CHAPTER-IX
SUMMARY AND CONCLUSIONS

In less developed countries industrial development is considered necessary to achieve high rates of economic growth. The process of industrialization in India dates back to the middle of the 19th century; however the pace of industrialization is still not adequate to meet the requirements of growing population. The automobile sector plays a pivotal role in the economic growth of any economy. The key segments of the economy, directly or indirectly, are linked with automobile industry, as for the success of these different segments of economy a sound transportation system is required. The Indian automobile industry has emerged as a ‘sunrise’ sector in the Indian economy. Therefore, it is imperative to study the different aspects and characteristics of this very important industry. Thus in the present study, an attempt has been made to study the growth performance of automobile industry of India as well as the evaluation of SCP this industry. Specifically the objectives of present study are:

- To present an overview of India’s automobile industry.
- To analyze the extent of concentration and its determinants in Indian automobile industry
- To analyze the effect of market structure on performance of Indian automobile industry
- To analyze the effect of market conduct on performance of Indian automobile industry
- To draw some conclusions and policy implications from the study

To fulfill the above said objectives the required data have been taken from the various secondary sources like Centre for Monitoring Indian Economy (CMIE, PROWESS) reports, Automotive Component Manufacturers Association of India (ACMA), Society of Indian Automobile Manufacturers (SIAM) reports and related searches on the internet from 1998 to 2014. The data on Herfindahl Index has been

143
calculated using firm level data of sales from different segments (Commercial Vehicle, Passenger Cars, Two and Three-Wheelers), which was available on the PROWESS database. To analyze the data Compound Annual Growth Rates (CAGR), Ordinary Least Squares (OLS) method and Simultaneous Equation Scheme (TSLS) has been utilized. The following variables have been used in the study:

**Concentration Ratio (CR):** In the present study 2 firms concentration ratio has been calculated due to less number of firms in different segments of Indian automobile industry. The concentration ratio is calculated as follows

\[
CR = \frac{\text{Net Sales of the largest N firms}}{\text{Total Industry Sales}}
\]

Where N is number of firms i.e. two

**Advertising Intensity (ADVEXP):** Advertising intensity is defined as the ratio of advertising expenditure to the value of sales. The advertising intensity is calculated as

\[
ADVEXP = \frac{\text{Advertising Expenditure}}{\text{Value of Sales}}
\]

**Research and Development Intensity (RD):** R&D intensity is measured by dividing research and development expenditure of firm with its total sales value.

\[
RD = \frac{\text{Research and Development Expenditure}}{\text{Value of Sales}}
\]

**Export Intensity (EXPIN):** Export intensity is the ratio of value of exports to value of sales.

\[
EXPIN = \frac{\text{Value of Exports}}{\text{Value of Sales}}
\]

**Import Intensity (IMPIN):** Import intensity, is computed as the ratio of value of imports to the value of sales.

\[
IMPIN = \frac{\text{Value of Imports}}{\text{Value of Sales}}
\]

**Profit Margin:** In present study two indicators of profitability are utilized
Summary and Conclusions

Pr₁: is the ratio of net profit to total sales turnover

Pr₂: Price-Cost Margin defined as Value added minus total cost (wages and salaries, raw material cost, rent and interest) divided by sales

SIZE: Industry size in present study is presented by two variables

SIZ₁: is a measure of firm size represented by total sales turnover

SIZ₂: is a measure of firm size represented by net assets

The study is divided into nine chapters. The brief summary of each chapter is given below:

Chapter I: Chapter one recapitulates India’s industrial policy since independence. It also exhibits the evolution of automobile industry in India and different government initiatives to help blooming this key industry in Indian economy. The chapter further discusses the journey of growth of automobile firms and main clusters of automobile industry in India. The chapter also justifies the need of the study, objectives of the study and the chapter scheme.

