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A Review on Competitive Structure of Automobile Industry

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ABSTRACT

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. Companies across the regional and volume spectrum have adopted a portfolio of manufacturing concepts derived from both mass and lean production paradigms, and the recent wave of consolidation means that regional comparisons can no longer be made without considering the complexities induced by the diverse ownership structure and plethora of international collaborations. In this paper we review about how the basis of competition has shifted from cost-leadership during the heyday of companies at original mass production, to variety and choice following their portfolio strategy, to diversification through leadership in design, technology or manufacturing excellence, as in the case of all automobile companies and to mass customization, which marks the current competitive frontier. We will explore how the production paradigms that have determined much of the competition in the first automotive century have evolved, what trends shape the industry today, and what it will take to succeed in the automotive industry of the future. This paper studies the evolution of the competitive structure of the automobile industry at international and national level.

Keywords: Evolution of industry, Auto Component Industry, International Trade, Exports, Imports and Automobiles.

1. INTRODUCTION

The auto sector is one of the biggest job providers, both directly and indirectly. The turn of the twentieth century witnessed the dawning of the automobile industry. Tinkering by bicycle, motorcycle, buggy, and machinery entrepreneurs in Europe and the United States led to the first prototypes of automobiles in the late nineteenth century. French woodworking machinery makers Rene Panhard and Emile Levassor built their first car in 1890 with an engine designed in Germany by Gottlieb Daimler and Wilhelm Maybach. Global sales of passenger cars are forecast to hit 73.9 million vehicles in 2015. Along with China**,** the United States is counted among the largest automobile markets worldwide followed by Japan & Germany. The automobile industry is one of India's most large and growing industries. This industry shared 22 per cent of the country's manufacturing gross domestic product (GDP. It is estimated that every job created in an auto company leads to three to five indirect ancillary jobs. India's domestic market and its growth potential have been a big attraction for many global automakers. India is presently the world's third largest exporter of two-wheelers after China and Japan. According to a report by Standard Chartered Bank, India is likely to overtake Thailand in global auto-export market share by the year 2020. The Indian auto industry is one of the largest in the world. The industry accounts for 7.1 per cent of the country's Gross Domestic Product (GDP). The Two Wheelers segment with 81 per cent market share is the leader of the Indian Automobile market owing to a growing middle class and a young population. Moreover, the growing interest of the companies in exploring the rural markets further aided the growth of the sector. The overall Passenger Vehicle (PV) segment has 13 per cent market share.

India is also a prominent auto exporter and has strong export growth expectations for the near future. In April-March 2016, overall automobile exports grew by 1.91 per cent. PV, Commercial Vehicles (CV), and Two Wheelers (2W) registered a growth of 5.24 per cent, 16.97 per cent, and 0.97 per cent respectively in April-March 2016 over April-March 2015.* In addition, several initiatives by the Government of India and the major automobile

players in the Indian market are expected to make India a leader in the 2W and Four Wheeler (4W) market in the world by 2020.

Fig 1: Image of Automobile Industry

Global Automobile Industry

The begging of the twentieth century witnessed the dawning of the automobile industry. Tinkering by bicycle, motorcycle, buggy, and machinery entrepreneurs in Europe and the United States led to the first prototypes of automobiles in the late nineteenth century. The Worldwide Big Three automakers are General Motors, Toyota Motor Corporation, and Ford Motor Company. In 2004 these companies had worldwide market shares of 13 percent, 11 percent, and 10 percent, respectively. French woodworking machinery makers Rene Panhard and Emile Levassor built their first car in 1890 with an engine designed in Germany by Gottlieb Daimler and Wilhelm Maybach. Armand Peugeot, a French bicycle maker, licensed the same engine and sold his first four lightweight cars in 1891. German machinist Carl Benz followed the next year with his four-wheeled car and in 1893 Charles and Frank Duryea built the first gasoline-powered car in the United States. Ransom Olds is credited as the first mass producer of gasoline-powered automobiles in the United States, making 425 "Curved Dash Olds" in 1901. The first gasoline-powered Japanese car was made in 1907 by Komanosuke Uchiyama, but it was not until 1914 that Mitsubishi mass-produced cars in Japan.

