

A Temporal Analysis of the Growth of Manufacturing Industries in Northeast India During 1981-82 to 2014-15

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Abstract

Government of India has made concerted efforts for industrial development of the North Eastern Region of India with a major initiative in the form of North East Industrial Policy in 1997 followed by a more inclusive North East Industrial and Investment Promotion Policy implemented since 2007. Based on Annual Survey of Industries data from 1981-82 to 2014-15, the paper examines the growth of manufacturing industries with respect to few selected variables and analyses the impact of the special industrial policies of the Government of India on industrial development in the region,. The analysis indicates that there has been growth of manufacturing industries across various states in the region. For the region too, there has been positive growth for all the variables under study. It has been observed that the manufacturing sector is more capital-intensive, with low level of employment generation over the years. However, the increase in industrial activities has not led to a major structural change in the economy of the region as the share of manufacturing sector in Gross State Domestic Product has increased marginally during the period under study.

Introduction

Disparities across regions are intrinsic to the process of development, and these often get aggravated by regional variations in industrial growth. In a developing country like India, inter-regional disparities in levels of development and income is a major concern as it has social and political ramifications. The industrial scenario of India has also been impaired by regional inequalities in terms of industrial development, which is highly uneven across states and regions. Industrialisation in India so far has clustered around only a few states like Gujarat, Maharashtra, Tamil Nadu, Haryana, Punjab, Delhi and Karnataka, whereas states like Bihar, Jammu & Kashmir, Rajasthan, Orissa, Assam, Madhya Pradesh and Uttar Pradesh have continuously been dominating in the list of underdeveloped states (Sharma & Khosla, 2013). The states in the North Eastern Region (NER) are particularly

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worse off among the industrially backward states of the country.

There are various studies on industrialisation in India undertaken at the sub-national level. These studies throw light on the unevenness of industrial performance of various states and regions in the country. Even though growth has been buoyant in the economy including industrial sector of many states and the country as a whole, the problem of inter-state disparities continued to persist (Jalaja, 2004). Disparities exist within the states too, and this is notable in the study of industrialisation in a highly backward state like Orissa where there are large intra district variations over time (Vyasulu & Kumar, 1997). The case of interstate disparity in industrial growth can also be seen in case of Karnataka whose industrial performance till the mid-eighties was at par with those of the industrially advanced states like Maharashtra, Gujarat, Tamil Nadu and Andhra Pradesh but the other states outperformed it subsequently (Upendranath, Vijayabaskar & Vyasulu, 1994). Another comparative study between the industrial performance of Andhra Pradesh and Gujarat during 2000-01 to 2010-11 revealed that while the former had a higher number of factories, the overall performance of industrial sector of the latter was certainly better as reflected in various indicators (Mishra & Yadav, 2013).

There are many studies which highlight the positive impact of economic reforms initiated since 1990s on industrial growth across states in India. Some studies have brought out the improved performance of the industrial sector of states like Gujarat and Kerala after the liberalisation policies (Unni, Lalitha & Rani, 2001; Malhotra, 2008; Sahadudheen, 2015). In case of Maharashtra, there was a recovery in the manufacturing sector in terms of growth of output, employment, fixed capital and value added during the post-liberalisation period (Burange, 1999). On the other hand, other studies have reported an unimpressive picture of industrial growth in India after the 1991 economic reforms. Though the manufacturing industry of Kerala improved its growth performance over time, the growth rates recorded during the 1990s at the macro level are not higher than the corresponding figures for the 1980s. This has been attributed to high growth rates observed in a few industries only accompanied by low growth rates in a large number of industries in the state (Subrahmanian & Azeez, 2000). The industrial sector in Punjab was found to have decelerated since the commencement of economic reforms in 1991 (Sharma & Mohan, 2016). In Andhra Pradesh regional inequalities in industrial activities increased within the state in the post-reform period as compared to the pre-reform period (Alivelu, 2014).

The NER continues to take a backseat in terms of industrial growth in the country. The structural change that the states in the region are undergoing indicates a shift from the primary to tertiary sector bypassing the secondary sector particularly the manufacturing sector (Das, 2005). However, understanding the process of

industrialisation in the region, particularly the impact of the special industrial policy implemented by the Government of India (GoI) since 1997 is limited by the scarcity of analytical studies that use the Annual Survey of Industries (ASI) data. One such study that has used ASI data, albeit in a limited way, dealt with the progress of industrial development in the region in the post-liberalisation period and found that North East Industrial Policy (NEIP) 1997 has not made much meaningful impact on industrial growth in the region. The study showed that since the implementation of NEIP until the year 2002-03, industrial development in the region deteriorated as compared to early 1990s, with the number of factories and number of workers in the organized manufacturing sector showing a declining trend in the region except for Tripura. Growth in capital invested and per capita net value added also showed a negative trend in the other states except Assam during the period (Das, 2012).

