



GROWTH RATE OF THE MANUFACTURING SECTOR DURING PRE AND POST REFORM PERIODS: A COMPARATIVE ANALYSIS OF MAJOR INDIAN STATES

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ABSTRACT The present study estimates and compares the growth rates of Net State Domestic Product (NSDP) of the manufacturing sector of major Indian states during the pre- and post economic reform phases. The results indicate that during the pre-reform period, Haryana had registered maximum compound annual growth rate of NSDP followed by Punjab and Uttar Pradesh. A sizeable change in the growth rates and the respective ranking of the states has been observed during the post reform period. The states of Gujarat, Himachal Pradesh and Jammu & Kashmir have emerged as the top three performing states, whereas the states of Assam, Bihar and Uttar Pradesh have witnessed low growth rates of the manufacturing sector during the post reform period. This indicates that the growth of this sector has not been uniform and the key causal factors behind the existence of varied performance amongst the Indian states need to be identified by the policy makers for sustained growth of the manufacturing sector in India.

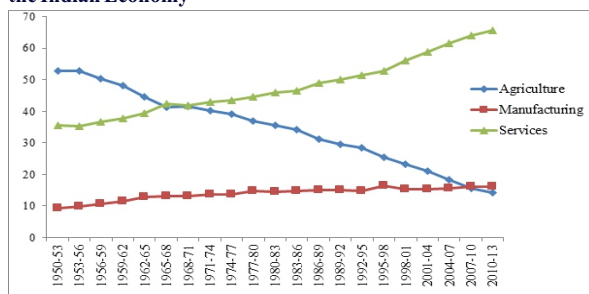
KEYWORDS : Manufacturing Sector, Compound Annual Growth Rate, Economic Reform

Introduction

There exists a strong relation between the growth of manufacturing sector output and the growth of Gross Domestic Product of an economy (Thirwall, 1983), therefore a thriving manufacturing sector is critically important for the economic growth and development of an emerging economy like India. The growth of the manufacturing sector diverts labour resources from the primary sector, which is generally plagued by the disguised unemployment. This contributes to the growth of the capital employed in the industry, while the productivity of other sectors is not affected, signifying that a study of the manufacturing sector is necessary for the sustained economic growth and development of an economy. However, this did not have a persuasive influence on the Indian politicians, economists or other policymakers which is evident from the fact that the contribution of the manufacturing sector has relatively been undersized over the years.

By the year 2013-14, the manufacturing sector contributed only 14.93 per cent in Gross Domestic Product at Factor Cost (GDP_{FC}) of India and it was relegated to be a second-fiddle to services sector which commands more than 50 per cent share (Figure 1). The share of the agriculture and allied activities in the GDP showed a downward trend (55 per cent to 15 per cent) from 1950-53 to 2010-13, while the manufacturing sector had a small share ranging from 10 per cent to 20 per cent during the same period, whereas services showed a steep upward trend ranging from 35 per cent to 65 per cent during the period under reference.

Figure1- Percentage Share of the Major Sectors in the GDP_{FC} of the Indian Economy



Source: Graph constructed on the basis of data procured from Central Statistics Office (CSO).

The trends in manufacturing sector are being debated in India since mid sixties. The pre -1991 reform period Indian economy's prominent feature was the predominance of the primary sector, which employed a huge proportion of the Indian population (Burange, 1991). The lack of expertise and vision contributed to a sluggish manufacturing sector, which being state run was hardly meeting the demand for commodities in the domestic market. It was only after the mid eighties that as a result of liberalization and opening of the economy that this sector got some boost and started showing signs of improvement (Rani and Unni, 2004). The policy initiatives undertaken by the government during the

post reform period of 1991 to revitalize and enhance the growth of the manufacturing sector resulted in a change in the growth rates of manufacturing sector across different Indian states. The present study, therefore is devoted to estimate and compare the rate of growth of Net Domestic Product of the manufacturing sector of the major Indian states during the pre- and post reform periods. This would further facilitate in evaluating and identifying those Indian states, whose position have improved in terms of growth of NSDP (Net State Domestic Product) post the period when the reforms were undertaken in the Indian economy.

