CHAPTER-II
REVIEW OF LITERATURE, OBJECTIVES AND RESEARCH METHODOLOGY

The review of literature guides the researchers for getting better understanding of methodology used, limitation of various available estimations, procedures and database, logical interpretation and reconciliation of the conflicting results. Besides this, the review of empirical studies explores the avenues for future and present research efforts related to the subject matter. A number of research studies have been carried out on different aspects of automobile industry by the researchers, economists and academicians. Different authors have analyzed performance of automobile firms in different perspectives. A review of this analysis is important in order to develop an approach that can be employed in the context of the study of Indian automobile industry and firms. Therefore, the present chapter reviews the empirical studies related with automobile industry and firms under industry and finds out the research gaps. The chapter has been divided in to three sections. Section-I deals with the review of the available existing literature related to the research topic, it also throws light on the rationale of the study besides the discussion of the objectives of the study. A portrayal of the methodology followed to pursue the objectives has been presented in section-II. Section-III highlights some limitations of the study.

Section-I

Literature Review

Agarwal (1982) explains that the automobile industry in India is said to have come into existence in 1953 but even after three decades, the industry has not matured enough to contribute considerably in the industrial production. The diversity and quality of the passenger cars itself reveals the situation. The situation has been somewhat better in case of commercial vehicles. As per the study, the Government policies for this industry have not been very much clear. On one side, the industry has been protected from foreign competition but on the other hand, it has been left entirely in the hands of the private owners. Hardly any step has been taken to improve technology and to encourage the level of investment in the industry. The major
problems with the industry have been its uneconomical size, backward technology and inadequate financial resources. This study does inter firm analysis of determination of investment, profits, dividend, borrowing and other vital financial variables in automobile industry.

Berry, Grilli and Silanes (1992) consider the effect of a free trade agreement between U.S. and Mexico on the automobile industry. As there have been restrictions on imports into Mexico, one important outcome of a free trade agreement would be the opening of the Mexican market to U.S. producers. The state of the Mexican auto industry has been analyzed in great detail, suggesting that the Mexican industry would continue to prosper, increasing output but also relying heavily on production from U.S. owned plants and on inputs imported from the U.S. and Canada. However, much of the existing domestically oriented industry has been expected to be replaced by other North American producers. Finally, it has been concluded that economic growth together with decline in prices to world level could rapidly expand the size of the Mexican auto market. The free trade agreement would represent an opportunity for product diversification and rationalization in the auto industry.

Rao (1993) in his study ‘Financial Appraisal of Indian Automotive Tyre Industry’ studied the financial appraisal of Indian automotive tyre industry. The study is intended to probe into the financial condition, financial strength and weakness of the Indian tyre industry. To this end, a modest attempt has been made to measure and evaluate the financial performance through inter-company and inter-sectoral analysis over a given period of time (1981-1988). The main finding is that the fixed assets utilization in many of the tyre undertakings is not as productive as expected and inventory is managed fairly well. The tyre industry's overall profit performance has been subjected to inconsistency and ineffective.

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 development in the Indian auto industry from fifties. 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 analyzed.
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 eighties. The study indicates that R&D capabilities and new product ranges have been the result of the challenges arising from time-bound indigenization program, but still Indian technology frontier remained far below global levels. 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.

Narayan K. (1997) has attempted to analyze the effects of deregulation policy introduced in India during eighties on technology acquisition and competitiveness in the Indian automobile industry. Following evolutionary theoretical framework, the study argues that asymmetry among firms in terms of technology acquisition explain much of the firm level differences in competitiveness. Asymmetry in technology acquisition is largely due to differences in the firms' ability to bring about technological paradigm. The results of the econometric exercise support the view that, even in the era of capacity licensing, development of competitive skills is crucially dependent upon the ability to build specific technology advantages. This has been achieved by successfully complementing imported technology with in-house technological efforts. Competitiveness in a deregulated regime would, however, depend upon the ability of the firm to bring about technological paradigm shifts. New firms that are dependent on intra-firm transfer of technology and firms with in-house R & D efforts to accomplish paradigm shifts appear more successful. Furthermore, in a liberal regime, advantages of vertical integration also appear to be important determinant of competitiveness.

Mukherjee (1998) in his study has indicated that automobile manufacturers and car dealers entering fast growing, emerging markets often face several crucial decisions. A key question in this context is: what are the characteristics of an efficient dealer? This study identifies best practices in dealer management in the Indian automobile industry. The research is based on a survey among dealers and manufacturers in India. The study links dealer strategies to dealer performance, using Data Envelopment Analysis as a technique where elements of dealer strategy are treated as inputs, and performance parameters as outputs. Three patterns or configurations of efficient
dealers have emerged: the laissez faire, where manufacturers leave dealers to function independently with minimum regulation or control, market leaders with high investments in facilities who are associated with high sales, and agile dealers with relatively low sales, low investments and high levels of training. Using regression, study also identifies important factors that seem to lead to better performance. These factors are investments in sales and after sale facilities, dealer training, and dealer expenditure on advertising and promotions, and dealer participation in decision making. The results also indicate that there is a need to benchmark distribution practices to help dealers improve their performance.

Agarwal (1999) studied the profitability and growth in Indian automobile manufacturing industry. The objective of the study is to examine if firms have been making super normal profits since 1975 when price controls were removed. It also evaluates the impact of policy changes since 1981-82 on profitability and growth of firms in the industry using Tobin’s Square as a measure of profitability. The study finds no evidence to show that firms have made super normal profits. Profitability is found to be explained mainly by the age of the firms, vertical integration, diversification and industry policy dummy variable. Important determinants of the growth of firms are found as diversification, industry policy dummy variables, gross retained profits and expansion of capacities. Results also reveal differences in performance between car and non-car sectors as well as within the sectors of the industry.

Humphrey (1999) compares the impact of globalization on supply chain networks in auto industry in India and Brazil. According to him, global industry hubs are situated in three regions, 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 auto industries in these two countries. The analysis considers the auto industry as a producer-driven commodity chain, wherein global auto assemblers control the entire supply chain from components to dealerships. While the global auto assembly majors used to produce 60-70 percent of the value in-house till eighties, various phenomenal developments have started taking place, such as the emergence of independent dealers and rise of catalogue suppliers who supply their standard and indigenously designed components to many assemblers. India and Brazil have liberalized 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 imports and domestic production both. FDI has occurred in both the countries since the mid nineties. Brazil and India have emerged as preferred suppliers for global auto assemblers.

The main objective of the study undertaken by Gounasegaran (2000) is to analyze the working of selected automobile firms. With the view to highlight and to analyze the operating and financial performance, the study examines the structure and development of Indian automobile industry over a period of 1960 to 1996. In addition to this, the study analyzes the trends in overall productivity, operating performance, financial performance and management and strategic issues of the selected automobile firms.

