indian Automobile Industry

With rising freight charges and hardening prices of steel, rubber and aluminum putting pressure on margins, Maruti Udyog Ltd on Wednesday announced that it will hike the price tags of all its cars by this month-end. While Hyundai has already hiked prices earlier this month, other manufacturers like General Motors and Ford are expected to follow suit by July-end. This fresh hike – the second this year – coupled with rising interest rates and increased state levies like Road Tax and Sales Tax would neutralize the 8% excise duty benefits offered by the government in the 2006-07 fiscal.

Source: Times of India, 19th July 2006

In most of the countries, automobile sector is identified to have monopolistic market (in some countries it is oligopolistic) structure where many players compete for market share with significant amount of product diversification. As a result of this, in the long run, most of the players earn zero normal profit and in the short run super-normal profit. Hence, competition in the short run is intense particularly when product life-cycle is very short. Moreover, within segment the nature of competition sometimes is oligopolistic as the number of models under one segment may be limited in a model year. Dominant firm sometimes take a strategy of 'limit pricing' setting it below monopoly prices while bringing a new model to bloc entry of other firms in that category. However, after sometimes, it raises prices and allows entry in the usual fashion and convert the competition towards non-price variables. If non-price attributes involve slower responses by the other players e.g., due to product development lags, the dominant firm is likely to prefer to manipulate these characteristics in order to maximize profitability. According to (Kwoka, 1984), when a dominant firm or core begins with a substantial advantage over the fringe, we would expect an initial effort to drive the fringe down in size through strategic product policy, followed by product alterations which increase profitability while permitting some entry. According to Copeland et al. al.(2005) companies develop only one vintage of a product at a time and accumulate inventories and consequently sell multiple vintages of the same product simultaneously. The profit maximizing pricing and production strategies under a build-to-stock inventory policy lead to declining prices and rise in sales (and fall there after) and similarly, inventory stocks get built up initially and then gradually get depleted. A significant portion of the price decline is driven by

inventory control considerations, as opposed to decreasing demand. Hence, along with 'limit pricing' strategy, inventory control plays an important role in maximizing profit of the automobile companies.

There has been evidence of collusive pricing also. The price disclosure law in the USA made major players to come together and which created a collusion among themselves regarding equalization of 'quality adjusted' prices. The law has inhibited players to provide price discounts (Boyle & Hogarty, 1975). Sudhir (2001) uses the ability-motivation theories and argues that in markets with high concentration and stable environment cooperative behaviors among producers are sustainable and therefore provide firms with the ability to cooperate. He also argues that in a market where firms' current customers tend to be loyal, they have the motivation to compete aggressively for new customers. Firms do so as they believe about the positive benefits of loyalty from the customer base in the long run. As consumer loyalty in the market increases, the gains from increasing market share by aggressive competitive behavior are more than offset by losses in profit margins. Firms therefore have the motivation to price cooperatively.

In the USA, earlier GM used to announce price in late summer and Chrysler and Ford would follow suit. However, foreign competition and erosion of domestic concentration has changed price uniformity. Prices are now continually altered throughout year. In general, price variation is subject to mark-ups, costs and also imports duties and other trade barriers (Goldberg and Verboven, 1998).

II.II.IV International Trade:

The dynamics of international trade in automobile sector attracted attention of economists and policy makers to formulate trade strategy. International trade of automobiles has been influenced both by liberalization as well as protectionism. In the 1970s and 1980s, the U.S. auto industry faced its first major challenge from foreign competition as Japanese automakers aggressively entered the American market. The decline of automobile sector in USA and rising Japanese imports led to protectionism in USA through imposition of quota. This led to voluntary export restraints (VER) from Japan anticipating further restriction. Japan continued with VER even after the relaxation of quantitative restrictions by the USA government in 1985. In the post oil crisis period, Japanese fuel efficient cars were high in demand in USA (Finan, & Rappoport (1982). Also, reluctance of the Big Three in the USA to produce smaller cars led to increase in import demand from Japan[**]. Apart from this, the annual import limit had the perverse effect of encouraging Japanese car companies to change the product mix of vehicles they shipped to the USA, sending more upscale models, where the profits were greatest, and fewer smaller, cheaper cars. In the early 1980s estimates say that the quota was transferring US$5 billion a year in additional profits to Japanese automakers, who could

[**] This was due to constrained small car production capacity by the US players in short run.

sell their quota-limited cars at a premium[††]. Japanese car majors Toyota, Nissan, Honda, etc jumped the quota barrier and invested in USA for the domestic market also. The protectionism in automobile market is also prevalent in Korea Rep. Korean automobile companies developed the sector through protection and currently companies like Hyundai are heavily into export business. Similarly, Indian trade policy ensures high barrier in importing vehicles to provide protection to domestic players who have started exporting recently.

In contrast to Japanese producers, companies from the USA were catering mainly to domestic market. In the post quota period, when Japanese players reduced prices in US market, domestic players were unable to compete. Due to very high level of output and efficiency, Japanese players achieved significant economies of scale which was unattainable for US automobile giants. Today, this has led to complete restructuring of the industry where even US majors have started investing in other countries to capture the global market share. Germany, Japan and Canada emerged as major exporters of automobiles to USA (Warf, 1990). There is a strategic difference between Japanese and German players also. Studying the trade data (see Table 2), it is clear that Germany has emerged as a major vehicles exporting country in 2005 overshooting Japan. Japanese companies are more interested to relocate their plants (and also bring fresh investments) to SE Asia or other developing countries and use that base as exporting platforms. As a result, export from Japan gets reduced. Germany has given thrust to mid and big size high priced vehicles in its export basket in contrast to Japan which also gives importance to low value small cars. Table 2 shows that major European countries also import a lot and the import growth is quite significant during 2000-2005. All these countries also import auto components significantly. Quite interestingly, Asian players such as Japan and Korea, rep import very less amount of components giving importance to domestic component industry which is fairly protective.

Table 2: International Trade of Major Auto producing Countries
(Figures in Billion US$)

		Export			Import		
	Description	1995	2000	2005	1995	2000	2005
France	Auto Components	17.53	19.67	28.86	11.83	13.56	24.84
	Vehicles	20.62	24.09	42.54	21.49	22.43	36.64
Germany	Auto Components	29.93	35.59	73.33	15.88	22.63	47.03
	Vehicles	60.83	72.37	131.18	29.95	27.61	43.62
Italy	Auto Components	11.42	12.75	23.54	5.62	7.30	11.71
	Vehicles	12.56	12.15	15.61	16.06	21.98	36.75
UK	Auto Components	10.69	13.11	15.74	14.72	15.15	24.45
	Vehicles	13.89	16.92	28.48	18.93	25.78	42.40
Japan	Auto Components	40.26	35.23	47.93	3.11	4.68	8.53
	Vehicles	57.28	70.38	97.27	10.55	7.47	8.94
Korea	Auto Components	1.18	2.63	9.78	3.31	2.80	5.09
	Vehicles	8.55	13.36	29.60	0.61	0.31	1.68

[††] Protectionism and Politics by *Bruce Stokes*
Available at http://usinfo.state.gov/journals/ites/0107/ijee/stokes.htm

USA	Auto Components	37.16	52.55	53.08	41.69	57.16	81.90
	Vehicles	24.22	25.89	40.67	81.49	133.44	154.47

Note: Detailed HS Codes for Auto Components and vehicles are given in the Appendix
Source: Calculated from WITS Database

III. Methodology:

In this study, we broadly follow the paradigm of Structure-Conduct-Performance (SCP) to analyze the changing features of automobile industry in China, India, Indonesia and Thailand. The study will be done in a comparative framework to evaluate the dynamics of automobile industries in these countries. The market performance along with international trade of any industry depends on various elements of market structure, such as ownership pattern, entry conditions, market concentration, and number and size of firms, as well as different forms of firm conduct and strategic behavior, such as capacity utilization, advertising and collusion. Market performance is finally linked to competitiveness of the sector which is essential for studying the trade prospect of the sector. Under the 'structure', analysis has been done considering ownership structure, size distribution & concentration, integration & cooperation. Marketing strategies regarding product policies has also been discussed under 'conduct'. The nature of competition is analyzed. Through 'performance' focus is given on profitability and problem areas of the sector. Special attention has been given on government policies regarding investment in the automobile sector, trade performance and other trade policies which are affecting automobile sector of these countries.

Automobile market structure in the selected countries has been evaluated taking into account the demand pattern and production structure. Considering the market segment, country wise production data is analyzed to identify in which segments these countries are specializing. Also, major players and their ownership pattern have been identified to understand the role of government, domestic private sector and MNCs in the development of the automobile sector. Some of the policy elements such as variety of taxes and tariffs on the sector are also studied. Taxes are divided into three major groups' viz. corporate income tax, tax on vehicles and import tariffs on CBU and a cross comparison will be provided to understand the business environment.

To analyze production, sales and trade data, we have noticed that the data structure of productions are different in different countries. Productions data are structured considering the nature of market segmentation which varies from one country to other. As a result of this, production and sales data are non-comparable. Nature of market segmentation of each of the selected countries is given below.

- Segmentation in India: Indian passenger vehicle market segmentation is based on length, price or weight. Weight based segmentation is divided into two sub segments viz. utility vehicles and multi-purpose vehicles, where utility vehicles is again divided into two groups viz. weight up to 3.5 tons and weight up to 5 tons.
- Segmentation in Thailand: Segmentation on the basis of number of seats, engine capacity and engine powers (HP). According to Thailand Automotive

Performance, Execution and Layout (APEAL) passenger car markets are divided into following categories Entry, mid size segment, Pick up extended cab segment, Pick up double cab segment, etc.

- Segmentation in China: Segmentation is based on type of manufacturing, type of category and type of fuel used (diesel or petrol). For example type of category segmentation has four groups viz. Car, MPV, SUV and Others.
- Segmentation in Indonesia: Segmentation is based on type of manufacturing and type of category such as sedans, MPVs, bus, double-cabin trucks etc.

In contrast to this, trade data is reported in terms of HS code which is harmonized at the 6-digit level across the countries. Automobile sector consists of 82 6-digit level HS codes[⌗⌗] and the nature of segmentation does not match with the types of production data. Hence, the analysis of trade data could not be linked with the production data.

The trade analysis is done considering these 6-digit codes. These codes constitute all the components of vehicles and vehicles as a whole. Codes are segmented into 7 sub-groups viz. Rubber and Glass component, Iron and Steel component, Engines and parts, Auto component I, Auto component II, Auto component III and Vehicles. Auto component I, consists of pulleys, gaskets, screws, electrical fittings, Auto component II contains body components, bumpers, brakes, clutches, safety component and Auto component III includes seats, indicators, bicycle and motor cycle components, etc. The trends of international trade related to these sub groups are analyzed to understand their pattern. First, six sub-groups are mainly components and among these first three are critical and major components for any vehicle. Auto-components (I-III) are mainly small components and accessories. The aggregated trade dynamics are analyzed to understand the nature and technical standards of the automobile industry of those selected countries. Also, major export destination and import sourcing countries for each group will be analyzed to evaluate the change in trading partners. All the export-import data of all the countries are taken from World Trade Integrated Solutions (WITS).