Within NER, intra state disparities in industrialisation are also prominent, and the industrial sector has mainly grown around tea and timber in Assam and mining, saw-mills and plywood factories in other parts of the region (Bahadur, 2009). However, much of the existing literature on industrialisation in the region mainly deals with the patterns and problems of industrial development in the region, focusing on a few specific states and a few specific industries particularly small-scale industries (Khanka, 1998; Ahmed, 2007; Daimari, 2008; Srivastav & Syngkon, 2008; Kabra, 2010). Studies which dealt with industrial development of the region as a whole are limited and mostly concerned with the bottlenecks existing in the way of industrial development (Sarma & Bezbaruah, 2009; Choudhury, 2013).

Given the paucity of literature on industrial development in the region, the present study is an attempt to examine the growth of manufacturing industries in NER with emphasis on the impact of the successive specific industrial policies on NER implemented by GoI, using data from ASI for the period 1981-82 to 2014-15.

Implementation of NEIP and NEIIPP in NER

The industrial backwardness of the region has been recognized way back in 1980 in the Report on Industrial Dispersal of the National Committee on Development of Backward Areas (Planning Commission, 1980). However, a major policy initiative to kick start industrial activities in the region was launched by GoI in the form of a package of incentives under the North East Industrial Policy (NEIP) of 1997 in order to attract industrial investments in the region. The policy which was in operation for a period of ten years from December 24, 1997 to December 23, 2007 covered the states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. The NEIP 1997 laid emphasis on development of industrial infrastructure and provision of fiscal incentives and subsidies to 18 thrust sectors identified by GoI for the purpose of developing local resource based

and high employment generating industrial sectors in the region. Under the policy, provisions were made for a comprehensive insurance scheme, concessions to industrial units for development of infrastructure, subsidies for transport, capital investment, interest on working capital, and exceptions were made on excise and income tax for a period of ten years. Apart from these, the policy also provided provisions for export of products of the region to neighbouring countries like Bangladesh, Myanmar and Bhutan, providing grants for techno-economic studies on industries and infrastructure of the region, and development of village and small industries through trainings, exhibitions, etc.

The limited success of NEIP 1997 led the GoI to approve another package of fiscal incentives and other concessions for the NER, viz. the North East Industrial and Investment Promotion Policy (NEIIPP) 2007, effective from April 1, 2007 up to March 31, 2017 which also included the state of Sikkim. The NEIIPP 2007 was introduced with a substantial increase of fiscal incentives and other concessions prescribed in NEIP 1997. Under NEIIPP 2007, capital investment subsidy was enhanced to 30 per cent from 15 per cent in the earlier policy, and subsidies on transport, interest on working capital, excise duty refund, income tax exemptions, etc. were continued for industries in the region. The distinction between thrust and non-thrust industries made in NEIP 1997 was withdrawn and incentives were made available to new as well as existing industrial units in NER on their substantial expansion. Besides industries in the manufacturing sector, benefits of the new policy were also extended to service sector, bio-technology and power generating units. However, goods produced by petroleum oil or gas refineries, goods pertaining to tobacco and manufactured tobacco substitutes, pan masala as covered under the Central Excise Tariff Act 1985, plastic carry bags of less than twenty microns and goods in respect of which only peripherals activities take place were exempted from the benefits of NEIIPP 2007.

Despite more than 20 years of the implementation of the special industrial policy for the region starting with the NEIP in 1997, not much effort has been made to study the impact of the policy on industrial development in the region as a whole and also within states in the region. In 2004, an impact evaluation study of the NEIP of 1997 was undertaken by Tata Economic Consultancy Services (TECS) which revealed that much of the benefits of the policy was cornered by Assam and Meghalaya which together accounted for 94 per cent of the total investments post 1997, and the states of Nagaland, Arunachal Pradesh and Tripura accounting for the remaining six per cent, while the states of Manipur and Mizoram did not attract any investment proposal. Resource-based industries like tea, cement, jute, rubber and coal, metallurgical sector and excise intensive sectors like food and beverages accounted for a major share of investment, whereas other resource-based and high employment sectors such as handloom, handicrafts, bamboo, agro-forestry, etc. did not avail the benefits of the policy. The report brought to

light the skewed pattern of development within the region, which was a setback to the fundamental objective of achieving balanced economic growth across the different states of the region (TECS, 2004).

Data and Methodology

The database of the study is drawn from ASI for the period 1981-82 to 2014-15 across the various states in NER which come under the purview of ASI survey. The period of analysis is chosen in such a way as to capture the growth trends of the manufacturing industry before and after the implementation of NEIP 1997 and NEIIPP 2007. The state of Mizoram has been excluded from our study since it was not covered by ASI survey, and Sikkim and Arunachal Pradesh were included in the survey only from ASI 2009-10 and 2014-15 respectively, and accordingly the results for these states are reported for limited period only. In case of Nagaland, data was under-reported for a number of years prior to 1989-90 and hence estimations for the state could be done only from 1989-90 onwards which is another caveat that needs to be added here. Finally, since the analysis is based on ASI data, the limitations of the data due to collection and compilation procedures of ASI will automatically affect our analysis.