Zafar and Sushil (2000) reveal that after independence, Indian automobile companies have started acquiring technology from abroad and this technology transfer started flowing freely in the Indian automobile industry from various parts of the world after 1983 when the process of economic reforms began.

Pingle (2000) reviews the policy framework of India’s automobile industry and its impact on growth. While the cooperation between bureaucrats and the managers of state-owned enterprises played a positive role especially since the late eighties, ties between politicians and industrialists and between politicians and labor leaders have impeded the growth. The first phase of forties and fifties has been characterized by socialist ideology and vested interests, resulting in protection to the domestic auto industry and entry barriers for foreign firms. There has been 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 sixties has been a major event that took place towards the end of this phase. During the second phase of rules, regulations and politics, many political development and economic problems have affected the auto industry, especially passenger cars segment in the sixties and seventies. Though politicians have picked winners and losers mainly by licensing production, this situation changed with oil crisis and other related political and macro-economic constraints. The third phase starting in the early eighties has been characterized by delicensing, liberalization and
opening up of FDI in the auto sector. These policies have resulted in the establishment of new light commercial vehicle manufacturers and passenger car manufacturers. All these developments have 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 Maruti Udyog Limited (MUL). Further, the non-contractual relations between bureaucrats and MUL have dictated most of the policies in the eighties, biased towards passenger cars, MUL in particular.

Sutton’s study (2000) 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 is clear by increase in auto-component exports from India and China. Of the 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 of sizeable market share with their indigenously designed and assembled MUVs.

Piplai (2001) examines the effects of liberalization on the Indian vehicle industry, in terms of export, technology tie-up, product upgradation and profitability. Due to the high degree of regulation and protection in the seventies and eighties, the reforms in the early nineties, have led to a boom in a 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 has led to price wars and aggressive cost-cutting measures including layoffs and large-scale retrenchment. While Indian companies have 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 pushed upon a high degree of unsustainable competition.
Gurtoo and Tripathy (2001) have shown that there is growing concern about the adaptability and willingness of Indian industrial worker to cope with radical technological changes such as the introduction of advanced manufacturing technologies. The workers of Indian automobile industry also have positive attitude towards the introduction of new technologies like AMT.

The study by Gulyani (2001) pinpoints the important fact that many developing countries including India are facing acute shortage of infrastructure facilities which have affected the growth of automobile industry. Gulyani uses analytical framework to examine the infrastructure problem and relies on different methodologies to understand how infrastructure particularly electric power and transportation system affect the cost and competitiveness of automobile firms and how they cope. By examining the individual firm’s infrastructural problems empirically, the study deals with the question, how these deficiencies affect their performance and the solutions that firms device.

Gan (2001) in a research paper ‘Globalization of the Automobile Industry in China: Dynamics and Barriers in the Greening of Road Transportation’ describes the state of the automobile industry and urban road transportation management in China. It reviews how the automobile industry is evolving to respond to challenges in economic development, environmental regulations and technological change. The dynamics and barriers resulting from technological change of the automobile in response to reduction of exhaust emissions and energy-efficiency improvement are analyzed in this study. It is argued that consideration of externality costs should be integrated in automobile industrial policymaking and transport management. This paper questions the Government policy of encouraging private car ownership, and suggests that improvement in public transportation systems and stronger emissions control would be relevant to China’s drive toward sustainable transportation development.

Esteban, Matthew (2001) have examined the effects of durability on producer behavior in the car market. In this setting, forward-looking producers take into account the effect of their current production decisions on their current and future profits due to the existence of a secondary market. First, the study constructs a dynamic oligopoly model of a vertically-differentiated product market to understand the equilibrium production dynamics that arise from the durability of the goods and
their active trade in secondary markets. Secondly, the study uses data from the automobile industry to estimate a good linear-quadratic version of this model. One result suggests that durability may be a particularly desirable car feature for high-quality car producers since by overproducing today they can exploit durability and the existence of a secondary market to potentially reduce their lower-quality competitors' future production. Planned obsolescence appears to be a more profitable strategy for lower-end than higher-end producers.

Velso and Kumar (2002) have given an overview of the major trends in the global automotive industry. They emphasize on the Asian automotive industry. Consumer preferences, Government regulations and competition have been driving the firms towards new and modern technologies; and research and development in design and production. Market saturation in developed countries and rapid emergence of markets in Asia has resulted in launching of many models and segments in these markets. Auto majors have started adopting a global perspective and reorganizing their vehicle portfolio around product platforms. The automobile industry in India has been facing the problem of overcapacity during 2000 and the auto-component sector has not been much developed as to be able to produce world class products. Chinese tariff and quota policies, coupled with local content regulations have protected the auto industry in China. At the same time, Chinese auto industry suffers from fragmentation, lower quality, less technological upgradation and lack of managerial skills. Consolidation and liberalization are expected to promote auto industry in China. Automobile industry in ASEAN and Korea has recovered quickly out of Asian crisis of 1998.

The study by Arnold (2003) explores causes of the western preponderance in China’s motor vehicle sector and the consequences for Japan’s major automotive producers as well as the defensive reactions that followed. The first section focuses on the historical antecedents of China’s motor vehicle development through the early eighties. It is further followed by a brief discussion of the nature of early Japanese presence in China’s motor vehicle market and their refusal to localize assembly. The next section explains the western foray into China and establishes the causes of western predominance in passenger car production. It further discusses the uses of strategic auto industry policy to forge strategic alliances with western auto makers.
that bring state of the art automotive manufacturing technology and capital to China. The study also throws light on the future of Japanese auto industry in China.

The Investment Information and Credit Rating Agency of India (ICRA, 2003) studies the competitiveness of the Indian auto industry by global comparisons of macro-environment, policies and cost structure. The study has a detailed account on the evolution of the global auto industry. The United States has been 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 a mature 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 favorite destinations for the first-tier Original Equipment Manufacturers (OEMs) since late eighties. 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). The study pinpoints the fact that the major advantage of the Indian economy is educated and skilled workforce with knowledge of English. Among the disadvantages, the poor infrastructure, complicated tax structure, inflexible labor laws, inter-state policy differences and inconsistencies are highlighted. The drivers of Chinese economic growth are FDI and labor productivity growth that has been 1.5 times higher than that in India in the last decade. 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; import duty cuts on raw materials; common testing and design facility; labor reforms; upgradation of design and engineering capabilities and brand building.

Dangayach and Deshmukh (2004) depict the findings of an exploratory survey on advanced manufacturing technologies (AMT) administered in Indian automobile companies. The objective of this survey is to assess the status and identify advanced manufacturing technologies relevant to Indian automobile companies.

