Journal of Advances in Science and Technology
Vol. 20, Issue No. 1, March-2023, ISSN 2230-9659

https://doi.org/10.29070/v464e460

Impact on Competitiveness in Indian Automobile Sector During Post Liberalization Phase

Kamble Kalpesh Sunil[1]*, Dr. Vinay Chandra Jha[2]

[1] Phd Student, Kalinga University, Raipur, Chhattisgarh, India

Email: kalpeshkamble89@gmail.com

[2] PhD Guide, Dept. of Mechanical Engineering, Kalinga University, Raipur, Chhattisgarh, India

Abstract - The Indian automobile sector has undergone significant transformations, particularly during the post-liberalization phase that commenced in 1991. This phase marked the opening of the Indian economy to global markets, ushering in technological advancements, foreign direct investment (FDI), and increased competition. This study critically examines the impact of liberalization on the competitiveness of the Indian automobile sector. By analyzing key factors such as market entry of global automobile giants, adoption of modern manufacturing practices, and the role of government policies, the study reveals that liberalization enhanced both domestic and international competitiveness. However, it also exposed the sector to global market volatility and operational challenges. The study further discusses the industry's transition, highlighting shifts in production standards, consumer preferences, and supply chain efficiencies, all of which contributed to the sector's resilience and growth.

Keywords: Impact, Competitiveness India, Automobile sector, Post liberalization phase

----------X----------

INTRODUCTION

The Indian automobile industry, one of the largest in the world, has experienced remarkable growth, especially after the economic reforms initiated in 1991. The post-liberalization phase marked a pivotal moment, characterized by the removal of trade barriers and the promotion of market-driven competition. This allowed for greater collaboration with international manufacturers, infusion of foreign capital, and access to cutting-edge technologies. Prior to liberalization, the industry was dominated by a few players with limited innovation and a restricted consumer base. With the entry of global automakers and the relaxation of regulations, the sector witnessed an unprecedented shift in productivity, quality, and scale. This paper seeks to explore how the post-liberalization policies transformed the competitiveness of the Indian automobile sector, examining key drivers such as foreign direct investment (FDI), strategic partnerships, and the evolution of domestic firms.

Organized Automobile Industry

The automotive supply chain is topped by Original Equipment Manufacturers (OEMs), however it's worth mentioning that a small number of Indian OEMs provide components to other OEMs both domestically and internationally. The majority of India's original equipment manufacturers are active members of SIAM, whereas the majority of Tier-1 auto parts suppliers are active members of ACMA. Each one is part of the organised industry and supplies either Tier-1 players overseas or original equipment manufacturers (OEMs) in India and elsewhere.

The car parts companies that make up Tier-2 and Tier-3 are not very big. Even if there are a few Tier-2 companies in the organised sector, the vast majority operate in the unorganised. In the unorganised sector, all suppliers of auto components fall under Tier-3 manufacturers. This includes certain Own Account production Enterprises (OAMEs) where the owner and his family members work together, and where a single machine, such a lathe, is used for production.

The after-sales sector is just as important as the original equipment manufacturers (OEMs) when it comes to auto components. The automobile aftermarket has evolved into a highly organised, knowledge-intensive, and rapidly developing industry in recent years. Therefore, in terms of size, kind of operation, market structure, etc., the Indian automotive sector is very diversified and complicated.

Theory of Competitiveness

Businesses, industries, or nations are considered competitive when their sales and supply of products and services in a particular market are compared to

those of other businesses, industries, or countries in that market.

When discussing markets, the phrase may also be used to describe how far down the path to perfect competition the market system is. The degree to which certain businesses are "competitive" is irrelevant to this application.

Firm Competitiveness

There is a clear regional concentration of talent, money, labour, and technology, according to empirical evidence (Easterly and Levine 2002). This finding is in line with the reality that businesses rely on their inter-firm ties to obtain an edge in the marketplace. These links extend to networks of suppliers, customers, and even rival businesses. Although these advantages are provided by markets when companies are operating independently, there are occasions when externalities emerge from regional or industry-specific links among businesses (such as in the textile, leather products, or silicon chip industries) that cannot be addressed or promoted by markets on their own.

Modelling the benefits of networks, processes such as "clusterization," the development of "value chains," and "industrial districts" are available.