The variables used for the study are number of factories, fixed capital, total persons engaged, value of output and net value added. These variables have been chosen so as to have a fair insight regarding the position of registered manufacturing industries in the region, how these industries have engaged people in various manufacturing activities directly or indirectly, whether the industries are labour or capital intensive and most importantly, to look into the contribution of these industries towards the process of overall industrial production as reflected by net value added, which is one of the most crucial indicators of the performance of the manufacturing sector. To smoothen fluctuations in the data, three year moving average has been calculated for all the variables. The variables with monetary values were deflated using the all-India wholesale price index (WPI) of manufactured products taking 2011-12 as base year for analysis. Thus, there is a probable limitation of taking the all-India WPI to the state level analysis since the state level deflators are not available so far. The index number for the year 1981-82 was given with 1970-71 as the base, 1982-83 to 1993-94 with base 1981-82, 1994-95 to 2004-05 with base 1993-94, 2005-06 to 2011-12 with base 2004-05, 2012-13 to 2014-15 with base 2011-12. The price index corresponding to the years 1981-82 to 2014-15 have, therefore, been converted into the 2011-12 base before deflating the series.

The analysis is carried out at the aggregative level using the five variables viz. number of factories, fixed capital, total persons engaged, output and net value added. Growth rates of the manufacturing sector for the entire period in the

various states as well as the entire region are estimated by fitting a semi-log trend of the form:

$$\ln Y_t = a + bt + U_t$$

where,

Y_t = dependent variable (number of factories, fixed capital, total persons engaged, output and net value added)

t = time (1981-82 to 2014-15)

a and b = regression coefficients

U_t = error term

This method has been used in studies by Vyasulu and Kumar (1997), Malhotra (2008), to study industrial growth in states like Orissa and Gujarat. To analyse the impact of industrial policy on industrial growth, the entire period is divided into three sub-periods, as was done in the earlier section. The division of the year in 1997-98 and 2007-08 is to capture the impact of NEIP 1997 and NEIIPP 2007 respectively, taking into consideration the time-lag involved in policy implementation. Growth rate is estimated for the three sub-periods by breaking the data in the year 1997-98 and 2007-08 and fitting a 'Kinked Exponential Model' (Boyce, 1986), which has also been used by Burange (1999), Subrahmanian & Azeez (2000), etc. for comparison of industrial growth in the pre and post liberalisation period. As the data is broken at two points k_1 and k_2 , we use the two-kink exponential model of the form:

$$\ln Y_t = a_1 + b_1 (D_1 t + D_2 k_1 + D_3 k_1) + b_2 (D_2 t - D_2 k_1 - D_3 k_1 + D_3 k_2) + b_3 (D_3 t - D_3 k_2) + U_t$$

where,

b_1 = growth rate for sub-period 1

b_2 = growth rate for sub-period 2

b_3 = growth rate for sub-period 3

D_1, D_2 and D_3 = sub-period dummy variables which assume the value 1 accordingly and 0 otherwise

k_1 and k_2 = break points (1997-98 and 2007-08 are taken as break points)

a_1 = constant

U_t = error term

It may be noted here that the growth rates for Arunachal Pradesh and Sikkim cannot be analysed separately using this model as data for these two states were available only after their inclusion in the ASI survey, i.e. in the third sub-period. However, they are included in the NER total, as was done for estimation of semi-log growth rate.

Contribution of Manufacturing Sector of NER to GSDP

Despite its vast natural resources, NER is one of the least industrially developed regions in the country. To have an overview of the industrial development in NER over the years, a detailed look into the sectoral composition of gross state domestic product (GSDP) is warranted. As a precursor to assessing the industrial progress in the NER using ASI data base, we examine the average percentage shares of the primary, secondary and tertiary sectors of the economy to the GSDP at constant prices (2004-05) for the region, individual states in the region and all-India status (Table:1). For this, the period of our study has been grouped together under three time periods, namely (i) the period from 1981-82 to 1997-98 before the implementation of the NEIP of 1997 (ii) the period of implementation of NEIP (1998-99 to 2007-08) and (iii) the period of implementation of NEIIPP 2007 (2008-09 to 2014-15). Within the secondary sector, we have focused on the shares of manufacturing sector to show the status and performance of industries in the region vis-à-vis the country.

The estimates of sectoral shares in GSDP highlight the unsatisfactory development of the secondary sector of NER particularly the manufacturing sector as compared to that of the all- India situation. The regional averages of the percentage share of secondary sector to GSDP were lower than the all-India averages in all the three periods under consideration. The average share of secondary sector in NER to the to the total GSDP has been steadily increasing from 16.7 per cent during the period prior to implementation of NEIP to 18 per cent during period of implementation of NEIP and subsequently to 20.5 per cent in the period of implementation of NEIIPP (Table:1). However, these figures are well below the corresponding figures for all-India average.