Table 3: Understanding HS Code of Automobile Industry

Segmentation of HS Code (82 codes at 6-digit level)	
GR-I	Rubber and Glass component
GR-II	Iron and Steel component
GR-III	Engines and its parts
GR-IV	Auto-component-I
GR-V	Auto-component-II
GR-VI	Auto-component-III
GR-VII	Vehicles

Detailed Group wise HS codes are given in the appendix.

[⌗⌗] The study follows 82 codes as per Automotive Component Manufacturers Association (ACMA), India.

IV. Brief Review of Automobile Industry Growth in Selected Countries

IV.I China:

China today, is one of the most important automobile markets in Asia. From the beginning, China's automobile industry continues to grow rapidly. The automobile industry in China is composed of 120 vehicle manufacturers 9currently getting consolidated), employing nearly 2 million workers.

In early days, there was a debate on whether automotive industry should be controlled by public enterprises or automotive industry should be restricted in the hand of private sectors. This debate has ended with the solution of joint venture. That is why today most of the Chinese automobile company runs in the hands of both public and private enterprises. FDI is also a major factor of the development of Chinese automotive industry. During the 1990s, China received more foreign investment than any other developing country as investors sought to reap some of the gains of China's fast-growing economy. Much of this foreign investment in China was in the automobile industry. By 2001, more than 800 Chinese companies in vehicle-related industries (including component manufacturers) had received FDI and the total agreed investment was valued at $233 billion with actual registered capital of $12 billion.

Despite China's growing auto industry, productivity lags behind the other Asian competitors, and industry lacks the ability to conduct research and development, relying on its foreign partners to develop new vehicles. Although Chinese automakers are presently creating new and more trade friendly policies and methods through foreign joint-ventures, but China's automotive industry still remains underdeveloped both technically and managerially. These conditions present a significant challenge for China's automotive industry, and it is expected to take a considerable amount of time before China becomes a global competitor in the automotive market.

IV.II India:

India is also an emerging market for worldwide auto-giants. Due to low cost of labor many multinational companies are investing in India. Its automotive industry has grown very rapidly from the middle of 1990's. Recently, there are two big investments expected to boost the sector further, one is from Maruti and the other is from Honda Siel. Tata's proposed investment to manufacture cheap car is also expected to boost the industry.

India is the second most populated country in the World, and the growth rate of Indian economy is very high, which indicates the presence of huge demand in different industrial sectors. Automobile industry is not the exception in this regard. Indian automobile sector has huge demands from its own country. This demand also attracts the

giant automobile suppliers through out the world to come and invest in the Indian automotive industry.

Due to the contribution of many different factors like sales incentives, introduction of new models as well as variants coupled with easy availability of low cost finance with comfortable repayment options, demand and sales of automobiles are rising continuously.

Government has also contributed in this growth by liberalizing the norms for foreign investment and import of technology and that appears to have benefited the automobile sector. The production of total vehicles increased from 4.2 million in 1998-99 to 7.3 million in 2003-04. It is likely that the production of such vehicles will exceed 10 million in the next few years.

The increase in the exports of automobile sector is also due to the adaptation of international standards. After a temporary slump during 1998- 99 and 1999-00, such exports registered robust growth rates in last few years. Investment is also a major factor for this growth of Indian automotive industry, with investment exceeding US$ 11.11 billion, the turnover of the automobile industry exceeded US$ 13.22 billion in 2002-03. The turnover has increased to US$ 18.5 billion by the end of 2004-05. Recently in 2006, Maruti invested US$ 0.67 billion and Honda invested US$ 0.2 billion on small cars. It is expected that by the year 2016, the turnover of the Indian automobile sector could grow to $145 billion. Today, this sector has emerged as a sunrise sector. However, the overcapacity problem is haunting many of the players as demand may not go up significantly. Hence, many players are looking for an external market for Indian automobiles. The prospect of component industry is quite positive. The leading local firms have established over 200 technical cooperation agreements with foreign firms to be able to reach international standards in cost and manufacturing.

IV.IV Indonesia:

Although the development and the markets of Indonesian automotive industry is not as drastic as compared to the other three countries discussed above, but Indonesia's automotive industry is currently growing steadily.

Many factors, like easily obtainable credit and low interest rates, coupled with a strong increase in consumer lending by banks and an abundance of new, low-priced models assembled locally, have fueled a car boom in Indonesia.

Under AFTA, tariffs were cut, including those on cars, which brought new opportunities to Indonesia to export vehicles to ASEAN members. Since, 2000, through liberalization programmes, tariffs have been brought down, component industry has been further strengthened. However, as the entire region is gearing up with the automobile sector Indonesia will face stiff competition in South East region.

Shortcomings like, poor infrastructure, legal uncertainty and a lack of tax incentives have been blamed for declining foreign investment in the sector, but still it remains a key pillar of the economy with investments raising more than US$7 billion and generating employment of over 300,000. The economy expanded by 5.1% in 2005, mainly spurred by consumption, and is expected to continue on track, spurring hopes of continued demand for cars[§§].

IV.III Thailand:

Thailand's automotive industry is the South East Asia's largest and most advanced automotive industry. Thailand's automotive industry is well on the way to solidifying its status as the Detroit of Asia. It is already the ASEAN's largest automotive market and assembler and world's second largest pick-up truck market after the U.S.A.

Although for Thailand, most of the export growth has come from Europe, Australia and the Middle East, ASEAN are becoming major markets. With a population of approximately 550 million and 2003, production totaling 1.3 million vehicles, industry sources predict that an integrated ASEAN auto market could become the world's fifth largest in 2005. The Thai-Australian Free Trade Agreement (2005) is expected to raise automotive trade with Australia.

Thailand's rising status in automotive industry may also boost up due to many new ventures in the country such as by the Tata Industries, the major Indian Auto producer. Tata Motors is in the process of setting up a pick-up truck manufacturing plant in Thailand, from where it could access the ASEAN and the Chinese markets through the Free Trade Area (FTA) treaties. The entry of Tatas into Thailand would pave the way for other Indian auto players also to explore manufacturing opportunities in this country.

Thailand Automotive Industry (TAI) has developed an 8.7 billion baht (US $ 217.5 million) plan to further develop the sector. This plan includes human resource development program, automotive experts dispatching program to establish clusters and upgrade auto parts manufacturing technology, generation of fund for the establishment of research and development centers, development of information center to analyze industry data and automobile export promotion center.

V. Production and Market Structure:

In this section we have addressed the production and the market structure of the selected four countries. In this process, we have analyzed the structure and organization of major companies of each of these countries, along with the market shares held by these

[§§] (Source: http://www.atimes.com/atimes/Southeast_Asia/GG01Ae01.html)

companies. Finally, we have discussed the overall production structure and the nature of demand in the market. A brief description of government's policy towards promoting automobile sector is given as reference to changing features of automobile industries of these countries.

V.I: China

Historically, Chinese automobile industry has been highly fragmented. The industry is made up of 120 complete vehicle manufacturers, 780 refitted and special-purpose vehicle manufacturers, and over 1,800 auto parts and components enterprises, 149 of which are joint ventures (Veloso & Kumar 2002). Changchun First Automobile Works (FAW group), Dong Feng Motor Corporation (DMC), Shanghai Automobile, etc are major domestic players. The Chinese government gives high priority to developing a competitive indigenous auto industry. China maintained high tariff wall to protect domestic automobile sector. In 2000, average tariff on vehicles were more than 40%. Automobile policy allowed joint ventures (JVs) with MNCs. Generally JVs were limited to single product line. Local content regulations require at least 40 percent local content for sedans and 50 percent for commercial vehicles (Veloso & Kumar 2002). Moreover, sedan manufacturers must use 60 percent local content in the second year and 80 percent in the third year. In addition, joint ventures are also pressed to accept parts produced by subsidiaries of their partners. Quite interestingly, today China has a strong component manufacturing sector and tariffs on components have come down significantly.

During the Tenth Plan (2001-2005) government wanted some amount of consolidation to tackle the problem of growing overcapacity in the industry. The state decided not to establish new sedan-manufacturing facilities. Instead, government aimed to concentrate gradually on developing three major auto groups, FAW, Shanghai, and DMC through JVs with MNCs.

Having experienced a "Golden Period" in 2005, the Chinese automobile market has been influenced by revitalized industrial policies in 2006, which include the adjustments in automobile customs, petroleum price and excise, the "three guarantees" policy (provisions on maintenance, replacement & return of private auto) and incentive policies on the development of economical cars proclaimed by the National Development and Reform Commission. As a result, in 2006, the production and sale of automobiles were 3.63 million units and 3.53 million, up by 28.94% and 26.71% than 2005 separately. The output and sales of passenger vehicles have been 2.60 million units and 2.51 million units separately, up by 40.30% and 36.53% than 2005; the output and sales of business vehicle have been 1.03 million units and 1.02 million units respectively, up by 7.16% and 7.71% than 2005[***]. China's car consumption showed a CAGR of 54.42% from 2001 to 2005[†††]. To exploit growth opportunities in automobile industry, MNCs as well as Chinese automobile companies are currently investing heavily. Companies like Audi AG (Germany), BMW Group, Daihatsu Motor Company (Japan), DaimlerChrysler AG, Fiat

[***] (Source: http://www.researchandmarkets.com/reports/357271)
[†††] http://www.chinaccm.com/4S/4S11/4S1101/news/20070504/094559.asp

automobile, Ford, Honda etc. have their production base in China. The whole automobile industry is speeding up to reorganize the investment. The large state-owned enterprises and MNCs are playing pivotal roles in the process of reorganizations.

Table 4: Reorganisation of Chinese Automobile Companies

Oct 2002	Shanghai Automobile declared to acquire 10% shares of GM Daewoo with USD 59.7 million.
Feb 2004	Shenyang Jinbei GM was jointly reorganized by Shanghai Auto, GM and Shanghai GM. Shanghai Auto and GM (China) separately acquired 25% of the shares, while Shanghai GM held 50% of the shares to form the third whole-car production base.
Oct 2004	Changan Automobile Co., Ltd. and Jianglin Group separately invested RMB 50 million to establish the Jiangling Holding Co Ltd. On Dec, 6, Changan Automobile and Jianglin Group separately input RMB 450 million to enhance the capital capacity of Jiangling Holding,Co, Ltd. And equally 50% of the shares were held separately.
Mar 2005	Dongfeng Motor spent RMB 352 million to acquire 51% of the shares of Zhengzhou Nissan. Dongfeng Motor is a joint venture founded by Nissan and Dongfeng Motor, each holding 50% of the shares, which is the largest investment project of Nissan all over the world.
July 2005	Nanjing Motor Group acquired MG Rover with over 50 million pounds, and then began to make full use of the tangible assets to launch cars of its own brand one year later on this platform.
Aug 2005	Weichai Power spent RMB 1.023 billion and became the largest shareholder by acquiring 28.12% of the total stock of Torch Automobile Group Co., Ltd, which is the most and largest eye-catching open tendering case. Weichai Power then follows the trend to integrate the advantageous capital from the affiliated companies of Torch such as Shanxi Automobile Group and Fast Gear

http://www.researchandmarkets.com/reports/357271/china_automotive_industry_report_merger_and.htm

Despite having lot of JVs, Chinese automobile industry lack capabilities technically and managerially. Therefore, making it internationally competitive will be a major challenge. The labor productivity in Chinese automobile industry is much less than that of Japan. They also do not spend much on R&D. Only in recent times, China has started spending on product development through its JV partners. Nevertheless, any results are still far in the future.