As per Sagar’s study (2004), the decade of nineties has seen a major transformation of the Indian car industry, from a protected business with only one world-class manufacturer to a landscape that includes most of the world’s major players as well as some emerging domestic firms competing for a significant piece of an expanding
market. In the process, the industry has also leaped forward technologically, driven by a confluence of factors such as intense competition, demanding consumer preferences, Government policies, and the global strategies of the various players. The study further indicates that the cars manufactured in India are based on designs and incorporate technologies that are often comparable with those available globally. At the same time, Indian car exports are also growing. Interactions with automobile manufacturers also continue to fuel substantial changes within ancillary auto-component firms. Many of the players increasingly see India as their global manufacturing hub for small cars, and the Government’s new Auto Policy intends to build on and promote such developments. The Government also anticipates undertaking policies that will reduce the environmental impact of automobiles, an issue that will be of escalating importance as the vehicle population in the cities and rest of the country continues to grow.

Sumantran (2004) in his study ‘Accelerating Product Development in Automobile Industry’ shows that time in product development is reducing because of greater variety demanded by customers. Major automobile manufacturers in India have used various methods for reducing product development time. Tata Motors have also used some specific methods to accelerate product development. Tata Motors has developed a Sedan Indigo in about 20 months.

The study by Sartzetakis & Tsigaris (2004) have developed a simple model of the automobile market, in which significant network and environmental externality are present, and examines consumers' choice of technology. There are two types of technology: one that currently dominates the market but imposes significant environmental costs and other, that is, expected to be introduced and has zero environmental costs. The study finds that in the absence of policy intervention, the benefits of the installed base and the price differentials in favor of the existing technology will deter new users from adopting the clean technology. Different tax policies will induce adoption provided it is welfare warranted. First, a tax policy on the dirty technology with the tax revenues generated being used for general purposes has been analyzed. Under this case, we find that the tax, to induce adoption, will be greater than the marginal environmental damage. Second, it has been considered that the tax revenue generated from the dirty technology to be earmarked towards a future subsidy to the clean technology. In this case, the tax is found to be lower than the case
where revenues are used for general purposes and more interesting is the fact that the tax can be set equal to the marginal damage. Finally, the case has been analyzed where the Government credibly commits a revenue neutral tax/subsidy policy prior to the introduction of the clean technology. It has been found that the tax and the subsidy expenditures required could be lower relative to the case without pre commitment.

Venugopal (2005) tries to identify the antecedents to new product success in emerging market like India. He takes the example of success of Tata Indica and failure of Peugeot 309 in Indian market.

The study by Mariuzzo (2005) provides an empirical analysis of own and cross-price elasticities of substitution for the duration 1989-2000 in Italian automobile industry. The study has used the product-level data consistent with a structural model of equilibrium in a differentiated product in oligopolistic industry and follows a random coefficient model to get reliable price elasticities of substitution. The study analyses the data with a special section having information on individuals buying and non-buying vehicles. Tracking the different characteristics of individuals buying and non-buying ends to be determinant for more precise estimations, study concludes that models that disregard this refined information tend to consistently overestimate price elasticities.

Saripalle in her unpublished thesis (2005) shows the growth of the Indian automobile industry. The tremendous growth of Indian automobile industry in post liberalization period has been despite a number of constraints, including huge income inequalities and bottlenecks in transportation infrastructure. This study does a case study of the growth and learning of the Indian automobile industry across three policy regimes. The objective is to study whether policy regime can influence firm-level learning, highlighting the lessons to be learnt from successful learners from a developing country perspective. The study relies on qualitative case study approach to analyze the product development and supplier development capabilities across two domestic, Tata Motors and Maruti Suzuki, and two multinational, Ford and Hyundai India Limited, automobile firms.

McKinsey (2005) predicts the growth potential of India-based automotive component manufacturing at around 500 per cent, from 2005 to 2015. The report describes the initiatives required from industry players, the Government and the ACMA to capture
this potential. The study has been based on interviews and workshops with 20 suppliers and 7 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 further identifies strong engineering skills and an emerging culture of cost-competitiveness as the major strengths of the Indian auto-component sector, while its weaknesses includes slow growth in domestic demand and structural disadvantages such as power, tariffs and indirect taxes. The policy recommendations include VAT implementation, lower indirect taxes, power reforms, tax benefits lined 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 resource development and modernization fund for new investments in auto clusters.

Maksymiuk (2006) in his study ‘The Attractiveness of the Automotive Industry in Poland for Foreign Direct Investments’ describes the influences of foreign direct investments (FDI) on the automotive industry in Poland. The data and indices provided in the work confirm the close relationships between FDI and the growth of automotive industry. The author compares areas of activity of the automotive suppliers in Poland. The main aspects include finance and sales, human resource, logistics, quality and production. The used measures allow us to compare the competitiveness of Polish and foreign suppliers. The study emphasizes the major strengths and weaknesses of automotive sector in Poland, which is ultimately a measure of the attractiveness of the sector for FDI. The study includes results of research based on the author’s questionnaires (with feed-backs from 147 Polish and foreign suppliers). The results illustrated in graphs present tendencies, where foreign suppliers are more competitive than their Polish counterparts. Further it also shows a dualism in the Polish automotive industry. The final part provides an assessment of the perspectives for the automotive industry in Poland. Although competitors are developing rapidly in Central and Eastern Europe, China and India, Poland is still an exceptionally attractive country for FDI, mainly because of the positive attitude of workers, a large number of highly qualified specialists, participation in the EU market, a growing economy, a high standard of living and the development of suppliers based in Poland.
Saripalle (2006) attempts to apply model of growth and learning in Indian automobile industry across three different industrial policy regimes i.e. protection, deregulation and liberalization to understand the unpredictability in growth process and the reasons for the same. It tries to analyze whether learning is promoted by a competitive or a protective policy regime. It also tries to decompose learning into several types to understand the mechanism underlying the growth process. In doing so, it relies on the growth-size distribution literature.

Narayanan (2006) analyses the determinants of export intensity of Indian automobile firms using a Tobit model. The 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.

Valerie and Daniel (2006), in their study have documented the dramatic changes in volatility that occurred in the U.S. auto industry in the early eighties. Building on the work of Blanchard (1983), study shows how these changes could have stemmed from one underlying factor, a decline in the persistence of motor vehicle sales. The study uses both industry-level data as well as micro data on production schedules from 103 assembly plants in the United States and Canada to document the developments in the early eighties. Then the original Holt, Modigliani, Muth and Simon (1960) linear quadratic inventory models have been used to show how a decline in the persistence of sales leads to all of the changes noted above, including the propensity to use intensive margins of adjustment over extensive labor margins, even in the absence of technological change.

Hashmi (2007) in a study examines relationship between market structure and innovation in automobile industry for the period 1980-2005. The dynamic industry framework of Ericson and Pakes estimates the parameters of the model using a two-step procedure. After estimating the parameters of the model, the study simulates the industry forward and analyse how changing market structure affects innovative activity at the firm as well as the industry level. The findings of the study are: (a) The effect of market structure on innovation in the global auto industry depends on the
initial state of the industry. If the industry is not very concentrated, as it was in
eighties, some consolidation may increase the innovative activity. However, if the
industry is already concentrated, as in 2005, further consolidation may reduce the
innovation incentives. (b) Mergers reduce the value of merging firms though they
may increase the aggregate value of the industry. (c) Mergers between big firms
eventually reduce consumers' utility.