The average percentage share of manufacturing sector to states' GSDP in NER has recorded only a marginal increase from 6.7 per cent during the period prior to implementation of NEIP to 6.9 per cent in period of implementation of NEIIPP. However, in all the three periods under consideration the average percentage shares of manufacturing sector to states' GSDP were less than half of the corresponding all-India average (Table:1). In fact, in majority of the states like Assam, Manipur, Mizoram, Nagaland, and Tripura the percentage share of manufacturing sector to GSDP has dropped during the phase of implementation of NEIP and NEIIPP compared to period 1981-82 to 1997-98.

On the other hand, Sikkim has recorded a significant improvement in manufacturing sector particularly during the period of implementation of NEIIPP. Until the implementation of NEIIPP, Sikkim's industrial development as revealed by share of this sector to the GSDP was comparable to other states in the region. During the period of implementation of NEIP, the share of manufacturing sector was 4.1

Table 1: State-wise Sectoral Shares in GSDP at Constant Prices (2004-05)

	1981-82 to 1997-98			1998-99 to 2007-08			2008-09 to 2014-15					
	Pri.	Sec.		Ter.	Pri.	Sec.		Ter.	Pri.	Sec.		Ter.
		All	Mfg			All	Mfg			All	Mfg	
Arunachal Pradesh	55.8	22.1	2.2	22.1	42.5	23.1	2.5	34.3	31.9	29.7	3.3	38.4
Assam	48.9	16.8	9.8	34.3	37.4	16.1	8.9	46.5	27.8	17.2	7.8	55.0
Manipur	35.9	29.7	5.4	34.4	24.9	33.4	4.7	41.7	21.9	30.2	4.7	47.9
Meghalaya	38.9	13.4	2.3	47.7	32.5	16.5	3.3	51.0	23.9	22.5	5.7	53.6
Mizoram	NR	NR	NR	NR	24.7	17.3	1.5	57.9	22.3	17.5	1.3	60.2
Nagaland	22.9	12.0	4.5	65.0	31.1	13.3	2.0	55.6	27.5	12.9	1.8	59.5
Sikkim	33.4	23.4	7.7	43.1	18.7	26.8	4.1	54.5	10.5	54.0	31.8	35.5
Tripura	45.9	10.0	5.6	44.1	28.7	21.1	4.1	50.2	25.8	23.2	3.4	50.9
NER	44.8	16.7	6.7	38.4	34.4	18.0	6.6	47.6	26.3	20.5	6.9	53.2
All-India	34.4	25.3	16.0	40.2	23.3	26.2	16.1	50.4	16.8	26.3	16.1	56.9

Source: Calculated using CSO data on National Accounts Statistics collected from Economic and Political Weekly Research Foundation.

Notes: Figures are in average percentages of the time period grouped together:

Mfg. = manufacturing sector; NR = non-availability of data, Pri. = primary sector; Sec. = secondary sector; Ter. = tertiary sector.

per cent while that of NEER average was 6.6 per cent. It is only in the NEIIPP implementation period that one can observe a manifold jump in the share of the sector which leaped from 4.1 per cent during NEIP implementation period to 31.8 per cent during period of implementation of NEIIPP (Table:1). This is indicative of the phenomenal impact of the NEIIPP on the growth of manufacturing sector in the state. Other states like Meghalaya and Arunachal Pradesh have also recorded increased share of manufacturing sector to GSDP since implementation of NEIP and NEIIPP, however the increases are only marginal and the share of manufacturing sector to GSDP continues to remain well below the national average. During NEIIPP implementation period, the share of manufacturing sector in the GSDP of Meghalaya and Arunachal Pradesh were 5.7 and 3.3 respectively, while the corresponding figure for all India was 16.1 per cent (Table:1).

Results and Discussion

In this section we examine the changes in the relative share of individual states and the region as a whole in the manufacturing sector in terms of the five indicators used for the study that have been calculated using ASI database. The changes in the shares of states in terms of the five indicators have been shown at three points of time, namely 1981-82, 1997-98 and 2014-15 (Table:2). The three points of time have been purposely selected to reflect the changes in the industrial scenario in the region starting from 1981-82, the year from which data are available for most of the states in the region. The year 1997-98 represent the period at the start of the first north east industrial policy, while 2014-15 is the latest year for which the data have been analysed.

Among the states in the region, Assam accounts for the majority share with respect to all the variables under consideration, and percentage shares of all the other states taken together is less than the share of Assam which reflects the dominance of industrial sector of the state in the region. In 1981-82, about 83 per cent of the total industries in northeast were located in Assam. At the beginning of the implementation of NEIP 1997, the state accounted for 77 per cent of the total industries with marginal decline to 75.5 per cent in 2014-15, indicating high concentration of industries in the state. The dominance of Assam in the industrial scenario of the region is also evident when we compare other variables. For example, in fixed capital, share of Assam was 75.3 per cent in 1981-82 and 72.6 per cent in 2014-15. Assam also accounted for major share in terms of the other three indicators, viz. employment, value of output and net value added for all the periods under consideration, and it was higher than the combined shares of all the other states. The dominant position of Assam is mainly attributable to its rich resource base (tea, limestone, coal, jute, etc.), large population (67 per cent of region's total population in 2011), its geographical position as gateway to the region and its clear edge over other north-eastern states in terms of infrastructure,

logistics and connectivity to mainland India. The hilly topography of the other states in the region coupled with institutional barriers such as communal land ownership and restriction in entry of outsiders to most of the tribal majority states put Assam in advantageous position to receive most of the investments among the states in the region.

