Industrial Development and Regional Disparities in Andhra Pradesh (Pre and Post Economic Reforms)

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Abstract

The objective of the present study is to analyse whether inter-regional disparities in industrial activity increased during the last two decades in Andhra Pradesh. Further, the study makes an attempt to focus on the pattern of disparities in the post-reform period in the three regions (Coastal Andhra (CA), Telangana, Rayalaseema). In all the three regions the District Domestic Product (DDP) from industry registered an increase in the post-reform period with the increase being the highest in Rayalaseema. However, we observe that the registered manufacturing accounted for a negative growth rate in Rayalaseema in the post-reform period as compared to the pre-reform period. The analyses of the structural ratios across the three regions reveal that the capital-output ratio performed better in Telangana in post-reform period when compared to the other two regions. Labour productivity increased in all the three regions in the post-reform period and the increase is the highest in Coastal Andhra.

Industrial base of Coastal Andhra is comparatively wide consisting of 8 out of 12 industries having location quotient more than one. Telangana comes next with 6 industry group having a higher than one location quotient. Rayalaseema has the narrowest industrial base with only 3 product groups having a location quotient greater than one. Further, Rayalaseema has the lowest specialization coefficient for almost all the product groups excepting manufacture of tobacco products and manufacture of non-metallic mineral products.

1. Introduction

1.1 Backward linkages created from autonomous industrialization lead to the growth of markets for the primary products of the region. A more obvious improvement from this process comes in the direction of infrastructure. As industrialization absorbs primarily local labour, it is likely to reduce disguised unemployment in agriculture and increase agricultural productivity. These and similar arguments urge that industrialization should be considered as an 'opportunity' for the development of the regional economy. Attempts to explain regional growth patterns analytically have always recognized both the potential contribution of international trade

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theory and its inadequacies. The implications of conventional trade theories applied to regional development are that there would be continual pressures for equalization of regional product prices and factor incomes. However, it has also been recognized that a substantial amount of time might be required for this theoretical prediction to work out (Chakravarty et al.2009).

1.2 According to dominant theory of modern economic development, industry is expected to play a major role in creating as well as mitigating disparities among different regions. Industry is seen as the main engine of growth (Kaldor, 1967) and industrial development is subject to cumulative causation to a larger degree than development of other sectors (Myrdal, 1957). Industrial development, and consequently overall economic development of different regions, according to the typical conventional theory of regional development, is expected to take a path that finally leads to a convergence (See Barro and Sala-i-Martin, 1992 and 1995). To begin with, industrial development takes place as a result of developed infrastructure, agglomeration and linkages, but subsequently, when diminishing returns set in-in the more industrialized regions-it shifts to less developed regions. Since diminishing returns set in agriculture much earlier, due to land being fixed in nature and because of limits to technological progress, it is industry with extension of increasing returns for a logically long period of time, that plays the leveling role once the process of its development starts in the poorer regions. The historical experience of development, as a result, has revealed what is called "inverted U-shaped" behaviour of disparities in the long period development (Williamson, 1965; Barro and Sala-I-Martin, 1990; Kuznets, 1955). In a way, this represents the spatial version of Kuznets Hypothesis on income inequality.

1.3 Quite contrary to the convergence hypothesis there is an equally strong outlook that puts forward increasing divergence because of technology and agglomeration externalities which make increasing returns possible over long periods. Different regions situated differently in terms of initial levels and capacities for development are thus subjected to cumulative causation. They not only grow differentially due to internal factors, but differences get reinforced through interaction among them through the mechanism of "back-wash effects" (Myrdal, 1957; Hirschman, 1958; Kaldor, 1967). Differences arise and get perpetuated often by what are called the 'core-periphery' and 'dependency' relationships that apply

both internationally and inter regionally (Baron, 1957). Technological change, new forms of organization and transaction costs are also seen by some, specially the post-Fordist scholars, as factors leading to widening of disparities (Piore and Sebel, 1984).