Nag, Banerjee, Chatterjee (2007) examine the growth patterns, changes in ownership
structures, trade patterns and role of governments of selected Asian countries (viz.
China, India, Indonesia and Thailand) in the automobile sector. The study pinpoints
the fact that the developing countries are making efforts to develop their automobile
sector through different paths with direct and indirect influence of Government
through innovative policies and trade liberalization programmes. Government policies
towards investment liberalization have brought significant benefits to the selected
countries as private players stepped in with modern technology. Protection in
component sector has not worked well in general as it helped only the basic
components sector to grow domestically in these countries, with most of the critical
components still being imported. Thailand has aimed to plug the gaps in the
component sector through a focused investment promotion scheme. India is also
making an effort to develop indigenous component sector through giving focus in
R&D and tightening the IPR regime and thereby inviting big players to step in the
critical component sector leaving the basic components in the hands of SMEs. China,
on the contrary, is increasing its comparative advantage in the basic component sector
through further reduction in cost. China is specialising in components, India in two
wheelers and small vehicles, Thailand in pick-up trucks and passenger cars and
Indonesia in utility vehicles. Thailand is exporting to developed countries and
strengthening its position in ASEAN. Indonesia is also increasing its trade relation
with ASEAN. India is concentrating on Middle East and south Asia beside traditional
developed country destinations.

Valentina (2007) argues that the technical and commercial relationships maintained
by Škoda with its dealers in the neutral countries - in particular Finland, Switzerland,
Austria and Sweden - during the First and Second Five-Year Plans has played an
important role in stimulating and orienting the modernization of the Czechoslovak
automobile production. Further, the letters of grievance received by Škoda and
Motokov from their partners, pointing out defects and bottlenecks of both Škoda production processes and products, have been used by the technicians responsible of the Czechoslovak motor vehicle industry as a valid learning tool during late fifties. In the first half of the sixties, foreign distributors have helped Škoda take the first steps in automobile marketing, as well as in designing an assistance system of repair centres and overseas assembly plants based on licensing, fundamental to the establishment of an effective commercial organization.

Okada and Siddharthan (2007) in their study ‘Industrial Clusters in India: Evidence from Automobile Clusters in Chennai and the National Capital Region’ have analyzed the patterns of jumbled cluster of some modern manufacturing sectors in India and in particular the Indian automobile sector. It also examines the factors that have led to different patterns of cluster development in two leading auto clusters in India, Chennai and the National Capital Region (NCR). Moreover, the study analyzes whether firms in clusters perform better than those that are excluded and whether the relative importance of variables that determine the behavior of firms differ among clusters. The study uses a combination of quantitative and qualitative methods, which show that Indian industrial clusters are largely concentrated in the three clustered regions: NCR, Mumbai-Pune, and Chennai-Bangalore, across different manufacturing sectors. The study of the auto clusters in Chennai and the NCR find substantial differences in the patterns of cluster formation, partly due to the historical and policy conditions under which firms, particularly, the lead firms must operate. Moreover, econometric analyses confirmed that being part of a cluster positively influences the performance of the auto component firms and those belonging to a cluster perform better.

Ramudu and Rao (2007) in their study ‘Receivables Management in the Commercial Vehicles Industry in India’ have examined the efficiency of receivables management of the Indian commercial vehicles industry. The study reveals that the industry as a whole has managed receivables efficiently, where as a few individual companies achieve less satisfactory scores in this respect. The study further reveals that the level of investment in receivables as a percentage of sales across the industry is reasonably less. When benchmarked against the industry average, Ashok Leyland and Swaraj Mazda have recorded poor performance in the receivables management, while Tata Motors, Bajaj Tempo, and Eicher Motors, did well.
The study by Badari and Vashiht (2008) analyses the determinants of competitiveness of auto industry in India, based on a field survey and a quantitative analysis of secondary data. It highlights that all segments of Indian auto sector are growing at a fairly high rates and their productivity as well as export intensity is on the rise. Domestic sales show rising trend, but they have declined in certain sub-segments of vehicles during the period under study. However, the R&D expenditure has been scarce. Effective rate of protection of automobile assembly is far higher than that of auto-components manufacturing. Unorganized sector, which is quite significant in auto-component manufacturing, has grown more rapidly in the urban areas than in the rural areas. The econometric analysis suggests various measures that could be taken by the government, particularly, the credit facilitation for small and medium enterprises (SMEs). A field survey comprising auto manufacturers in India underlines various constraints faced by the sector, such as the shortage of skilled manpower along with poor infrastructure, fluctuating steel prices and unavailability of land at reasonable price. The study suggests that the Government could facilitate the industry in becoming more competitive by taking steps such as structural fiscal reforms, cut in import duties on raw materials and capital goods, promotion of R&D and FDI, training facilities, research-backed negotiations of foreign trade agreements (FTAs), roadmap for harmonizing emission norms across the country and infrastructure improvement. Industry, on the other hand, should improve its R&D capabilities and market research.

Thuy (2008) has analyzed the effect of industry policy measures such as tax, subsidy, trade measures, antitrust enforcement measure etc. on the localization of automobile industry in Vietnam. The study includes joint ventures and pure Vietnamese automobiles (PVAs). Both qualitative and quantitative research methods are utilized to understand the responses of automobile companies. The study finds out that localization of Vietnamese automobile industry did not happen as per policy maker’s expectations.

Burange and Yamini (2008) has tried to analyze the performance and competitiveness among the different firms in automobile industry in India. The competitiveness among the firms in Indian automobile industry has been assessed by understanding the factors that determine its competitive advantage. The efforts have been made to construct a competitiveness index for a sample of fourteen firms for the year 2005-06,
which represents around 85 percent of each segment of the industry namely passenger vehicles, commercial vehicles, three-wheelers and two-wheeler. About 50 percent of the sample firms have recorded above industry average performance from all the segments of the automobile industry. The marginal difference between the competitiveness of different firms reveals tough competition among the firms in the automobile industry in India.

Morris (2008) in his study points out the fact that the insertion of the South African automotive industry into the global mainstream of vehicle manufacturing highlights a number of valuable analytical lessons for developing country’s automotive industry. The global value chains that dominate the automotive industry have fostered substantial upgrading within the South African automotive industry but pervasive international trends also limit the opportunities for value addition and more substantial increases in vehicle output. The study further highlights the fact that the benefits to the South African automotive industry of engaging in global value chains are clear but the long term sustainability and development of the industry remain in question. The importance of industrial policy in shaping any national industry's insertion into global value chains, as well as the need for ongoing upgrading and adoption of world class manufacturing standards is stressed as pivotal to maximizing the gains that can be derived from insertion into global automotive value chains.