Among the other states, Tripura accounts for the second highest share in terms of number of factories and employment in all the three periods under consideration whereas it lags behind Sikkim and Meghalaya in terms of share in fixed capital, value of output and net value added (except in 1997-98 for value of output and net value added). Although Tripura stands second in respects of percentage share of number of industries and total persons engaged in manufacturing sector, yet in terms of fixed capital, value of output and net value added the state lags behind other states in the region indicating the labour-intensive nature of industries that have come up.

On the other hand, Meghalaya and Sikkim performed relatively well in terms of the three variables, with the former accounting for the second highest share in fixed capital during the three reference period of time. Sikkim (which was not initially under the ASI survey) accounted for the second highest share in output and net value added in 2014-15. Sikkim's share of 31.1 per cent in net value added in 2014-15 was particularly significant as there is simultaneous decline in the relative share of other states particularly that of Assam (from 80 per cent in 1997-98 to 57.5 per cent in 2014-15). Even though Sikkim has the least share among the NER states in terms of number of factories, its share in terms of value of output and net value added, is higher than all the other states (barring Assam), which clearly alludes to more capital-intensive industries being present in the State.

Manipur, Nagaland and Arunachal Pradesh are the laggards in the region and account for the lowest percentage shares in terms of most indicators of industrialisation analysed here. Manipur and Nagaland have not shown any improvement in terms of percentage shares of fixed capital, employment, output and net value added as their shares in terms of these indicators have decreased over the period of study. In case of Manipur, there was a marginal increase in the percentage share of factories over the years, but this has not resulted in increase in percentage shares of the state in the other variables. The declining percentage share of Nagaland in terms of all the indicators is palpably visible and the state continues to lag behind compared to other states in the region. The share of Arunachal Pradesh, which recently came under the ASI survey in 2014-15 is still not very significant, but seemed to keep pace with the other states particularly in terms of its percentage share in output and net value added which is higher than Manipur and Nagaland in 2014-15.

An interesting observation that arises is that even though Assam occupies a dominant position in terms of industrialisation in the region, we find that pace of industrialisation has been picking up across other states in north east India. There is also diffusion of the process which is noticeable from the fact that the percentage share of Assam in terms of number of factories has decreased from 82.9 per cent in 1981-82 to 77.9 per cent in 1997-98 and further to 75.5 per cent in 2014-15. Similarly, in respect of share of employment, value of output and net value added created by the manufacturing sector in the region in the 34 years of study Assam's share has declined considerably and share of fixed capital too declined to an extent. This can be regarded as an improvement in terms of intra-regional imbalance in industrial situation in NER as the dominance of Assam has been scaled down and shares of other states have improved.

Having analysed the changes in the relative shares of states using five indicators of growth for the manufacturing sector in NER, it would be to examine the growth rates of selected variables during 1981-82 to 2014-15, excluding Arunachal Pradesh and Mizoram for reasons explained earlier.

The estimated semi-log function for the period under study shows a positive trend coefficient for the region as a whole and all the states except Nagaland which registered negative growth of fixed capital and employment (Table:3). Meghalaya recorded the highest growth rate in the number of factories (4.26 per cent) which is well above the region's sluggish growth average of 2.09 per cent, followed by Sikkim (3.71 per cent). Fixed capital of the manufacturing sector shows a high average growth rate of 7.22 per cent for the region with Sikkim (15.59 per cent) achieving the highest growth among the states in the region. The growth in number of persons engaged in manufacturing sector has been slow for the region (1.6 per cent) except for Sikkim (15.87 per cent) and Manipur (4.02 per cent) over the study period. In terms of value of output, Meghalaya's growth rate was exceptionally high (14.02 per cent) followed closely by Sikkim (12.86 per cent), compared to other states and the region's average (8.69 per cent). Meghalaya recorded the highest growth (11.96 per cent) in terms of net value added, much higher than the regional growth rate (7.05 per cent).

Overall, we find that growth in number of factories and employment in the region over the 34 years of study period has been rather sluggish and much lower as compared to the growth rates of fixed capital, output and net value added, which is an indication of the capital-intensive nature of manufacturing sector in the region accompanied by low employment creation.