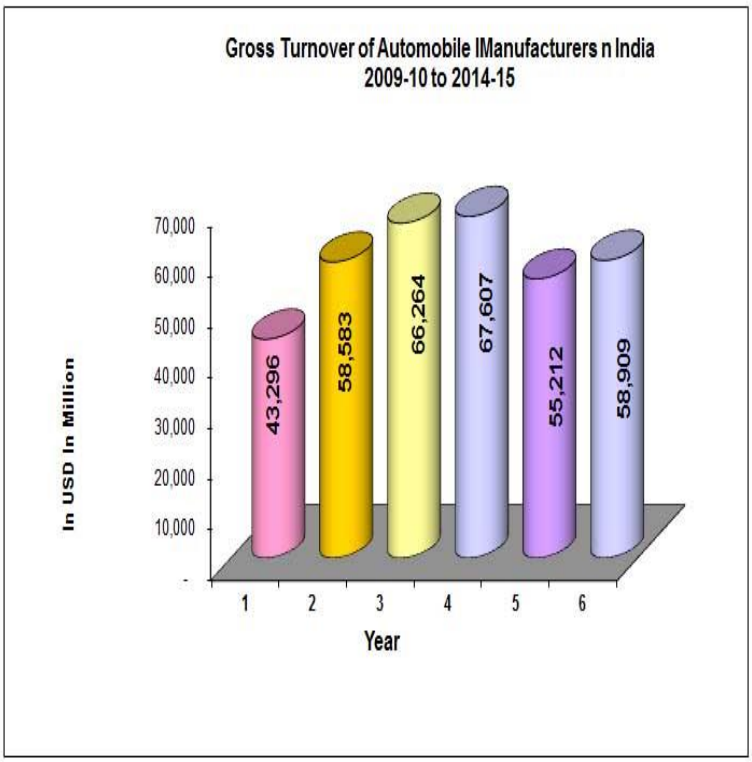
Each region in the triad—North America, Europe, and Asia—has made significant contributions to process, product, and organization throughout the twentieth century. These innovations together have shaped the competitive structure of the automotive industry that exists today. The organization of production inputs—such as labour and suppliers of components and materials—as well as the configuration of distribution channels are also important dimensions of the growth and evolution of the industry. Furthermore, various forces outside the industry shape industry structure and strategies: trade flows; regional and international movement of capital; regional and global policies on trade, environmental regulation, and intellectual property, particularly in emerging economies; and the infusion of information technology throughout the procurement, production, and distribution systems. The

fastest growing market segment in the United States in recent years has been sport utility vehicles (SUVs). By the early 2000s, SUVs captured 55 percent of vehicle sales.

Indian Automobile Industry

Mobility are one of the key outcomes of growth and development of any economy i.e. increased mobility will further promote economic growth and development since it connects people to jobs, markets, and services, and gives people a chance to gain equity in the political, economic, and social spheres. Considering an insatiable demand for vehicles in an economy that is expected to grow at an average of 7% for the next 20 years, the automobile sector in the country will require disproportionate amounts of natural resources which will not only have economic cost implications, but also have strong environmental and social impacts. Future growth will be associated with increased raw material extraction, processing of primary materials for production of auto components,

TERI in association with GIZ India is undertaking a project supported by Federal Ministry for the Environment, Nature Conservation, Building and Nuclear safety (BMUB) and Ministry of Environment Forest and Climate Change, to understand the existing and future dependence on material resources of India's growing automobile sector and exploring opportunities of saving resources along the value chain for improved sustainability of the sector. The consortium is working with medium and small-scale industries producing auto components as well as the end of life vehicle (ELV) dismantlers in implementing pilot interventions to achieve material use efficiency.