The primary motivation for businesses in capitalist economies is, obviously, to stay or become as competitive as possible. A new paradigm in economic growth has evolved in recent years: competitiveness. At a time when governments are facing budget cuts and private companies are encountering formidable obstacles in both local and international markets, the concept of competitiveness has come to symbolise the realities of these pressures. The World Economic Forum's Global Competitiveness Report used the phrase "the set of institutions, policies, and factors that determine the level of productivity of a country" to characterise competitiveness.

Economic competitiveness of nations, regions, or cities may also be denoted by the phrase in a more general meaning. A growing number of nations are assessing their ability to compete in international marketplaces. There are advisory committees or specific government agencies that deal with competitiveness concerns in many countries. Some examples are Ireland (1997), Saudi Arabia (2000), Greece (2003), Croatia (2004), Bahrain (2005), the Philippines (2006), Guyana, the Dominican Republic, and Spain (2011). Many more. Dubai and the Basque Country in Spain are among the areas and cities contemplating the formation of such an organisation.
National Competitiveness Programmes (NCPs) follow different institutional models in different countries, but they share some characteristics. The NCP's leadership structure is firmly backed by the highest echelons of political power. Credibility among the right private sector players is enhanced by backing from higher-ups. Typically, a public sector leader (such as a minister, vice president, or president) and a private sector leader are chosen to serve as co-presidents on the council or governing body. Strong, dynamic leadership from the private sector at all levels—national, local, and firm—is necessary for national competitiveness programmes, even while the public sector is responsible for strategy creation, monitoring, and execution.

At its foundation, the programme must diagnose the economy's challenges clearly and provide a compelling vision that attracts a wide range of stakeholders eager to pursue change and execute a growth plan focused on expanding internationally. Lastly, when it comes to collective action, the majority of programmes agree that networks of enterprises, or "clusters," are crucial. Using a bottom-up approach, programmes that foster partnerships among public institutions, private organisations, and political leaders can more effectively pinpoint obstacles to competition, collaborate on strategic policy and investment decisions, and achieve better results during implementation.

National Competitiveness

Small open economies, which depend on trade and usually FDI to provide the scale needed for productivity growth to drive living standard rises, are said to place a premium on national competitiveness. A Competitiveness Pyramid framework helps the Irish National Competitiveness Council to clarify the elements that impact national competitiveness. It differentiates between policy inputs concerning the business environment, physical infrastructure, and knowledge infrastructure, as well as the necessary conditions for competitiveness, such as business performance metrics, productivity, labour supply, and prices/costs.

If a country's economy is dependent on foreign commerce to offset the cost of energy and raw commodities imported, then that economy must be competitive. In an effort to strengthen its position in the global market, the European Union (EU) has included R&D in its Treaty. Increases to Europe's competitiveness will get €12 billion in 2009 from the European Union budget, for a grand total of €133.8 billion. Investing in education, research, innovation, and technology infrastructures is the way for the EU to tackle competitiveness.

Washington, D.C.'s International Economic Development Council (IEDC) released "Innovation Agenda: A Policy Statement on American Competitiveness" in its August 2017 publication. This document compiles the thoughts shared during the 2007 IEDC Federal Forum and offers suggestions for federal policymakers and economic developers on how to keep the United States competitive despite the many threats it faces both at home and abroad.

The World Economic Forum's Global Competitiveness Report and the Institute for Management Development's World Competitiveness

Yearbook compare country competitiveness on an international scale.

The majority of research on national competitiveness has used a descriptive, qualitative approach. Researchers have made concerted attempts to both define and statistically analyse national competitiveness, and they have even econometrically modelled the factors that contribute to this phenomenon.

According to some development economists, Western Europe has lagged behind the most active growing economies in Asia. This is mainly due to the fact that these countries have implemented policies that encourage investments with a longer time horizon.

METHODOLOGY

The data used in this research comes from CMIE Prowess, the annual reports of some car companies, and the ACMA Buyer's Guide. The whole study is built around the integration of data from firms.

The conclusions obtained here are pretty reliably relevant for the whole car sector in India, even if the sample of enterprises covered by CMIE Prowess database does not represent the entire population. However, it does contain more than 70% of the population. Employee salaries, overall taxation, fuel costs (including energy consumption), total exports, maintenance costs, royalty expenditures, borrowings, total capital, raw material and capital good imports, and a host of other variables are all part of our analysis. Passenger and Commercial Vehicles were handled independently.