It is worth mentioning that some states have shown an impressive growth in terms of certain variables over the years with Sikkim notably standing out in terms of high growth of fixed capital and employment, whereas Meghalaya leads in growth

Table 2: State-wise Shares of Manufacturing Industries in No. of Factories, Fixed Capital, Total Persons Engaged, Output & Net Value Added

	Assam	Manipur	Meghalaya	Tripura	Nagaland	Sikkim	Arunachal Pradesh	Total NER
Number of Factories								
1981-82	1,851 (82.9)	53 (2.4)	47 (2.1)	281 (12.6)	NR	NR	NR	2,232
1997-98	1,861 (77.9)	77 (3.2)	43 (1.8)	243 (10.2)	165 (6.9)	NR	NR	2,389
2014-15	3,717 (75.5)	160 (3.3)	109 (2.2)	548 (11.1)	197 (4.0)	67 (1.4)	124 (2.5)	4,922
Fixed Capital (Rs. Lakh)								
1981-82	27,048 (75.3)	262 (0.7)	7,661 (21.3)	966 (2.7)	NR	NR	NR	35,937
1997-98	425,482 (83.9)	15,027 (3.0)	27,251 (5.4)	26,141 (5.2)	13,468 (2.7)	NR	NR	507,369
2014-15	1,616,940 (72.6)	11,374 (0.5)	350,312 (15.7)	32,428 (1.5)	20,029 (0.9)	176,248 (7.9)	19,175 (0.9)	2,226,506
Total Persons Engaged								
1981-82	121,633 (82.2)	6,141 (4.1)	6,071 (4.1)	14,170 (9.6)	NR	NR	NR	148,015
1997-98	154,909 (86.3)	4,440 (2.5)	6,550 (3.7)	8,659 (4.8)	4,856 (2.7)	NR	NR	179,414
2014-15	195,567 (72.6)	7,591 (2.8)	14,339 (5.3)	28,871 (10.7)	5,519 (2.0)	13,675 (5.1)	3,684 (1.4)	269,246
Value of Output (Rs. Lakh)								
1981-82	71,661 (94.2)	499 (0.7)	2,394 (3.1)	1,520 (2.0)	NR	NR	NR	76,074
1997-98	751,290 (87.3)	21,397 (2.5)	22,435 (2.6)	32,759 (3.8)	32,383 (3.8)	NR	NR	860,264
2014-15	6,176,083 (79.4)	37,736 (0.5)	431,852 (5.6)	151,764 (2.0)	44,889 (0.6)	802,006 (10.3)	134,873 (1.7)	7,779,203
Net Value Added (Rs. Lakh)								
1981-82	13,994 (90.8)	303 (2.0)	736 (4.8)	387 (2.5)	NR	NR	NR	15,420
1997-98	126,751 (80.0)	9,301 (5.9)	9,182 (5.8)	10,559 (6.7)	2,693 (1.7)	NR	NR	158,486
2014-15	818,933 (57.5)	6,976 (0.5)	62,697 (4.4)	47,161 (3.3)	12,225 (0.9)	442,439 (31.1)	33,964 (2.4)	1,424,395

Source: Calculated using ASI database (various issues) collected from Economic and Political Weekly Research Foundation.

Notes: Figures in brackets indicate percentage figures, NR = non-availability of data.

Table 3: State-wise Growth Rate of Manufacturing Industries in Number of Factories, FixedCapital, Total Persons Engaged, Output and Net Value Added (1981-82 to 2014-15)

Growth rate (Per Cent)					
State	Number of Factories	Fixed Capital	Total Persons Engaged	Value of Output	Net Value Added
Assam	1.80*	6.96*	1.19*	8.21*	5.68*
Manipur	2.94*	4.27*	4.02*	9.70*	6.40*
Meghalaya	4.26*	7.14*	2.43*	14.02*	11.96*
Nagaland#	1.14	(-).0.82	(-).1.34*	4.43*	5.96*
Sikkim@	3.71*	15.59*	15.87*	12.86*	10.44*
Tripura	2.07*	4.67*	2.69*	9.27*	8.92*
NER!	2.09*	7.22*	1.60*	8.69*	7.05*

Source: Same as Table 2.

Note: * indicates significance at 5 per cent level, # indicates growth rate from 1989-90 to 2014-15, @ indicates growth rate from 2009-10 to 2014-15, NER! includes Arunachal Pradesh for 2014-15.

of number of factories, value of output and net value added. States with comparatively low initial figures, such as Manipur, Meghalaya and Tripura experienced growth rates higher than the regional average and that of Assam in terms of employment and output. The high growth rate of Meghalaya in terms of number of factories, output and net value added is also undeniably due to the low initial figures recorded by it as compared to Assam, for which the initial figures of the variables under study were distinctly high. Strategic location of Meghalaya, particularly the Byrnihat-Guwahati belt that provides ease of road and rail connectivity, availability of low cost electricity in the state has helped in attracting investments to Meghalaya and in turn leading to the high growth rate. The subsidies and tax exemptions offered under the industrial policies, low power tariff and easy access to power have attracted power intensive industries which accounts for a large share of the total energy sale by the state (Umdor, 2016). High growth of manufacturing industries of Sikkim has largely been brought about by the concerted efforts of the Government of Sikkim in addition to the GoI schemes.