V.II: India

In India, automobile market is mainly dominated by Japanese and Indian manufacturers; also some other multinational companies are currently investing in India. The major foreign automobile manufacturers in India are Honda, Toyota, Ford, Fiat, Daimler Chrysler, etc. The major Indian players are Marutyi Udyog, TATA motors, Hindustan motors, etc. Automobile production in India rose substantially in last five years. 77% of market share is captured by two wheelers. Passenger and commercial vehicles capture around 19% market share (SIAM statistics for 2006-07). In China, JVs have given preferences for development of automobile sector. On the contrary, in India government made an attempt to develop automobile sector through domestic private sector before the liberalization. As a result of this, important Indian players have diversified ownership structures (see Diagram 3) where promoters, banks and financial institutions own significant shares of the companies. Maruti was developed as a subsidiary of Suzuki. Today, government owns around 10.27% and Suzuki Motors around 54% of total shares. In case of Tata Motors, Indian corporate bodies own

significant shares (33%) and only around 7% comes from FDI. In both the companies, FII owns limited number of shares. In case of Hindustan motors, promoters own around 29%, financial institutions 11% and individuals around 31%[‡‡‡].

Table 5: Automobile Production of India (in nos.)

Category	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	CAGR
Passenger Cars	49273	70263	125320	160670	169990	192745	31.36
Utility Vehicles	3077	1177	3049	4505	4489	4403	7.43
MPVs	815	565	922	1227	1093	1330	10.29
Total Passenger Vehicles	53165	72005	129291	166402	175572	198478	30.14
M&HCVs	4824	5638	8188	13474	14078	18838	31.32
LCVs	7046	6617	9244	16466	26522	30928	34.43
Total Commercial Vehicles	11870	12255	17432	29940	40600	49766	33.20
Three Wheelers	15462	43366	68144	66795	76881	143896	56.23
Scooters	28332	32566	53687	60699	83934	35685	4.72
Motorcycles	56880	123725	187287	277123	386054	545887	57.19
Mopeds	18971	23391	24078	28585	43181	37566	14.64
Total Two Wheelers	104183	179682	265052	366407	513169	619138	42.82
Grand Total	184680	307308	479919	629544	806222	1011278	40.50

Source: Society of Indian Automobile Industry (SIAM) website www.siamindia.com

Table 5 explains the segment wise production of vehicles. Between 2002 and 2004 there has been major jump in production in almost all segments. During the period 2000-01 to 2006-07, average growth of vehicle production was around 40%. The majority of this growth has come from the growth of motorcycles and three wheelers. However, the growth of scooter has been only 4.72%. Passenger vehicles grew by 30% in last six years. Despite the speculations of slow growth from different quarters due to unprecedented rise in input prices, the growth of passenger vehicles has been quite impressive in last two years. In 2004-05, installed capacity for four wheelers was 1.72 million and for two and three wheelers it was 9.13 million.[§§§]

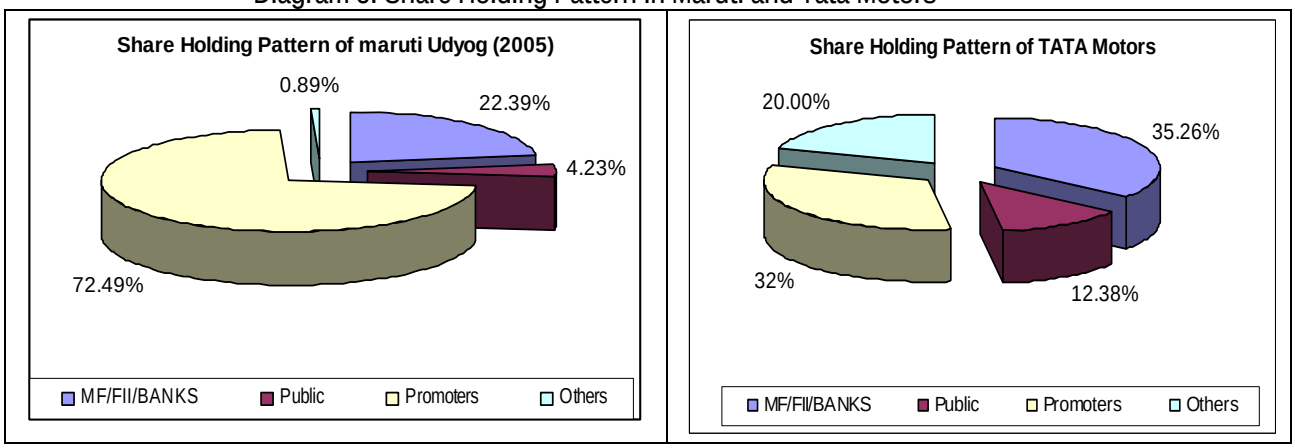
In India, domestic producers initially concentrated on producing small and basic models under a protective environment. Most of the foreign players in India have focused on mid-range market (with exceptions such as Hyundai's Santro) with the models which have been successful in other countries. Many MNCs took up a cautious approach till the time Indian consumers are ready for big cars. It has been gradual but very steady approach. However, like Chinese market, Indian automobile sector also experienced surge of investment which led to overcapacity problem. Some companies changed their strategy and started exporting to tackle the demand related issue. The overall automotive Components sector is highly fragmented and has important quality problems. Over 300 small and medium companies service directly more than 20 companies assembling vehicles in the country, with as much as 5,000 other micro firms working for the first tier suppliers and for the replacement market. Mostly due to regulation, component import

[‡‡‡] For details refer to company websites.

[§§§] Source: http://www.siamindia.com/scripts/installed-capacities.aspx

dependence is also small, with 87 percent of the domestic demand satisfied by local firms. Despite these levels of localization, the industry is quite small by international standards (Veloso & Kumar 2002). Indian auto producers are capable of exploiting the cost advantage due to cheap labour and sufficient amount of localization but they are unable to do so due to small demand and low level of productivity.

Diagram 3: Share Holding Pattern in Maruti and Tata Motors



Source: Company websites

V.IV: Indonesia

Indonesia is now the third-largest car market in Southeast Asia after Thailand, where an estimated 620,000 cars were sold, and Malaysia, with some 485,000 cars sold in 2005. Figures from Gaikindo (the Association of Indonesian Automotive Manufacturers) show that around 483,000 cars were sold in 2004, up 36% on 2003, with sales growing at a pace second only to China. Increased demand could see sales reach 1.3 million cars a year by 2010. The homegrown automotive giant, publicly listed PT Astra International, is 42% owned by Singapore's Jardine Cycle and Carriage. Astra last year increased its market share to 45% from 41.5% in 2003. The company sold cars in the domestic as well as external market. International players control 90% of the market, with the rest shared by the US, European and Korean imports, the majority from Europe. Like several other regional markets, Japanese manufacturers have the lion's share of sales. It is estimated that over 80% of all new passenger car and commercial vehicle sales in Indonesia are claimed by Toyota, Mitsubishi, Isuzu, Suzuki and Daihatsu. As passenger car ownership has been discouraged through progressive taxes, and because utility vehicles are well suited to local usage patterns, approximately 80% of the market is made up of commercial vehicles and MPVs. Car manufacturers across the globe are competing in Indonesia, but domestic manufacturers are little more than assemblers for foreign car makers. The major assembler is P.T. Astra International, whose subsidiaries build cars and trucks for Toyota, Daihatsu and Isuzu, and motorcycles for Honda. Other major assemblers in the country include the Indomobil Group and the P.T. Krama Yudha Group.

Large number of assemblers in Indonesia producing for a relatively small market, a proliferation of various makes and models, market fragmentation, and a lack of standardization, have prevented automobile assemblers from achieving economies of scale[****]. Moreover, to achieve minimum efficient scale the industry requires huge capital investment. This was done mainly by MNCs who took the advantage of vertically integrated global production system and reduced the cost part significantly. The industry was highly regulated in 1970s and there was ban on importing CBUs. Domestic investments were encouraged through JVs for assembling and distribution activities. High import duties were introduced for not using domestic components[††††]. The restrictive policies pushed automotive producers to assign a domestic company as a sole agent for importing cars in a CKD forms. In 1970s, there were more than 22 assemblers producing more than 20 brands, with more than 50 models. However, since these sole agents and assemblers were originated from trading companies that generally have limited knowledge of car production and little motivation to develop the industry, there was no significant improvement attained in this industry (Aswicahyono, et. al, 1999). The protective policies helped domestic component sector to grow.

Table 7: Production (in numbers) of Vehicles in Indonesia (2006)

Passenger Cars	
Sedan Type	2008
Mpv 4x2 Type	203676
Suv 4x4 Type	637
Subtotal	206321
Commercial Vehicles	
Bus	1254
Pick Up / Truck	88433
Double Cabin 4x2 / 4x4	0
Subtotal	89687
Grand Total	296008

Source: www.Gaikindo.org

In 1990s, government provided incentives to automobile producers for using domestic component and reduced import duties in the ancillary sector. The higher the level of local content achieved, the lower import duty would be applied for the remaining components that have to be imported[‡‡‡‡]. This was further liberalized in 1995. The 1995 policy package deregulates investments in the automotive industry for the production of new cars; setting a target for lower import duty in 2003 that was mainly due to Indonesia's commitment to AFTA and APEC. In 1996, government took steps for

[****] As per Gaikindo, in 2006, models such as Toyota Avanza (16.4%), Toyota Kijang (14.6%), Daihatsu Xenia (7.4%), Suzuki Carry/Futura (7.3%) were having very high market share. Top ten models consist of almost 73% of domestic sales of the vehicles in 2006.