Bart and Bart (2008) have studied the technological change with regard to CO₂ emissions by passenger cars, using a free disposal hull methodology to estimate technological frontiers. Study has collected sample of cars available in the UK market in the period 2000 – 2007 which shows that the rates of technological change (frontier movement) and diffusion (distance to frontier at the car brand level) differ substantially between segments of the car market. The study concludes that successful policies should be aimed at diffusion of best-practice technology, and take account of the different potential for further progress between different segments of the market i.e. diesel and gasoline engines, and small vs. large engines.

Singh (2008) is of the view that developing countries have emerged as significant participants in the OFDI (Outward Foreign Direct Investment) activities having the strategic asset seeking motive. Such OFDI which is assets exploiting cum augmenting involves potential two way cross border knowledge flows. The study examines these
issues for the Indian automotive industry that is presently transnationalizing at a rapid rate in terms of both exports and OFDI. The study traces the technological capability building and several dimensions of OFDI in this industry. The case studies of two major automotive groups (Tata Motors and Amtek Group) highlight their competence building, and knowledge seeking operations. This study undertakes a quantitative analysis of the influence of OFDI activities on the in-house (domestic) R&D performance of Indian automotive firms during 1988–2008. As expected, the favorable impacts on R&D intensity appear to be stronger for developed vs. developing host nations, and for joint venture vs. wholly owned ownership OFDI. The study concludes with suggestions to promote particularly the strategic asset enhancing OFDI.

A study by Kumar and Selvi (2008) makes an attempt to find the relevance of Stem and Stewart’s claim and the hypothesis that market value added (MVA) of the firm is largely positively associated with its economic value added (EVA) generating capacity in Indian context. The study also portray the temperament of association between MVA and other selected traditional financial variables like earning per share (EPS), return on capital employed (ROCE), net operating profit after tax (NOPAT) and return on net worth (RONW). The result of the study reveals that supporting Stem and Stewart’s claim positively associates the relationship between MVA and EVA. Further, the results revealed ROCE as the most significant related variable with MVA followed by EPS and EVA. The study concludes that EVA and MVA itself positions in an appearance as the most outstanding factors in the definitive analysis as having a decisive on a firm’s value.

Thakar, Joshi and Chitale (2009) in their study ‘An Investigation of Customer Awareness with Reference to Green Marketing of Automobiles: An Empirical Study Conducted at Indore, Madhya Pradesh’ depict that presently both individual and industrial consumers are more concerned and aware of natural environment. So automobile industries should also adopt green marketing strategies. Further, the study reveals that rural people are less aware about the environmental issues. So programs creating awareness about green products are needed in these less aware segments. The green technologies in the automobile sector can not be allowed at the cost of increased price of green products. This shall serve the dual purpose of keeping the price low and also that of recovering the costs associated with development of green technology.
The Government policies should aim at encouraging the innovations and development of low cost technologies associated with green automobile. This study is likely to help the marketers to design the marketing strategies, so that benefits of the green products are continuously demonstrated in their product promotion.

Fang and Mohnen (2009) use firm-level data of the Chinese automobile industry to analyze the determinants and the interrelationships between innovation input and innovation output and in particular whether FDI has any influence on these two aspects of innovation. A generalized Tobit model is used for both R&D and the share of innovative sales for 2002-2003 and 2005-2006. The findings show that FDI firms are less R&D intensive but when they innovate in new products, they are more product innovative than domestic-funded firms.

Julio and Tomas (2009) have done empirical research to establish the degree of improvement of the production indicators of industrial companies from the automotive components industry. The aim of this study is to explore the possibility of improving production indicators by implementing Kaizen events. The teams are composed of both managers and operators with the aim of developing and implementing improvements in three to five days. Each company follows up different interventions over a 9-12 month period. The study presents the initial situation, the activities carried out by the companies and the evolution of manufacturing performance approximately three months after the activities are finished and qualitative improvements on the carrying out of Kaizen Events.

Pries and Dehnen (2009) is the pioneers to discuss the location strategies of the international automotive industry. Its aim is to develop a new scientific approach to the explanatory factors that help to build their international chain in the case of automobile companies and their suppliers. A special focus is laid on relocation tendencies from the 'old' industrialised countries to new markets in Eastern Europe and Southeast Asia. The study reviews empirical evidence of value chain reorganizations over the last 15 years and some common tendencies such as a stronger organizational differentiation of functions in the value chain. The analysis shows that economic factors alone cannot explain location strategies. In addition to cost, markets, economies of scale and scope, other factors such as product complexity, physical
space and process time aspects, actors' strategies and company trajectory influence decision-making processes.

The study by Kaushik (2009) analyses a case study of inter organizational systems (IOS) at Maruti Udyog Limited (MUL), which is a major player in the Indian automotive industry. The study suggests an approach to IOS planning for the automotive industry. It provides new insights into the existing literature on critical success factors (CSFs) in the IOS domain. The study examines two specific IOS initiatives in the MUL value and supply networks and presents a differentiated analysis of design elements (e.g., relationships, processes, information systems and change issues). It is a best practice of how IOS initiatives can add value to the focal company and its business partners and provides support to the business relevance of inter-organizational investments. The research is based on interviews with senior managers, heads of departments, employees and business partners of MUL who have been directly affected in their work. Other sources of information are company documents and publicly available background information.

Ranawat and Tiwari (2009) attempt to trace the evolution of the automotive industry from its inception and identifies the important policies made by the Indian Government. The work also studies the influence of important policies on the development of the industry. The study finds out that the development of the industry has been shaped by the demand on the one hand and the Government interventions on the other, the influence of the latter being considerable. The evolution of India's automotive industry is identified to have occurred in four phases. In the first (1947-1965) and second phase (1966-1979), the important policies identified are related to protection, indigenization and regulation of the industry. On the one hand, these policies helped India to build an indigenous automotive industry, while on the other it has led to unsatisfactory industry performance. In the third phase (1980-1990), the single most important policy identified was the one with regard to relaxation in the means of technology acquisition. The foreign competition inducted into the industry has transformed its dynamics. Lastly, in the fourth phase (1991 onwards) the liberalisation with regard to foreign investment has a significant influence on the Indian automotive industry as we see it today.
Sturgeon and Biesebroeck (2010) has applied global value chain analysis to study recent trends in the global automotive industry. The authors pay special attention to the effects of the recent economic crisis on the industry in developing countries. The principal finding is that the crisis has accelerated pre-crisis trends toward greater importance of the industry in the South. More rapid growth of car ownership is the impetus, but the co-location and close interaction of suppliers and lead firms in this industry is an important catalyst. Opportunities to move up in the value chain for suppliers in emerging economies have proliferated and are likely to become even stronger now that an increasing number of new models are developed specifically for markets in developing countries. The co-location of assembly and parts plants in national and regional production systems has largely confined the impact of sales declines during the crisis to each country/region. In addition, the different development strategies followed by countries like Mexico, China, and India are slowly converging as their industries gain size and independence.