Source: *Society of Indian Automobile Manufacturers (SIAM)*

Fig 2: Gross turnover of automobile Manufacturers

Table 1.Automoble Domestic Trends (In Lacks)

Category	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Passenger Vehicles	26.30	26.65	25.04	26.01	27.89	30.47
Commercial Vehicles	8.09	7.93	6.33	6.15	6.86	7.14
Three Wheelers	5.12	5.38	4.80	5.33	5.38	5.12
Two Wheelers	134.09	137.97	148.07	159.76	164.56	175.90
Grand Total	173.62	177.94	184.32	197.24	204.69	218.62

Source: *Society of Indian Automobile Manufacturers (SIAM)*

Table 2: Automobile Exports Trends *(In Lacks)*

Category	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Passenger Vehicles	5.09	5.59	5.96	6.21	6.53	7.58
Commercial Vehicles	0.92	0.80	0.77	0.87	1.03	1.08
Three Wheelers	3.62	3.03	3.53	4.08	4.04	2.72
Two Wheelers	1,98	1,96	2.08	2.45	2.48	2.34
Grand Total	11.41	11.38	11.34	13.61	14.08	13.72

Source: *Society of Indian Automobile Manufacturers (SIAM)*

Indian Government Initiatives: Following steps taken by government to boost up the industry

i).The Government of India promotes foreign investment in the automobile sector and allows 100 per cent FDI under the automatic route.

ii).To encourage manufacturing, the government imposed lowered excise duty on small cars, motorcycles, scooters and commercial vehicles to eight per cent from 12 per cent, on sports utility vehicles to 24 per cent from 30 per cent, on mid-segment cars to 20 per cent from 24 per cent and on large-segment cars to 24 per cent from 27 per cent.

iii).The government's decision to resolve VAT disputes has also resulted in the top Indian auto makers namely, Volkswagen, Bajaj Auto, Mahindra & Mahindra and Tata Motors announcing an investment of around Rs 11,500 crore (US$ 1.87 billion) in Maharashtra.

iv).The Automobile Mission Plan for the period 2006–2016, designed by the government is aimed at accelerating and sustaining growth in this sector. Also, the well-established Regulatory Framework under the Ministry of Shipping, Road Transport and Highways, plays a part in providing a boost to this sector.

v).The Government of India-appointed SIAM and Automotive Components Manufacturers Association (ACMA) are responsible in working for the development of the Indian automobile industry

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Competitive structure of Automobile industry:

The competitive structure of the automobile industry was overviewed with the following areas:

1. ***First movers established market dominance in the early 1900s:*** Rivalry among assemblers in the automotive industry, once contained within national boundaries, has evolved into global competition. First movers established market dominance in the early 1900s, and their brands are still the most recognized by consumers today. The fact that auto producers choose market strategies based on what their rivals are doing indicates that this is an oligopolistic industry. What is interesting here is that market leadership remains dynamic: It is not a given that General Motors or Toyota or Daimler Chrysler will be the market leader of tomorrow.

2. ***Beachhead in the industry in the year 1909:*** Before industry standards for products and production were established, hundreds of automakers existed, each vying to establish a beachhead in the industry. In the United States, for example, the year 1909 saw the largest number of automakers in operation in a given year—272 companies. It is estimated that in the first twenty years of the industry's existence, over five hundred firms entered the industry in the United States alone.

3. ***Precipitous exits by auto manufacturers between 1920-1930:*** The 1920s brought a wave of precipitous exits by auto manufacturers, with many firms merging into more profitable companies. In the 1930s General Motors became the market leader, with Ford slipping to second place because of a yearlong changeover in production from the Model T to the Model A.

4. ***Forming a dominant-firm oligopoly by 1937:*** General Motors, Ford, and Chrysler—long referred to as the Big Three—had 90 percent of total sales in the U.S. market, forming a dominant-firm oligopoly (General Motors accounted for 44.8%, Chrysler 25%, and Ford 20.5%). By the 1960s, only seven domestic auto producers remained.

