## GROWTH OF TWO WHEELER INDUSTRY IN INDIA WITH CHANGING PREFERENCES

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3.1 Introduction

The Automotive industry in India is one of the largest in the world and one of the fastest growing globally. India manufactures over 17.5 million vehicles (including 2 wheeler and 4 wheeler) and exports about 2.33 million every year. It is the world's second largest manufacturer of motorcycles, with annual sales exceeding 8.5 million in 2009 (World Honda, 2010). India's passenger car and commercial vehicle manufacturing industry is the seventh largest in the world, with an annual production of more than 3.7 million units in 2010. According to recent reports, India is set to overtake Brazil to become the sixth largest passenger vehicle producer in the world, growing 16-18 per cent to sell around three million units in the course of 2011-12 (OCIA, 2010). In 2009, India emerged as Asia's fourth largest exporter of passenger cars, behind Japan, South Korea, and Thailand (Nair, 2009).

India is a global major in the two-wheeler industry producing motorcycles, scooters and mopeds principally of engine capacities below 200 cc. It is the second largest producer of two-wheelers. The two-wheeler industry in India has grown at a compounded annual growth rate of more than 10 per cent (in number) during the last five years and has also witnessed a shift in the demand mix, with sales of motorcycles showing an increasing trend. Indian two wheelers comply with some of the most stringent emission and fuel efficiency standards worldwide.

This chapter critically evaluates the development of the Indian automobile industry with specific reference to two wheelers. The discussion is divided in the following parts:

1. Introduction of the Indian Automobile Industry
2. Review of Studies undertaken on the Indian Automobile Industries
3. Analysis of the current socio-economic scenario in India and its relevance to the Automobile sector.

4. Analysis of the current socio-economic scenario in Maharashtra State and its relevance to the Automobile sector.

5. Analysis of the Maharashtra State Automobile Cluster

6. Conclusions

3.2 Indian Automobile Sector

The first car ran on India's roads in 1897. Until the 1930s, cars were imported directly, but in very small numbers.

Embryonic automotive industry emerged in India in the 1940s. Mahindra & Mahindra was established by two brothers as a trading company in 1945, and began assembly of Jeep CJ-3A utility vehicles under license from Willys. The company soon branched out into the manufacture of light commercial vehicles (LCVs) and agricultural tractors.

Following the independence, in 1947, the Government of India and the private sector launched efforts to create an automotive component manufacturing industry to supply to the automobile industry. However, the growth was relatively slow in the 1950s and 1960s due to nationalisation and the license raj which hampered the Indian private sector. After 1970, the automotive industry started to grow, but the growth was mainly driven by tractors, commercial vehicles and scooters. Cars were still a major luxury. Japanese manufacturers entered the Indian market ultimately leading to the establishment of MarutiUdyog. A number of foreign firms initiated joint ventures with Indian companies.

In the 1980s, a number of Japanese manufacturers launched joint-ventures for building motorcycles and light commercial-vehicles. It was at this time
that the Indian government chose Suzuki for its joint-venture to manufacture small cars. Following the economic liberalisation in 1991 and the gradual weakening of the license raj, a number of Indian and multi-national car companies launched operations. Since then, automotive component and automobile manufacturing growth has accelerated to meet domestic and export demands.

Following economic liberalization in India in 1991, the Indian automotive industry has demonstrated sustained growth as a result of increased competitiveness and relaxed restrictions. Several Indian automobile manufacturers such as Tata Motors, Maruti Suzuki and Mahindra and Mahindra, expanded their domestic and international operations. India's robust economic growth led to the further expansion of its domestic automobile market which has attracted significant India-specific investment by multinational automobile manufacturers according to the Draft Automotive Mission Plan 2006-16. In February 2009, monthly sales of passenger cars in India exceeded 100,000 units (Economic Times, 2009)\textsuperscript{4} and has since grown rapidly to a record monthly high of 182,992 units in October 2009 (AFP, 2010)\textsuperscript{5}. From 2003 to 2010, car sales in India have progressed at a CAGR of 13.7\%, and with only 10\% of Indian households owning a car in 2009 (whereas this figure reaches 80\% in Switzerland for example this progression is unlikely to stop in the coming decade. Congestion of Indian roads, more than market demand, will likely be the limiting factor.

SIAM is the apex industry body representing all the vehicle manufacturers, home-grown and international, in India. Table 3.1 through Table 3.4 presents the available statistics on the Indian Automobile Industry.
### Table 3.1: Automobile Production & Industry Details

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<tbody>
<tr>
<td>Motor Vehicle Production</td>
<td>8,467,853</td>
<td>9,743,503</td>
<td>11,087,997</td>
<td>10,853,930</td>
<td>11,175,479</td>
</tr>
<tr>
<td>Industry Revenue</td>
<td>24,379</td>
<td>26,969</td>
<td>30,507</td>
<td>32,383</td>
<td>33,342*</td>
</tr>
<tr>
<td>Exports (Units)</td>
<td>629,544</td>
<td>806,222</td>
<td>1,011,529</td>
<td>1,238,333</td>
<td>1,530,660</td>
</tr>
<tr>
<td>Exports (Revenue)</td>
<td>1,915</td>
<td>2,231</td>
<td>2,552</td>
<td>3,008</td>
<td>3,718*</td>
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*Source: Imaginmor, 2009*

### Table 3.2: Automobile Production Details

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<tbody>
<tr>
<td>Passenger Vehicles</td>
<td>1,209,876</td>
<td>1,309,300</td>
<td>1,545,223</td>
<td>1,777,583</td>
<td>1,838,697</td>
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<tr>
<td>Commercial Vehicles</td>
<td>353,703</td>
<td>391,083</td>
<td>519,982</td>
<td>549,006</td>
<td>417,126</td>
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<tr>
<td>Three Wheelers</td>
<td>374,445</td>
<td>434,423</td>
<td>556,126</td>
<td>500,660</td>
<td>501,030</td>
</tr>
<tr>
<td>Two Wheelers</td>
<td>6,529,829</td>
<td>7,608,697</td>
<td>8,466,666</td>
<td>8,026,681</td>
<td>8,418,626</td>
</tr>
<tr>
<td>Total</td>
<td>8,467,853</td>
<td>9,743,503</td>
<td>11,087,997</td>
<td>10,853,930</td>
<td>11,175,479</td>
</tr>
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*Source: Imaginmor, 2009*
### Table 3.3: Automobile Sales

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<tr>
<td>Passenger Vehicles</td>
<td>1,061,572</td>
<td>1,143,076</td>
<td>1,379,979</td>
<td>1,549,882</td>
<td>1,551,880</td>
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<tr>
<td>Commercial Vehicles</td>
<td>318,430</td>
<td>351,041</td>
<td>467,765</td>
<td>490,494</td>
<td>384,122</td>
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<td>Three Wheelers</td>
<td>307,862</td>
<td>359,920</td>
<td>403,910</td>
<td>364,781</td>
<td>349,719</td>
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<tr>
<td>Two Wheelers</td>
<td>6,209,765</td>
<td>7,052,391</td>
<td>7,872,334</td>
<td>7,249,278</td>
<td>7,437,670</td>
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<tr>
<td>Total</td>
<td>7,897,629</td>
<td>8,906,428</td>
<td>10,123,988</td>
<td>9,654,435</td>
<td>9,723,391</td>
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*Source: Imaginmor, 2009*

### Table 3.4: Automobile Exports

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<tr>
<td>Passenger Vehicles</td>
<td>166,402</td>
<td>175,572</td>
<td>198,452</td>
<td>218,401</td>
<td>335,739</td>
</tr>
<tr>
<td>Commercial Vehicles</td>
<td>29,940</td>
<td>40,600</td>
<td>49,537</td>
<td>58,994</td>
<td>42,673</td>
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<tr>
<td>Three Wheelers</td>
<td>66,795</td>
<td>76,881</td>
<td>143,896</td>
<td>141,225</td>
<td>148,074</td>
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<tr>
<td>Two Wheelers</td>
<td>366,407</td>
<td>513,169</td>
<td>619,644</td>
<td>819,713</td>
<td>1,004,174</td>
</tr>
<tr>
<td>Total</td>
<td>629,544</td>
<td>806,222</td>
<td>1,011,529</td>
<td>1,238,333</td>
<td>1,530,660</td>
</tr>
</tbody>
</table>

*Source: Imaginmor, 2009*
3.2.1 Product and service segmentation

The automotive industry of India is categorised into passenger cars, two wheelers, commercial vehicles and three wheelers, with two wheelers dominating the market. More than 75% of the vehicles sold are two wheelers. Nearly 59% of these two wheelers sold were motorcycles and about 12% were scooters. Mopeds occupy a small portion in the two wheeler market however; electric two wheelers are yet to penetrate.

The passenger vehicles are further categorised into passenger cars, utility vehicles and multi-purpose vehicles. All sedan, hatchback, station wagon and sports cars fall under passenger cars. Nano is the world’s cheapest passenger car, manufactured by Tata Motors - a leading automaker of India. Multi-purpose vehicles or people-carriers are similar in shape to a van and are taller than a sedan, hatchback or a station wagon, and are designed for maximum interior room. Utility vehicles are designed for specific tasks. The passenger vehicles manufacturing account for about 15% of the market in India.

Commercial vehicles are categorised into heavy, medium and light. They account for about 5% of the market. Three wheelers are categorised into passenger carriers and goods carriers. Three wheelers account for about 4% of the market in India.
Table 3.5: Automobile Categorisation Details in terms of Sales Percentage

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<tr>
<td>Passenger Car (%)</td>
<td>10.22</td>
<td>10.39</td>
<td>9.91</td>
<td>10.65</td>
<td>12.42</td>
</tr>
<tr>
<td>Utility Vehicles (UVs) (%)</td>
<td>2.15</td>
<td>2.23</td>
<td>2.18</td>
<td>2.18</td>
<td>2.39</td>
</tr>
<tr>
<td>Multi Purpose Vehicles (MPVs) (%)</td>
<td>0.87</td>
<td>0.82</td>
<td>0.75</td>
<td>0.82</td>
<td>0.98</td>
</tr>
<tr>
<td>Total Passenger Vehicles (%)</td>
<td>13.25</td>
<td>13.44</td>
<td>12.83</td>
<td>13.65</td>
<td>15.79</td>
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<tr>
<td>Passenger Carriers (%)</td>
<td>0.36</td>
<td>0.32</td>
<td>0.32</td>
<td>0.28</td>
<td>0.43</td>
</tr>
<tr>
<td>Goods Carriers (%)</td>
<td>2.01</td>
<td>2.19</td>
<td>2.01</td>
<td>2.44</td>
<td>2.10</td>
</tr>
<tr>
<td>Total Medium &amp; Heavy Commercial Vehicles (%)</td>
<td>2.37</td>
<td>2.51</td>
<td>2.33</td>
<td>2.73</td>
<td>2.53</td>
</tr>
<tr>
<td>Passenger Carriers (%)</td>
<td>0.28</td>
<td>0.25</td>
<td>0.25</td>
<td>0.24</td>
<td>0.32</td>
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<tr>
<td>Goods Carriers (%)</td>
<td>1.17</td>
<td>1.27</td>
<td>1.36</td>
<td>1.67</td>
<td>1.77</td>
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<tr>
<td>Total Light Commercial Vehicles (%)</td>
<td>1.45</td>
<td>1.52</td>
<td>1.61</td>
<td>1.90</td>
<td>2.10</td>
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<tr>
<td>Total Commercial Vehicles (%)</td>
<td>3.82</td>
<td>4.03</td>
<td>3.94</td>
<td>4.63</td>
<td>4.63</td>
</tr>
<tr>
<td>Passenger Carriers (%)</td>
<td>2.56</td>
<td>2.17</td>
<td>2.39</td>
<td>2.34</td>
<td>2.51</td>
</tr>
<tr>
<td>Goods Carriers (%)</td>
<td>1.61</td>
<td>1.73</td>
<td>1.65</td>
<td>1.65</td>
<td>1.51</td>
</tr>
<tr>
<td>Total Three Wheelers (%)</td>
<td>4.17</td>
<td>3.90</td>
<td>4.04</td>
<td>4.00</td>
<td>4.01</td>
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<tr>
<td>Scooters/Scooterettes (%)</td>
<td>13.01</td>
<td>11.68</td>
<td>10.21</td>
<td>9.31</td>
<td>11.57</td>
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<tr>
<td>Motorcycles/Step-Throughs (%)</td>
<td>61.24</td>
<td>62.86</td>
<td>65.24</td>
<td>64.83</td>
<td>59.35</td>
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### Segment