Kale (2011) has tried to examine the development in the Indian auto industry and seeks to understand the factors, both internal and external to firms that have shaped innovative capabilities. It points out that the Indian Government’s industrial policy has secured the development of basic capabilities but restricted innovative capability development in auto manufacturing. The paper reveals that key attributes of firm ownership such as managerial vision and diversified nature of business, helped Indian firms in the development of the innovative capabilities.

Menon and Jagathy (2012) in a study explain that with the entry of many prominent foreign manufacturers, the automobile scenario in India has changed since early nineties. Manufacturers such as Ford, General Motors, Honda, Toyota, Suzuki, Hyundai, Renault, Mitsubishi, Benz, BMW, Volkswagen and Nissan set up their manufacturing units in India in joint venture with their Indian counterpart companies. By making use of the foreign direct investment policy of the Government of India, these manufacturers have started capturing the hearts of Indian car customers with their choice of technological and innovative product features, with quality and reliability. With the multiplicity of choices available to the Indian passenger car buyers, it has drastically changed the car purchase scenario in India and particularly in the state of Kerala. This transformed the automobile scene from a seller’s market to buyer’s market. Car customers have started developing their own personal preferences.
and purchasing patterns, which were hitherto unknown in the Indian automobile segment. The objective of the research paper is to explore and conceptualize various parameters, which influence the purchase patterns of passenger cars in the state of Kerala. The paper also aims to develop a framework to study the behavioral patterns of passenger car owners so that further research could be done, based on the framework and the identified parameters. The relevance of this study is to measure the emerging customer preferences and tendencies in the passenger car industry, which can be very useful to the car manufacturers and marketers to better understand, strategize and orient their marketing programs accordingly.

Bose (2012) in his research covers empirical study of ‘Labor’ in the automobile industry in the National Capital Region (NCR) in the era of neo-liberal economic reforms in India. The study documents and discusses the experiences of the working people by tracking labor relations in terms of (a) nature of labor contracts, (b) work organization and worker participation,(c) skills and training, (d) wages and working conditions and (e) worker organization and labor-management relations in a selected sample of large, medium, small and tiny firms in the auto production chain found in the NCR. The study finds out that the component or ancillary firms are not only linked to lead firms or final assembly firms, but also with their own suppliers in the vertical supply chain through multi-layered subcontracting relations. The study is made to contribute to the much unexplored link between industrial organization within and between firms in terms of production chain on the one hand and labour and human resource policies and practices in the production chain of final assembler and component firms on the other.

Sirapalle (2012) has focused in her study the impact of Government policy regime on the learning and capability acquisition of firms over time. Through a case study analysis of the Indian automotive industry, the study develops three hypotheses relating policy regimes with learning strategies of firms. The study tests these hypotheses through a model of learning using a panel data for the Indian automotive industry. It finds that speed of knowledge assimilation is more important in the liberalized policy regime vis-à-vis protection.

Ray (2012) has examined the performance of Indian automobile industry in terms of various financial indicators viz, sales trend, production trend, export trend etc for the
period of 2003-04 to 2009-10. The result suggests that the automobile industry has been passing through turbulent phases characterized by enhanced debt burden, low utilization of assets, and above all, huge liquidity crunch. The key to success in the industry is to improve labor productivity, labor flexibility, and capital efficiency.

An attempt has been made in a research paper by Velury (2013) to see the impact of various policies enunciated at various times on the creation of employment opportunities directly and indirectly in the fast changing automobile sector of India. The study further tries to highlight the importance of the foreign direct investment in the automobile sector as FDI has been considered as a major catalyst in promoting sustainable development in developing countries. FDI has the potential to generate employment, raise productivity, transfer skills and technology, increase incomes, enhance exports and contributes to the long-term economic development of the world’s developing countries. Evidence presented in the form of (available) empirical data with its interpretation suggests there has been significant impact of FDI on auto sector in employment generation – both in quantity and quality. It can be concluded that with further infusion of FDI in this sector as envisaged in Automotive Mission Plan (2006-16) and 12th five year plan (2012-17) of the Government of India, the potential for employment generation is expected to show the same CAGR estimated for the automobile industry – automobile manufacturers (OEMs), auto component sector and in related enabling services.

In Dharmaraj and Kathirvel (2013) study, an attempt is made to find out the effect of FDI on the financial performance of Indian automobile industry. For this purpose, sixteen companies are selected and analyzed through various financial ratios. Descriptive statistical tools like mean, standard deviation and Student’s paired’ test were used to test the hypothesis. The liquidity ratio analysis showed little changes and profitability analysis have depicted an increasing trend during post FDI as compared to pre FDI. The efficiency analysis has indicated that the companies are efficiently utilizing the available resources during post- FDI as compared to pre- FDI. It is concluded that foreign direct investment in India has made positive impact on the financial variables of the automobile companies.

Lokhande and Rana (2013) explain that globalization has opened the doors of opportunities, but the market is still crowded with some unknown risks and lot of
competition in case of automobile industry in India. Because of this competition, a marketing strategy must aim at being unique, differential-creating and advantage-creating. Today, due to innovative marketing strategies, Maruti Suzuki has become the leading and largest seller of passenger cars in India. The company has adopted various brand positioning, advertising, distribution strategies to capture the market. The main objective of the paper is to focus on various marketing strategies of Maruti Suzuki India Ltd.

The main objective of the study undertaken by Dharamraj and Velmurugan (2014) is to analyze the effects of various factors on the profitability of the Indian automobile industry. The study has analyzed the data for sixteen selected companies, based on earlier empirical studies. On the basis of regression model, the researchers have concluded that the profitability of the industry is dependent on operating ratio, current ratio, return on capital employed ratio, inventory turnover ratio, equity ratio etc. The study also gives emphasis on the development of infrastructure for the growth and profitability of the industry.

Shinde (2014) presents analysis of his research in the area of consumer behavior of automobile car customer. The study opines that proper understanding of consumer buying behavior helps the marketer to succeed in the market. All segments in Indian car industry are studied and it has been found that buyer has different priority of behaviors in each segment, where as main driver for car purchase is disposable income. Value for money, safety and driving comforts top the rank in terms of customer requirement, whereas perceived quality by customers mainly depends on brand image. The objective of this study is the identification of factors influencing customer’s preferences for particular segment of cars. In the end, the study suggests the ways to overcome present scenario of stagnancy in sales and cultivate future demand for automobile car market.