Chapter II: Chapter second illustrates the basic concept of structure, conduct and performance (SCP) paradigm and its journey from 1930 to modern age. The chapter has given the different determinants of SCP i.e. Market Structure (Number and Size Distribution of Sellers, Number and Size Distribution of Buyers, Barriers to Entry, Extent of Product Differentiation, Market Concentration, Economies of Scale), Market Conduct (Collusion, Advertising Strategies and Research & Development) and Market Performance (Price Cost Margin, Tobin’s q Ratio and other accounting ratios like profit /revenue, profit /capital, profit /equity and profit /net worth).

Chapter III: A careful examination of the studies conducted on the subject so far brings out the need for comprehensive study covering various aspects of Indian automobile industry and structure-conduct-performance paradigm. The available literature is reviewed with the aim to get deep insight into various aspects and identify the key research gaps. Present chapter is divided into three segments, the first one is related to Indian automobile industry, second is related to SCP Paradigm case of foreign industries and finally third one is related to SCP paradigm into Indian industries.
**Chapter IV:** To realize the afore-mentioned objectives, the study made use of secondary data extracted from CMIE Prowess from 1998 to 2014. The study has also taken data from other various secondary sources like Automotive Component Manufacturers Association of India (ACMA), Society of Indian Automobile Manufacturers (SIAM) reports and related searches on the internet. To analyze the data, Compound Annual Growth Rates (CAGR), Ordinary Least Squares (OLS) method and Simultaneous Equation Scheme (TSLS) has been utilized.

**THE MAIN FINDINGS OF THE STUDY:**

**Chapter V: Section A-** The chapter fifth presents an overview of remarkable achievement of Indian automobile industry. Overall the outlook for Indian automobile industry appears to be bright. With post-liberalization reforms in place since 1991, India has achieved remarkable development on the overall economic front by achieving a sustained growth rate for its economy in recent years. The World Bank and other reliable sources state that India is set to emerge as the second-most important economic powerhouse in Asia and the third-largest economy in the world in terms of purchasing power parity by 2020 (Kumar, 2007). As regards the automobile sector, India has already become the world’s seventh largest vehicle producer with a huge potential for growth in other segments. Exports have also started flourishing and it is expected that Indian manufacturers can grab the global market in a big way. However, the Indian manufacturers will have to upgrade their technology and quality to move from good to excellent.

**Section B-** The present section analyzes the concentration ratio of each segment of Indian automobile industry. It further investigated firm level market shares of each individual firm in their respective segments over the periods. On the basis of above analysis the study finds that

- The economic reforms of 1991 opened the Indian shore for the rest of the world and the entry, exit and FDI restrictions were dissolved which attracted the foreign players. Due to entry of foreign players competition went on increasing and the concentration ratio started declining.
Summary and Conclusions

- After structural reforms of 1990s, number of firms increased year by year. This further led to competition in passenger cars segment and passenger cars concentration ratio remained half in 2010-11. However, while analyzing share in total sales at individual firm level, it was found that Maruti-Suzuki more or less maintained its dominance in total passenger cars sales i.e. 68.77 and 42.47 per cent during 1991-92 and 2010-11 respectively.

- In Light commercial Vehicles segment, Tata Motors maintained its major market share and first position over the years with all the latest facilities in its LCVs like launched rigid as well as tippers in their light trucks. On the other hand Mahindra & Mahindra registered its presence in LCVs market by increasing market share year by year.

- Medium & Heavy Commercial Vehicles reported decline in concentration ratio while moving towards competitive markets. Tata Motors and Ashok Leyland are the leaders in Medium and heavy commercial vehicle segment.

- The three-wheelers segment transformed from a very high concentration oligopoly type (0.79 per cent) to a medium concentration oligopoly type (0.34 per cent).

- In case of Mopeds, due to falling demand, manufacturers shifted to motor-cycles and scooter segments. In 2010-11, the TVS remained sole manufacturer of mopeds and the mopeds segment has achieved almost pure monopoly.