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<tr>
<td>Mopeds (%)</td>
<td>4.52</td>
<td>4.08</td>
<td>3.74</td>
<td>3.52</td>
<td>4.47</td>
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<tr>
<td>Electric Two Wheelers (%)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.07</td>
<td>0.19</td>
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<tr>
<td>Total Two Wheelers (%)</td>
<td>78.76</td>
<td>78.63</td>
<td>79.18</td>
<td>77.73</td>
<td>75.57</td>
</tr>
<tr>
<td>Grand Total (%)</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
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</table>

**Source:** Imaginmor (2009)

#### 3.2.2 Industry Composition and Current Scenario Analysis for Two Wheelers

Motorcycles account for bulk of Two-Wheeler sales in India. Two-Wheeler sales in India are spread across three main product categories: motorcycles, scooters, and mopeds. While in the previous decade, scooters were the largest selling product category, in the current one, consumer preferences appear to have shifted decisively in favour of motorcycles, which now account for over 80% of total Two-Wheeler sales in India. The rural market, a key demand driver for the Two-Wheeler industry as a whole, has been a significant contributor to the shift in preference towards motorcycles. With their longer wheel base and better mileage, motorcycles enjoy preference over scooters, especially in country-sides, as they ride well over long distances and uneven roads, besides being perceived to have a superior style quotient. However, given the practicality of scooters, especially in urban areas, their demand is likely to be sustained. As a product category, scooters have also undergone an image makeover, having metamorphosed into vehicles with cleaner technology, gearless options, and features targeted at female commuters. In fact, while motorcycle sales volumes in 2007-08 and
2008-09 remained lower than the levels achieved in 2006-07, scooter volumes have maintained consistent volume growth over the last two years.

**Chart 3.1: Trend in Two-Wheeler Volumes by Category**

*Source: SIAM, ICRA’s estimates*

**Chart 3.2: Trend in Two-Wheeler Sales Volumes, Domestic and Exports**

*Source: SIAM, ICRA’s estimates*
3.2.3 Motorcycles

Motorcycle models with a sticker price of up to Rs. 40,000 comprise the “entry-price segment”, which largely consists of 100cc bikes and is currently dominated by the *CD Deluxe* model of Hero Honda Motor Limited (HHML) and *Platina* of Bajaj Auto Limited (BAL). The entry segment has suffered volume declines during the last two to three years, being hit the worst by the tightening of credit; being a relatively small ticket item, its customers usually belong to the most vulnerable section economically within the universe of motorcycle buyers. The segment’s profitability for Two-Wheeler manufacturers has also declined over this period, with volumes falling and price competition getting more intense. The Rs. 40-50,000 “mid-price segment” is largely concentrated around 100-135cc models of various players and account for bulk of the volumes (~63%) in motorcycles. HHML remains a strong market leader in the mid-price segment with its highly successful *Passion* and *Splendor* models. BAL has *Discover* and *Pulsar 135* in this range. The “premium price segment” (Rs. 55,000 and above) is currently dominated by BAL with its *Pulsar* range of motorcycles.

Chart 3.3: Trend in Sales Mix (Volumes) of Motorcycle Models by Price Range

Source: Industry estimates
Sales in the entry segment (Rs. 35-50,000 range) remained lacklustre in 2007-08 and 2008-09 with BAL diminishing its focus on the 100cc segment and most financial institutions displaying a lack of keenness to finance low-ticket loans. Nevertheless, sales in the entry segment, which accounted for 69% of the total motorcycle sales volumes in 2008-09, have received support in the current fiscal from:

(i) new model launches in the segment; and

(ii) the renewed focus being placed on the rural market where sales are largely cash driven. The executive segment, on the other hand, continues to report growth in double digits; as a result, the share of this segment in total motorcycle sales went up from 21% in 2006-07 to 30% in 2008-09.

Based on the classification of the Society of Indian Automobile Manufacturers (SIAM), that is, Entry segment: 75-125 cc; Executive segment: 125-250 cc; and Premium segment: >250 cc the trend in motorcycles sales are presented in figure 3.4.

Chart 3.4: Trend in Motorcycle Sales by engine capacity

Source: SIAM, ICRA’s estimates
HHML is currently the clear market leader in the entry segment, enjoying a market share of close to 70%. The company has a portfolio of six models in the 100cc segment in the Rs. 35,000-45,000 price band and continues to maintain a dominant market position led by its Splendor and Passion series of motorcycles. HHML’s strong franchise, wide distribution network, and regular refurbishments and line extensions of the Splendor and Passion series have allowed it to protect its turf in the entry segment on a sustained basis. Earlier, intense price competition and relatively low profitability in the lower end of the entry segment had prompted BAL (in 2007-08) to diminish its focus on the 100cc segment, and with that its market share dropped to 17% in 2008-09 from 26% in 2006-07. However, with the launch of Discover 100cc by BAL in July 2009, the company has made a comeback in the 100cc segment. This has supported volume growth for BAL in the current year, pushing up its market share in the entry segment to 23% (April-January 2010) from 17% in 2008-09. TVS Motor Company (TVS) is the other prominent player in the entry segment with its Star City model (7% market share in April-January 2010). However, despite being a competent product, this model has failed to grow its volumes, with refurbishments being limited and HHML increasing its dominance of the segment.

**Outlook for the entry segment**

With BAL making a comeback in the entry segment and Honda Motorcycles and Scooters India Limited (HMSI) planning to launch a 110cc bike (CB Twister) in February 2010, competitive intensity in this segment is likely to increase. BAL is expected to make a strong return in the entry segment, leveraging the brand image of Discover 135 to launch Discover 100cc. However, ICRA does not expect HHML’s overall market leadership in this segment to get usurped over the medium term, given the low running costs image of the Splendor and Passion family bikes and the company’s extensive sales and service network.
The launch of new products in the entry segment augurs well for the enrichment and expansion of the segment. However, the already high rate of penetration in the urban markets is likely to remain a moderating factor. Increased competition in this segment is expected to lead to an increase in below-the-line promotions, thereby squeezing profit margins; this may get accentuated further by a likely increase in raw material costs in the near term. Among the entry-segment players, HHML is better placed to meet the anticipated challenges to profitability, given its larger economies of scale.

**Executive Segment Analysis**

The executive segment (125-250cc) has witnessed significant activity over the last few years with multiple models and variants being launched by almost all the original equipment manufacturers (OEMs). The lower end of the executive segment features HHML’s *Super Splendor* and *Glamour*; BAL’s *Platina 125*, *Discover 135* and *Pulsar 135*; TVS’ *Flame*; HMSI’s *Shine* and *CBF Stunner*; and Suzuki Motorcycle India Pvt Limited’s (SMIPL’s) *Heat* and *Zeus*. The upper end has HHML’s troika of *CBZ*, *Hunk*, and *Karizma*; BAL’s *Pulsar* series; HMSI’s *Unicorn*; SMIPL’s *GS 150R*; TVS’ *Apache*; and four offerings from the Yamaha stable.

The executive segment hails its origin to the year 1999 when HHML launched the sports-oriented *CBZ* (sporting the Honda 156.8cc engine), giving customers the option to graduate from plain-vanilla commuting to performance biking. This was followed by the launch of *Pulsar 150* and *Pulsar 180* models by BAL in 2001 which paved the way for high sales growth in this segment capitalizing on the latent demand. While entry-segment motorcycles typically offer higher fuel economy and lower operating costs, performance bikes are characterised by features such as higher speed, quicker acceleration, and superior ride, handling and braking. With increasing disposable incomes in the hands of customers in a growing
economy, executive segment motorcycles appear to have caught the fancy of customers and seem to hold a strong growth potential in India over the long term. While most Two-Wheeler OEMs operating in India now have a presence in the executive segment, BAL is the current market leader, accounting for almost half the sales in the segment. BAL’s presence in the segment is marked by its flagship brand *Pulsar*, which is available in the 150cc, 180cc and 220cc variants. However, BAL’s market share in this segment has seen some erosion over the last five years because of increased competition; from 70% in 2005-06, its market share has come down steadily to the level of 47% now (April-January 2010). Also, with a host of new products being launched by HMSI, HHML, Yamaha, TVS and SM IPL over the last five years, the segment has witnessed increasing competition in both the 125cc and 150cc sub-categories. Yamaha, Honda and Suzuki are strong global brands, but given their relatively short track record in India, their ability to succeed here is yet to be tested. These companies have had mixed success in the Indian market so far, as highlighted by Yamaha’s weak market position in India till two years back and the limited presence of HMSI (focused mainly on scooters) in motorcycles. Nevertheless, there is evidence of resurgence of Yamaha in India, given that its newly-launched *FZ16* and *YZF-R15* models have been well accepted by performance enthusiasts in the country and that its market share in the executive segment has risen from 4% in 2007-08 to 10% in April-January 2010. Even HMSI, with its twin offerings *Shine* and *CBF Stunner* in the 125cc category and *Unicorn* in the 150cc category, has been able to make inroads into the executive motorcycles segment, garnering a market share of 22% in April-January 2010 (11% in 2006-07). In contrast, despite having a large portfolio of products in the executive segment—including *Super Splendor* at the lower end, and *Glamour, CBZ, Hunk*, and *Karizmaat* the higher end—HHML’s market share is moderate (11% in April-January 2010). Overall however, HHML, BAL and TVS benefit from their local expertise and are
looked upon with greater confidence by stakeholders, including suppliers and dealers.

**Outlook for the executive segment**

Investment in brand-building assumes far greater significance now than earlier with Indian customers turning more demanding and competition also intensifying. Since bikes in the upper end of the executive segment also have an aspirational value attached, the ability of OEMs to build strong brands in this space could have a positive rub-off on their entry-segment offerings as well. Thus, going forward, the executive segment is expected to claim a greater share of marketing spends.