Specific Objectives of the Study

The specific objectives of the present study are outlined below:

1. To compute and compare the compound annual growth rates of NSDP of the manufacturing sector across the major Indian states during both pre and post reform periods.
2. To assess the changes in the compound growth rates of NSDP and respective ranking of the major Indian states with respect to the manufacturing sector.

Database and Methodology

In the present study, secondary data sources have been utilized to achieve the aforementioned objectives. State wise data on the Net Domestic Product of the manufacturing sector has been procured from the Annual Survey of Industries (ASI) conducted by the Central Statistical Office and from the 'Handbook of Statistics', published by Reserve Bank of India. For the present study, as per the standard accepted practice in economics literature, 16 major states over the time period 1970-71 to 2014-2015 have been examined, whereby the bifurcations in the states after 1970-71 have not been included because of the data unavailability. In order to compute the compound annual growth rates of the NSDP of the manufacturing sector across the major Indian states, the log-linear model has been used, which is described below in detail.

The Log-Linear Model to Compute Compound Annual Growth Rates (CAGR) of the NSDP

$$NSDP_t = NSDP_0 (1+r)^t$$

where, $NSDP_t$ = Net State Domestic Product of each state at time t for the manufacturing sector

$NSDP_0$ = the initial value of the Net Domestic Product of the state.
 r = Compound Rate of growth of NSDP.

If we take the natural logarithm of the above equation, we get the following:

$$\ln NSDP_t = \ln NSDP_0 + t \ln(1+r)$$

Simplifying this equation further, we get the following final equation of the log-linear model.

$$\ln\text{NSDP}_t = B_1 + B_2 t$$

Using the above equation, we can calculate the CAGR in the following manner:

$$\text{CAGR of the NSDP during a given time period} = \{ \text{Antilog}(B_2) - 1 \} \times 100$$

Results and Discussion

The compound annual growth rates of the NSDP of the manufacturing sector for each of the major state during pre- and post reform phase of the Indian economy has been presented in table 1. It is observed that during the pre-reform period the state of Haryana had registered maximum compound annual growth rate of NSDP (9.09 per cent) followed by Punjab (8.98 per cent) and Uttar Pradesh (8.22 per cent). While, Odisha (2.94 per cent), Kerala (3.15 per cent) and Rajasthan (3.77 per cent) performed poorly in terms of growth rates; the states of Gujarat (7.05 per cent), Karnataka (7.03 per cent) and Jammu & Kashmir (6.40 per cent) registered more or less medium growth rates of the manufacturing sector NSDP during the pre-reform phase. A sizeable shift and change in the growth rates of the states has been observed, if we look at the growth rates in the post reform period. The states of Gujarat (11.62 per cent), Himachal Pradesh (10.96 per cent) and Jammu & Kashmir (6.93 per cent) have emerged as the top three performing states in terms of growth of the NSDP of the manufacturing sector, whereas the states of Assam (3.05 per cent), Bihar (3.46 per cent) and Uttar Pradesh (3.98 per cent) have witnessed low growth rates during the post reform period.

Table 1: Comparison of the Growth Rates of the Manufacturing Sector across the Major Indian States during Pre and Post Reform Periods

Growth Rates of NSDP of Manufacturing Sector in the Pre-Reform Period (1970-71 to 1990-91)		Growth Rates of NSDP of Manufacturing Sector in the Post Reform Period (1990-91 to 2014-15)	
States	CAGR of NSDP (%)	States	CAGR of NSDP (%)
Jammu and Kashmir	6.40	Jammu and Kashmir	6.93
Himachal Pradesh	7.47	Himachal Pradesh	10.96
Punjab	8.98	Punjab	6.61
Haryana	9.09	Haryana	6.72
Rajasthan	3.77	Rajasthan	6.82
Gujarat	7.04	Gujarat	11.62
Uttar Pradesh	8.22	Uttar Pradesh	3.98
Maharashtra	5.55	Maharashtra	6.29
Madhya Pradesh	5.13	Madhya Pradesh	4.08
Bihar	8.01	Bihar	3.46
Odisha	2.94	Odisha	5.23
Andhra Pradesh	7.14	Andhra Pradesh	4.19
Karnataka	7.03	Karnataka	5.87
Tamil Nadu	4.81	Tamil Nadu	5.76
Kerala	3.15	Kerala	4.08
Assam	4.71	Assam	3.05

Source: Author's Calculations.