[††††] Popularly known as "Deletion Programme" which was introduced in 1976

[‡‡‡‡] In 1993, the government replaced the Deletion Program with the Incentive Program, known as the 1993 Automotive Policy Package. Automobile manufacturers were allowed to choose the components that would use local products and were granted discounts on import duties, even total exemption, according to the vehicles' level of local content.

development of ‘national car’ with stringent conditions on local content requirement and tax incentives for that. The idea was challenged in WTO and following the recommendation of the Dispute Settlement Body the policy was discontinued in 2000. Also following the advice from IMF in the post-financial crisis period, Indonesia had to liberalise the economy including automobile sector. Also, under AFTA, Indonesia put several automotive products under Temporary exclusion List (TEL) which was transferred to Inclusion List (IL) and tariffs were brought down to 20% initially and then gradually to below 5%. The series of policy change due to internal as well as external pressure led to a paradigm shift for automobile industry. The 1999 Automotive Policy Package brought a new dimension in the automobile industry of Indonesia, which aimed at stimulating the export of automotive products, driving the post-crisis domestic market and strengthening the sector’s structure by developing the parts manufacturing industry. The Incentive Program was removed and import duties were lowered by more than half on average.

Indonesian automobile industry (especially passenger cars segment) as a result of interplay between demand factors and policy factors suffered from extreme fragmentation with lot of brands and models. However, volume of sales of each model has always been very low. As local content rule had some relaxation for passenger vehicles, each company imported advanced components and changed models quite fast to compete aggressively in relatively smaller domestic market. In commercial vehicle segment, number of brands is less. The fragmented market structure of the sectors prevents the automobile and component makers to achieve sufficient economies of scale. As the domestic market for the sector is highly protected, selling the products in the domestic market has been more profitable than exporting them. MNCs took the advantage of this protected market to increase their profitability. As a result of the policy, domestic component market got developed only for basic ancillaries. Most of the components which have high technology contents and require precision in their production are imported. Today, Indonesian domestic component manufacturers are concentrating on low value, relatively simple and labour/natural resource intensive components such as tires, electrical equipment, and wires and conductors. Of late, Indonesia is making a room for export oriented automobile industry and some investment is expected in that direction. Nissan, Mazda, etc have been contemplating large investment to increase their production base in Indonesia

V.III: Thailand

Thailand is already the world's second largest pick-up truck market after the U.S. and ASEAN's largest automotive market and assembler. Today all leading Japanese car producers as well as BMW, Mercedes Benz, General Motors, Ford, Volvo and Peugeot assemble cars in Thailand along with their legions of suppliers. Thailand has become the main production base for auto exports in South East Asia. The biggest foreign producer located in Thailand is Toyota with a total production of more than 300,000 cars a year and the number is increasing. General Motors (GM), although a much smaller player in

Thailand than Toyota, is also increasing production. Among the other big auto companies located in Thailand are Nissan, Isuzu, Auto Alliance, Mitsubishi and Honda etc. In recent years, Daimler Chrysler (Mercedes-Benz) and BMW have also increased their investments to gain complete control on local manufacturing and marketing operations.

The revival of the industry in post-financial crisis period is noteworthy. Soon after the crisis, when demand came down significantly, local manufacturers got integrated with large foreign players. As a result, JVs became popular choice for many Thai players. Toyota and Isuzu are market leader claiming a combined 65% of the total vehicle market. Isuzu and Toyota also dominate the one-ton pickup market with more than 72% of the pickup market between them. The rest is divided up between Mitsubishi, Nissan, Chevrolet, Ford and Mazda. Sales of passenger cars, which are increasingly becoming diesel powered because of petrol price increases, are dominated by Toyota, which took more than 51% of the segment. Honda is second in this segment with a 25.9% share. Segment wise sales from different companies are given in Table6. Post Implementation period of AFTA is expected to create a good export market for Thai automobile industry.

Table 6: Market Share (monthly) of Various Automobile Companies in Thailand (in Numbers)

Segments	Companies	May 2007	May 2006	Share (May 2007)
Total sales volume for all categories	Toyota	23,082	25,585	44.90%
	Honda	6,605	5,888	12.90%
	Isuzu	9,985	11,710	19.40%
	Nissan	3,723	3,005	7.20%
	Mitsubishi	2,309	2,190	4.50%
	Total	51,364	55,700	100.00%
Sales volume of saloon cars	Toyota	8,811	8,755	53.70%
	Honda	5,429	5,850	33.10%
	Chevrolet	624	281	3.80%
	Nissan	331	504	2.00%
	Mitsubishi	288	413	1.80%
	Total	16,422	17,227	100.00%
Sales volume of commercial vehicles	Isuzu	9,985	11,710	28.60%
	Toyota	14,271	16,830	40.80%
	Nissan	3,392	2,501	9.70%
	Mitsubishi	2,021	1,777	5.80%
	Ford	1,174	1,494	3.40%
	Honda	1,176	38	3.40%
	Total	34,942	38,473	100.00%
Sales volume of commercial vehicles with weight not over 1 ton	Isuzu	9,172	10,808	30.10%
	Toyota	13,204	16,038	43.40%
	Nissan	3,191	2,369	10.50%
	Mitsubishi	1,833	1,589	6.00%
	Ford	1,134	1,448	3.70%
	Total	30,449	35,383	100.00%

Source: http://www.toyota.co.th/red/en/sales_summary.asp

The government's support and promotion of automobile industry has been quite consistent for decades. Policy and procedure have been set to facilitate the process in which the automobile industry would grow from the assembly plant stage to the production plant stage. Initially, government's policy was quite protective but in post AFTA period, it is quite liberal and many MNCs are poised to take advantage of the situation. Earlier, automobile sector was developed through an import substitution policy where import tariff was set high, components import was restricted and promotion of domestic investment was given due importance. In a liberal trade regime, Thailand is now ready for fresh round of investment in the automobile sector. Government is focusing on industrial clusters for providing opportunities to new entrants. In case of component sector, careful attention is being given to chalk out the plans for the missing link sub-sectors of the value chain to reduce importable components providing incentives to produce in the country.

VI. Dynamics of Trade

It has been mentioned earlier that the international trade in the automobile sector consists of trade in vehicles and components. The sector consists of 82 six digit HS codes. We have divided them into 7 broad categories: rubber & glass components (Group I), iron & steel parts (Group II) , engine& parts thereof (Group III), small parts such as pulleys, gaskets, electrical fittings, etc. (Group IV), body parts, bumpers, brakes, clutches and other safety components (Group V), seats, indicators, bicycle and motor cycle components (Group VI) and full vehicles (Group VII). Changing pattern of export and import of all these subgroups will be analysed for each one of the selected countries. Top 5 exporting markets and importing sources are identified for each sub-group in this context.

It may be noted that earlier discussion has pointed out that trade in automotive sector takes place either for market seeking activities or for using destination country as offshore export platform. Trade in components is very much dependant on status of domestic component sector, protection and government regulation in component trading, level of technology absorption etc. Among these four countries, Thailand's automobile sector is truly export oriented. It has developed domestic component sector but still several critical components get imported. India's export orientation was started to tackle the domestic overcapacity problem. Export orientation has come out as a second best strategy for many players and as a result much focus has not been given to make component sector internationally competitive. However, as export is increasing, importance is being given on the component sector also. India is emerging as component exporting country as well. China's domestic market is the main target of most of the players. The strategy of JVs has helped Chinese players to consolidate themselves with modern technology from MNCs. Focus has also been given on development of the component sector. Domestic component sector got flourished in a relatively weak patent regime. Today, China is more into component trading than trading of vehicles. On the other hand, Indonesia remained as a small market. Most players concentrated on assembling activities as economies of scale are not being achieved through

manufacturing due to smaller size of the market. Though Indonesia exports some vehicles, majority of companies play with 'models' and 'makes' for the domestic market only. Component sector got developed through government protection. However, technology absorption in the component sector is not sufficient and as a result critical components are still imported (Nag et. al, 2007). Table 8 provides a snapshot view of automobile trade of the selected countries. Several attempts are also being taken to integrate fragmented international production structure of automobile industries in South East Asia. APEC automotive Dialogue is one such forum (see Box 4).

Table 8: International Trade of Selected Asian Auto producing Countries
(Figures in Million US$)

		Export		Import	
	Description	2000	2004	2000	2004
China	Auto Components	3043.47	9692.39	4479.02	15058.67
	Vehicles	1000.62	2888.99	1219.94	5447.61
India	Auto Components	757.01	1604.74	746.82	1610.41
	Vehicles	338.36	1381.75	27.4	109.73
Thailand	Auto Components	1335.61	3113.5	2755.76	5092.24
	Vehicles	1755.4	3935.16	523.71	717.33
Indonesia	Auto Components	501.42	1056.53	2465.26	2966.41
	Vehicles	115.24	187.79	463.01	1049.11

Note: Detailed HS Codes for Auto Components and vehicles are given in the Appendix
Source: Calculated from WITS Database

VI. I China's automobile Trade

The distribution pattern of automobile exports of China shows that it exports more of auto components compared to full vehicles. In 2004, more than 75% of total export from automotive sector was mainly components. China's major exporting destinations are USA, Japan, Germany, UK, Honk Kong, etc. (See Table 10). Interestingly most of them are developed countries; particularly USA and Japan are the main two nations to which China exports most. Among developing countries, Indonesia imports significantly from China. During 2000-2004, highest export growth has been observed in Group V which consists of body parts, brakes and clutches etc. China's vehicles have a good market in USA, Japan and Indonesia. For most of the product groups USA occupies more than 20% of China's exports from automobile sector. Among the exports of vehicles two wheelers, passenger vehicles and vehicles for transportation of goods are worth mentioning.

Table 9: China's Total Export and Import from Automobile Sector (US$ Million)

Export	2000	2001	2002	2003	2004	CAGR
GR-I	199.85	229.85	253.67	301.32	442.74	22.00
GR-II	422.66	269.92	332.39	410.20	1152.20	28.49
GR-III	329.09	410.38	591.25	676.61	1133.18	36.22
GR-IV	581.36	661.04	849.75	1201.67	1528.80	27.34

GR-V	1123.07	1351.22	1841.62	2415.53	4409.18	40.76
GR-VI	387.44	481.34	633.14	846.71	1026.29	27.57
GR-VII	1000.62	1008.38	970.14	1936.13	2888.99	30.35
Import	2000	2001	2002	2003	2004	CAGR
GR-I	134.18	159.77	230.60	385.31	512.29	39.78
GR-II	421.53	266.20	405.87	538.14	1119.69	27.66
GR-III	960.65	1114.19	1400.11	2378.13	3037.58	33.35
GR-IV	765.17	1072.56	1375.69	2008.27	2756.14	37.76
GR-V	2112.83	2515.32	2980.31	6135.27	7325.79	36.46
GR-VI	84.65	115.46	157.02	250.84	307.18	38.02
GR-VII	1219.94	1765.27	3243.72	5284.44	5447.61	45.37

Source: Calculated from WITS Database

However, in case of imports Japan occupies the top position for most of the product groups. Other important sourcing nations of automobile imports are Germany, Korea, Taiwan and USA. China's imports of vehicles are significantly higher than that of exports. Vehicle imports registered a growth of 45.37% during the period 2000-04. The imports of component also grew significantly. In 2004, total import for components in group V was around US$ 7.3 billion much more than the export from that category (US $ 4.4 Billion). The trading pattern of China's automobile sector provides the idea that historically, China has focused on the growth of the domestic sector and as it is gaining confidence; its export has started increasing. Currently, intra-industry trade in this sector is significantly high. Though there are discussions on over capacity problem in China but looking at the import figure, we get an idea that high internal demand is going to persist for some more time and this will fuel the growth of Chinese automobile sector.