Increased activity is expected at the higher end of the executive segment, in which global majors like Honda and Yamaha are likely to leverage their global portfolios to launch models in India. Given their currently low base, some of these players may be expected to generate strong growth, causing some market share erosion for market leader BAL over the medium term. While the launch of *Pulsar 135* is expected to make up for the anticipated loss of volumes of its bigger cousins, the risk of *Pulsar’s* brand dilution cannot be ruled out.

The executive segment is expected to be able to maintain its volume growth over the medium term, which should translate into superior profit margins for players that are stronger in this segment.

**Premium Segment Analysis**

The premium segment of motorcycles in India (>250cc) is currently dominated by Eicher Motor Limited’s *Royal Enfield*, which offers motorcycles in the 350cc and 500cc categories; HMSI, Yamaha, and SMIPL are the other prominent players here. While *Royal Enfield’s* products are in
the category of cruiser bikes, the other players’ products are sports bikes. These machines are designed to deliver high power, come packed with technology, and accordingly command a premium price. Many of the models launched earlier in the premium segment had met only limited success; for instance, Yamaha’s Enticer, Kawasaki-Bajaj’s Eliminator, and Kinetic’s Aquila showed promise in the initial months of their launch, but later had to be discontinued. Given the low volume potential of these bikes, some of the other large players in India like HHML and TVS have stayed away from this segment.

**Outlook for the premium segment.**

This market offers large scope for segmentation in terms of price points and performance characteristics. Also, the premium segment is expected to get crowded as new players like Harley Davidson, Ducati, and Kawasaki gear up to expand their presence in it. Further, BAL, SMIPL, and HMSI have a pipeline of multiple products that are slated for launch in 2010-11. Given the premium and niche character of these bikes, the volume base is likely to remain small over the medium term.

The low volumes of products in this segment do not justify investments in localisation of parts. Hence, most of the new products planned to be launched are either likely to be imported as completely built units (CBUs) or they would have a high import content. Thus, product prices are likely to remain high over the medium term, which in turn could curtail growth prospects. While it is true that these products are not meant for the mass market, considering the increase in customer awareness levels, OEMs cannot afford to ignore the price-value equation altogether.
3.2.4 Scooters

As a product category, scooters have covered a considerable distance over the last decade. From being a laggard in technology and characterised by two-stroke engines, higher emissions, and old styling, scooters have now acquired more refined engines and contemporary styling. Product positioning has also undergone a change with all OEMs now including in their portfolios gearless scooters with low kerb weight and self-start, features that appeal to certain consumer categories like women. HMSI currently occupies the leading position in the scooters segment with a market share of 51% (April-January 2010) and drawing on its flagship brand Activa (besides Aviator and Dio). It is followed by TVS (Scooty Pep+ and Streak), which has a market share of 22%. In the past, several players such as Scooters India Limited, Kinetic Motor Company Limited (KMC), and LML Limited exited the segment, unable to run a profitable business in a scenario of declining volumes industry-wide; even BAL has recently announced that it plans to exit from scooters. That notwithstanding, the segment has also seen several relatively new entrants in the form of HHML, which launched Pleasure in January 2006, and SMIPL, which launched Access 125 in September 2007. Besides, Mahindra & Mahindra has also entered the Two-Wheeler circuit via its acquisition of the business assets of KMC in July 2008.

**Outlook for the scooters segment**

The entry of new players and increased segmentation (with 100cc and 125cc options) are expected to drive volume growth further and lead to an expansion of the market for scooters.

HMSI has enjoyed a strong market position till now, but could be facing competition from newer entrants like Mahindra Two Wheelers Limited (MTWL), going forward.
Profit margins in the scooters segment are lower than in motorcycles. This is primarily because of the low volumes and the fragmented nature of the segment (barring HMSI, all others are averaging less than 25,000 scooters a month over the last four-five years). With competition increasing, profitability is bound to come under further pressure, which may then lead to another round of churn in the segment, prompting OEMs to rethink their strategies and focus more on specific motorcycle/scooter categories.

3.2.5 Rural v/s the Urban Market
The demand for Two-Wheeler from rural and semi-urban cities has been strong so far in the current fiscal, despite the monsoons having been poor. While it is believed that poor monsoons generally translate into lower disposable incomes in the hands of the farming community, industry estimates suggest that around 60% of the rural economy now depends on non-agricultural sources of income, such as trading, remittances from cities, and employment in the manufacturing sector. That apart, a substantial increase in crop prices during the last three years has also left larger disposable incomes with rural customers. Further, the implementation of the Sixth Pay Commission’s recommendations in Tier II/III cities has collectively helped in supporting the growth in the semi-urban cities. However, the impact of the weaker monsoons during the current year may begin to be felt in the near term, leading to a slowdown in the growth momentum.
3.3 Review of Relevant Studies on Indian Automobile Sector

As noted by NMCC (2006)\(^6\), competitiveness of manufacturing sector is a very broad multi-dimensional concept that embraces numerous aspects such as price, quality, productivity, efficiency and macro-economic environment.

In this section, various studies on the Indian auto industry are reviewed, under different heads pertaining to competitiveness, namely, global comparisons, policy environment and evolution of the Indian auto industry, productivity, aspects related to supply-chain and industrial structure and technology and other aspects.

3.3.1 Global Comparisons

The Investment Information and Credit Rating Agency of India (ICRA, 2003)\(^7\) studies the competitiveness of the Indian auto industry, by global comparisons of macro-environment, policies and cost structure. This has a detailed account on the evolution of the global auto industry. The United States was the first major player from 1900 to 1960, after which Japan took its place as the cost-efficient leader. Cost efficiency being the only real means in as mature an industry as automobiles to retain or improve market share, global auto manufacturers have been sourcing from the developing countries. India and China have emerged as favourite destinations for the first-tier OEMs since late 1980s.

There are only a few dominant Indian OEMs, while the number of OEMs is very large in China (122 car manufacturers and 120 motorcycle manufacturers).
According to this study, the major advantage of the Indian economy is educated and skilled workforce with knowledge of English. Our disadvantages include poor infrastructure, complicated tax structure, inflexible labour laws, inter-state policy differences and inconsistencies. The drivers of Chinese economic growth are FDI, labour productivity growth, which was 1.5 times higher than that in India in the last decade, and domestic demand. Fiscal pressure is mounting on the Chinese government, while India is in a better state. Based on comparisons of cost composition to pinpoint the areas in which the Indian auto industry is at a disadvantage, this study recommends a VAT regime, speedy procedures, imports duty cuts on raw materials, common testing and design facility, labour reforms, upgradation of design and engineering capabilities and brand building.

ICRA (2004a)\(^8\) analyses the implications of the India-ASEAN Free Trade Agreements for the Indian automotive industry. ASEAN economies are globally more integrated than India. The current size of Indian and ASEAN market for automobiles is more or less the same but the Indian market has a larger growth potential than the ASEAN market due to the low level of penetration. The labour cost is low in India but the stringent labour regulations erode this advantage. The level of infrastructure is better in India than Indonesia and the Philippines but worse than that in other ASEAN countries. The financial and banking sector is better in India than in the ASEAN countries. The study notes that there is a huge excess capacity in ASEAN countries, in comparison with that in India, which will help them to tackle the excess demand that may arise in future. The study finds a 20-30 per cent cost disadvantage for Indian companies on account of taxation and infrastructure and 5-20 per cent labour cost advantage over comparable Association of South East Asian Nations.
Similar findings are noted in a study by the Automotive Component Manufacturers Association of India (ACMA, 2004), particularly in comparison with Thailand.

ICRA (2004b)\(^9\) analyses the impact of Preferential Trade Agreement (PTA) with MERCOSUR on the automobile sector in India. This study finds a significant threat of imports in sub-compact and compact cars and certain auto-components. There is huge excess capacity and intense competition in MERCOSUR countries, propelling them to look for export opportunities. This is true especially of Brazil, which has a well-developed auto-component sector with huge economies of scale. Further, weak currency in all MERCOSUR countries provides a natural tariff barrier. In addition, MERCOSUR countries have an equitable arrangement within themselves to have a balanced trade, with fair level of exports and imports. The Indian auto industry could gain from this PTA with MERCOSUR only if it is assured of the balanced trade, as MERCOSUR countries practise among themselves.

ICRA (2005)\(^10\) studies the possible impact of FTA with South Africa on the Indian automobile industry. The study finds that there are a few policies in South Africa that indirectly subsidizes the auto industry, unlike India, in terms of financial grants. Hence it is suggested that India could minimise losses only if it goes for inclusion of certain auto components, which involve huge logistic costs of imports, creating a natural protection (for example, stampings, glass, seats, plastics and tyres) and those in which India enjoys economies of scale and is cost-competitive (e.g. castings and forgings) in this FTA. If South Africa is ready to discontinue the schemes such as Motor Industry Development Programme (MIDP), India could include all automotive components in this FTA. There should be a minimum
local content of 60 per cent and the agreement should not be trade balancing as India will not gain much in that case.

3.3.2 Composition of Economy

India’s growth has been mainly driven by the services sector. India has also become one of the world leaders in technology and business outsourcing. The service sector constituted 54% of the Indian GDP in 2009-10 up from 43% in 1988 while the manufacturing sector constituted 15.8% and the agriculture sector constituted 17.5%. Among all clusters, communications services cluster has shown an exceptional strength in its growth rate and world export share.

Low productivity, higher input and material cost, cumbersome regular environment, stringent labor law, and insufficient development in infrastructure have been the major bottlenecks for growth of the manufacturing sector. However recent trends have indicated that manufacturing is showing promising signs. Manufacturing growth has contributed significantly to the overall recovery of the economy in 2009 (ADB 2010)\(^{11}\). Also, 42% of Indian CEOs stated in a recent survey that they believed that the manufacturing sector has improved its competitiveness (PWC 2009)\(^{12}\). The automotive manufacturing, particularly in small cars, and the manufacture of pharmaceuticals are expected to play major role in the growth of the sector (World Economic Forum 2009)\(^{13}\).

In 2007, when Tata Motors was required to relocate its proposed Nano plant from the state of West Bengal (due to resistance of farmers and local politicians), it preferred the neighboring state of Gujarat to establish the plant, over its home base of Maharashtra, because Maharashtra cluster did not have adequate land with supporting infrastructure.
As of 2009, the automotive production in India ranks 7th globally. India’s automotive production is showing robust growth in all segments. In production volume terms, 75% of total production is of two-wheelers. However, the passenger vehicle segment is showing the strongest growth in the past 5 years. Especially after the liberalization policy started in 1991, most global automotive manufacturers entered India and established local manufacturing bases through joint ventures with local partners. Foreign manufacturers and local players formed multiple clusters attracting component suppliers all over India, where they could obtain better infrastructure facilities and strong support from local governments. Though most of the passenger vehicle production is concentrated in the small/basic segment reflecting India’s demand condition for cheaper models, passenger car exports from India are showing exponential growth, led by Maruti Suzuki and Hyundai Motors. These phenomena indicate that Indian automotive industry is transitioning to a global automotive hub, fulfilling international quality requirements.

