



## AN OVERVIEW OF INNOVATION AND INCLUSIVE GROWTH OF TECHNOLOGY AND ITS DEVELOPMENT IN AUTOMOBILE INDUSTRIES.

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### INTRODUCTION

Innovation can be considered as new idea, device or process. Innovation has viewed as the application of better solutions that meet new requirements, in articulated needs, or existing market needs. This is accomplished through more effective products, processes, services, technologies, or ideas that are readily available to markets, governments and society. The term innovation can be defined as something original and more effective and, as a consequence, new, that "breaks into" the market or society.

In the organizational context, innovation may be linked to positive changes in efficiency, productivity, quality, competitiveness, market share, and others.

"Disruptive Innovation" is the key to future success in business (Clayton Christensen). Thus innovation means something newly introduced, such as a new method or device, introduction of new things or methods.

Innovation is nothing but an act of starting something for the first time; introducing something new; using or showing new methods, ideas, etc.

### INFORMAL INFORMATION SHARING IN LOW-TECHNOLOGY CLUSTERS IN INDIA

**The study titled** Informal Information Sharing in Low-Technology Clusters in India conducted by **Anant Kamath**. The study fuses economic and sociological perspectives on information sharing by means of informal interaction in a low-technology cluster in a developing country. In doing so, the study sheds new light on settings where economic relations arise as emergent study properties of social relations.

The study examines industrial innovation and microeconomic network behavior among producers and clusters, perceiving knowledge diffusion to be a socially-spatial, as much as a geographically spatial, phenomenon. The study pushes towards an economic-sociology approach to understanding knowledge diffusion and technological learning, which perceives innovation and learning as being more *social* processes than the mainstream view perceives them to be.

Indian manufacturing has failed to be an engine of growth, which it must urgently become. Rather than exceeding and leading the overall growth of the economy as it should, manufacturing has just about come along. Moreover, the formal manufacturing sector has added few jobs in the past decade.

And worryingly, it is losing depth. While China's GDP is 3.8 times larger than India's, its production of machine tools, the 'mother industry' of manufacturing, is 55 times more! India needs a strategy to grow manufacturing 12% to 14% per annum, create 100 million new manufacturing jobs in the next 15 years to realise its 'demographic dividend', and create more depth in capital goods industries and innovation for its manufacturing sector to be competitive and sustainable( Manufacturing strategy for India,2011,Arun Mairra)

### METHODOLOGY

The major objectives of the study is to examine the Innovation input, Innovation output and efficiency ratio of various countries ,To examine the performances of various companies, domestic sales trend in Indian Automobile



Industry. To examine the production trend in Indian Automobile Industry and to study export trend in Indian Automobile Industry.

The study made with the help of secondary data information obtained through journals, reports, periodicals and internet. **The study is analytical in its nature.**

In all over the world North America, Europe, and Asia—has made significant contributions to process, product, and organization throughout the twentieth century. As a result of this these innovations together have shaped the competitive structure of the automotive industry that exists today. The organization of production inputs as well as the configuration of distribution channels is also important dimensions of the growth and evolution of the industry. Moreover, various forces outside the industry shape industry structure and strategies: trade flows; regional and international movement of capital; regional and global policies on trade, environmental regulation, and intellectual property, particularly in emerging economies; and the infusion of information technology throughout the procurement, production, and distribution systems.

The automotive industry is very much dynamic and vast, accounting for approximately one in ten jobs in industrialized countries. Developing countries enhancing the development of local automotive sector for economic growth opportunities.

Organizational innovations have also occurred over the past century. In concert with the introduction of mass production techniques comes the vertical organization of production processes. Auto assemblers internalized the production of critical components in an effort to minimize transaction costs associated with late deliveries and products that were not produced to exact specifications.

The globalization of the auto industry surely challenges the status quo for labor in traditional regions of vehicle production. Autoworkers—particularly those who work in assembly plants in developed countries—certainly have a great deal at stake as the industry continues to globalize.

The automotive industry is an important sector of the overall economy, particularly in industrialized countries.

Motor vehicles are also a major component of international trade and foreign direct investment between countries. During 2000 the share of automotive products in world trade was 9.4 percent, unchanged from its share a decade earlier. Western Europe, North America, and Asia in declining order are the global leaders in exports and imports. While western Europe and Asia are net exporters of vehicles, North American imports far outpace exports. In North America, exports have remained relatively flat since the 1980s, whereas imports have ratcheted up. North America, eastern Europe, the Middle East, and Africa are all net importers of automotive products. Intraregional trade figures show that intra-western European trade was the largest in value at almost US\$200 billion that year, intra-North American trade was second at US\$87.7 billion, and intra-Asian trade was the lowest at US\$19.6 billion. Interestingly, intra-North American trade declined by 10 percent compared to 1990. The fastest growing region-to-region trade was North America's trade with its European and Latin American partners.