- The multiple linear regression fitted to study the determinants of concentration in case of passenger vehicles segment showed that import intensity ($IMPIN$) significantly affected the concentration ratio ($CR$) and the remaining variables were not statistically significant. However, pric cost margin ($PCM$) and net assets ($SIZE$) have showed negative relationship with concentration ratio ($CR$). It may be due to trade liberalization of 1990s which might have caused more effect on concentration and neutralized the effect of $PCM$ and $SIZE$ Variables.

- In case of commercial vehicles only import intensity was found to be related positively to concentration and all others variables were negatively related.
Two & Three wheeler segment of Indian automobile industry is dominated by domestic players. That is why foreign effect i.e. imports and exports intensity are found to be negatively related to concentration ratio.

Chapter VI: Indian automobile industry occupies a prominent place in Indian economy. It passed through different phases i.e. the emergence of indigenous automobile manufactures and self reliance before 1983 to Freedom to Grow after 1991 economic reforms and grew in size. In this chapter the relationship between size and profitability of automobile firms in India has been analyzed. For profitability, ratio of net profits to total sales turnover and ratio of net profits to net assets plus working capital has been used, whereas, firm size is represented by total sales turnover and net assets of the respective firms. For considering Structure-Conduct-Performance Paradigm, this study obtained mixed results.

- Time-series analysis showed the positive relationship between firm size and its profitability.
- On the other hand when analyzed cross-sectionally, the results indicate no relationship between firm size (SIZ$_1$ is a measure of firm size represented by total sales turnover and SIZ$_2$ is a measure of firm size represented by net assets) and profitability indicators (Pr$_1$ ratio of net income to total sales turnover and Pr$_2$ is the ratio of net income to net assets plus working capital).
- Thus, the study found that profitability of any firm is independent of firm size.

Chapter VII: This chapter analyzed the impact of market conduct on market performance and got some important results which are as follows:

- While testing model 1.1 (time-series), the study observed that 17 firms out of 25 showed statistically significant results i.e. ratio of net profits to total sales turnover is significantly determined by AI (advertising intensity) except General Motors India Pvt. Ltd, International Cars & Motors, Defence Land System, Bajaj Auto Ltd, Kerala Automobiles Ltd, L M L Ltd, Scooters India Ltd and Yamaha Motors India Pvt. Ltd. The model 1.2 (time-series) observed that Ford India Pvt. Ltd, General Motors India Pvt. Ltd, Hyundai Motors India Ltd, International Cars & Motors, Maruti Suzuki India Ltd, Ashok Leyland Ltd,
Summary and Conclusions


- Table 7.6, 7.7, 7.8 and 7.9 studied the relationship cross-sectionally as well and found that in the year 1999 non-significant association existed between advertising intensity, R&D intensity and ratio of net profits to total sales turnover. This might have happened due to industry facing decline in exports during 1998-99 and 1999-00 which led to low sales of vehicles, hence advertising intensity and R&D intensity became ineffective.

Chapter VIII: This chapter makes an effort to study the interrelationship among market structure, market conduct and market performance and two-stage least square (TSLS) regression was employed to test the interrelationship between Structure (Concentration), Conduct (Advertising) and Performance (Price-Cost Margin) and observed following findings in Passenger, Commercial and Two & Three Wheelers segments:

- Passenger Vehicles Segment
  - In case of passenger vehicles segment, it is observed that the highest and positive value of regression coefficient in market structure equation is 0.29 i.e. 1 per cent increase in lagged profits or previous year price cost margin ($PCM_{t-1}$) leads to 29 per cent increase in present or current year concentration ratio.
The market structure equation does not support the general hypothesis that advertising and R&D intensity have positive relationship with concentration ratio.

In total 68 per cent variations are explained by lagged Price-Cost Margin ($PCM_{t-1}$), industry size ($SIZE_{t-1}$) and Concentration ratio ($CR$) in market conduct ($ADVEXP$).