Cost comparison with those in competing nations (Brazil, China, and Thailand) indicates that India is especially behind in taxation incidence and power costs. High import tariffs on passenger cars and two-wheelers force global automotive manufacturers to produce in India. Indian government has initiated tax reforms to provide a level playing field for its manufacturing sector, as well as focused on infrastructure investment for upgrading power and road supply, because India is still significantly behind in infrastructure development compared to China or Thailand. In terms of labor cost and productivity, India is almost at the same level with China and Thailand, though in terms of talent availability (number of annual graduating engineers, etc.) India is still in a leading position.
**Bottlenecks for Growth:**

Productivity in India had been a challenge in the early years of India’s development. From 1960 to 2000, annual total factor productivity (TFP) growth averaged a mere 0.25% (Goldman Sachs 2007)\(^4\). Although productivity of the country has been improving steadily since 1991, it is still much lower than China especially in the manufacturing sector. Annual growth in productivity marked 4% for China while it was 2.3% for India between 1993-2004.

### 3.3.3 Policy Environment and Evolution of Indian Auto Industry

In this section, studies on the policy environment pertaining to the Indian auto industry and its evolution over the years have been reviewed.

Pingle\(^{15}\) (2000) reviews the policy framework of India’s automobile industry and its impact on its growth. While the ties between bureaucrats and the managers of state-owned enterprises played a positive role especially since the late 1980s, ties between politicians and industrialists and between politicians and labour leaders have impeded the growth.

The first phase of 1940s and 1950s was characterised by socialist ideology and vested interests, resulting in protection to the domestic auto industry and entry barriers for foreign firms. There was a good relationship between politicians and industrialists in this phase, but bureaucrats played little role. Development of ancillaries segment as recommended by the L.K. Jha Committee report in 1960 was a major event that took place towards the end of this phase. During the second phase of rules, regulations and politics, many political developments and economic problems affected the auto industry, especially passenger cars segment in the 1960s and 1970s, though politicians picked Southern Common Market, which comprises Latin American countries.
The third phase starting in the early 1980s was characterised by delicensing, liberalisation and opening up of FDI in the auto sector. These policies resulted in the establishment of new LCV manufacturers (for example, Swaraj Mazda, DCM Toyota) and passenger car manufacturers. All these developments led to structural changes in the Indian auto industry.

Pingle argues that state intervention and ownership need not imply poor results and performance, as demonstrated by MarutiUdyog Limited (MUL). Further, the non-contractual relations between bureaucrats and MUL dictated most of the policies in the 1980s, which were biased towards passenger cars and MUL in particular. However, D’Costa (2002) argues that MUL’s success is not particularly attributable to the support from bureaucrats. Rather, any firm that is as good as MUL in terms of scale economies, first-comer advantage, affordability, product novelty, consumer choice, financing schemes and extensive servicing networks would have performed as well, even in the absence of bureaucratic support. D’Costa has other criticisms about Pingle (2000)\textsuperscript{16}.

The major shortcoming of Pingle’s study is that it ignores the issues related to sector specific technologies and regional differences across the country.

Piplai (2001)\textsuperscript{17} examines the effects of liberalisation on the Indian vehicle industry in terms of production, marketing, export, technology tie-up, product upgradation and profitability. Till the 1940s, the Indian auto industry was non-existent, since automobile were imported from General Motors and Ford. In early 1940s, Hindustan Motors and Premier Auto started, by importing know-how from General Motors and Fiat respectively. Since the 1950s, a few other companies entered the market for two-wheelers and commercial vehicles. However, most of them either imported or indigenously produced auto-components till the mid-1950s, when India had
launched import substitution programme, thereby resulting in a distinctly separate auto-component sector. Due to the high degree of regulation and protection in the 1970s and 1980s, the reforms in the early 1990s had led to a boom in the auto industry till 1996, but the response of the industry in terms of massive expansion of capacities and entry of multinationals led to an acute over-capacity. Intense competition had led to price wars and aggressive cost-cutting measures including layoffs and large-scale retrenchment. While Indian companies started focusing on the price-sensitive commercially used vehicles, foreign companies continued utilizing their expertise on technology-intensive vehicles for individual and corporate uses. Thus, Piplai concludes that vehicle industry has not gained much from the reforms, other than being thrusted upon a high degree of unsustainable competition.

In August 2006, a Draft of Automotive Mission Plan Statement prepared in consultation with the industry was released by the Ministry of Heavy Industries and Public. This was finally released as a report in December 2006. This document draws an action plan to take the turnover of the automotive industry in India to US$145 billion by 2016, accounting for more than 10 per cent of the GDP and providing additional employment to 25 million people by 2016. A special emphasis is laid on small cars, MUVs, two-wheelers and auto-components. Measures suggested include setting up of a National Auto Institute, streamlining government/educational/research institutions to the needs of the auto industry, upgrading infrastructure, considering changes in industry structure and fiscal incentives for R&D. Similarly, NMCC (2006), which lays down a national strategy for manufacturing, recognises the importance of the Indian automobile and auto-component industry, particularly the latter, as a competitive knowledge-based industry with immense employment generation potential.
McKinsey (2005) predicts the growth potential of India-based automotive component manufacturing at around 500 per cent, from 2005 to 2015. This report describes the initiatives required from industry players, the Government and the ACMA to capture this potential. This study was based on interviews and workshops with 20 suppliers and OEMs and survey with ACMA members. Increase in cost pressures on OEMs in developed countries, coupled with the emergence of skilled, cost-competitive suppliers in Low Cost Countries (LCCs), is likely to facilitate further acceleration of sourcing of automotive components from LCCs. The analysis identifies strong engineering skills and an emerging culture of cost-competitiveness as the major strengths of the Indian auto component sector, while its weaknesses include slow growth in domestic demand and structural disadvantages such as power tariffs and indirect taxes.

The policy recommendations of this study include VAT implementation, lower indirect taxes, power reforms, tax benefits linked to export earnings, duty-cut for raw material imports, R&D incentives for a longer period, establishment of auto parks, benefits for export-seeking investments, human resources development and modernisation fund for new investments in auto clusters. Industry players have been advised to improve their operational performance, determine their strategic posture as one among those identified in the study, improve capabilities in line with their posture and invest very rapidly in a planned manner. ACMA needs to promote India as a brand, enable sourcing from India by global customers and promote the quality and productivity efforts of the auto component firms in India.

ACMA (2006) notes that India’s joining the WP (Working Party) 29: 1998 Agreement for global harmonisation of automotive standards, coupled with the funding of National Automotive Testing and Research Infrastructure Project (NATRIP) by the Government of India, has increased prospects of
the Indian auto industry rising up to global standards in the near future, in all aspects.

Narayanan\(^{21}\) (1998) analyses the effects of deregulation policy on technology acquisition and competitiveness in the Indian automobile industry during the 1980s and finds that competitiveness has depended on the ability to build technological advantages, even in an era of capacity-licensing. In a liberalised regime, this would depend on firms’ ability to bring about technological changes, as inferred from the behaviour of new firms in the sample considered. Further, vertical integration could score over subcontracting in a liberal regime. This is probably because of the entry of new foreign firms that produce technologically superior and guaranteed quality vehicles and choose to produce most of the components in-house. Narayanan (2004)\(^{22}\) analyses the determinants of growth of Indian automobile firms during three different policy regimes, namely, licensing (1980-81 to 1984-85), deregulation (1985-86 to 1990-91) and liberalisation (1991-92 to 1995-96). Unlike the prediction by Narayanan (1998), this study finds that vertical integration is detrimental for growth in a liberalised regime as it potentially limits diversification.

Narayanan (2006)\(^{23}\) also finds that vertical integration plays a positive role in a regulated regime, while it is not conducive for export competitiveness in a liberal regime.

Kathuria (1995)\(^{24}\) notes that the time-bound indigenization programme for commercial vehicles in the 1980s facilitated the upgradation of vendor skills and modifying vehicles to suit local conditions, which demand functional efficiency, overloading capabilities, fuel economy, frequent changes in speed and easy repair and maintenance. Kathuria also mentions that the choice between vertical integration and subcontracting crucially
depends on the policy regime: In a liberal regime, vertical integration may not work.

India’s macroeconomic policy environment has not been very strong. The country ranked 68 out of 74 countries (GCI 2009) in this area, especially owing to its poor fiscal deficit management. The high rates of fiscal deficit make it harder for the government to invest in infrastructure, a key component for the growth of the manufacturing sector. India’s relatively low savings rate, as compared to its Asian neighbours, is also constraining its investment. Inflation has been managed well by the government in the past but recent spikes, especially in food inflation (20%) have caused concerns, due to its negative effects on consumption. Exports have been growing but India is still a net importer.

In order to decrease deficit the government committed to the Fiscal Responsibility and Budget Management Bill in 2000 and implemented the value added tax (VAT) in 2005 and committed to the Fiscal Responsibility and Budget Management Bill in 2000. Government deficit has come down from 10.1% in FY 2001 to 6.7% in FY 2009 (ADB 2010)²⁵.

India faces a huge challenge in human development. While a part of India is growing very quickly, about 300 million people still live below the poverty line. India’s enrolment rates in primary and secondary education remain low at 89% and 55% respectively, as compared to China which is at 98% and 75% respectively (UNESCO, 2007)²⁶. More than 70 % of the population still lives in suburbs (CIA, 2010)²⁷. Lack of adequately educated work force also constrains the development of capital intensive industries. The government is taking steps to increase social spending. In FY 2009, it increased the allocation of budget for education and health sector by 16% and 14% respectively.
3.3.4 Productivity
Sharma (2006) analyses the performance of the Indian auto industry with respect to the productivity growth. Partial and total factor productivity of the Indian automobile industry have been calculated for the period from 1990-91 to 2003-04, using the Divisia-Tornquist index for the estimation of the total factor productivity growth. The author finds that the domestic auto industry has registered a negative and insignificant productivity growth during the last one and a half decade. Among the partial factor productivity indices only labour productivity has seen a significant improvement, while the productivity of other three inputs (capital, energy and materials) haven’t shown any significant improvement. Labour productivity has increased mainly due to the increase in the capital intensity, which has grown at a rate of 0.14 per cent per annum from 1990-91 to 2003-04.

3.3.5 Aspects Related to Supply Chain and Industrial Structure
In this section, the studies that examine the aspects pertaining to local and global auto supply chains as well as the structure of the Indian auto industry are reviewed. Humphrey (1999) compares the impact of globalisation on supply chain networks in the auto industry in Brazil and India. According to Humphrey, global auto industry hubs were situated in three regions, namely, North America, Western Europe and Japan. Brazil and India are examples of the countries which could develop the indigenous auto industry despite not being situated very close to any of these regions. Hence, Humphrey compares the auto industries in these two countries. However, as Narayanan (2004) notes, vertical integration was gradually replaced by subcontracting, because Indian auto-component sector could emerge as a competitive sector after the entry of foreign firms.