On top of that, we compared the success of Asian automakers to that of their American and European competitors in India.

Ordinary Least Square Multiple Regression

Estimating technical efficiency and its determinants is a common practice in the field, and one prominent parametric approach for this is Ordinary Least Square (OLS).

The specification of a production function is necessary, since it contains the information about the inputs and their interactions that are important to production. In order to determine the various regression,

$$\tilde{y} = a + bx$$

$\tilde{y}$ = estimated y and is the y-axis value that is diagonally opposite the predictor x value point on the regression line. ($\tilde{Y}$ or y' may be used to indicate it at times.) Given a value for the predictor variable, this is the predicted criterion variable's value.

a = where the y-axis meets the regression line as its intercept. The formula determines it.

$$a = y - bx$$

As a result, knowing the sample means of the two variables and the value of b is necessary prior to calculating a.

b = the slope of the regression line and is calculated by this formula:

$$b = \frac{\sum(x - x)(y - y)}{\sum(x - x)^2}$$

Everything needed to solve this equation is already known if the Pearson Product Moment Correlation has been computed.

x = a randomly selected value of the predictor variable as a target for the criteria variable.

Benchmarking may be understood in several ways. One group that specialises in benchmarking, The Benchmarking Network, describes it as "a performance measurement tool used in conjunction with improvement initiatives to measure comparative operating performance and identify best practices." To provide an example, The following steps are supposedly included in benchmarking, according to this definition:

1. Measure comparative operating performance.
2. Identify best practices.
3. Institute improvement initiatives.

Based on what we learned in Steps (1) and (2), regression is a great tool for benchmarking as it shows us how practices (the X factors) impact performance (the Y variable). To be more specific, the most effective methods are the ones that are considered best practices.

1. **The Benchmarking Regression**

A benchmarking regression looks something like this:

$$P = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + B_3 X_3 + \ldots + \text{noise; where}$$

X_1, X_2, X_3, etc. represent different aspects of the company and its operations, and P is a performance metric. Whether the X variables are positive or negative performance determinants is shown by the coefficients β_1, β_2, β_3, etc.

2. **Unit of Observation**

Companies, departments, or even people may all be the subjects of benchmarking research. The inventory costs of a subset of car parts suppliers might be the subject of an industry analyst's study (with the business serving as the unit of analysis). One such exercise for an Intel quality control manager would be to compare foundry-level failure

rates for chips. A manager in charge of human resources at AT&T Cable may, for example, look at how long it takes for different customer service agents to handle a client's call.

3. Performance Measures

Almost infinite options exist for evaluating performance. One may look at total profitability (ROA, ROS, etc.) at the firm level. Production per employee and other accounting ratios (such as the administrative cost ratio) are additional metrics used to evaluate business success. One way to assess success at the product level is by looking at unit costs or market shares. Pick metrics for performance that matter and that managers can really influence. Profits should not be the only metric considered. Making more money is as simple as being better at what you do.

Predictors

Both external factors (such as local market circumstances) and internal ones (such as product offers) may serve as predictors for managers. While compiling your list of potential indicators, keep the KSFs in mind. Finding out which of the selected variables are reliable success predictors is what the regression coefficients show.

RESULTS

Table 1: Commercial Vehicles

	Coefficients	Standard Error	t Stat	P-value
Total Expenditure	0.946716147	0.064792588	14.61148837	4.77E-07
Total Emolument	4.366119601	1.450547577	3.009980278	0.016814
Total Taxes	-0.606582215	0.318225151	-1.90614141	0.093083
Total Fuel Cost	-0.222000675	4.754159695	-0.046696094	0.9639
Total PAT	0.395173185	0.297091194	1.330141032	0.220141
Total Export	-0.329042001	0.471900194	-0.697270325	0.505338
Total Import raw material	1.027738947	0.570325706	1.802021091	0.109215
Total Maintenance cost	-9.211824783	9.784515949	-0.941469643	0.37402
Total Import capital good	-0.824898808	0.428771279	-1.923866736	0.090574
Total Borrowing	-0.111277058	0.079150114	-1.405898894	0.197384
Total Capital	-7.766296626	1.956086492	-3.967256387	**0.004135**
Total Foreign expenditure know	9.956352304	3.996831327	2.491061416	**0.03745**
total royalty	165.5599858	74.36489512	2.226319106	**0.056621**
Total R&D expenditure	3.666275315	3.754272299	0.976560842	0.357389