5. ***Market share slipping in the late 1990s:*** Japanese auto manufacturers took over more than a quarter of the U.S. market, and Big Three market share slipped below 70 percent. Today, there are only two-and-a-half U.S. automakers—General Motors, Ford, and DaimlerChrysler—collectively capturing 58.7 percent of the U.S. market. GM still has the largest share of the U.S. market (27.3%), but Toyota's market share in the United States is just one percentage point below Chrysler's (13%). Worldwide, market concentration has also been declining since the mid-1980s, with entrants such as Hyundai/Kia diluting the collective market share held by dominant automakers.

6. ***Market rivalry between two strategic variables:*** One is product variety and quality, and another is transactions price, which is manipulated to boost sales. The tension between shareholder concerns about short-term profitability and a company's desire for long-term viability is palpable. For example, Mercedes, BMW, Lexus,

Infiniti, and Acura capture a third of the upscale market in the United States, whereas Buick, Ford, Mercury, and Toyota are known for their family-styled traditional cars. Turnkey reliability is the hallmark of Japanese makes, whereas Ford, Chevrolet, and Toyota appeal to buyers of small or sporty vehicles. The fastest growing market segment in the United States in recent years has been sport utility vehicles (SUVs). By the early 2000s, SUVs captured 55 percent of vehicle sales.

7. ***Product offerings for a broad spectrum of customers****:* Auto producers have used various means to develop a full line of product offerings for a broad spectrum of customers. For example, GM has historically used acquisition or shareholdings to offer a variety of brands—including Chevrolet, Oldsmobile, Pontiac, Buick, GMC, and Cadillac. In the late 1970s, GM purchased shares in Suzuki and Isuzu subcompacts and imported those vehicles, in part to satisfy Corporate Average Fuel Efficiency requirements.

8. ***Companies Diversified its portfolio****:* In recent years, Ford-Mercury-Lincoln has also diversified its portfolio by acquiring Volvo and Jaguar. Toyota, Honda, and Nissan initiated a clever marketing ploy in the 1980s aimed at selling luxury vehicles in the United States: They named their luxury brands Lexus, Acura, and Infiniti, respectively, even though these cars are built on the same platforms as their other vehicles.

9. ***Product quality has been converging over time****:* As recently as 1998, European and Japanese makes had fewer vehicle defects than average for cars in their first few months on the road, whereas U.S. and Korean cars had more defects than average. By 2004 vehicles from all four regions were within ten defects per hundred vehicles of the average, which had fallen from 176 to 119 defects per hundred vehicles. Interestingly, both the Japanese and the South Korean newcomers outperformed U.S. and European vehicles on this quality scale.

10. ***Firm will sell their low-end vehicle at a price below invoice:*** To attract customers to a brand, small cars are at times used as a loss leader; that is, a firm will sell their low-end vehicle at a price below invoice, while recuperating large returns on SUVs, luxury brands, and specialty cars. Another pricing strategy that is often used by automakers to clear inventories and to get the customer in the door is discounting. At particular times of the model year (which typically begins in October and ends in September of the following year) direct assembler-to-customer discounts as well as dealer-to-customer discounts are used to adjust transaction prices to ebbs and flows in demand. If the revolutionary pull system becomes pervasive in the auto industry, the need to manage inventories through end-of-model-year discounting could become obsolete. However, product positioning will continue to be an important competitive variable for automakers because demographic attributes drive the needs and desires of customers.

11. ***Auto industry was comprised of auto assemblers****:* In its initial stage of development, the auto industry was comprised of auto assemblers that integrated parts production into the enterprise. Independent auto parts producers mainly supplied aftermarket parts. Throughout the twentieth century, this vertically integrated

structure within assemblers has been replaced by a more network-oriented tiering structure. Here, assemblers coordinate design and production efforts with premier first-tier suppliers, while these suppliers are responsible for global coordination of the supply of their subassemblies and for the coordination of production by sub-tier parts manufacturers. Thus, first-tier suppliers have been rivaling automakers in market power and in share of value added to any given vehicle. While it seems unlikely at this time that such suppliers will evolve into complete vehicle manufacturers, the profit generated by the sale of a vehicle is shifting toward the supplier and away from the traditional assembler.