While the global auto assembly majors used to produce 60-70 per cent of the value in-house till the 1980s, various phenomenal developments have started
taking place since the 1980s, such as the emergence of independent dealers and rise of catalogue suppliers who supply their standard and indigenously designed components/modules to many assemblers. Brazil and India had liberalised auto investments and tariff structure since 1990. Prior to 1991, India had a much more protectionist regime than Brazil, in terms of licensing and quantitative restrictions on both imports and domestic production. Inflows of auto FDI occurred in both the countries since the mid-1990s. Further, Brazil and India have emerged as preferred suppliers for global auto assemblers. When the global auto assemblers entered India and Brazil, the phenomenon of ‘follow-source’ was also happening. Now, there are parallel global networks of both assemblers and Tier-1 suppliers. Even Indian component suppliers have opportunities to enter the global auto supply chains, mainly in low technology products made to detailed drawings but the space for domestic industry is diminishing. With the global centralization of product engineering, skill requirements are likely to be immense in process engineering, particularly in assemblers and Tier-1 component manufacturers. Sutton (2000)\textsuperscript{31} compares the auto-component supply chains in India and China, based on field surveys. In both these countries, the supply chain has developed very rapidly at the level of car makers and Tier-1 suppliers, with quality levels close to world standards, largely driven by the entry of multinational car makers. But, the Tier-2 suppliers are still not up to the global standards. The domestic content requirements, based on the infant industry argument, have helped the international car makers in enhancing the production capabilities of the domestic players effectively, as shown by increases in auto-component exports from India and China. Of the top ten exporting firms in India and China, five and six are domestic ones, respectively. Enhanced supply-chain capabilities have benefited the domestic auto-makers as well, such as Mahindra and Mahindra in India, who have been able to capture a sizeable market share with their indigenously designed and assembled MUV.
Some leading component producers in China and India strategically use highly capital intensive techniques such as robotics, occasionally, despite the low wages, mainly on account of their concerns to achieve high levels of quality. This in combination with employing high-quality workforce even at shop floor is another strategic choice of a few leading firms in India, to promote exports. Many Tier-1 firms follow the standard Japanese work practices to improve quality and minimise costs. Interactions between carmakers and component suppliers have also helped the latter improve quality.

Addressing a larger question of the impact of Foreign Direct Investment (FDI) on the domestic industry and economy, Tewari (2000) studies the automotive supply chain of Tamil Nadu, based on field surveys, while this study shows evidence for the fact that medium-sized firms, which entered in the mid-1990s in Tamil Nadu have formed networks with smaller domestic suppliers and helped them upgrade their technologies. These medium-sized suppliers require more support from the government, since they play a crucial role in facilitating the development of the domestic auto industry. Joint ventures and technical tie-ups with overseas suppliers have been the strategies that were followed by well-performing auto component manufacturers, long before the global auto majors entered India. These relationships and the entry of foreign OEMs not only promote employment and income, but also diffusion of technologies and knowledge to the entire supply chain, including smaller firms.

Veloso and Kumar (2002) provide an overview of the major trends taking place in the global automotive industry, emphasising on the Asian market. Consumer preferences, government regulations and intense competition have been driving the firms towards new technologies, modernisation, research and changes in design and production. Market saturation in Triad
regions (the United States, Western Europe and Japan) and rapid emergence of markets in Asia have led to increasing diversity in market needs. As a result, there are many models and segments coming up rapidly.

Auto majors have started adopting a global perspective and reorganising their vehicle portfolio around product platforms, modules and systems. They are also minimising the number of suppliers, by opting for bigger ones, based on cost and quality competitiveness, R&D capacity and proximity to development centres. Mergers and acquisitions are taking place for consolidation. Suppliers have been taking new roles, as systems integrators, global standardiser-systems manufacturers, component specialists and raw material suppliers. These roles are based on their focus, market presence, critical capabilities and types of components and systems.

The automobile industry in India had been facing the problem of overcapacity by 2000 and the auto-component sector was not so developed as to be able to deliver products of world-class quality. Chinese tariff and quota policies, coupled with local content regulations protect the auto industry in China immensely. However, the Chinese auto industry suffers from fragmentation, lower quality, lack of technological up-gradation and managerial skills. Consolidation and liberalisation that are happening recently in China are expected to promote its auto industry. Auto industries in the ASEAN and Korea have recovered quickly from the Asian crisis of 1998. This report concludes with some aspects that any study on auto sector should focus on, such as evaluation of the capabilities of auto-component supply chain – both large and small suppliers, strategies of OEMs, cost, delivery, dependability, quality, product development, process development, flexibility, facilities/equipment, technology, process, workforce and organisation, logistics and supply chain, research and engineering and interfaces.
ACMA (2006) presents the recent trends in the Indian auto industry as a whole and their implications for automotive supply chain in India. The market-oriented growth and growing automobile industry in India have ensured bright prospects for the Indian auto component sector, which is vibrant and competitive. Huge future growth potential of the automobile industry and increased access to consumer finance may lead India to a place among the top five automotive economies by 2025. Most of the ACMA members have at least one standards certification. They are embracing world-class modern shop-floor practices. The auto-component sector has been showing high rates of growth of production and exports, with a comprehensive production range, transforming as an attractive OEMs Tier-1 supplier. Many leading OEMs and Tier-1 companies have plans of sourcing from Indian auto-component manufacturers, who are scaling up, establishing partnerships in India and abroad, acquiring foreign companies and establishing Greenfield investments overseas.

Proficiency in understanding technical drawings, understanding of different global standards, appropriate automation, flexibility in small-batch production and use of Information Technology (IT) for design, development and simulation are some of the growing capabilities among Indian auto-component manufacturers. India is expected to emerge as the next big automotive R&D base, given its IT capabilities coupled with automotive domain knowledge and shifting of automotive design centres to India, by global MNCs, as it is a potentially excellent base for prototyping, testing, validating and producing auto-components.
3.3.6 Technology and Other Aspects

Kathuria (1996) analyses the Commercial Vehicles (CV) industry in India in a detailed manner, dwelling on the concepts of vertical integration and subcontracting, production technology and technological change. After an overview of the global auto industry, Kathuria traces the developments in the Indian auto industry from the 1950s to 1991. To evaluate the competitiveness of Indian commercial vehicles manufacturers in the domestic market, growth trends, structural trends, market shares, profitability, productivity ratios, prices, quality, dealer network and performance are analysed. Macro and micro performance of India’s vehicle exports with major markets and Indian vehicle characteristics have been outlined, along with an analysis of global demand patterns.

Domestic resource costs and global comparison of prices, credit and service are the other international trade-related aspects analysed in this study. On vertical integration, the analysis leads to the conclusion that the Indian CV industry needs to learn from the international experience to get into subcontracting and buying-in. Lack of scales and high inventories had impeded the competitiveness of Indian CV firms in the 1980s.

R&D capabilities and new product ranges were the result of the challenges arising from time-bound indigenisation programme, but still Indian technology frontier remained far below global levels. Further, different firms have followed very different strategies and hence the impacts on their technological capabilities were also very different. However, success of Indian firms despite such a wide range of strategies is partly due to the protection available to them in the domestic market. Kathuria concludes that the Indian auto industry in general and CV industry in particular, have a lot to learn from the global auto industry, in terms of best-practice technology and vertical integration and supplier relationship. The study rightly predicted
that the industry would see heightened activity and recommended that the government should ensure that the domestic firms do not lose out because of the unrestricted entry of highly competitive foreign firms.

Narayanan (1998)\textsuperscript{36} finds that during the 1980s, technology acquisition through imports of technology and in-house R&D efforts explains much of differences in competitiveness, as measured by changes in market share, at the firm level, in the Indian automobile industry.

Based on an econometric analysis, which considers technology acquisition, skill intensity, component imports, firm size, product differentiation, age and vertical integration as the determinants of competitiveness, Narayanan finds that competitiveness has depended on the ability to build technological advantages, even in an era of capacity licensing. This is facilitated by complementing imported technology with in-house R&D efforts.

Narayanan (2004)\textsuperscript{37} uses two-way fixed effects estimation of the firm growth as a function of variables capturing technology, such as R&D expenditure as a proportion of sales, foreign equity participation and import of capital goods. Role of technology depends on the technological regime in which the firm operates. In a licensed regime, firms with foreign equity grow faster because of better access to resources and technology. In a deregulated regime, import of capital goods has been the technology-related variable that triggered growth. In a liberal regime, growth is positively influenced by the intra-firm technology transfer.

Narayanan (2006)\textsuperscript{38} analyses the determinants of export intensity of Indian automobile firms using a Tobit model, taking the variables discussed in Narayanan (1998) and Narayanan (2004) as the determinants. This study is based on the premises that there is a systematic difference in the
characteristics and performance between the firms that export and those which sell in the domestic market, mainly in terms of technology acquisition, which in turn depends on the policy regime. Technology acquisition, firm size, vertical integration, capital intensity, imports of components and policy regime are found to be the main determinants of export competitiveness, by this analysis.

The studies reviewed so far were of a wide range in terms of objectives, methodologies used and conclusions arrived at. Some of them aim at studying very specific aspects of the Indian auto industry such as global comparisons to examine the implications of FTAs, productivity, technology and supply chain, while others dwell on more general aspects such as strategies, competitiveness, evolution of the industry, structure of the industry and policy aspects pertaining to the Indian auto industry. These studies are based on field surveys, interviews, secondary data sources, econometric analysis and descriptive analysis. Their conclusions vary widely on specifics, but there is almost a consensus that the Indian auto industry has a bright future due to various factors considered.

Piplai (2001)\textsuperscript{39}, who argues that the competition in the auto industry in India is highly unsustainable. The studies by ICRA, ACMA and McKinsey, which focus on global comparisons and policy environment of the auto industry, are based on quite realistic and practical approach, but lack analytical and quantitative rigour. When looked from a neutral perspective, it clearly emerges that most of the findings of these studies seek some degree of protection for the auto-component sector. They are justified in some ways because of the immense protection offered to the auto-component sectors in the competing countries.
However, a more analytical and quantitative approach is required to arrive at concrete conclusions on protection, because tariff barriers will be removed at some point of time in future and the industry needs to gear up to face the free trade regime.

Narayanan (1998, 2004 and 2006) studies the issues related to technology in the Indian automobile industry econometrically. These papers are based on sound econometric theories and the results have been critically analysed based on evolutionary theoretical framework. However, these studies suffer from a few common problems. First, the dataset used, which is CMIE Prowess database, does not cover all the major players in the automobile industry, including Toyota. Hence, this study could have been supplemented by an analysis on the major companies that have been left out, through field surveys, interviews or annual reports. Secondly, considering automobile industry in isolation is not sufficient, since the auto-component sector in India has been playing a key role in the automobile industry, throughout the period considered in these papers.

Thirdly, vertical integration is proxied by the share of value-added in total sales, in these papers. This may not be sufficient because vertical integration and sub-contracting are too complex to be captured by a single variable based on value-added. Value-added could be high, as a share of output, despite the absence of vertical integration, because of the fact that several activities other than component-manufacturing such as painting, assembly and welding take place within the assemblers’ factories. Further, the conclusion by Narayanan (1998), that vertical integration is a preferred strategy in a liberal regime, based on the premises that foreign firms, which enter in this regime, produce technology intensive and high-quality products, for which they need to produce components in-house, is likely to be misleading. This is because of the fact that these foreign firms have
imported the components and have not produced them in-house for this purpose.