Table 10: Top 5 Export Destinations of China in 2004 (US $ million)

Summary	Country-I	Country-II	Country-III	Country-IV	Country-V	WORLD
GR-I	USA	Japan	Hong Kong	Australia	Korea	
	102.50	57.65	40.95	30.26	25.82	442.74
GR-II	USA	Japan	Germany	UK	Hong Kong	
	274.17	131.61	72.08	64.59	53.63	1152.20
GR-III	Canada	USA	Japan	Indonesia	Korea	
	255.02	111.98	77.52	52.00	26.46	1133.18
GR-IV	USA	Japan	Italy	Hong Kong	Germany	
	380.38	237.60	75.51	67.44	58.27	1528.80
GR-V	USA	Canada	Germany	UK	Indonesia	
	1213.67	93.03	80.90	59.24	49.47	4409.18
GR-VI	Indonesia	Taiwan	Japan	USA	Germany	
	99.86	79.15	74.67	68.92	56.92	1026.29
GR-VII	USA	Japan	Indonesia	UK	Hong Kong	
	579.12	128.58	107.49	74.33	58.24	2888.99

Source: Calculated from WITS Database

Table 11: Top 5 Import Sources of China in 2004 (US $ million)

Summary	Country-I	Country-II	Country-III	Country-IV	Country-V	WORLD
GR-I	Japan	Germany	Korea	USA	Taiwan	
	188.45	93.54	63.43	46.24	22.62	512.29
GR-II	Japan	Taiwan	Germany	Korea	USA	

	368.79	149.21	145.88	115.20	94.84	1119.69
GR-III	Japan	Germany	Korea	USA	Brazil	
	1133.93	617.25	282.52	212.07	81.79	3037.58
GR-IV	Japan	USA	Korea	Taiwan	Italy	
	854.54	241.67	229.06	183.78	87.15	2756.14
GR-V	Japan	Germany	Korea	Taiwan	USA	
	2480.70	2108.55	1123.02	369.43	226.76	7325.79
GR-VI	Germany	Japan	Korea	Taiwan	USA	
	112.63	92.27	34.61	31.40	11.32	307.18
GR-VII	Japan	Germany	Korea	USA	UK	
	2064.49	2047.61	376.07	309.41	108.90	5447.61

Source: Calculated from WITS Database

VI.II India's automobile Trade

As described earlier, India's export orientation has been developed to tackle the overcapacity problem. As a result of this, the entire sector is not geared up equally for exports. The export growth figure (Table 12) reveals that vehicle export growth has been much higher than components and during 2000-04, average growth from this group was more than 42%. The overall export is much lower than that of China but unlike China, India's exports are more than its imports in most of the categories. In components, overall export and imports are very close to each other in 2004.

Table 12: India's Total Export and Import from Automobile Sector (US$ Million)

Export	2000	2001	2002	2003	2004	CAGR
GR-I	37.19	36.04	42.19	63.51	62.79	13.99
GR-II	89.16	77.89	112.50	183.05	214.55	24.55
GR-III	174.69	164.34	187.35	294.10	401.97	23.16
GR-IV	73.02	73.40	119.61	143.04	202.93	29.11
GR-V	309.15	306.01	370.95	475.87	663.86	21.05
GR-VI	73.81	65.54	67.28	55.91	58.65	-5.59
GR-VII	338.36	285.09	489.97	949.13	1381.75	42.15
Import	2000	2001	2002	2003	2004	CAGR
GR-I	41.17	41.20	49.75	67.29	82.54	18.99
GR-II	43.77	44.19	61.23	81.86	101.63	23.44
GR-III	186.38	182.95	198.57	282.12	364.22	18.23
GR-IV	185.39	216.39	231.06	318.20	384.91	20.04
GR-V	281.18	249.03	220.89	423.56	661.18	23.83
GR-VI	8.93	7.65	9.05	9.55	15.93	15.58
GR-VII	27.40	33.10	86.11	94.45	109.73	41.47

Source: Calculated from WITS Database

India's major export destinations of automobiles are developed countries such as USA, UK, Germany, Middle East and SAARC countries. Unlike China, Japan does not come among the top 5 export destinations of India. Also, India is making an effort to find out a South Asian market for its products which is evident as Sri Lanka, Bangladesh are among the major export destination of some product groups. India's export basket is

more diversified compared to China in full vehicles category. India significantly exports, motorcycles, passenger cars, tractors, vehicles for transporting more than 10 persons and vehicles for transportation of goods. Though India is not heavily into component trading the country is gradually specializing in safety components and engine parts. Also it is expected that due to capability in R&D India may be a right choice for sub-system and design development.

Table 13: Top 5 Export Destinations of India in 2004 (US $ million)

Summary	Country-I	Country-II	Country-III	Country-IV	Country-V	WORLD
GR-I	UK	USA	Germany	UAE	Mexico	
	7.14	6.45	4.03	3.53	2.46	62.79
GR-II	USA	Bangladesh	Germany	UK	UAE	
	61.26	34.37	15.26	15.03	9.74	214.55
GR-III	USA	Germany	UK	Sri Lanka	UAE	
	89.88	60.78	28.01	22.08	11.35	401.97
GR-IV	USA	UK	Germany	Italy	China	
	38.44	25.47	17.44	12.29	12.08	202.93
GR-V	USA	UK	Italy	Germany	UAE	
	166.84	54.91	41.99	34.68	26.17	663.86
GR-VI	UK	Bangladesh	USA	Malawi	Italy	
	3.02	1.90	1.90	1.85	1.82	58.65
GR-VII	UK	Italy	USA	Germany	UAE	
	100.01	99.80	90.66	56.07	38.17	1381.75

Source: Calculated from WITS Database

In case of imports, Japan, USA, Germany, UK, Korea Rep are important sourcing countries. Highest import is observed in body parts and safety component category. Thailand also has come as a major sourcing country for brakes, clutches and some basic components. India-Thailand FTA has given emphasis on trade of auto components and in future India's imports from Thailand is expected to increase.

Table 14: Top 5 Import Sources of India in 2004 (US $ million)

Summary	Country-I	Country-II	Country-III	Country-IV	Country-V	WORLD
GR-I	Japan	USA	Germany	Korea	UK	
	17.06	13.74	9.14	6.94	6.68	82.54
GR-II	Japan	Germany	Korea	USA	UK	
	16.53	16.23	14.95	11.90	8.47	101.63
GR-III	Japan	Korea	USA	UK	Germany	
	82.70	60.72	41.41	29.69	24.82	364.22
GR-IV	Germany	Japan	USA	Korea	Italy	
	104.41	56.95	43.26	25.36	20.07	384.91
GR-V	Korea	Japan	Germany	Thailand	USA	
	208.66	128.73	56.29	51.88	27.03	661.18
GR-VI	Japan	China	Thailand	Italy	Germany	
	5.35	3.47	2.22	1.52	0.73	15.93
GR-VII	Japan	Germany	Korea	Thailand	UK	
	50.11	23.12	11.89	5.36	3.15	109.73

Source: Calculated from WITS Database

VI.III Indonesia's automobile Trade

Indonesia has a small market. During 1990s, automobile sector was significantly influenced by the government policy. Component sectors were highly protected and assemblers were provided incentives to use local components. As the domestic market was not big; economies of scale was difficult to achieve. Hence, production activities were limited and the sector was operational mainly through assembling which was done through importing critical components and using basic local components. Marketing was very aggressive through frequent changing of models mainly by dominating Japanese players. However, import was more flexible in post 2000 period which has been explained earlier. Both export and import showed rising trend but much slower compared to other selected countries in most of the product category.

Table 18: Indonesia's Total Export and Import from Automobile Sector (US$ Million)

Export	2000	2001	2002	2003	2004	CAGR
GR-I	39.44	38.38	50.44	66.04	64.84	13.23
GR-II	22.86	30.42	35.26	35.25	45.60	18.84
GR-III	94.77	88.52	135.01	181.43	201.11	20.7
GR-IV	83.59	48.38	48.52	60.81	120.89	9.66
GR-V	230.28	261.56	294.12	386.72	533.89	23.4
GR-VI	30.48	36.57	57.50	60.74	90.20	31.16
GR-VII	115.24	88.11	92.19	82.33	187.79	12.98
Import	2000	2001	2002	2003	2004	CAGR
GR-I	40.95	41.82	42.85	53.56	65.76	12.57
GR-II	86.59	82.88	96.85	109.02	144.49	13.66
GR-III	618.51	489.41	534.70	568.02	840.15	7.96
GR-IV	339.42	312.25	352.30	348.55	597.53	15.19
GR-V	1120.89	936.33	829.68	956.38	987.59	-3.12
GR-VI	258.90	396.91	389.38	300.40	330.90	6.33
GR-VII	463.01	497.06	409.16	591.89	1049.11	22.69

Source: Calculated from WITS Database

Due to opening up of the economies import of vehicles increased significantly during 2000-04 period. Earlier, during the protection period, basic component sector grew. As a result of that today Indonesia is supplying components especially from Group IV, V, and VI to many ASEAN members and also to Japan. Indonesia has specialized in components used in CVS and MPVs. As a result of this some Japanese companies are now investing in Indonesia in these segments for exporting vehicles to other ASEAN members. For import, major sourcing countries for Indonesian imports are Japan and Thailand. Most of the Japanese companies settled in Indonesia import components either from Japan or from Thailand. Indonesia also imports components and vehicles from Germany, China, USA , Korea Rep., etc.