From time to time barriers have been erected around the globe to protect local automotive sectors.

Auto industry analysts anticipate major organizational and geographical changes in the global auto industry in response to innovations in auto-manufacturing techniques, reconfigurations in the loci of demand for vehicles, and growing environmental concerns. A new model of labor utilization will develop as suppliers and automakers adjust to flexible manufacturing practices and the globalization of their operations.



## ANALYSIS OF THE RESULTS OF THE STUDY

**Table - 1, Overall Score, Innovation input, Innovation output and Efficiency Ratio of various countries.**

Rank	Country	Overall Score	Innovation input	Innovation output	Efficiency Ratio
1	Switzerland	66.59	66.52	66.65	1.0
2	Sweden	61.36	67.86	54.86	0.81
3	United Kingdom	61.25	68.20	54.30	0.80
4	Netherlands	61.14	64.18	58.09	0.91
5	United States of America	60.31	69.19	51.42	0.74
6	Finland	59.51	66.67	52.35	0.79
7	Hongkong	59.43	70.65	48.21	0.68
8	Singapore	59.41	72.27	46.56	0.64
9	Denmark	58.34	66.34	50.35	0.76
10	Ireland	57.91	64.09	51.73	0.81
11	Canada	57.60	64.76	50.45	0.78
12	Luxembourg	56.57	59.95	53.20	0.89
13	Iceland	57.91	59.65	53.14	0.89
14	Israel	55.98	59.82	52.14	0.87
15	Germany	55.83	59.78	51.88	0.87
16	Norway	55.64	63.39	47.88	0.76
17	Newzealand	54.46	62.76	46.15	0.74
18	SouthKorea	53.31	62.10	44.53	0.72
19	Australia	53.07	64.15	41.99	0.65
20	France	52.83	59.03	46.64	0.79

It is clear from the above table that innovation ratio has recorded relatively more in Switzerland followed by Sweden, United Kingdom, Netherlands, United States of America, Finland, Hong Kong, Singapore, Denmark, Ireland, Canada, Luxembourg, Iceland, Israel, Germany, Norway, New Zealand, South Korea, Australia and France in this chronological order.

Innovation input is relatively more in Singapore, Hong Kong, United States of America, United Kingdom, Sweden, Finland, Switzerland, Denmark, Canada, Netherlands, Ireland, Norway, New Zealand, South Korea, Luxembourg, Iceland, Israel, Germany and France in this chronological order. Innovation output is relatively more in Switzerland, followed by Netherlands, Sweden, United Kingdom, Luxembourg, Iceland, Finland, Israel, Germany, Ireland, America, Canada, Denmark, Hongkong, Norway, France, Singapore, New Zealand, South Korea and Australia in this sequence.

### INDIAN AUTOMOBILE INDUSTRY

The Indian Automotive Industry after de-licensing in July, 1991 has grown at a spectacular rate of 17% on an average for the last few years. The industry has now got a turnover of Rs. 1,65,000 crores (34 billion USD) and an investment of Rs. 50,000 crores. Over of Rs. 35,000 crores of investment is in pipeline. Because of this industry direct and indirect employment to 1.31 crore people. The export in automotive sector has grown on an average CAGR of 30% per year for the last five years. The export earnings from this sector are 4.08 billion USD out of which the share of auto component sector 1.8 billion USD. Even with this rapid growth, the Indian Automotive Industry's contribution in global terms is very low. This is evident from the fact that even though passenger and commercial vehicles have crossed the production figure of 1.5 million in the year 2005-06, India's share is about



2.37 percent of world production as the total number of passenger and commercial vehicles being manufactured in the world are 66.46 million against the installed capacity of 85 million units. Similarly, export constitutes only about 0.3% of global trade. It is a well-accepted fact that the automotive industry is a volume driven industry and a certain critical mass is a pre-requisite for attracting the much needed investment in Research and Development and New Product Design and Development. R&D investment is needed for innovations which is the life-line for achieving and retaining the competitiveness in the industry.

**Table- 2, Performances of Various Companies**

Year	Maruti Udyog limited (MUL)Company	Hyundai Motor India Ltd	Hyundai Motor India Ltd	Tata Motors LTD	Fiat India Automobiles (P)
2002	50.29	19.08	13.83	5.96	3.63
2003	51.43	18.65	16.10	1.85	2.28
2004	51.15	17.36	16.75	0.84	1.90
2005	52.20	18.18	16.98	0.19	1.69
2006	50.38	18.13	17.00	0.21	1.42

It is clear from the above table that Maruthi Udyog limited,Hyundai Motor India Limited,Tata Motors limited,Fiat India Automobiles showed good performance in this chronological order.