1.4 While Myrdal (1957) refers to the forces of convergence and of divergence as spread and backwash effects, Hirschman (1961) describes these broadly as trickling-down and polarization effects respectively. Scrutinizing regional economic literature, one comes across at least three different hypotheses in this regard and these differ on the emphasis given to the relative importance over time of the forces of convergence and of divergence. One of these is the self-perpetuation hypothesis propounded by Hughes (1961) and found empirically valid by Booth (1964) for the USA. According to this view, the forces of divergence dominate over those of convergence and as a result, inter-regional differences in the levels of economic development keep on widening over time. A completely opposite view is the convergence hypothesis propounded and found empirically valid by Hanna (1959) and substantiated these days also with the Solovian logic that the rate of economic growth is inversely related to the level of per capita income and hence given identical technologies, preferences and rates of population growth, cotemporaneous differences in per capita incomes between any two regions will be transitory. Considerable evidence to support the hypothesis empirically has been provided by Hanna (1959), Perloff et al (1960) and more recently by Sala-i- Martin (1996) .The third hypothesis, which is a combination of these two diametrically opposite views is the concentration cycle hypothesis propounded by Williamson (1965). The proponents of this view show that inter-regional economic differentials diverge initially to converge later on and thus trace out the famous Kuznetsian inverted U shaped curve over time in the process of national economic development. Considerable empirical evidence in support of such a view emerged as a result of a detailed international study of regional development experiences by Williamson (1965). A new and suitable point that is being given importance in this regard by many including Nair (1982) is that the pattern of regional change depends upon the indicator of development being considered, with different indicators demonstrating different patterns of regional change.

1.5 What then has been the experience in Andhra Pradesh? Have inter-regional disparities in industrial activity increased or declined especially since early 1990s when economic reforms were introduced and the state adopted the path of globalisation? There is a view that post- reform regional development is likely to be more evenly balanced" (Elizondo and Krugman, 1992), as a "free flow of goods, services and factors of production" would have strengthened spread affects thus reducing inter-regional disparities (Dholakia, 2009). A study using ASI data has, however, found that the new investments are spatially more concentrated in the post-reform than in the pre-reform period (Chakravorty and Lall, 2007). It is, therefore, interesting to study the pattern of disparities in the post-reform period when most of the interventionist measures have been removed in comparison with the pre-reform period when they were in place.

1.6 Broadly, the study seeks to answer the following questions:

- How is industry distributed across the different regions of AP? What changes have taken place in the share of industries in different regions over the years?
- What has been the performance of different regions in the growth of industry during the study period?
- How does the structure of industries - agro-based and non-agro based differ among regions? Have there been significant changes in recent years? What explains the structural variations in industry among regions?
- How do technical ratios like output-labour, capital-output and capital-labour differ among regions? Have there been changes in relative position of different regions in these ratios?
- How do the location quotients and specialization coefficients differ among regions?

1.7 Andhra Pradesh is divided into three regions on the basis of cultural, socio-economic and region specific resource base: Coastal Andhra (CA), Telangana (TEL) and Rayalaseema (RS) (CESS, 2008). In this paper, we primarily stick to this standard regional classification. We bring in the issue of the state as a whole mainly to contrast different regions in the context of AP.

1.8 This paper is organized in six sections. The next section deals with issues related to data. This is followed by a detailed discussion of industrial development as a whole, along with the service sector, in Telangana, Coastal Andhra and Rayalaseema. We bring out some contrasts between the development of the service sector and the performance of industry in different regions of AP. As registered manufacturing plays the most important role within the industrial sector, the fourth section is devoted to an analysis of the features of this sector in the three regions of AP. Section five looks at the performance of the agro-based and non-agro based sectors of the registered manufacturing sector. The overall features of the state will be used as a meaningful benchmark for all the three sections dealing with hard facts. The last section provides the conclusions.

2. Data and Methodology

2.1 In order to capture the regional performance of the industrial sector in AP we have to look mainly at two crucial variables relating to this sector, employment and output. The industrial sector comprises mining, manufacturing, electricity, gas and construction. The National Accounts Statistics (NAS) published by the Central Statistical Organization (CSO) provide time series data for gross state domestic product (GSDP) in terms of broad industrial classifications at the single digit level. From this source it is easy to get the industrial output figures at the state level.