The above review of literature indicates that although numbers of studies have been undertaken on automobile industry but most of them relate to its technological aspects, efficiency, managerial aspects and competitiveness. Very few studies have been conducted on the performance of this industry particularly during liberalization period. During this period, the structure of the industry has changed that has led to
change the conduct and hence the performance. In the past few years, more than a
dozen multinational firms have entered the Indian market, changing the character of
the industry from near duopoly to oligopoly. Most of the multinational firms have
formed joint ventures with Indian firms. Although the vehicles of multinational firms
might remain expensive by Indian standards and planned capacity exceeds projected
demand, new entrants are betting on the rising income of middles class family.
Despite of the large growth potential of the Indian market, no one expects the industry
to sustain fragmentation caused by more than a dozen suppliers. Moreover, cost and
quality remain the underlying issues of India’s auto industry. Indian automakers are
being challenged on several counts such as cost, especially labor cost are rising for
Indian manufacturers, while the cost reductions that should come with infrastructure
improvements are painfully slow in materializing. The quality imperative means that
Indian automakers have to seek new technological resources through alliance and
acquisition, challenging the capital and management resources of companies that are
often small and family owned. The firms are also using different marketing strategies
to strengthen their position. The market conduct of the firms in turn would affect the
performance of the firms in the market.

Thus it is important to study the impact of stiff competition caused by the policy of
liberalization on the Indian automotive industry in general and particularly on Indian
firms. In the light of these facts, the study has been chosen.

**Objectives of the Study**

The main objectives of the study are:

1. To analyze the growth of automobile industry in India.
2. To examine the firm-wise growth of Indian Automobile Industry.
3. To study the financial and non-financial performance of the sampled firms.
4. To evaluate the marketing strategies used by the firms.
5. To identify the strengths, weaknesses, opportunities and threats of the firms under
   study
Section-II

Research Methodology

The time period chosen for the study is 1991-92 to 2012-13 i.e. post liberalization period as the period selected records massive growth of automobile industry due to favorable policies around the globe. The firm-wise analysis of performance and marketing strategies has been limited to four wheeler manufacturing firms of Indian origin by covering the commercial vehicles, multi-utility vehicles and passenger cars segments. To meet the objectives of the study, primary as well as secondary data has been used. Secondary data has been collected from Centre for Monitoring Indian Economy (CMIE), Society of Indian Automobile Manufactures (SIAM), firm’s annual reports, economic surveys, Organisation Internationale des Constructeurs d’Automobiles (OICA) and other sources such as balance sheets, profit and loss accounts of the selected firms. The data collected from secondary sources facilitate in monitoring the overall growth of Indian automobile industry and also in evaluating the performance of selected firms on financial and non financial grounds. For assessing the market strategies of the firms in question, primary data has been collected through structured questionnaire. On the basis of it, parameters of marketing strategies have been analyzed. To analyze the data, the following techniques have been used:

Regression Analysis

The regression analysis has been used to examine the effectiveness of the marketing expenditure and advertisement expenditure. The domestic sale has been regressed against marketing expenditure and advertisement expenditure separately and the regression equations have been formed by using SPSS 17.0.

Compound Annual Growth Rate

The compound annual growth rate has been used to explain the growth of various variables in Indian automobile industry and the firms under study. The growth rates have been estimated from the following equation:

\[ y = ab^t \]
Where \( y \) is the variable of which the rate of growth is to be estimated, \( t \) is the time period and \( a \) & \( b \) are the intercept and regression co-efficient.

The growth rates \( (r) \) are computed as under

\[
 r = \left( \frac{\text{Anti} (\log b) - 1}{1} \right) \times 100
\]

Where \( a = \text{constant} \)

\( b = \text{slope of the semi logarithmic trend} \)

\( r = \text{Compound Annual Growth Rate} \)

**Trend Analysis**

To analyze the future prospects for the selected firms, the trend analysis of the key variables of the firms such as domestic sale and exports have been done by regressing the values of the variables against time. On the basis of this trend, the future values of the above mentioned variables have been calculated.

Performance of the firms has been evaluated on the basis of non financial and financial measures. Non financial measures used in the study are capital productivity, labor productivity, capacity utilization and capital-labor ratio while financial performance has been judged through ratio analysis.

**Capital Productivity**

Capital productivity shows the output produced per unit of capital. The year wise comparison is done of the selected firms that reveal which firm has more productive capital. Capital productivity is calculated by dividing output with units of capital.

**Labor Productivity**

Labor productivity shows per unit of labor responsible for how much units of production. Labor productivity is calculated by dividing output with units of labor.

**Capital-Labor Ratio**

Capital- labor ratio measures the ratio of capital employed per unit of labor. It is used to measure a firm’s degree of capital intensity. Higher the ratio, higher is the capital intensity of a firm.
Capacity Utilization

It shows the efficiency of a firm in using its productive resources. It is calculated by dividing per year output of the firms with their per year installed capacity.

Ratio Analysis

To analyze the performance of the selected firms financially, the following ratios have been calculated by collecting the data from the balance sheets and profit and loss accounts of the firms under study.

(1)Liquidity Ratio: It shows the ability of a firm to meet its current obligations. It measures the short term solvency and liquidity of any firm. These ratios reflect the short term strength of a firm. In this study the liquidity ratios i.e. current ratio, quick ratio and net working capital ratio have been calculated.

1. (a) Current Ratio: This ratio shows the relationship between current assets and current liabilities. There are two components of this ratio:

   - Current Assets: Current assets are those assets that are expected to be converted into cash within one year in the normal course of business. Current assets include cash, accounts receivable, inventory, marketable securities, prepaid expenses and other liquid assets that can be easily converted to cash.
   - Current Liabilities: Current liabilities are those liabilities which would be paid generally within a year or immediately

   Current ratio is computed by dividing the current assets by current liabilities. The current ratio is an indicator of a firm's market liquidity and ability to meet creditor's demands. A current ratio of 2:1 is usually considered to be acceptable i.e., current assets are twice than current liabilities. If current liabilities exceed current assets means the current ratio is below one, then the firm may face problems in meeting its short-term obligations and if the current ratio is too high, then the firm may not be efficiently using its current assets or its short-term financing facilities. This also indicates problems in working capital management and wastage of resources.
1. (b) **Quick Ratio:** This ratio shows the relationship between quick assets and current liabilities. This ratio is also used to show the ability of the firm to meet its short term obligations.

- **Quick Assets:** Quick assets are those current assets which can be converted into cash immediately without any loss of value and can be computed by deducting inventories from current assets.
- **Current Liabilities:** Explained above

1. (c) **Net Working Capital Ratio:** The net working capital ratio explains the relationship between working capital and total assets. This ratio helps stakeholders to analyze the extent of assets tied up in working capital, or the amount of assets required to run the day to day operations of a firm.

- **Working Capital:** Working capital is a financial measure which represents operating liquidity available to a business. It is calculated by deducting current liabilities from current assets.
- **Total Assets:** Total assets are everything that a business or an individual owns. These assets are valued based on their purchase prices, not the current market value of the assets.

A high net working capital to total asset ratio shows the firm’s ability to match its account payable obligations on time. Suppliers prefer to strike relationships with such firms, who would make payments on time.