Piplai (2001)\textsuperscript{41} studies the policy environment and its impact on the Indian automobile industry. While Piplai appears to be justified in saying that there has been excess capacity in the auto industry and the auto majors are facing difficulties in aggressively marketing their products, it is probably not correct to conclude, as he has done, that the current levels of competition resulting from liberalisation are unsustainable. As noted in the introduction, car penetration levels are very low in India and hence the future potential for demand is very high. This would ensure that competition is quite sustainable as there will be enough consumers, given the rapid economic growth that is taking place. The quantitative analysis of productivity indices is quite rigorous in Sharma (2006)\textsuperscript{42}, but this study suffers from some major inadequacies that include absence of analysis of disaggregate data and lack of consistency with the reality.
3.4 Analysis of India’s Competitiveness and its relevance to the Automobile sector.

Diamond model by Porter (2008)\textsuperscript{43} was used for the following sections while critically analysing the country and Maharashtra state for their suitability to the automobile sector.

3.4.1 Diamond Analysis

The approach looks at clusters of industries, where the competitiveness of one company is related to the performance of other companies and other factors tied together in the value-added chain, in customer-client relation, or in local or regional contexts. The Porter analysis was made in two steps. First, clusters of successful industries have been mapped in 10 important trading nations. In the second, the history of competition in particular industries is examined to clarify the dynamic process by which competitive advantage was created. The second step in Porter's analysis deals with the dynamic process by which competitive advantage is created. The basic method in these studies is historical analysis. The phenomena that are analysed are classified into six broad factors incorporated into the Porter diamond, which has become a key tool for the analysis of competitiveness. (see figure 3.1)
**Figure 3.1: Porters Diamond Analysis**

**Factor conditions** are human resources, physical resources, knowledge resources, capital resources and infrastructure. Specialized resources are often specific for an industry and important for its competitiveness. Specific resources can be created to compensate for factor disadvantages.

- **Demand conditions** in the home market can help companies create a competitive advantage, when sophisticated home market buyers pressure firms to innovate faster and to create more advanced products than those of competitors.

- **Related and supporting industries** can produce inputs which are important for innovation and internationalization. These industries provide cost-effective inputs, but they also participate in the upgrading process, thus stimulating other companies in the chain to innovate.

- **Firm strategy, structure and rivalry** constitute the fourth determinant of competitiveness. The way in which companies are
created, set goals and are managed is important for success. But the presence of intense rivalry in the home base is also important; it creates pressure to innovate in order to upgrade competitiveness.

- **Government** can influence each of the above four determinants of competitiveness. Clearly government can influence the supply conditions of key production factors, demand conditions in the home market, and competition between firms. Government interventions can occur at local, regional, national or supranational level.

- **Chance** events are occurrences that are outside of control of a firm. They are important because they create discontinuities in which some gain competitive positions and some lose.

The Porter thesis is that these factors interact with each other to create conditions where innovation and improved competitiveness occurs.

### 3.4.2 India’s Competitiveness Analysis

**1) Factor conditions:**

India is relatively well endowed in some factor conditions. It has availability of ores and minerals, and built production capacities for metals—iron/steel, aluminium etc (primary raw materials for manufacturing sector) in the period of public sector led industrialization in 60s and 70s. Sophistication of its financial markets and availability of cheap and skilled labor force, as well as scientists and engineers, also give India a competitive advantage in factor conditions.

However, India has a lot to improve in other factor conditions. The government has not been able to keep pace with the huge increase in the demand for power, roads, railways, and ports etc. required for the economic development of the country. The lack of adequate infrastructure is a serious bottleneck for the manufacturing and the automotive sectors which rely
heavily on electricity and other material inputs for their production. The business environment in India is also an area of concern. There is considerable red tape in starting a business, and enforcing a contract is considered very difficult (World Bank, 2010). Protective labor laws make it hard to fire employees. Despite the high quality of tertiary education and the availability of scientists and engineers, India ranks among the lowest patent propensity of the world, with fewer than 0.3 triadic patent families per million populations.

The power industry has been dominated by public sector firms and demand consistently exceeded supply (World Economic Forum, 2009)\(^4\). 50% of the roads which transported 65% of freight and 85% of passenger traffic were unpaved and congested.

Patent increase as India’s patent registration has been growing by 33% on average between 1995 and 2005 (OECD 2008)\(^5\). The government spending on R&D had never exceeded 1% of GDP (WB 2007). The government has pledged to increase R&D spending to 2% of GDP by 2012 under the 11th Five-Year Plan.

(2) *Context for Strategy and rivalry*:

India has a relatively positive context with an abundant FDI flow, a stable democratic polity. The manufacturing sector has high rivalry among local competitors. However, prevalence of corruption and high tariff rates pose challenges. India has progressively reduced its tariffs since 1991, but the average applied tariff on industrial goods remains high especially on passenger cars, two-wheelers, and natural rubber (USTR, 2009). India also maintains a negative list of products subject to various forms of non-tariff barriers.
According to Transparency international, India ranked 85th out of 180 countries. (TI 2009) Non tariff barrier includes import policy barriers; standards, testing, labeling and certification requirements; antidumping and countervailing measures; export subsidies and domestic support; Government procurement; service barriers; lack of adequate protection to intellectual property rights

(3) **Demand conditions/ Related and Supporting Industry:**

The demand conditions are robust as India’s market is growing, with a shift in population from the lower class to the middle class. Related and supporting industry is strong in India. Availability of local suppliers in India is high but there is room of improvement in the local suppliers’ quality. Presence of numerous clusters in each region promotes healthy competition and development of technology.

In order to increase FDI inflow into India and to promote growth of the manufacturing sector, it is necessary to take steps such as increasing productivity and improving infrastructure. Following are the specific recommendations-

(1) India should increase investment in education, and particularly in primary and secondary education. At the same time investments should be channelized to rural India, and in agriculture, to improve the condition of life of the people at the base of the pyramid. This would increase social stability, and create an environment conducive to FDI, and induce people to move to the manufacturing and services sectors, enhancing productivity in the long term.

(2) One of the biggest challenges of India is infrastructure. India should substantially increase its investment in infrastructure to keep up with the
rising demand. To help develop the manufacturing sector, it should particularly focus on improving the country’s roads and electricity supply. To contain budget deficit while increasing investments in infrastructure, the government should cut subsidies. Increased public-private partnerships would be a way to address this.

(3) Remaining tariff rates should be lowered and non tariff barriers need to be decreased to facilitate flow of trade and investments.

(4) India needs to improve its national business environment. Procedures needed to start and close a business as well as the time needed to enforce contracts need to be reduced through business process re-engineering, and increased computerization of procedures. Besides, improvement in transparency of the government by implementing more stringent anti-corruption laws is needed.

(5) India has to relax its labor laws and lower the cost of severance to help the manufacturing sector’s access to human resources.

(6) Finally, to move forward, India should invest in R&D to help Indian companies increase their patent level and thereby improve their technology level.
3.5 Analysis of Maharashtra State’s Competitiveness and its relevance to the Automobile sector.

(1) Basic Facts:
Maharashtra is the second largest state in India both in terms of population (9.4% of India’s population) and geographical area (10% of India’s total area). 42% of the population lives in urban areas and 67% are less than 34 years old. The state has five of the biggest cities having population more than a million- Mumbai (13 million people), Pune (2.5 million), Nagpur (2 million, Nashik (1.5 million) and Aurangabad (1.2 million) The state has been politically stable and has been investor friendly.

(2) Role of State Government:
Policy decision-making is shared among federal and state levels. The federal government is in charge of policies regarding central taxes, major ports, highways, and airways, while the state government manages infrastructure provision, land distribution, energy and water supply, local taxes like octroi and sales. Some matters like education and health are joint responsibility.

Positives and Negatives
(+ ) Good location and infrastructure, abundant HR, superior social indicators, presence of educational and research institutions.
(-) Long administrative processes, bureaucracy, power and water supply.
(+ ) Industrial promotion policy, economic incentives in SEZ, highest FDI attraction, assistance for SME.
(-) Taxes
(+ ) Cluster development promoted by the state, well developed supportive industries and high productivity, Good Finance sector
(+): Population with higher per-capita income, rapid urbanization. No. 1 in demand conditions (by India’s state competitiveness index).
(3) State Economy at Glance:

Maharashtra has the highest GDP among all states, reaching USD 131 billion in 2008, which was 15% of national GDP. The State’s GDP per capita in 2008 (Rs. 38,785) is higher than the national average (Rs. 30,097) and ranks third after Delhi (Rs. 65,156) and Goa (Rs. 38,785) (Directorate of Economics & Statistics, 2010). Although Maharashtra’s income highly depends on services (60%), the State has been recognized as the industrial state of India, and a pioneer in small-scale industries. Maharashtra has also become a leading automobile production hub and a major IT growth centre. It has the largest number of special export promotion zones being set up in the country. The agriculture & allied activities sector contributes 11% to the State income.

The State Competitiveness Report 2010 ranks Maharashtra second (after Delhi) among 29 states in India. Maharashtra’s strengths are in factor and demand conditions (figure 3.2).

**Figure: 3.2   Comparison with other states**

<table>
<thead>
<tr>
<th>State's Place among 29 states</th>
<th>Maharashtra</th>
<th>Delhi</th>
<th>Goa</th>
<th>Tamilnadu</th>
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<td>institutional support</td>
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*Source: Institute for Competitiveness, 2010*

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3.5.1 Maharashtra State Analysis

(1) Factor Conditions: There are many factor conditions which have attracted investment to the state. Mumbai, the capital of Maharashtra and the financial capital of India, houses the headquarters of almost all major financial institutions, insurance companies and mutual funds.

The State has a strong human capital, high literacy rate (77%), HDI (0.67) and low infant mortality rate (34 per 1,000 live births) than the country’s indicators of 65%, 0.59 and 53 respectively. Maharashtra has a strong network of educational institutions with 12% of the country’s universities, 13% of engineering colleges (594 institutions) and 19% of management institutions. Annual student intake in professional, technical and related institutions is over 200,000. Also technical education supply has been recently updated to match clusters in the State, for example automobile design and manufacturing, e-supply chain management, insurance services, among others (MIDC, 2009).

Maharashtra’s infrastructure is better than all other regions. It has well-developed road and train networks, especially around special economic zones (SEZ) in big cities and the two biggest ports in India, including JNPT. It also has two international airports and handles 34% of international passengers and cargo in India (MIDC 2009). The state has over 250 industrial Parks with accompanying amenities and incentives, which have attracted companies, especially after liberalization policy in the 1990s. However, a power deficit of 22% (4.500 MW) is the main bottleneck the State faces. Although Maharashtra has focused on supplying better electricity for commercial use, it is more expensive than in other states.

Administrative performance is another challenging area for India, but more for Maharashtra. In administrative processes the state ranks 26 among 29
states studied as shown in figure 3.6. The project clearance pipeline and the ability to do business with the government is not an easy task in Maharashtra as many investors have learnt to their dismay.