Table 2 presents the changes in the compound growth rates of NSDP and respective ranking of the major states with respect to the manufacturing sector in India. Considerable changes in the growth rates of the manufacturing sector NSDP and the corresponding shifts in the ranking of the Indian states have been witnessed from pre- to post reform phase of the economy.

Table 2: Assessment of the Change in the Growth Rates of NSDP and respective Ranking of the Major Indian States with respect to the Manufacturing Sector

States	Ranks (Pre-Reform Period)	Ranks (Post-Reform Period)	Change in the Growth of NSDP (%)	Change in the Ranking	Assessment
Jammu and Kashmir	9	3	0.53	+ 6	Position improved by 6 ranks

Himachal Pradesh	5	2	3.49	+ 3	Moved upwards by 3 ranks
Punjab	2	6	-2.37	- 4	Position declined by 4 ranks
Haryana	1	5	-2.37	- 4	Moved downwards by 4 ranks
Rajasthan	14	4	3.05	+ 10	Marked improvement by 10 ranks
Gujarat	7	1	4.58	+ 6	Appreciable increase by 6 ranks
Uttar Pradesh	3	14	-4.24	- 11	Sizeable decline by 11 ranks
Maharashtra	10	7	0.74	+ 3	Position improved by 3 ranks
Madhya Pradesh	11	12	-1.05	- 1	Slight decline in the Position by 1 rank
Bihar	4	15	-4.55	- 11	Considerable decline by 11 ranks
Odisha	16	10	2.29	+ 6	Moved upwards by 6 ranks
Andhra Pradesh	6	11	-2.95	- 5	Position declined by 5 ranks
Karnataka	8	8	-1.16	0	No change in the ranking
Tamil Nadu	12	9	0.95	+ 3	Position improved by 3 ranks
Kerala	15	13	0.93	+ 2	Upward movement by 2 ranks
Assam	13	16	-1.66	- 3	Decline in the ranking by 3 rank points

Note: Change in the Growth of NSDP = CAGR of NSDP in Post Reform Period – CAGR of NSDP in Pre- Reform Period.

Source: Author's Calculations.

The state of Haryana has been overthrown by Gujarat, which has topped the ranking in terms of the growth rates. The position of Jammu & Kashmir has sizeable improved as the state has witnessed 6 points increase in the ranking. Both, Punjab and Haryana have witnessed a decline in the growth rates and subsequently have moved downwards by 4 ranks during the period under reference. The states of Uttar Pradesh and Bihar have registered a decline of 4.24 per cent and 4.55 per cent, respectively in the growth rates and consequently their rankings have declined by 11 rank points. Rajasthan has witnessed a substantial increase in the growth rate of NSDP (3.05 per cent), which has catapulted its position to the 4th rank, thereby causing a jump of 10 ranks during the post reform phase. Though, Karnataka has registered a slight decline of 1.16 per cent in the growth rates, however there has been no change in its ranking during the period under reference.

Conclusion

The results of the present study indicate that there has been a shift in the growth rates of the manufacturing sector NSDP and the respective ranking of the Indian states from pre- to post reform phase of the economy. This is indicative of the presence of disparities across the major Indian states with respect to the growth of the manufacturing sector whereby in certain states the manufacturing sector has played a more prominent role and in other states the said sector does not contribute to the economy in a noteworthy manner. Therefore, the causal factors behind the existence of varied performance amongst the

Indian states need to be identified and looked upon by the policy makers so as to formulate a viable growth strategy where manufacturing sector can be hailed as the engine of growth.

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