Table 2: Passenger Vehicles

	Coefficients	Standard Error	t Stat	P-value
Intercept	8.028143571	146.3954947	0.055214384	0.95810604
Total Expenses	0.802289998	0.355209628	2.25861146	**0.07347943**
total employee compensation	1.878641373	6.789983327	0.276863609	0.793110785
Total Taxes	0.250012998	1.084361865	0.231300077	0.8202+904
total repair cost	8.332441368	67.3768857	0.123570971	0.90639502
total power & fuel	-8.320879872	26.33564372	-0.126087327	0.90456851
Total PAT	0.585760278	0.583462228	1.003971201	0.36147614
Total Export of goods(fob)	0.145372687	0.437199961	0.332508671	0.75299288
Total Import of Raw Material	-0.026049604	0.567627121	-0.045900192	0.98516663
Total import capital good	0.142989132	0.239226443	0.597755358	**0.5760440**
Total Borrowing	-0.005589671	0.160088648	-0.034906983	0.97373980
Total Capital	-0.099589704	0.38252304	-0.260349656	0.80497580
Total Foreign Techknow how	-1.657636827	4.507354778	-0.367762625	**0.72810479**
total royalty	3.698267286	4.134806405	0.894423535	0.41207658
total R&D	25.17037828	22.19382112	1.134111367	**0.30817684**

There are various ways to measure competitiveness, but sales are the one that really reveal how different businesses and industries are. We will now use regional exports as our primary indicator. The present global economic downturn makes this issue all the more pressing; by tracking exports, we may learn about the competitiveness and adaptability of India's automotive sector.

Automobile Manufacturers' Regional Competence

The capabilities of the automotive sector were shown by the results of the regression analysis of the aforementioned firms.

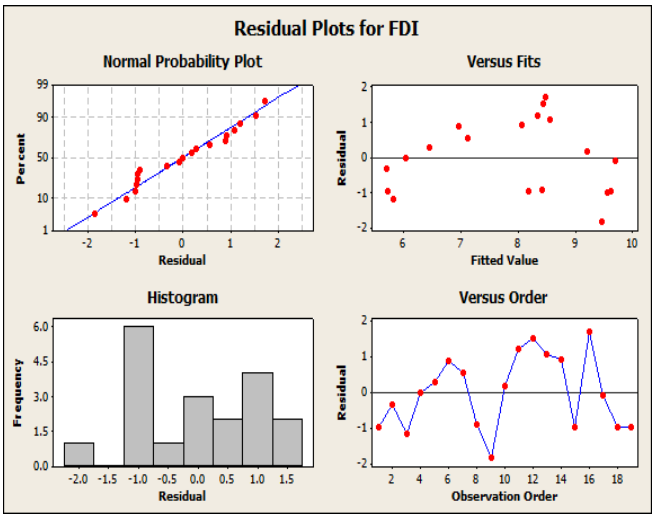
- Output = 71208 + 0.0789832 Europe + 0.0111725 Export Others - 0.0280434 Export Asia

- When it comes to global production of passenger vehicles, Europe's competence is obviously quite important.

1. Regression Output

```
Regression Equation

output  =  71208 + 0.0789832 export europe + 0.0111725 export others -
           0.0280434 export asia


Coefficients

Term              Coef  SE Coef        T      P
Constant       71208.0  19833.4  3.59030  0.002
export europe      0.1      0.0  5.20979  0.000
export others      0.0      0.0  2.17392  0.040
export asia       -0.0      0.0 -1.02496  0.316


Summary of Model

S = 59552.9           R-Sq = 94.18%        R-Sq(adj) = 93.42%
PRESS = 148628811385  R-Sq(pred) = 89.39%


Analysis of Variance

Source           DF       Seq SS       Adj SS       Adj MS        F        P
Regression        3  1.31886E+12  1.31886E+12  4.39619E+11  123.957  0.000000
  export europe   1  1.30161E+12  9.62601E+10  9.62601E+10   27.142  0.000028
  export others   1  1.35225E+10  1.67607E+10  1.67607E+10    4.726  0.040254
  export asia     1  3.72578E+09  3.72578E+09  3.72578E+09    1.051  0.316043
Error            23  8.15705E+10  8.15705E+10  3.54655E+09
Total            26  1.40043E+12


Fits and Diagnostics for Unusual Observations

Obs  output      Fit   SE Fit  Residual  St Resid
 20  288294   316143  41542.2    -27849  -0.65266     X
 23  562971   452268  22253.2    110703   2.00408  R
```

2. Relationship between FDI and Capital



3. Regression Equation

- Foreign direct investment (FDI) = 158.138 + 0.177313 = total sales - 8.1968 = total employee compensation + 12.8417 = total capital.