Table 19: Top 5 Export Destinations of Indonesia in 2004 (US $ million)

Summary	Country-I	Country-II	Country-III	Country-IV	Country-V	WORLD
GR-I	Singapore	Japan	Australia	USA	Thailand	
	25.08	8.16	6.59	6.31	2.54	64.84
GR-II	Japan	Germany	Italy	USA	Singapore	
	14.57	6.92	3.54	3.51	2.65	45.60
GR-III	Japan	Thailand	Taiwan, China	Malaysia	Singapore	
	64.85	29.40	22.90	17.35	13.14	201.11
GR-IV	Thailand	Japan	USA	Philippines	Singapore	
	40.27	18.51	12.67	11.87	7.47	120.89
GR-V	Japan	UK	Malaysia	Thailand	USA	
	117.76	65.10	64.61	63.13	46.61	533.89
GR-VI	Thailand	Japan	Malaysia	Vietnam	Philippines	
	30.80	13.60	11.89	11.33	4.80	90.20
GR-VII	Thailand	Malaysia	Vietnam	Philippines	Colombia	
	88.77	28.22	14.14	12.89	7.80	187.79

Source: Calculated from WITS Database

Table 20: Top 5 Import Sources of Indonesia in 2004 (US $ million)

Summary	Country-I	Country-II	Country-III	Country-IV	Country-V	WORLD
GR-I	Japan	USA	Thailand	Singapore	China	
	32.98	9.51	6.98	3.01	2.71	65.76
GR-II	Japan	Thailand	Taiwan, China	China	USA	
	81.21	12.22	10.06	8.02	7.19	144.49
GR-III	Japan	Thailand	USA	Germany	China	
	567.21	105.84	41.13	20.33	18.94	840.15
GR-IV	Japan	Thailand	USA	Germany	China	
	289.78	100.65	37.05	29.53	19.66	597.53
GR-V	Japan	Thailand	Germany	Taiwan, China	Korea, Rep.	
	696.36	84.61	46.58	21.80	20.48	987.59
GR-VI	Japan	Thailand	China	Taiwan, China	Malaysia	
	132.52	85.53	59.25	17.06	12.77	330.90
GR-VII	Thailand	Japan	USA	Germany	Sweden	
	455.39	287.87	65.02	47.06	31.08	1049.11

Source: Calculated from WITS Database

Box 3 : 8th Meeting of APEC: An attempt for Regional Integration of Automobile Sector

APEC Automotive Dialogue is an independent forum and is attended by automotive industries and APEC state members. This is a forum that discusses early voluntary sectoral liberalization for automotive sector in the APEC areas. In the future, the forum will play a role to bring APEC economic area into integrating the automotive sector area. Meanwhile the integration is aimed at strengthening regional integration efforts through liberalization, facilitation and promotion measures to ensure full integration of the automotive sector by 2010. The Integration is also aimed at promoting private sector participation. The 8th APEC Automotive Dialog in Bali was expected to help the integration process of automotive industries in Asia Pacific area in general and especially Indonesia. The main topics of discussion in the 8th APEC Automotive Dialogue include customs and trade facilitation, information technology (IT), intellectual property rights, harmonization of regulations and road safety, environmental issues, market access, rules of origin and certification system, ecotech, other topics as proposed and agreed by the steering committee, such as, world trade organization Doha development and ASEAN cooperative agreement for automotive technical regulations.
Source: http://www.gaikindo.org/index.php?fuseaction=events.detail&id=150620061350496

VI.III Thailand's automobile Trade

Thailand is a major Asian exporter of automobiles especially cars and pick up trucks. The industry is mainly driven by Japanese companies. In 2004, exports of vehicles from Thailand were around US $ 4 billion which registered an average growth around 22% during 2000-04. Among components, Thailand exports body parts, brakes and clutches significantly followed by engine and its parts. However, its imports are still very large in these two product groups (see Table 15). Japan has occupied the first position among the sourcing countries in all product categories (see Table 17). Overall import growth has registered much smaller rate compared to China and India.

Table 15: Thailand's Total Export and Import from Automobile Sector (US$ Million)

Export	2000	2001	2002	2003	2004	CAGR
GR-I	86.80	73.42	87.76	110.85	158.31	16.21
GR-II	98.11	83.05	122.19	167.36	245.84	25.82
GR-III	271.84	241.23	292.55	407.41	615.67	22.68
GR-IV	166.94	170.10	202.24	259.39	339.61	19.43
GR-V	507.83	496.43	634.06	971.97	1422.68	29.37
GR-VI	204.10	173.52	188.90	237.27	331.40	12.88
GR-VII	1755.40	2029.19	2095.57	2836.86	3935.16	22.36
Import	2000	2001	2002	2003	2004	CAGR
GR-I	89.92	47.99	50.50	54.24	65.00	-7.79
GR-II	197.59	198.45	222.89	266.28	334.61	14.08
GR-III	693.18	756.62	980.68	1214.42	1363.36	18.42
GR-IV	369.93	348.67	423.77	509.68	722.89	18.23
GR-V	1337.88	1496.62	1629.10	2142.64	2512.97	17.07
GR-VI	67.25	67.69	67.52	77.48	93.41	8.56
GR-VII	523.71	401.45	439.80	653.14	717.33	8.18

Source: Calculated from WITS Database

Table 16: Top 5 Export Destinations of Thailand in 2004 (US $ million)

Summary	Country-I	Country-II	Country-III	Country-IV	Country-V	WORLD
GR-I	Japan	USA	France	Malaysia	Australia	
	56.3	13.1	2.1	7.2	5.2	158.3
GR-II	USA	Japan	Indonesia	Malaysia	Germany	
	60.2	46.9	21.0	16.9	7.3	245.8
GR-III	Indonesia	Malaysia	Japan	USA	Australia	
	142.1	82.7	68.1	32.0	17.5	615.7
GR-IV	Indonesia	Japan	Malaysia	Australia	USA	
	36.9	35.1	32.4	7.9	16.5	339.6
GR-V	Japan	Malaysia	USA	Indonesia	Australia	
	298.2	181.9	106.0	127.5	47.6	1422.7
GR-VI	Indonesia	Japan	Philippines	Malaysia	Italy	
	94.2	32.1	32.0	31.1	13.6	331.4

GR-VII	Australia	UK	Indonesia	Japan	Philippines	
	697.45	368.56	452.82	90.61	207.55	3935.17

Source: Calculated from WITS Database

Earlier, Thailand was concentrating in developed country market. As AFTA is increasingly defining intra-ASEAN trade, Thailand is now consolidating its position in the regional market. As a result of this, Indonesia, Malaysia, Philippines etc have become major export destination for Thailand both for vehicles and components. Thai vehicles are sold maximum in Australia followed by UK. Export of vehicles back to Japan has been very low. USA has come among the top 5 export destination of vehicles both in case of India and China. However, for Thailand it is not the case. Overall component exports are less than full vehicles which shows the export orientation of Thailand in case of final products. Import of components has been high only in Group V and Group II which was mainly due to inclination of Japanese producers towards Japanese components.

Table 17: Top 5 Import Sources of Thailand in 2004 (US $ million)

Summary	Country-I	Country-II	Country-III	Country-IV	Country-V	WORLD
GR-I	Japan	Indonesia	USA	Germany	China	
	35.78	4.94	6.39	3.08	2.69	65.00
GR-II	Japan	USA	Germany	China	Korea	
	217.42	17.81	8.84	11.68	5.51	334.61
GR-III	Japan	Germany	Indonesia	USA	China	
	1179.14	24.31	32.13	12.73	13.24	1363.36
GR-IV	Japan	USA	Germany	Korea	China	
	359.59	58.77	36.06	41.74	30.18	722.89
GR-V	Japan	Germany	Indonesia	Korea	USA	
	1725.20	242.86	64.70	41.61	41.97	2512.97
GR-VI	Japan	Indonesia	China	Taiwan	USA	
	32.47	23.53	13.01	4.08	1.43	93.41
GR-VII	Japan	Germany	Indonesia	Korea	USA	
	327.10	47.58	83.09	12.98	11.21	717.33

Source: Calculated from WITS Database

VII. Tax and Tariff Structure:

Tax structure is important both for demand and production as it is treated as an additional cost and affects demand by rising selling prices. Automobile industry in these countries is subject to variety of taxes such as excise tax, sales tax, corporate income tax, VAT and import duties. Table 21 provides the comparison of tax structure in these four countries.

It may be noted that taxes on automobile industry do not have a homogeneous structure in the selected countries. In India taxes are not vehicle specific. However, in Thailand and China different taxes are levied on cars, motor vehicles, CVs etc. Corporate Income tax is highest in India among all these four countries. Quite interestingly,

corporate income tax in China is higher in state owned enterprises (SOEs) compared to JVs. China is giving importance on JVs in terms of production. This is reflected in lower corporate income tax. In Indonesia it varies from 10-30%.

In Thailand and India import tariffs on CBU are quite high which provide protection to domestic industries. Different vehicles have different import duties in Indonesia and Thailand. However, for India it is same rate for all kinds of vehicles. It is important to note that most of the countries other than India have differential duties in case of imports. In general, duties faced by automobile industry in India are on the higher side compared to other countries.

Table 21: Comparison of Tax Structure

	INDIA	CHINA	INDONESIA	THAILND
Corporate Income Tax	36.75%	SOEs and Chinese companies: 33% JV's: 16%	10 – 30%	30%
Tax on vehicles	Excise tax: Cars 24% Others 16% Sales tax: Cars 12 % Others 4%	VAT: 17% Consumption tax: 3 – 8% for motor-vehicles 10% for Motorcycle	VAT 10% Excise tax 2 – 20% ad valorem	VAT: 7% Interior tax: 10% Excise tax: Cars and PV 12 – 48% CVs 0 – 3% Bike 3 – 5%
Import tariffs on CBU	All vehicles at 60%	Car and light vehicles: 43 – 50% Parts and components: 15 – 20%	Cars 30% CV 20% Bikes 30% 10% duty under MVDP program	Cars and PV 60 – 80% CV 30 – 80% Bikes 30%

Source: SIAM (2004)

Table 22 below summarises the MFN average tariffs for each selected product groups. Most of the countries have reduced the tariffs especially in component sector except Indonesia. India's average tariff in component sector is now reduced to 15%. Thailand's strategy is very clear in case of import duties on components. We have earlier noticed that it exports lot of components from group V and government wants to develop this sector further. As a result of this higher duties are there on imports in Group V. Import duties on vehicles are relatively high in India and Thailand and both of them are making an effort to increase their exports.

In South East Asia, trade in automobiles is now under AFTA rules where tariffs were cut, including those on cars, to between 0 and 5%. Provided a car has a minimum local content of 40% from any ASEAN member, the car maker has to pay just 5% duty when exporting to member countries of the grouping. AFTA has a brought new range of issues for discussion related to automobile trade in ASEAN region. As many ASEAN members have effective component manufacturing capability, the intra-ASEAN trade will provide opportunity for sourcing different components from different countries and assembling in suitable locations for better distribution channel. The major challenge in ASEAN is to integrate the international production system (IPN) within ASEAN for

development of the automobile sector. As individual ASEAN member does not have very big internal market, to achieve economies of scale, it has become compulsion on domestic automobile sector to go for regional integration. Different tax structures and export-import procedural differences are other major hurdles for this integration. Currently, ASEAN automobile industry has a fragmented product make-up with dominance of Thailand in pick-up truck production, Malaysia and the Philippines in passenger car production, and utility vehicles and passenger vans by Indonesia. The regional integration will bring efficiency in the production system and also develop the market bringing homogeneity in several transportation sector related issues[§§§§].