Impact of NEIP 1997 and NEIIPP 2007

To analyse the impact of NEIP 1997 and NEIIPP 2007, the study period has been divided into three sub-periods, as mentioned in the previous sections. The growth rates have been estimated for each of the three sub-periods by using a two-kink Exponential Model. The state-wise growth rates of manufacturing sector for the three sub-periods are presented in Table 4.

Prior to implementation of NEIP 1997 (1981-82 to 1997-98), the performance of the region and the constituent states in the region in terms of growth in number of

factories was dismally low, barring Nagaland (17.39 per cent) which was followed distantly by Manipur (3.43 per cent), and these were in fact the only states in which growth was positive during this period. The employment situation was not satisfactory either- employment growth was marginal in the region and in most of the states and in Meghalaya and Tripura growth rates were negative. When it comes to growth in terms of the other three variables viz. fixed capital, output and net value added, the regional growth rates were fairly good. Manipur and Nagaland were the best performing states in the region registering growth rates higher than the regional averages for most variables, whereas Meghalaya with its growth rates lower than the regional averages was the worst performing state during the period. However, the results for Nagaland should be read with caution because of the under-reporting of data in the initial years prior to 1989-90, which could have partly resulted in the high growth rate of the state in the subsequent years of the first sub-period.

In the second sub-period i.e. the period of implementation of NEIP 1997, the regional growth rates have improved for all the variables under study except fixed capital which showed a marginal decline. Highest growth rate in number of factories was recorded by Meghalaya whereas Nagaland registered a negative growth, in sharp contrast to the first sub-period in which growth rate of Meghalaya was negative and Nagaland was the highest. Manipur also registered a decrease in its growth rate during this period. A striking result was observed in case of Manipur and Meghalaya during the first two sub periods. Growth rates of fixed capital and output was highest in Manipur and lowest in Meghalay during the first period under reference. During the second period, there was a reversal of the growth rates and Meghalaya registered the highest growth while Manipur registered the lowest growth. Tripura recorded significant growth in employment, whereas there was a decrease in respect of Assam and Nagaland. Growth in net value added was palpably visible in most of the states except Manipur and Nagaland. The increase in growth rates was marked in the states of Meghalaya and Tripura, while there was deterioration in case of Manipur and Nagaland during the period.

During the third sub-period (period of implementation of NEIIPP 2007), regional growth rates for number of factories, fixed capital, employment and net value added showed an improvement. However, there was a slowdown in regional growth rate for output during the period. Nevertheless, Manipur showed marked improvement during the period in respect of all the variables under study compared to its dismal performance in the second sub-period, thereby registering the highest growth rates among the states for all the variables studied. Except Meghalaya other states in the region witnessed growth in number of factories during the period. There was a surge in the growth rate of fixed capital in all the states except Assam for which the growth rate declined. In respect of employment, growth rate of Tripura which was the highest in the second sub-period declined, whereas

growth improved in other states particularly Manipur and Meghalaya. There was an increase in the growth rates of output and net value added in Manipur and Nagaland which were lagging behind in the second sub-period, whereas well-performing states like Meghalaya and Tripura recorded a significant decline during the third sub-period. This decline in growth rate in the third sub-period could be attributed to the withdrawal of certain industries like petroleum oil or gas refineries, tobacco and manufactured tobacco substitutes, pan masala, etc. from the benefit of NEIIPP 2007. Net value added was high in states having oil, and gas or mining industries like Assam, Meghalaya and Tripura (Sachdeva, 1998), and the withdrawal of these industries from the benefit of NEIIPP 2007 could have been one of the reasons for this decline in growth of net value added.

The introduction of NEIP 1997 has bolstered the growth of manufacturing industries in the region, and its impact was felt most in terms of growth in output which more than doubled. This is also true for the states which registered a significant growth in output, except Manipur and Nagaland which registered a decline in growth of output as well as net value added after implementation of the policy. NEIP 1997 also resulted in increase in growth of number of factories, employment and net value added in the region. However, the policy did not seem to have much positive impact on growth of fixed capital. The period following the implementation of NEIIPP 2007, growth of fixed capital in the region gained momentum, and growth in number of factories, employment and net value added showed a continuous increase. On the other hand, growth of value of output in the region took a downward turn. Overall, the impact of NEIP 2007 was felt mostly in Meghalaya particularly in case of output and net value added, whereas the impact of NEIIPP 2007 was more pronounced in the state of Manipur.