The high working capital-total assets ratio shows that the firm receives revenue from sales much quicker than it makes payments for raw materials and other services. Working capital to total asset ratio is one of the most keenly watched financial ratio by investors, business owners, and other stakeholders alike.

**2) Leverage Ratio:** It shows the long term solvency or liquidity position of a firm. It is used to calculate the financial leverage of a firm to get an idea of the firm's methods of financing or to measure its ability to meet financial obligations. These ratios measure the firm’s ability to pay the interest regularly and to repay the principal on the due date. It includes proprietary or equity ratio and debt equity ratio.
2. (a) Debt Equity Ratio: This is the basic and the most common measure for studying the indebtedness of any firm. The debt equity ratio shows the extent to which a firm takes debt in response to the size of share holder’s fund. The ratio develops relation between the debt and shareholders fund.

- Total Long Term Debt: Loans and financial obligations lasting over one year are known as long term debt. Long-term debt for a firm includes any financing or leasing obligations that are due in a greater than 12-month period. Such obligations would include firm’s bond issues or long-term leases that have been capitalized on a firm's balance sheet.
- Shareholders Fund: Shareholders’ equity represents the amount by which a firm is financed through common and preferred shares.

2. (b) Equity Ratio: The equity ratio also known as Proprietary Ratio is the proportion of shareholders’ equity to total assets, and as such provides a rough estimate of the amount of capitalization currently used to support a business. If the ratio is high, it indicates that a firm has a sufficient amount of equity to support the functions of the business, and probably has space in its financial structure to take on additional debt, if required. Conversely, a low ratio indicates that the business may be making use of too much debt rather than equity, to support operations and that may place the firm at risk of bankruptcy.

- Shareholders Fund: Explained above
- Total Assets: Total assets are everything that a business owns. These assets are valued based on their purchase prices, not the current market value of the assets.

(3) Profitability Ratio: Profit is the essence and main objective of any business. The long term survival of any firm depends on the profit generated by it. The efficiency of any business is measured by profitability and it is the measure of operating success of any firm. If we are comparing two firms, the one having higher profitability ratio will be considered more successful. Some important profitability ratios are: gross profit margin ratio and net profit margin ratio
3. (a) **Gross Profit Margin Ratio:** This ratio measures the relationship between gross profit and net sales. The main objective of this ratio is to determine the efficiency in the purchase and selling operations. A firm that boasts a higher gross profit margin than its competitors is considered to be more efficient. There are two components of this ratio, gross profit and net sales.

- **Gross Profit:** Gross profit is a firm's residual profit after selling a product or service and deducting the cost associated with its production and sale.
- **Net Sale:** Deductions from the gross sales are represented in the net sales figure. Therefore, net sale gives a more accurate picture of the actual sales generated by the firm.

3. (b) **Net Profit Margin Ratio:** The profit margin tells how much profit a firm makes for every rupee it generates in revenue or sale. It is calculated as net profits divided by sales. Profit margin is very useful when comparing firms in similar industries. A higher profit margin indicates a more profitable firm that has better control over its costs compared to its competitors. It has two components: net profit and net sale:

- **Net Profit:** It is the net profit earned by the firm after deducting all expenses like interest, depreciation and tax. It can be fully retained by a firm to be used in the business. However, dividend is paid to the share holders from this residue.
- **Net Sale:** Explained above

(4) **Turnover Ratio:** They are also called as activity ratios and performance ratios. For smooth operations, a firm needs to invest in both short term as well as long term assets. Turnover ratio indicates how efficiently a firm utilizes its assets. Sometimes they are also referred as efficiency ratios. It shows how quickly a firm turns their production into cash or sales. The study takes into account the total assets turnover ratio, fixed assets turnover ratio, capital employed turnover ratio and current assets turnover ratio.

4. (a) **Total Asset Turnover Ratio:** This ratio measures the sales generated by per rupee of tangible assets being maintained by the firm. Intangible assets like
goodwill etc. are not considered under this ratio. There are two components of this ratio: net sales and total assets. Higher the ratio higher is the efficiency of the firm in the utilization of its assets.

- Net Sale: Explained above
- Total Assets: Explained above

4. (b) Fixed Asset Turnover Ratio: This ratio measures the sales generated by per rupee fixed assets employed in the firm. Higher the ratio higher is the efficiency of the firm in the utilization of its fixed assets. The two components of this ratio are:

- Net Sale: Explained above
- Net Fixed Assets: The value of all fixed assets held by a person or firm based on the original purchase price plus any improvements minus depreciation.

4. (c) Capital Employed Turnover Ratio: This is the ratio which shows the relationship between net sales and capital employed. Capital employed is the value of all the assets employed in the business. The ratio shows how much capital is required for a specified level of sale. Higher the ratio, the greater is the sale made per rupee of capital employed in the firm and higher is the profit. The lower capital employed turnover ratio shows the excessive capital being used in the firm.

- Net Sale: Explained above
- Capital Employed: Capital Employed is the value of all the assets employed in a business.

4. (d) Current Assets Turnover Ratio: This is the ratio that indicates how efficiently a firm is using its current assets to generate revenue. Higher ratio shows higher efficiency of the current assets and vice-versa. There are two components of this ratio:

- Net Sale: Explained above
- Current Assets: Explained above
Marketing Mix

Marketing strategies of the firms are analyzed through marketing mix. The four Ps of marketing (product, price, place and promotion) have been used to analyze and compare the marketing strategies of the selected firms.

Product Strategy: With the help of primary and secondary data, product line, product features and product quality have been analyzed under product strategy.

Price Strategy: Under price strategy the number of vehicles a firm is providing in a specific price range and effectiveness of the discounts and concessions have been analyzed.

Place Strategy: The distribution strategies such as the number of service networks and dealers any firm has and what is the customer perception about the professionalism of dealers, after sale services and availability of spare parts have been examined.

Promotion Strategy: Under this strategy, the customer perception about brand, advertisement and promotion and the recommendations for purchasing a vehicle have been analyzed. Moreover, the effectiveness of the marketing and advertisement expenditure has also been analyzed under this strategy.

SWOT Analysis: On the basis of overall analysis, the strengths, weaknesses, opportunities and threats of the firms under study have been analyzed.

Section-III

Limitations of the Study

However, there are some limitations of the study, which are generally inherent in all such studies conducted at human level. The most important among them are:

1) The present study ignores the performance of some leading firms of foreign origin operating in automobile industry of India.

2) The scope of the present study is limited only to four or more wheeler industry.
3) Non availability of the data at certain levels of the thesis is the other limiting factor.

4) The financial analysis of the firms has been done on the basis of ratio analysis which has its own limitations.

5) The statistical analysis used in the study also has its own limitation and results in the analysis are subject to same constraints as are applicable to statistical tools.

However, it is expected that all these limitations do not affect the worth of this research work.