Table 22: Average MFN Tariff on Automobile

	China		India		Indonesia		Thailand	
	2001	2005	2001	2005	2001	2005	2001	2005
Group I	14.59	11.02	35.00	15.00	5.91	6.25	24.55	8.75
Group II	12.43	10.27	35.00	15.00	12.42	12.73	20.00	11.82
Group III	21.05	10.23	32.27	15.00	8.00	8.00	20.91	11.82
Group IV	13.03	8.36	30.26	15.00	4.65	4.45	16.58	8.53
Group V	29.47	13.13	35.00	15.00	15.00	15.00	44.75	32.50
Group VI	20.00	15.50	32.50	15.00	9.42	9.91	25.00	13.75
Group VII	42.62	23.64	66.82	53.64	29.49	29.69	49.24	42.88

Source: Calculated from WITS Database

VIII. Epilogue

VIII.I: Comparison of Policy Framework

All these countries made serious attempts to grab the opportunities emanated from the global restructuring of the industry and relocation of production base to developing countries. Most leading auto-manufacturers continue to invest in R&D so that the production costs get reduced and develop partnership with local firms which concentrate on production activities to reduce cost. Government policies towards automobile industries in these countries also got evolved along with this.

Policies towards liberalization of investment regime brought significant benefits to the selected countries as private players stepped in with modern technology and FDI started pouring in mainly through the hands of Japanese automobile majors. However, the overcapacity problem faced by the global automobile industry also creped in the automobile industry of these selected countries. Different countries took different policies to handle the overcapacity problem in the sector. Chinese has attempted to consolidate the industry through mergers and acquisition while Indians sought overseas market. In both these countries, government policies have been towards development of the

[§§§§] Refer to various APEC Automotive Sector Dialogues.

indigenous automobile sector through strengthening the national players while Thailand focused mainly on the export market through Japanese companies.

In China, company structures are mainly in the form of JVs. Consolidation of domestic companies is being promoted to form larger groups such as FAW, DMC, etc. In India, domestic companies such as Telco, Hindustan Motors are listed companies at the stock exchange with relatively low level of FDI. These companies grew considerably under the protective environment of the government and are now competing with MNCs. Even company like Maruti, in which Suzuki has a significant stake, has grown through government patronage and today, government holds more than 10% share in the company. On the contrary, domestic players in Indonesia remained as partners to MNCs in assembling activities. Protection in automobile sector in these countries earlier was mainly through high tariff, import ban of CBU, local content use condition, and restriction on private investment and other regulatory condition.

Protection in component sector did not work well in general as it helped only basic components sector to grow domestically in these countries. Most of the critical components are imported despite protection given to component sector. Thai government has adopted a strategy to plug the gaps in the component sector through its investment promotion scheme. India is also now making an effort to develop indigenous component sector through giving focus in R&D and tightening the IPR regime and thereby inviting big players to step in the critical component sector leaving the basic components in the hands of SMEs. China, on the contrary is increasing the comparative advantage in the basic component sector through further reduction in cost. For the vehicles, it is still focusing on the consolidation of the domestic sectors and improving the technological as well as managerial capabilities of the sector in general. Due to local content requirement and lack of intellectual patent rights, sub-system and design development sector has not been developed in China which is a prerequisite for international competitiveness. Protection in Indonesia through its 'incentive programmes' did not help component industry much as assemblers imported critical components and bought only basic and small components locally. However, larger demand in utility and commercial vehicles helped the sub-sector focus on components used in this segment.

Automobile industry in these countries is subject to variety of taxes such as excise tax, sales tax, corporate income tax, VAT and import duties. Tax structure of these countries on automobiles is not similar which shows the interest of the government. In Thailand and China different taxes are levied on cars, motor vehicles, CVs etc. whereas in India it is not vehicle specific and limited to 'cars' and 'others'. The taxes are relatively heavier in India. Corporate Income tax is highest in India among all these four countries. Quite interestingly, corporate income tax in China is higher in state owned enterprises (SOEs) compared to JVs. The policy towards taxes reflects the idea how government is looking into the tax elasticity of the demand of products and how it is related to the revenue and other social objectives.

In case of trade policy, all countries have relatively higher tariff on vehicles compared to auto components. Tariffs on components have been reduced in general,

except in Indonesia. India's average tariff in component sector is now reduced to 15%. Thailand is exporting significantly body parts, brakes, clutches and other safety components and it has certain level of comparative advantage. It wants domestic companies to use domestically produced components and hence, import duties are higher on those component sub-sectors. India still has higher duties on the vehicle section which reflects its inclination to develop domestic production system further. Thailand and Indonesia are now looking into ASEAN market due to reduction of duties in the region following the implementation of AFTA. Of late, in some regional forums such as in ASEAN, APEC, etc. automobile sector has become a subject of interest and attempts are being undertaken for integrating the fragmented regional production network of automobile sector especially in east and south-east Asia.

VIII. II Focusing more on Trade

The analysis shows that all these selected countries are increasingly engaged in international trade of vehicles and components, with domestic companies and MNCs both competing for market share. It reveals that these countries mostly trade with developed countries with some exceptions. China is mostly engaged with USA, European countries and Japan. India is making an attempt to find a market in south Asia and Middle East also. Thailand being an automobile hub traditionally trade mainly with Japan, USA, Australia, etc. However, it is increasing its share in the ASEAN market also. Indonesia's automobile sector development has a chequered history. In 1990s it was mainly an assembling industry due to small market size. Local component industry could not get developed beyond basic components despite having protection. From the new millennium, with a changed automobile policy Indonesia is now increasingly becoming production base of utility and commercial vehicles. Exports of those are also increasing mainly to ASEAN market.

China's focus on auto component sector is now revealed as its exports increased almost by three folds during 2000-2004. However, mostly these exports consist of small and basic components. China's import of engine and other critical parts are still high. At the same time, its imports of vehicles are also high. China is having net trade deficit in the automobile sector. .

India's market size is not as big as that of China. It has net trade surplus in that sector due to tight regulatory policy in importing automobiles. India's import tariffs on vehicles historically are higher than other selected countries. In component sector export and import figure remains very close to each other. India's export product basket consists of motorcycles, passenger vehicles, tractors and goods transportation vehicles. In recent time, export growth of passenger vehicles is impressive. India is gradually specializing in small cars and two-wheelers. Indian auto component sector was never designed for exports rather it was supposed to cater the demand of domestic producers only. But it is

believed that industry has reached some level of maturity and will be able to increase its exports in near future.

The automobile policy helped Thailand to become major automobile hub in Asia. The policy has helped countries to move from assembling stage to production stage. Mainly driven by Japanese FDI, the facilities have been used by MNCs to export vehicles and components to other countries. Most of the global automobile giants are present in Thailand along with their legions of suppliers. Regional trade liberalization through AFTA is fuelling the export growth of Thailand. Trade agreements with Australia, India and discussions in APEC forums are also acting as key elements to increase the regional trade of automotive sector and Thailand is playing a significant role. Thailand is clearly specializing in full vehicles.

Indonesia has been traditionally crowded by many Japanese players to assemble cars for the small domestic market. Main demand comes from the commercial and utility vehicles section. In case of passenger car segments, assemblers mainly play with 'makes' and 'models' and compete aggressively with frequent change of models. The incentive programme aimed towards developing passenger car production centre did not work well and companies import critical components. Indonesia's over protectiveness was challenged in WTO. In post-financial crisis period following IMF's advice and its commitment to AFTA and APEC, Indonesia opened up its automobile sector. Now, many Japanese players are bringing fresh investments to Indonesia especially in MPV and utility vehicles segments to tap the ASEAN market.

VIII. III: Identifying Niches and Future Challenge

Table 23 provides a summary of the salient features of the automobile industry in the four developing countries examined. The paper brings out the idea that specialization in automobile sector is becoming segment specific as each of these countries is finding its niche. China is specializing in basic components, India in two wheelers and small cars, Thailand in passenger cars and pick-up trucks and Indonesia is making attempt to specializing in utility vehicles.

Most of the governments earlier focused on protecting their domestic auto component sectors. However, it is being realized that within component sector also there are divisions between small and basic components and critical components. SMEs, often at the lowest end of the supply chain, specialize in basic components but have difficulty moving to production of critical components and sub-systems, as relatively large investments are required. However, MNCs need easy access to these critical components and sub-systems. In a protected investment environment, if these system suppliers are unable to enter the country, most of the MNCs will import critical components and system modules.

With the gradual opening up of the component sector, now the challenge is therefore how individual governments can effectively support the development of domestic system suppliers which can compete with large foreign players in this sector. The success of automobile sector in each of these countries significantly depends on this, and governments need to create proper investment environment, incentives for R&D and strong patent regime.

Table 23: Salient Features of Automobile Industry in Select Asian Countries

	India	China	Thailand	Indonesia
Market/ Demand Structure	Highest growth is observed in two-wheelers section, followed by CVs. Passenger cars and Three-wheelers also showing high growth. Current internal demand is low but rising very fast. Domestic production facilities are also increasing. Component sector is coming up very fast	Production of passenger vehicles showing high growth The sale of MPV and SUV also grew rapidly Sales of domestic brands are also robust. China produces more number of vehicles compared to other selected countries Strong component sector, developed through protection	Big market for pick-up trucks. Demand for diesel cars is increasing. Toyota is market leader Strong focus on making component sector export oriented. Now Govt. is providing importance on the weak sub sectors of auto ancillaries to make the entire supply chain equally efficient.	It is a small domestic market and assembling activities are more important compared to production. Frequent change in models is observed in passenger vehicles. High growth is projected in some segments, especially in utility vehicles and vans.
Ownership Structure	Market is dominated by Japanese and Indian players. Of late other foreign companies are coming in and developing production facilities	Company structures are mainly in the form of JVs. Attempt was made to consolidate domestic companies into few large groups such as FAW, DMC, etc.	Mainly Japanese player in all segments of the industry. Toyota and Isuzu control 65% of the market. MNCs are present in component manufacturing also.	Market is dominated by and Japanese and Indonesian players Foreign players control almost 80% of the market.
Trade Structure	Making an attempt to specialize in full vehicles. Component sector though growing is still inefficient. Exporting two wheelers and passenger cars. Export to Europe, USA and SAARC countries. Strong patent regulation is encouraging manufacturers to increasing production facilities including supply	Imports more than exports. Specializing in basic auto-components but imports engines parts. Technology absorption is given importance through JVs and follow up is made for component sector development and export of that. Lack of R&D and designing limits the export growth. Patent issues need to be addressed.	Specializing in full vehicles. Strong govt. support of domestic auto-component sector. Export mainly to Japan, Australia and ASEAN countries. FTA with Australia, India and AFTA are helping Thailand to increase exports. Components are getting exported to other ASEAN countries also.	Specializing in basic auto-component sector. Export opportunity of CVS and vans are increasing within ASEAN. Import components from Thailand and Japan.

	system.			
Product Specialization	India is specializing in motorcycles and small cars. Component industry is being developed and system and sub system suppliers are increasingly into it due to country's capability in R&D.	China is specializing in basic component sector and in future possibly in big cars. Currently specializing in two-wheelers, passenger cars, etc. Product development progress has limitation and may face competition.	Specializing in sedans and pick up. Currently focusing on gaps in component supply chain and will develop those missing links to have robust component sectors	Specializing in utility vehicles, MPVs and CVs. Strength in components required for this segments.
Tax Structure	High Corporate Income tax and import duties on CBUs. Differentiate excise and sales tax on cars and other vehicles. Having higher import duties on vehicles.	Lower corporate income tax for JVs to attract foreign players. Import duties are lower than India. Differentiated duties for vehicles and components	Import tariff on CBU is high. Not much reduction of duties on vehicles in last five years. Differentiated Import duties and excise taxes for different kind of vehicles	Range of excise duties are quite long implying low for some vehicles and high for other Different Import duties for cars, CVs and bikes.