12. ***Rivalry both from other automakers and from dominant suppliers****:* Automakers, therefore, face stiff rivalry both from other automakers and from dominant suppliers. Only a select few suppliers have achieved "true global competency" in the production of automotive systems, but the industry trend is pointing in this direction. The "Intel Inside" phenomenon seen with computers—in which the supplier's brand identity is critical for the sale of the final product—has not yet taken over the automotive industry, although "Hemi Inside" could be an emerging example.

13. ***Manufacturing momentum shifted toward auto parts suppliers****:* so too did the share of labor. Since the early 1960s, total employment in the U.S. auto industry has ranged between 700,000 and just over 1 million workers. Up until the mid-1980s, auto assemblers employed the majority of those workers, but from then on the employment share for automotive parts suppliers in the United States has consistently been greater than the share of workers at assembly plants.

14. ***The share of automotive sector employm****ent:* Between 1987 and 2002, the share of automotive sector employment at assembly plants declined from 44 percent to 36 percent, whereas the share of workers at automotive suppliers increased from 46 percent to 54 percent. Add to this change the influx of mostly non-unionized automotive transplants (foreign suppliers and assemblers), the outsourcing of parts and assembly to foreign nations, and the general sectoral shift away from manufacturing toward the service sector, and it is clear that the 1980s marked a turning point for labor in the U.S. auto industry.

15. ***Labor unions that represent autoworkers****:* In the United States has had to weather a myriad of undulations in domestic business cycles since 1935, when the United Auto Workers (UAW) was founded. (Other unions that represent auto workers in the United States include the International Association of Machinists and Aerospace Workers of America, the United Steelworkers of America, and the International Brotherhood of Electrical Workers.) Recent changes in the organization of the auto industry and in the ownership of domestic firms, only a few automotive transplants in the United States allow union status—namely, NUMMI (GM-Toyota), Diamond Star (Chrysler-Mitsubishi), and Auto Alliance (Ford-Mazda), all of which are joint ventures with U.S. companies.

16. Dealerships exert on assemblers: By contrast to labor, the power that dealerships exert on assemblers has historically been minimal. The push system of production meant that dealerships were the repositories for the inventory overruns of auto assemblers. Also, up until the 1960s, dealerships could legally be controlled by automakers. Therefore, auto dealers earn the majority of their profits from aftermarket sales of parts, accessories, supplies, and service, all of which are a small portion of their business. With the movement toward a pull system of production, dealerships could play a more important role in the automotive industry. However, the countervailing threat to dealerships is Internet-based sales, an innovation that stands to mitigate the market power of dealerships vis-à-vis auto assemblers.

17. Employment in the industry shifts toward the supplier sector and toward emerging economies: The globalization of the auto industry appears to challenge the status quo for labor in traditional regions of vehicle production. As employment in the industry shifts toward the supplier sector and toward emerging economies, the attempt to maintain good wages at traditional plants is paramount for autoworkers. Total hourly labor cost at GM and Ford for 2005 was estimated at $65.90, with $35.36 in wages and $30.54 in benefits, healthcare, and retirement costs. Other estimates for 2004 show earnings of production workers at assembly plants at $1,217 per week, whereas workers at parts plants earn $872 weekly, and workers in all manufacturing industries make an average of $529 per week. Autoworkers—particularly those who work in assembly plants in developed countries—certainly have a great deal at stake as the industry continues to globalize.