Only 37 per cent variations have been explained by these conduct ($ADVEXP$) and structure ($CR$) variables on performance ($PCM$).

**Commercial Vehicles Segment**

The market structure equation for this segment was tested and it was found that lagged price-cost margin significantly affected the concentration ratio. The lagged advertising intensity and R&D intensity were also statistically significant, but showed inverse relationship with concentration ratio. It means with the rising competition (decreasing concentration ratio), more and more advertising and R&D expenditure is required to survive in the market.

Overall the advertising intensity, R&D intensity and price-cost margin explained 75 per cent variations in market structure variable i.e. concentration ratio.

In case of market conduct equation all variables except the lagged price-cost margin are significantly associated. The non-significant relationship between advertising intensity and previous year profits showed that market performance does not affect the market conduct.

The market performance equation showed non-significant relationship of performance variable ($PCM$) with market conduct ($ADVEXP$) and structure ($CR$) variables.

**Two & Three Wheeler Vehicles Segment**

Out of the total variations 83 per cent have been explained by conduct and structure variables in the performance ($PCM$).
The results indicated that one unit change in market structure variable (CR) leads to 77 per cent changes in Price-cost margin (PCM).

In structure equation, lagged advertising intensity exhibited statistically significant and negative relationship with concentration ratio.

10.1 POLICY IMPLICATIONS

A sound transportation system is must for smooth functioning of an economy. In developing nations like India a sound transportation system is a catalyst for growth. In India the vehicle penetration ratio is very low. By increasing vehicle ratio country may have higher growth. On the basis of observed results the study gives following policy implications:

- In case of Two & Three-wheeler segment, exports are negatively associated to profitability whereas they are being expected positively related to profitability. This means the vehicles are not upto the level of international standards. Hence to increase exports and improve the performance of automobile industry, world class technology should be used.

- Export intensity in case of passenger and commercial vehicles segments is negatively related to concentration. This means increasing exports can increase the competition in this segment. To reduce the concentration domestic units should be established so that there is lesser dependence on imports, as import intensity is positively related to concentration.

- R&D is positively related to profits in case of passenger and two & three-wheeler segments. So expenditure on R&D should be intensified to cope up with world level competition. Thus, programmes like ‘Make in India’ can be of great help.

- Concentration and profitability are positively associated in case of passenger, Commercial and Two & Three-wheeler segments. Higher profits lead to further reinvestment in the economy. This means more contribution to national income as well as employment generation. So respective state governments should create congenial investment climate to establish more automobile units.
In the study most of the firm’s level of size has positively affected the profitability of their respective firms in the Indian automobile industry. However, few firms showed negative relationship between level of firm size and profitability. It is implied that an optimum firm size brings more profits and more efficiency. Thus some steps should be taken to increase the firm size upto optimum level in the automobile industry.

10.2 LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH:

- The present study is an attempt to investigate the structure, conduct (strategies) and performance of Indian automobile industry under the framework of SCP paradigm.
- To apply SCP paradigm to Indian automobile industry the study required the data on market structure, market conduct and market performance variables.
- But in case of Indian automobile industry for all firms the data on each variable of SCP paradigm during the study period 1998-2014 was not available.
- The study included only those firms which reported data on SCP variables (Net Sales, Advertising Expenditure, Research & Development Expenditure, Export, Import, Wages & Salaries, Raw Material Cost, Interest Net Profit and Net Assets).
- Thus, study first faced the problem of irregular availability of data.
- Secondly, few firms did not report on advertising expenditure and research & development data.
- The study extracted the data from CMIE Prowess which provided data on mainly three segments Passenger vehicles, Commercial vehicles and Two & Three Wheelers vehicles.
- Thus, there is a scope for future research to study sub-segments of Commercial vehicles like light commercial vehicles, heavy commercial vehicles; sub-segments of passenger vehicles like multi-utility passenger vehicles; sub-segments of two-wheelers like scooters and mopeds, etc.