References

Asia Times (online) (2005), Full speed ahead for Indonesia's auto industry, Bill Guerin, http://www.atimes.com/atimes/Southeast_Asia/GG01Ae01.html

Aswicahyono Haryo, Titik Anas & Yose Rizal , (1999), "The Development of the Indonesian Automotive Industry", Economics Working Paper Series, CSIS Working Paper Series, WPE051, http://www.csis.or.id/papers/wpe051

Boyle Stanley E.; Thomas F. Hogarty; (1975), "Pricing Behavior in the American Automobile Industry, 1957-71"; *The Journal of Industrial Economics*, Vol. 24, No. 2. Dec., pp. 81-95

Copeland Adam, Wendy Dunn & George Hall; (2005) "Prices, Production And Inventories, Over The Automotive Model Year", Working Paper 11257, NBER

Dicken, P. (2003) *Global Shift: Reshaping the Global Economic Map in the 21st century*, Fourth Edition. London: Sage Publications

Finan, William F. & Rappoport, Paul N (1982); "The international trade in automobiles: Explaining short-run changes in the import share of the United States market, 1979-1981**",** Journal of Policy Modeling, Volume 4, Issue 1, Pages 99-109

Friedlaender Ann F.; Clifford Winston; Kung Wang, (1983); Costs, Technology, and Productivity in the U.S. Automobile Industry, *The Bell Journal of Economics*, Vol. 14, No. 1. (Spring, 1983), pp. 1-20

Goldberg Pinolopi K & Frank Verboven (1998); "The evolution of Price Dispersion in the European Market, NBER Working Paper, 6818

Hoffer George; James Marchand; John Albertine; (1976), Pricing in the Automobile Industry: A Simple Econometric Model *Southern Economic Journal*, Vol. 43, No. 1. Jul., pp. 948-951

Humphrey John & Memedovic Olga (2003); "The Global Automotive Industry Value Chain: What Prospects For Upgrading By Developing Countries" By, UNIDO,

John E. Kwoka, Jr; (1984), "Market Power and Market Change in the U.S. Automobile Industry', *The Journal of Industrial Economics*, Vol. 32, No. 4. June. pp. 509-522

Lung, Y., J. J. Chanaron, T. Fujimoto, and D. Raff, eds., (1999), "*Coping with Variety: Flexible Production Systems for Product Variety in the Auto Industry"*. Abingdon, Oxon: Ashgate

Lung, Y., M. S. Salerno, M. Zilbovicius, and A. C. Dias, (1999). "Flexibility Through Modularity: Experimentations with Fractal Production in Brazil and in Europe." In Y. Lung, J. J. Chanaron, T. Fujimoto, and D. Raff, eds., *Coping with Variety: Flexible Production Systems* for Product Variety in the Auto Industry. Abingdon, Oxon: Ashgate

MacDuffie John Paul & Fred Moavenzadeh; (2001); "How Is the Auto Industry Responding to Technological Change?" Source: http://imvp.mit.edu/sloanres.html

Monteiro António José Marques (2001); Production Cost Modeling For The Automotive Industry PhD Thesis Submitted In Instituto Superior Técnico, Universidade Técnica De Lisboa

Nag Biswajit, Saikat Banerjee & Rittwik Chatterjee, (2007), "An Analysis of Automobile Industry in Select Asian Countries: Comparison of Production, Trade and Market Structure", Unpublished research report, Indian Institute of Foreign Trade, New Delhi

SIAM, (2004); "The Thailand & ASEAN India Free Trade Agreements – Implications for the Indian Automotive Industry" February

Stokes Bruce*:* Protectionism and Politics (2007) ***Available at*** **http://usinfo.state.gov/journals/ites/0107/ijee/stokes.htm**

Sudhir K (2001), **"**Competitive Pricing Behavior in the US Auto Market: A Structural Analysis" , Yale School of Management Working Paper 228

Veloso Francisco & Rajiv Kumar (2002); The Automotive Supply Chain: Global Trends And Asian Perspectives; ERD Working Paper No. 3, Asian Development Bank

Warf Barney (1990), "International Automobile Trade of the United States during the 1980s", *Geographical Review*, Vol. 80, No. 3. July, pp. 252-265

Web Sites :

http://wits.worldbank.org
http://www.atimes.com/atimes/Southeast_Asia/GG01Ae01.html
http://www.chinaccm.com/4S/4S11/4S1101/news/20070504/094559.asp
http://www.eurofound.europa.eu/emcc/publications/2004/ef0427en.pdf
http://www.gaikindo.org/index.php?fuseaction=events.detail&id=150620061350496
http://www.loc.gov/rr/business/BERA/issue2/industry.html
http://www.loc.gov/rr/business/BERA/issue2/industry.html
http://www.researchandmarkets.com/reports/357271
http://www.researchandmarkets.com/reports/357271/china_automotive_industry_report_merger_and.htm
http://www.siamindia.com/scripts/installed-capacities.aspx
http://www.toyota.co.th/red/en/sales_summary.asp
http://www.economywatch.com/business-and-economy/automobile-industry.html
www.Gaikindo.org

Appendix – HS Codes Relevant to Automotive Sector

HS Code and Descriptions	Groups
400930 : Tubes, pipes& hoses vulcanized /rubber reinforced with textile material without fittings	GR-I
400940 : Tubes, pipes & hoses vulcanised rubber reinforced nes ,without fittings	
401320 : Inner tubes of rubber for bicycles	
401693 : Gaskets, washers and other seals of vulcanised rubber	
681210 : Fabricated asbestos fibres; mixture with a basis of asbestos and magnesium carbonates	
681310 : Asbestos brake linings and pads	
681390 : Asbestos friction material and articles nes	
700711 : Safety glass toughened (tempered) vehicles, aircraft, spacecraft/vessel	
700721 : Safety glass laminated for vehicles, aircraft, spacecraft or vessels	
700729 : Safety glass laminated nes	
700910 : Rear-view mirrors for vehicles	
731815 : Bolts o screws nes, with or without their nuts or washers, iron or steel	GR-II
731823 : Rivets, iron or steel	
731824 : Cotters and cotter-pins, iron or steel	
731829 : Non-threaded articles of iron or steel, nes	
732010 : Springs, leaf and leaves thereof, iron or steel	
732020 : Springs, helical, iron or steel	
732090 : Springs, iron or steel, nes	
732619 : Articles of iron or steel, forged or stamped, but not further worked	
830120 : Locks of a kind used for motor vehicles of base metal	
830230 : Mountings, fittings& similar articles of base metal f motor vehicles, nes	
840731 : Engines, spark-ignition reciprocating, displacing not more than 50 cc	GR-III
840732 : Engines, spark-ignition reciprocating, displacing >50 cc but not more 250cc	
840733 : Engines, spark-ignition reciprocating displacing > 250 cc to 1000 cc	
840734 : Engines, spark-ignition reciprocating displacing more than 1000 cc	
840820 : Engines, diesel, for the vehicles of Chapter 87	
840991 : Parts for spark-ignition type engines nes	
840999 : Parts for diesel and semi-diesel engines	
841330 : Fuel, lubricating or cooling medium pumps for internal combustion piston engines	
842123 : Oil or petrol-filters for internal combustion engines	
842131 : Intake air filters for internal combustion engines	
870600 : Chassis fitted with engines for the vehicles of headg Nos 87.01 to 87.05	
841520 : Air conditioners used in vehicles	GR-IV
842139 : Filtering or purifying machinery and apparatus for gases nes	
848310 : Transmission shafts and cranks, including cam shafts and crank shafts	
848320 : Bearing housings, incorporating ball or roller bearings	
848340 : Gears & gearing, ball screws, gear boxes, speed changers/torque converters	
848350 : Flywheels and pulleys, including pulley blocks	
848360 : Clutches and shaft couplings (including universal joints)	
848390 : Parts of power transmission equipment/other goods used to transmit power	
848410 : Gaskets of metal sheeting combined with other material	
848420 : Mechanical seals	
848490 : Gasket sets consisting of gaskets of different materials	
851120 : Ignition magnetos, magneto-generators and magnetic flywheels	

851130 : Distributors and ignition coils	
851140 : Starter motors	
851190 : Parts of electrical ignition or starting equipment	
851220 : Lighting or visual signaling equipment nes	
851230 : Sound signaling equipment	
851240 : Windscreen wipes, defrosters and demisters	
851290 : Parts of electrical lighting, signaling and defrosting equipment	
870710 : Bodies for passenger carrying vehicles	GR-V
870790 : Bodies for tractors, buses, trucks and special purpose vehicles	
870810 : Bumpers and parts for motor vehicles	
870821 : Safety seat belts for motor vehicles	
870829 : Parts and accessories of bodies nes for motor vehicles	
870831 : Mounted brake linings for motor vehicles	
870839 : Brake system parts nes for motor vehicles	
870840 : Transmissions for motor vehicles	
870850 : Drive axles with differential for motor vehicles	
870860 : Non-driving axles and parts for motor vehicles	
870870 : Wheels including parts and accessories for motor vehicles	
870880 : Shock absorbers for motor vehicles	
870891 : Radiators for motor vehicles	
870892 : Mufflers and exhaust pipes for motor vehicles	
870893 : Clutches and parts for motor vehicles	
870894 : Steering wheels, steering columns and steering boxes for motor vehicles	
870899 : Motor vehicle parts nes	
871411 : Motorcycle saddles	GR-VI
871419 : Motorcycle parts nes	
871420 : Wheelchair parts nes	
871491 : Bicycle frames and forks, and parts thereof	
871492 : Bicycle wheel rims and spokes	
902910 : Revolution counters, prodion counters taximeters, milometer	
902920 : Speed indicators and tachometers; stroboscopes	
940120 : Seats, motor vehicles	
8701 : Tractors (other than tractors of heading no. 87.09	GR-VII
8702 : Motor vehicles for the transport of ten or more persons, including the driver	
8703 : Motor cars and other motor vehicles principally designed for the transport of persons other than those of heading no. 87.02, including station wagons and racing cars	
8704 : Motor vehicles for the transport of goods	
8705 : Special purpose motor vehicles, other then those principally designed for the transport of persons and goods	
8711: Motorcycles (including mopeds) and cycles fitted with an auxiliary motors with or without side cars, side cars	