Conclusion

When it comes to industrial development, NER has always been lagging behind in comparison with the rest of India. The manufacturing sector of the region has not shown much progress over the years accounting for a relatively low percentage share in the GSDP, which has in fact deteriorated for most states. The manufacturing sector of Sikkim, however, has shown a marked improvement towards the end of the study period. As observed from the study, inter-state differences within the region in levels of industrialisation are conspicuous, with Assam accounting for a major chunk in terms of all the variables under consideration largely on account of its geographical size, population and better connectivity. But an interesting observation here is that even though the dominance of Assam in the region is prominent, the shares of manufacturing sectors of other states have picked up over the years as seen from the foregoing analysis. This is a clear indication of the growing spread of industries across various states in the region which in turn heralds a more balanced industrial development in the region.

Table 4: State-wise Growth Rate of Manufacturing Industries in Number of Factories, Fixed Capital, Total Persons Engaged, Output and Net Value Added During Pre and Post NEIP 1997 and NEIHP 2007

	Assam	Manipur	Meghalaya	Tripura	Nagaland	Sikkim	Arunachal Pradesh	Total NER
Number of Factories								
1981-82	1,851 (82.9)	53 (2.4)	47 (2.1)	281 (12.6)	NR	NR	NR	2,232
1997-98	1,861 (77.9)	77 (3.2)	43 (1.8)	243 (10.2)	165 (6.9)	NR	NR	2,389
2014-15	3,717 (75.5)	160 (3.3)	109 (2.2)	548 (11.1)	197 (4.0)	67 (1.4)	124 (2.5)	4,922
Fixed Capital (Rs. Lakh)								
1981-82	27,048 (75.3)	262 (0.7)	7,661 (21.3)	966 (2.7)	NR	NR	NR	35,937
1997-98	425,482 (83.9)	15,027 (3.0)	27,251 (5.4)	26,141 (5.2)	13,468 (2.7)	NR	NR	507,369
2014-15	1,616,940 (72.6)	11,374 (0.5)	350,312 (15.7)	32,428 (1.5)	20,029 (0.9)	176,248 (7.9)	19,175 (0.9)	2,226,506
Total Persons Engaged								
1981-82	121,633 (82.2)	6,141 (4.1)	6,071 (4.1)	14,170 (9.6)	NR	NR	NR	148,015
1997-98	154,909 (86.3)	4,440 (2.5)	6,550 (3.7)	8,659 (4.8)	4,856 (2.7)	NR	NR	179,414
2014-15	195,567 (72.6)	7,591 (2.8)	14,339 (5.3)	28,871 (10.7)	5,519 (2.0)	13,675 (5.1)	3,684 (1.4)	269,246
Value of Output (Rs. Lakh)								
1981-82	71,661 (94.2)	499 (0.7)	2,394 (3.1)	1,520 (2.0)	NR	NR	NR	76,074
1997-98	751,290 (87.3)	21,397 (2.5)	22,435 (2.6)	32,759 (3.8)	32,383 (3.8)	NR	NR	860,264
2014-15	6,176,083 (79.4)	37,736 (0.5)	431,852 (5.6)	151,764 (2.0)	44,889 (0.6)	802,006 (10.3)	134,873 (1.7)	7,779,203
Net Value Added (Rs. Lakh)								
1981-82	13,994 (90.8)	303 (2.0)	736 (4.8)	387 (2.5)	NR	NR	NR	15,420
1997-98	126,751 (80.0)	9,301 (5.9)	9,182 (5.8)	10,559 (6.7)	2,693 (1.7)	NR	NR	158,486
2014-15	818,933 (57.5)	6,976 (0.5)	62,697 (4.4)	47,161 (3.3)	12,225 (0.9)	442,439 (31.1)	33,964 (2.4)	1,424,395

Source: Same as Table 2.

Note: * indicates significance at 5 per cent level, # indicates growth rate from 1989-90.

The region as a whole and the constituent states except Nagaland recorded a positive growth for all the variables under study. There are but variations with growth rate being sluggish for some and significant for some other variables under study. However, growth has been uneven across the states. Meghalaya and Sikkim lead the region with respect to the variables under consideration. The manufacturing sector of NER is apparently more capital-intensive rather than labour-intensive, exhibiting a low level of employment creation over the years.

It has been observed that with the introduction of NEIP in 1997, the industrial sluggishness in the region started to ameliorate. The various concessions and incentives offered by the policy paved the way to increased growth of industries in the region, as revealed by the different indicators particularly the value of output. The introduction of NEIIPP 2007 has also led to an expansion in growth of number of factories, fixed capital, employment and net value added in the region, although there was a slowdown in growth of output. It has been observed that barring a few states in respect of some of the variables, the implementation of the policies have resulted in the growth of number of factories, fixed capital, employment, value of output and net value added in the region. Nonetheless, the increase in growth rates of fixed capital, output and net value added without adequate growth in number of factories and employment over the years is an issue which needs to be dealt with.

Overall, the industrial policies for NER implemented by the GoI to promote industrial development have given a boost to the growth of manufacturing industries in NER. However, this increase in industrial activities supported by the special incentives under GoI policies have not led to a major structural change in the economy of the region in so far as augmenting the contribution of manufacturing sector to GSDP of states in the region, which still lags far behind the all-India average, not to mention the industrially developed states.

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