Forecasting the Future Competitive structure in Automobile industry:

At the turn into the second automobile century, the automobile industry finds itself in a complex competitive situation, and one that is hard to explain with the current notions of "craft, mass and lean producers. The following are the few forces to stand the future Competitive structure.

i). Unprecedented wave of mergers: the persistent overcapacity in the industry has resulted in an unprecedented wave of mergers and acquisitions in the industry .Most Western manufacturers have joined forces with others in order to achieve higher economies of scale in purchasing and product development, to develop a global brand portfolio, and to gain access to emerging markets. Many of these mergers have a rather troubled history, such as DaimlerChrysler and Mitsubishi, are far from delivering the financial returns that were hoped for, and have not led to the reduction in global overcapacity that had been hoped for (Holweg and Pil 2004).

ii). Theme of competitive advantage: since almost all vehicle manufacturers across global regions have adopted lean manufacturing techniques, the competitive advantage of the Japanese has been considerably reduced. The results from the global assembly plant survey of the MIT International Motor Vehicle Program show that the gap between the US and Japan has been reduced to duration of build.

iii). Local manufacturing presence Dilutes the incentives: The same applies to the brand image. Is Volvo still Swedish, or is Saab now American? Not only has the ownership of many "national" producers changed, some of their vehicles may also not even be produced in their "home countries" any longer in the future. This is furthermore problematic as a strong local manufacturing presence dilutes the incentives for policy-makers. In fact, the Big Three have continuously been losing their market share in the US, and in 2002 even lost their majority in the US passenger car market, down from a market share of more than 90% in the 1950s.

iv). Craft producers used to build all vehicles to customer order: While the fortunes in the industry have changed drastically over the last century, the way we sell and distribute cars has not. In fact, Henry Ford's legacy equally lies in the way we run factories, and sell the vehicles that have been made by our mass production factories. Craft producers used to build all vehicles to customer order in the 1900s. Henry Ford made his Model T entirely to forecast and sold the cars from dealer stock, which allowed him to run the factories as efficiently as possible. His reasoning was that running higher volumes at the factory would reduce unit cost, and thus the sales price. Lower sales prices in turn would increase demand, and therefore sales.

v). competitive realm of shift in technology: In my view, the next major change in the competitive realm is going to be triggered by a major shift in technology, i.e. the advent of a "disruptive technology" (Christensen 1997). Such radically new technology would then reset the competitive dynamics back to the days of Henry Ford – completely new technology will require considerable changes to current practices and change existing economies, as did mass production to the automotive industry at the time. Initially, manufacturers will seek to boost production volumes to achieve better economies of scale.

2. CONCLUSION

The competitive realm of the auto industry is dynamic, and has been throughout the past century.. Over the last century we have witnessed the evolution from craft production to mass production under Henry Ford, to Sloan's policy of brand and product variety, to lean production, and more recently, to build-to-order initiatives at both volume and luxury vehicle manufacturers.. In the process, the competitive realm has shifted considerably, and the main basis on which companies are competing has changed. In this chapter, the dynamics of the competitive realm in the motor industry have been laid out over time, and four generic phases could be identified: cost leadership, variety and choice, diversification, and customization. At present, most companies are at the diversification and customization stages of this model, although it could be argued that Ford and GM in North America have remained at the "variety and choice" stage, competing on both cost and model variety, whereas others, such as BMW, Volkswagen, Toyota, Audi, and Renault, have found their diversifying feature: brand image, innovative design, leading product technology or manufacturing excellence provide the basis on which these companies have established individual competitive profiles. Truly sustainable competitiveness in tomorrow's automobile industry can only be found in developing customer-responsive supply systems that respond to both demanding customer needs, as well an increasing product and model variety that has invoked considerable changes in the economic

foundations of the global automotive industry. Today the mood is cautious, and industry growth has moderated. But nonetheless the long term prospects are strong, as India is poised to be one of the fastest growing automotive markets worldwide over the next decade and is slated to move from number 8 positions to number 3 positions in the passenger vehicle market. And to harness this opportunity, effective management of the short term challenges and implementation of sustainable strategies is the key to robust industry growth.

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