Source: Association of Indian Automobile Manufacturers (AIAM),2007-08.

**Table – 3, Category-wise Production trend in Indian Automobile Industry (In Nos).**

Category/ Year	Passenger vehicle	Total commercial vehicle	Two Wheeler	Three Wheeler	Grand Total	Percentage Growth
2001-02	669719	162508	4271327	212748	5316302	11.70%
2002-03	723330	203697	5076221	276719	6279967	18.60%
2003-04	989560	275040	5622741	356223	7243564	15.12%
2004-05	1209876	353703	6529829	374445	8467853	16.80%
2005-06	1309300	391083	7608697	434423	9743503	15.06%
2006-07	1544850	520000	8444168	556124	11065142	13.56%

It is clear from the above table that manufacturing of Passenger vehicle, Total Commercial vehicle,Two Wheeler, Three Wheeler really showed good performance from 2001-02 to 2006-07.

**Table - 4,Category-wise Domestic sales trend in Indian Automobile Industry(In Nos)**

Category/ Year	Passenger vehicle	Total commercial vehicle	Two Wheeler	Three Wheeler	Grand Total	Percentage Growth
2001-02	675116	146671	4203725	200276	5225788	-
2002-03	707198	190682	4812126	231529	5941535	13.70%
2003-04	902096	260114	5364249	284078	6810537	14.60%
2004-05	1061572	318430	6209765	307862	7897629	15.96%
2005-06	1143076	351041	7052391	359920	8906428	12.77%
2006-07	1379698	467882	7857548	403909	10109037	13.50%

Source: SIAM,2007-08

It is clear from the above table that when we look into the domestic sales trend in Indian Automobile industry we come to know that Sales trend of passanger vehicle,total commercial vehicle,two wheelers, three wheelers increasing trend from 2001-02 to 2006-07.



**Table- 5, Category-wise Export trend in Indian Automobile Industry(In Nos)**

Category/Year	Passenger vehicle	Total Commercial Vehicle	Two Wheeler	Three Wheeler	Grand Total	Percentage Growth
2001-02	50088	11870	104183	15462	181603	-
2002-03	70828	12255	179682	43366	306131	68.57%
2003-04	126249	17432	265052	68144	476877	55.77%
2004-05	160677	29940	366407	66795	623819	30.81%
2005-06	170193	40600	513169	76881	800843	28.38%
2006-07	189347	49766	619187	143896	1002196	25.14%

Source: Society of Indian Automobile Manufacturing (SIAM), 2007-08.

It is clear from the above table that related to export trend in Indian Automobile Industry particularly passenger vehicle, total commercial vehicle, two wheelers, three wheelers has showed increasing trend from 2001-02 to 2006-07.

### CONCLUSION

It is clear from the above discussion that Overall Score, Innovation input, Innovation output and Efficiency Ratio of various countries are at satisfactory level. Production trend in Indian Automobile industry especially and Category-wise Domestic sales trend in Indian Automobile Industry, Category-wise Export trend in Indian Automobile Industry has showed satisfactory performance which indicate enhancement of the performance of Indian manufacturing sector.

### SUGGESTION

1. The Central government and State governments should take proper initiation to enhance Indian manufacturing sector by providing adequate finance to various companies.
2. Owners of various companies should strengthen research wing in their companies so that employees belong to their companies can engage in research and innovative activities and with the help of that they can show some creativity in their products and they can release their products to domestic and international markets and they can acquire more market share which is the urgent need of the day.

### REFERENCES

1. Maranville, S (1992), Entrepreneurship in the Business Curriculum, *Journal of Education for Business*, Vol. 68 No. 1, pp.27-31.
2. Kline (1985). Research, Invention, Innovation and Production: Models and Reality, Report INN-1, March 1985, Mechanical Engineering Department, Stanford University.
3. Strumsky, D.; Lobo, J.; Tainter, J. A. (2010). "Complexity and the productivity of innovation". *Systems Research and Behavioral Science* 27 (5): 496.
4. Davila, T., Epstein, M. J., and Shelton, R. (2006). "Making Innovation Work: How to Manage It, Measure It, and Profit from It." Upper Saddle River: Wharton School Publishing.
5. Huebner, J. (2005). "A possible declining trend for worldwide innovation". *Technological Forecasting and Social Change* 72 (8): 980–986. doi:10.1016/j.techfore.2005.01.003. edit
6. PRO-INNO Europe – Innovation policy analysis and development throughout Europe (Initiative of the European Commission).
7. Von Hippel, E. (1988). Sources of Innovation. Oxford University Press. The Sources of Innovation .