- According to the previous equation, foreign direct investment (FDI) has a substantial effect on both capital employed and sales.

CONCLUSION

The post-liberalization phase significantly reshaped the Indian automobile sector, fostering competitiveness on both domestic and international fronts. The liberalization policies opened the doors to global players, which brought in modern technologies, advanced production methods, and high standards of efficiency. Indian manufacturers adapted to these changes, improving their competitive edge. However, the increased exposure to global market fluctuations also presented new risks. The study concludes that while liberalization has undeniably propelled the Indian automobile industry toward growth and global recognition, continuous innovation, supportive government policies, and robust infrastructure development are crucial for sustaining competitiveness in an evolving global landscape.

REFERENCES

1. Henning, Dietmar (2008) http://www.wsws.org/en/articles/ 2008/10/auto-o10.html Humphrey, John and Memedovic,

2. Indian Brand Equity Foundation, (2008) Automotive- Market and Opportunities: online available at http://www.ibef. org/download/Automotive_250608.pdf

3. Krishna, P., & Mitra, D. (2021). Trade liberalization, market discipline and productivity growth: new evidence from India. *Journal of development Economics*, *56*(2), 447-462.

4. Narayanan, K. (2001). *Liberalization and the differential conduct and performance of firms: A study of the Indian automobile sector* (No. a414). Institute of Economic Research, Hitotsubashi University.

5. Okada, A., & Siddharthan, N. S. (2008). Automobile clusters in India: evidence from Chennai and the national capital region. In *The flowchart approach to industrial cluster policy* (pp. 109-144). London: Palgrave Macmillan UK.

6. Olga 2003. "The Global Automotive Industry Value Chain: What Prospects for Upgrading by Developing Countries", Sectoral Studies Series, UNIDO, Vienna.

7. Ray, S. (2012). Economic performance of Indian automobile industry: An econometric appraisal. *Business Intelligence Journal*, *5*(1), 151-162.

8. Resende, M. (2007), Structure, Conduct and Performance: A Simultaneous Equation Investigation for the Brazilian Manufacturing Industry, *Applied Economics,* Vol. 39 (4), pp. 937-942.

9. Berg, H. l. (2016). Working capital management: evidence from Norway. *International Journal of Managerial Finance, 12*(3), 295-313.

10. Chakraborty, K. (2008). Working Capital and Profitability: An Empirical Analysis of Their Relationship with Reference to Selected Companies in the Indian Pharmaceutical Industry. *The Icfaian Journal of Management Research, 7*(12), 41-59.

11. Charalampos Basdekis, A. C. (2020). Profitability and optimal debt ratio of the automobiles and parts sector in the Euro area. *Journal of Capital Markets Studies, 4*(2), 113-127.

12. Chun-Hao Chang, K. D. (1995). Current Assets Policies of European Corporations: A Critical Examination. *Management International Review, 35*, 105-177.

13. Claudiu BOȚOC, S. G. (2017). Is Profitability Driven By Working Capital Management? Evidence For High-Growth Firms From Emerging Europe. *Journal of Business Economics and Management, 18*(6), 1135–1155.

14. Dalayear, B. A. (2017). Working Capital Management and Profitability of Real Estate Industry in Jordan: An Empirical Study. *Journal of Applied Finance & Banking, 7*(2), 49-57.

15. Dash, M. (2018). Working-Capital Management And Profitability Of The Construction Sector In Bangalore. *Journal of Commerce & Accounting Research, 7*(4), 40-46.

16. Das, S., & Das, P. (2011). Competitiveness and its impact on research and development in indian automobile industry. *Int. J. Manag. Transform*, *5*, 79-89.

Corresponding Author

Kamble Kalpesh Sunil*

Phd Student, Kalinga University, Raipur, Chhattisgarh, India

Email: kalpeshkamble89@gmail.com