(2) **Demand Conditions:** The state population enjoys a higher per-capita income, which represents higher purchasing power. Early industrialization has made Maharashtra one of the most urbanized states with 42% of people living in urban areas, just behind Tamil Nadu. However, with seven of Maharashtra’s cities having more than one million inhabitants each, the state has one of the highest urban densities in the country, which currently generates congestion problems. Projections suggest the country’s urban population will be over 50% by 2013. This rapid urbanization represents a challenge for the state to meet related infrastructure and services needs. Demand conditions shape new products and innovations. That is why; this is an opportunity for companies to innovate and focus on more efficient and green technologies, for example smaller and fuel-efficient vehicles in automotive industries.

(1) **Context for Firm Strategy and Rivalry:** Among India’s States, Maharashtra has attracted the highest amount of FDI, 20.6% of total national FDI (figure 3.5). The most favoured sectors are IT industry 20%, Services 17%, Infrastructure 7%, and Automobiles 6%.
The state has an industrial promotion policy to develop Maharashtra as Asia’s most competitive manufacturing hub, led by a government established entity, Maharashtra Industrial Development Corporation (MIDC). MIDC promotes the establishment of SEZs, which provides economic incentives (tax exemptions), power and water supply, more diligence in land and administrative processes. There are 72 SEZ in Maharashtra 80% of them located in the Golden Quadrilateral, formed by Mumbai-Pune-Nasik-Aurangabad, which contributes 80% of Maharashtra’s GDP and focuses on manufacturing & services industries. SEZs have been used as a means to attract companies to the State. However, recently other states have offered more attracting incentives and some companies are moving there. As the Institute for competitiveness (2010) mentions Maharashtra was only number 4 among 29 states in offering business incentives when it should have been at the top. Although tax incentives in free zones could work in the short term, this is not a sustainable policy in the long term, and the state needs to focus on differentiating and providing other advantages for firms to locate there.
Maharashtra is one of the two states in India that have octroi taxes, and the only one among the major auto producing states in the country. Thus, firms in this state find it expensive to procure components from other states. In an attempt to develop its backward districts, the State government is providing few incentives to industrial units that are set up in these districts. These incentives include exemption from the electricity duty for 10 years, stamp duty and registration fees for 5 years. There is octroi refund to the industries in these places.

(4) Related & Supporting Industries: As mentioned before, Maharashtra has a strong financial sector. Firms in Maharashtra are 30% more productive than those in the rest of the country. The state also has a cluster policy, for developing infrastructure based on needs of specific industries; provide optimum utilities and common facilities, and attracting the right kind of talent. Clusters are developed on the basis of identified thrust areas and the available resources in the region. The MIDC reserves some areas for specific industries and their ancillaries and promotes SME development especially in the field of light engineering, textiles, biotech and IT (Government of Maharashtra, 2007).

Among Maharashtra’s industrial clusters, auto and auto components (represents 38% of national output), apparel and textile (10.4%), and pharmaceuticals and petrochemicals (40%) (MIDC 2009) deserve mention. Regarding IFCs, Maharashtra has the Bombay Productivity Council, the Kolhapur Productivity Council and the Poona Division Productivity Council, which collaborates in training and communicates best practices in productivity.
3.5.2 Recommendations for State Government

(1) Remove Cost Disadvantages of Locating in the State: There is a need to remove cost disadvantages of locating in the state on account of octroi and electricity duty. Octroi is likely to be phased out with the implementation of Goods and Services Tax in 2011, but the problem of ensuring consistent electricity supply at competitive cost will need to be addressed soon. Companies identify it as one of the most critical problems in Maharashtra. This problem could be addressed in the short-term by facilitating use of captive power generation by industrial units, and in the long-term through building new generation capacity.

(2) Improve Administrative Processes in the State: The state government needs to improve the administrative procedures related to obtaining approvals by industries (e.g. registration for land acquisition, power and water connection, environmental clearances etc), tax filing and tax refund procedures, inter-state movement of goods. The state government should decrease the time for starting a business below the country average. They should create an expeditious single window for all companies, as done for those in the SEZs. Reduction of transaction costs and improvement in ease of doing business will facilitate cluster growth.

(3) Improve infrastructure: The state government is the primary agency for providing land and supporting infrastructure (road network, port facilities, power etc). This has become a major constraint in recent years. The state government needs to prioritize infrastructure development, and channelize investments in this area to remove bottlenecks. The state government should also provide incentive for PPP to enhance private participation in expansion and maintenance.
3.6 Analysis of the Maharashtra Automotive Cluster’s Competitiveness

3.6.1 Introduction to the Cluster

1. Importance in Maharashtra’s Economy
The automotive cluster in the Maharashtra is one of the largest and promising clusters in the State. For example, in terms of the share in India, the cluster accounts for 50.9% in net added value, and 35.1% in output, which are higher than any other clusters in Maharashtra. The cluster also contributes to 10.4% of total employment in the State, making it one of the largest contributors in employment (the top being basic metal industry at 13.7%). It is also one of the fastest growing clusters at CAGR 3.2% during 1991-2007, following wood related cluster (6.79%) and other manufacturing (6.42%). (Maharashtra State Government, 2009)

2. History and Evolution of Maharashtra Automotive Cluster
The automotive cluster in the State of Maharashtra has a relatively long history. As the cluster is the largest of its kind in India, its evolution generally coincides with the development of the whole automotive cluster in India which was shown in the previous section. The origin of the cluster date back to as early as 1940s. Many of the major domestic automakers, such as Tata Motors, Bajaj Auto, Premier Auto and Force Motors were established in the State (Mahindra & Mahindra was originally founded in Punjab, but later moved to the State).

1980s saw the first major leap of the cluster. In response to the deregulation (de-licensing) by the National government, joint ventures with Japanese automakers began. In Maharashtra, Swaraj Mazda was created in 1983, and this lead to growth of supporting industries in the State. The major development of the cluster came in 1990s to 2000s. Tata Motors had launched a series of popular cars which attracted waves of entries of
supporting industries in the State. Rapid establishment of major foreign automakers' assembly plants within the State. This facilitated technological transfer and further development of local supporting industries.

3. Composition of Cluster (Cluster Map)
Figure 3.3 shows the current cluster map. It clearly shows that all the necessary segments are present in the State.

Figure 3.3: Maharashtra Cluster Map

At the centre of the map, there are automobile manufacturers. 21 domestic manufacturers exist in the cluster, including 2 of the 4 top manufacturers in India: Tata Motors (1st) and Mahindra & Mahindra (4th) for 4 wheel vehicle segment, and the 2nd largest manufacturer in 2 & 3 wheelers (i.e. Bajaj Auto). In addition, 9 out of the 18 international major automotive manufacturers operating in India locate in Maharashtra, indicating that Maharashtra has become a favourite location to invest. Furthermore, these companies are supported by a large number (more than 150 companies) of supporting industries from Tier I (component specialists) to tier III
(commodity suppliers). The existing strong manufacturing industry in the State contributes to this favourable condition. Strength of the related industries is also noteworthy.

4. Cluster Performance & Relative Positioning

(1) Competitive Advantage in Domestic Market

The automotive cluster in Maharashtra (the West cluster) is the strongest in many aspects in comparison with other automotive clusters in India, i.e., the North cluster (around Delhi) and the South cluster (around Chennai). For instance, in terms of the all segments combined, the West cluster (around Maharashtra) enjoys a lions’ share of for 43.6 % of gross turnover, 81 % of R&D expenditure, and 53% of cumulative investment in 2008-09. The cluster is especially strong in the 4 wheel vehicles segment (including passenger vehicles and commercial vehicles), with 46.6% of gross turnover, 46% of installed capacity, 84% of R&D expenditure and 53.2% of investment. In contrast, the North cluster has strength in motorcycles (2 & 3 wheelers) segment, while the South cluster is the third position in total as well as in the two segments.(Figure 3.4).
Since Maharashtra is the leading cluster in Indian automotive cluster, the advantage and challenges are basically the same with the international comparison with Brazil, China and Thailand in the previous section: taxation and power costs. As a peculiar condition to Maharashtra, regional octroi tax can become additional disadvantage. However, the higher percentage of R&D expenditure concentrated on this cluster can give the cluster advantages of higher productivity, lower costs, and advanced technology.

Role of National and State Government

(1) Role of National Government

Following the rapid development of the cluster subsequent to introduction of the liberalization policy, Indian government formulated “Auto Policy 2002” in order to accelerate the growth by providing higher fiscal incentives for R&D, and automatically approving 100 % FDI. This policy promoted
technological advancement of domestic automakers, as well as rush of major international automakers to Indian automotive market.

(2) Role of Maharashtra State Government
Proactive industrial policy of State Government has set the foundation of automotive cluster development in the state. Specific to the cluster, “Industrial, Investment & Infrastructure Policy of Maharashtra 2006” specified the automotive cluster as one of the target policy areas, and has been providing incentives (industry promotion subsidy) to eligible companies.

3.6.2 Cluster Diamond Analysis
(1) Factor Conditions: As mentioned in the previous sections, this cluster enjoys certain inherent advantages (infrastructure, finance, human resources, and labor conditions) which bestow a natural edge for all industries in this state. Specific to the automobile sector also, this sector has some advantages. Firstly, the presence of a number of engineering colleges and technical institutions ensured a steady supply of engineering and technical manpower, and a strong industrial legacy. Secondly, this cluster had the presence of the two big industrial houses of India- the House of Tatas, and the Bajaj group, who made an early start (in 1940s, as compared to the later start of the northern auto cluster in 1980s, and of the southern cluster in 1990s), and diversification of operations by them, which accelerated in the 1990s and led to influx of tier I and tier II industries. Thirdly, the setting up of the premier automobile testing, research and homologation facility-the Automobile Research Association of India’ in Pune in the 60s conferred an advantage to automobile manufacturers setting up facilities in the state.

But there remain some constraints in factor conditions, primarily in the area of infrastructure (roads) and taxes. Chakan area in Pune, which is home to
many big auto manufacturers, has only a 2-lane highway, which is perceived to be a major disadvantage. In general, road length in the state is better than other states, but the roads are poorly maintained. Moreover, since this region is prone to heavy seasonal rains (monsoons) for 3 months every year, most roads develop cracks and potholes after rains, and this causes serious disruptions to movement of containers carrying raw materials and finished goods. Another constraint is the cost disadvantage of Maharashtra-based industries on account of additional taxes (octroi and an electricity tax) (Narayanan et al. 2008)\(^{17}\).

(2) Related and Support Industries: There has been a robust growth of tier-I, tier-II and tier-III industries in the state. Because this industry has a high requirement of customized technological integration, suppliers in entire value chain have set up manufacturing and business facilities in Maharashtra, so as to have assured sales to OEMs through long-term relationships. Proximity to the OEMs helps the manufacturers of parts/components (plastic molded parts, steering systems, electronic systems etc) and accessories (air-conditioning units, audio/video systems). However, because of the inability of domestic manufacturers to achieve economies of scale and technological innovation commensurate with rapid entry and scaling up of manufacturers in the region, part of the supply chain is still met through imports. The region has also seen a proliferation of support industries- automobile finance and insurance companies, and auto dealerships, due to the synergistic dependence with the OEMs.

There are no significant cluster-specific institutes for collaboration, but the OEMs as well as auto-component manufacturers collaborate through two pan-India institutes of collaboration namely, the “Society of Indian Automobile Manufacturers (SIAM)\(^{50}\), and the “Auto Component Manufacturers Association of India (ACMA)\(^{51}\). These organizations serve
as umbrella bodies with almost complete representation from major OEM and component manufacturers respectively. They organize training and support programs for their members, organize annual promotional events (AUTO-EXPO), and have also developed considerable persuasion with policy makers in the central and state Governments

(3) Context for Firm Strategy & Rivalry: This has been guided by the all-India policy and industry environment; since firms located here (OEMs and component manufacturers) compete across clusters, in the competing market segment. As regards policy environment, Indian passenger car and two-wheeler manufacturers enjoy protection of high tariffs. Though this inhibited innovation till 1990s, with lowering of tariffs on “completely knocked down” imports in the 90s, foreign manufacturers, who wanted to gain access to the large Indian market, started setting up manufacturing facilities in India. This instilled rivalry, and forced local OEMs to diversify their product range. Government’s policy also imposed aggressive indigenization targets for entering firms. Increased and sophisticated demand for parts/components resulted in rapid growth of ancillary industries in each cluster. Maharashtra was among the first states to seize the opportunity provided by the policies of central government, and provided conducive business environment facilitating entry of foreign OEMs and component manufacturers. Thus, entry of foreign firms enhanced cluster externalities and productivity, and their activities contributed directly to generation of local employment and investment. Simultaneously, competition shifted from imitation to innovation and from low investment to high investment. But competition is yet to transition to intangibles such as skills and technology enhancement.

(4) Demand Conditions: The western region in India accounts for a robust demand, about 32 % of the total all-India sales
In all-India sales figures, Maharashtra ranks 1st in the passenger vehicles segment, and 2nd in the commercial vehicles, three wheelers and two wheelers segments. However, the major reason for good demand condition in this cluster is owing to the big manufacturers Tata Motors and Mahindra Motors (in the four-wheeler segment), and Bajaj Auto (in the two-wheeler segment).

3.6.3 Challenges for Maharashtra Auto Cluster

The Cluster analysis shows that the development of this cluster was a result of robust development of various parts of the diamond in a self-reinforcing manner. We believe that, in line with Prof. Porter’s concept, it is now crucial to recognize this cluster’s potential to upgrade by identifying and removing the obstacles, constraints and inefficiencies that impede productivity and innovation.

We also believe that there is an opportunity for the Indian automotive cluster, as a whole, to emerge as a globally competitive cluster, by overcoming the sources of competitive disadvantage (such as higher tax incidence, infrastructure, and regulation) over competing locations. This brings us to what we believe are some key issues facing this cluster and the automobile industry in India.

Key Issues Facing the Cluster

(1) State Level

(i) Infrastructure Bottlenecks: Though Maharashtra had an edge in attracting new investments in the automobile cluster earlier, recently, because of its inability to overcome its infrastructure bottlenecks (land, with good road connectivity and adequate/ cheap power), it is rapidly losing the edge it
provided to incoming automobile manufacturers, to other clusters—mainly the southern states of Tamil Nadu and Karnataka.

(ii) Tax Incentives in Other Regions: There is increased diversion of investment to new regions in India because of tax and other incentives. In recent years, Government of India has pursued a policy of incentivizing development of regional tax-free zones, primarily to promote industrial development in remote and backward regions. While this had a positive result in these areas by way of new investment, industrial development and employment generation, it also caused a shift in investment from existing clusters in states such as Maharashtra and Tamil Nadu.

(iii) Law and Order: Since 2008, there have been incidents of violence between the migrant population, and a section of the local people of Maharashtra, who feel that employment opportunities and civic amenities available to them are constrained on account of increased population influx. If this tension continues, it will be a big risk for further growth of the cluster.

(2) National Level
At the national level, the inconsistent policy environment is a major issue, primarily in two areas—tax incidence on automobiles, and environmental/emission regulations:-

(i) Inconsistent Tax Policy: In 2006, Government of India announced a policy of making the country a manufacturing and export hub for small, fuel-efficient cars. In pursuance of this policy, a differential excise duty rate was introduced in favour of small cars. Following this, OEMs made investments in launching small cars in the domestic market. However, since 2008, the excise duty rates on small as well as large cars have been modified frequently. Such frequent changes in tax incidence influence buying
decisions of customers, and consequently distort the cost calculations and investment decisions of OEMs.

(ii) *Inconsistent Environmental/Emission Regulations:* India resorted to implementation of emission regulations in a phased manner in different regions, due to the non-availability of compatible fuel which meets the prescribed standards. This poses a problem to OEMs and their suppliers in anticipating demand.

(3) *Industry and Firm Level*

(i) *Investment in R&D for Product and Process innovation:* Investment in R&D for technology development will be one of the most important aspects of future strength of this industry. Given India’s strength in the skills set required for technological development, the industry needs to invest in research and development to increase innovative breakthroughs for vehicle design as well as in manufacturing technology. Incentivisation of such investments will be needed on the part of the government.

(ii) *Promoting exports:* Indian companies have gained strength in the small car segment, which is already being leveraged by OEMs like Hyundai, Suzuki and Tata Motors, and component manufacturers. But there is tremendous opportunity for capture of market share in other categories such as multi-utility vehicles, two-wheelers, hybrid vehicles and electric cars. This will need to be driven by strategies of individual companies, and policy support from government (R&D and export incentives), but also by encouraging competitiveness of tier-I suppliers, and establishing a made-in-India brand.

(iii) *Development of auto component industry:* Indian auto component manufacturing is currently constrained by lack of large capacities. Greater
variety in vehicle launches by OEMs in recent years and increased export demand are offering newer challenges to manufacturing capabilities and economies of scale of component manufacturers. The component industry needs to increasingly maintain lean and efficient manufacturing systems to be ahead of cheaper imports from countries such as Thailand (under the Indo-Thai FTA).

3.6.4 Recommendations
Our recommendations are focused on two objectives, first to further develop and upgrade of the Maharashtra cluster, and second, to increase inter-cluster synergies among the different auto clusters in India, so as to rapidly develop India as a globally competitive automobile cluster.

(1) Recommendations at Industry & Firm level
(i) Build Design & Innovation Capability: The automotive industry in India needs to rapidly move to a “design and innovation” industry to achieve global competitiveness. Tata Motors has shown the way by developing the first sub $2500 car in the world (Nano). The auto component sector and the basic/ small car segment are steadily increasing their share in global markets by meeting global quality standards. But India still lags in building product and process development capabilities in the value chain in most vehicle segments. The way forward for firms is to increase investments for research in cost-saving technologies, product and process improvement, but also green technologies such as hybrid cars and hydrogen fuels.

(ii) Penetration to Rural Market: One of India’s strengths is its significant domestic demand. Rural India offers a huge market for motor vehicles, which is yet to be explored. Multi-utility vehicles have been popular in rural areas, but a constraining factor is the inadequate after-sales service in these
areas. With a strategic focus on rural market demand for multi-utility vehicles, OEMs could significantly enhance demand and market share.

(iii) Foreign manufacturers in India should bring their research and design capabilities, as well as their overseas vendors into the cluster, so that the entire ecosystem of commonalities and complementarities in the cluster grows further. The central and state governments need to identify this as a priority, and facilitate this process. Entry of overseas vendors may increase rivalry with domestic manufacturers, and may cause some distress to the latter in the short-term, but is likely to result in enhanced competitiveness, and cluster development in the long-term.

(2) Recommendations for State Government
As already stated in the states’ recommendation section, Maharashtra needs to remove its infrastructure bottlenecks, its administrative procedures, and remove cost disadvantages on account of octroi and electricity duty.

(3) Recommendations for National Government
(i) The Central government needs to provide a stable and conducive policy environment. The key ingredients of this would be:-

- A modest tax incidence on all categories of vehicles domestically produced, primarily to remove the competitive disadvantage with other international locations. It is expected that this will be substantially achieved in 2011, when Government of India implement the integrated “goods and services tax” (GST, akin to VAT in developed countries) w.e.f 1.4.2010. In addition, it is necessary to maintain a consistent policy, so that firms can make long-term investment decisions based on stable ground rules.
- Long-term emission roadmap, and ensure availability of required fuel in all retail outlets at least one year ahead of the introduction of emission norms, which would help the entire value chain in India to adopt the relevant technologies in advance.

(ii) The Central government also needs to promote policies to ensure adequate quantities of primary raw materials such as steel (hot-rolled coils, the primary raw material), and aluminium (for engine blocks) used by OEMs, as well as specific inputs such as special grade rubber and plastics for components, since domestic capacities for these materials are not adequate, and shortage is met through imports (Narayanan et al. 2008). Similar is the situation for tier-I, II and III suppliers (natural rubber for tires, for instance). Apart from the automobile industry, the central government needs to promote input industries (such as plastics, chemicals) to build cluster strength, through suitable policies. Industry sources said that manufacturers prefer to avoid high inventory costs, and they often suffer supply constraints when international prices of these materials go up on account of supply shortages (as in early 2008).

(iii) The Central Government, which determines the import tariff levels, should bring down the high import duties on fully-built cars and two-wheelers. The policy of continued high protection is likely to inhibit competitiveness growth of OEMs in the long run. With the present robust health of this sector in India, the time may have come for opening of market to imports that would promote local efficiency, upgrade local demand, and stimulate rivalry (Porter 1998)
(4) Recommendations for Centre and State Together

(i) The national and state governments need to collaborate actively is to build capabilities for export-led growth. Creation of specialized port infrastructure for handing vehicle exports is crucial for India to emerge as a global automotive hub. One specific measure would be creation of three automobile export hubs near Mumbai, Chennai and Kolkata, each equipped to handle output of 500,000 vehicles annually, and parking space for at least 20,000 vehicles at a time.

(ii) Incentivizing Modernization of Vehicle Fleet: India suffers from the presence of a large number of old and poorly maintained, polluting vehicles. Industry has been arguing for retiring old vehicles of more than 15 years of age by providing certain incentives and concessions for replacement through a single window program for modernization of vehicle fleet. This would help address pollution concerns, but also improve demand conditions. This can be achieved through joint efforts of the two governments.

(5) Institutes for Collaboration

By focusing on the following areas, IFCs, such as SIAM and ACMA, could contribute better to accelerate growth of automobile clusters: 1) Build institutional linkages between industry and academic institutions- for research and innovation in green technologies; and for cluster studies of global automotive industry, to forecast trends and building competitiveness; 2) Drawing out OEMs in a collaborative effort towards road safety; 3) Achieving harmonization with global regulations. UNECE WP 2942 offers the opportunity for India to participate in the standards making process.
CHAPTER 3: References

3.1 Introduction


3.2 Indian Automobile Sector


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3.3 Review of Relevant Studies on Indian Automobile Sector


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3.4 **Analysis of India’s Competitiveness and its relevance to the Automobile sector.**


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3.5 Analysis of the Maharashtra Automotive Cluster’s Competitiveness


3.6 Analysis of the Maharashtra Automotive Cluster’s Competitiveness


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