2.2 The period for analysis chosen for SDP in this study is 1980-81 to 2010-11. For District Domestic Product (DDP), period of study is from 1993-94 to 2006-07, as this data is available from 1993-94 onwards. In this paper we make an attempt to understand the regional dimension of industrial development in AP in the perspective of the foremost changes in macroeconomic policy regime of the country. Consequently, we work with two periods: the initial phase of liberalization/pre-economic reform from 1980-81 to 1992-93 and the later phase of liberalization/post-economic reform from 1993-94 to 2010-11 with 1999-2000 as base: we expect to capture changes through relevant comparisons. Considering the significance of the manufacturing sector within the industrial sector in general and registered manufacturing in particular, we decided to narrow down our focus. Another vital reason behind this decision is the availability of a rich data set for the registered manufacturing sector provided by the Annual Survey of Industries (ASI) published by the CSO. Annual Survey of Industry

(ASI) provides fairly detailed information regarding output, employment, capital formation, wages etc for the factory sector of manufacturing every year. 2008-09 is the latest year for which data are available for the districts of Andhra Pradesh. The wholesale price index numbers with 1981-82 as base for the first period and with 1993-94 as base for the second period are used for deflating the net value added (NVA) and the emoluments. We have deflated the fixed capital figures by a composite index of electrical and non-electrical machinery.

2.3 A close look at the performance of NVA and employment of agro and non-agro based industries reveals which industries play a major role in a particular region. Location quotients and specialization coefficients help in identifying whether a particular industry group is concentrated in one region or not. This is arrived at by examining the pattern of NVA and employment created by different industry product groups in different regions for the latest year for which data are available.

2.4 An attempt is also made to find out the industrial base of the region by making use of the location quotients and specialization coefficients. The location coefficient is calculated by subtracting for each region the percentage employment share of the industry in question from the total regional employment share. It varies between zero and one. Coefficient of Specialization is calculated just like the coefficient of localization, except that regions become industries and industries become regions. When the value of this coefficient is zero, then the industrial structure of the region is exactly similarly diversified as that of the state as a whole. If it is one, then that region has one industry which is present in that region only. In between, values of coefficient show the degrees of specialization of regions in relation to the industrial structure of the state.

3. Industrial Development in Andhra Pradesh

3.1 This section aims at giving a broad sketch of the production performance of the industrial sector in AP. Here, we look at the performances during 1980-81 to 2010-11 of the manufacturing sector, both registered and unregistered, and of the service sector in some detail. This is sub-divided into two periods - i.e., 1980-81 to 1992-93 (pre-reform) and 1993-94 to 2010-11(post-reform).

3.2 Sectoral trend growth rates of SDP are given in Table 3.1. The growth rates are calculated by fitting the semi-log equations. It may be seen that |in AP, the growth rate of industry in SDP registered an increase of nearly 0.4 percentage points while that of the manufacturing sector declined by around 2.5 percentage points during post-economic reform period when compared to the pre-reform period. Within the manufacturing sector, the growth rate of both registered and unregistered sectors in the state domestic product decreased with the decline being the highest for the registered manufacturing again in the post-reform period. Thus, at the state level, the manufacturing sector which is the driving force of an economy has not performed well in the post-reform period.

3.3 What is the scenario at the district level? Since data are available at the district level only from 1993-94 onwards, the percentage shares of industry, manufacturing and service sectors in DDP are analyzed for two points of time: in the early 1990s (1993-94) and in the mid- 2000s (2006-07). Average annual growth rates are analyzed for two periods - 1993-94 to 1998-99 and 1999-2000 to 2006-07.

3.4 If we look at the state as a whole, there is an increase (13 percentage points) in the share of industry in SDP in 2006-07 over 1993-94, while the share of the manufacturing sector in SDP remained more or less the same in 2006-07 when compared to 1993-94 (Table 3.2). The increase in the share of industries in SDP in 2006-07 compared to 1993-94 can be attributed to the increase in the mining and construction activity in the state. Within the manufacturing sector, at the state level, share of registered sector increased while that of the unregistered sector in SDP declined in 2006-07 as compared to 1993-94 (Table 3.3). On the other hand, the share of services in SDP registered an increase of nearly 15 percentage points in mid-2000s over the early nineties.

3.5 Across the regions of the state, share of the manufacturing sector (registered and unregistered) in SDP declined in 2006-07 vis-à-vis 1993-94 in Telnagana and Rayalaseema (Table 3.3) and share of service sector in SDP increased in all the three regions (Table 3.2) in 2006-07 over 1993 -94 (Table 3.2).

3.6 We now take a look at the average annual growth rates of industry, manufacturing and services in total domestic product in regions and the state as a whole.

3.7 The average annual growth rates of industry and manufacturing in SDP increased in CA while it registered a negative growth rate in Rayalaseema in the post-economic reform period. The average annual growth rate of industry in SDP increased by more than double in Rayalaseema, while that of the manufacturing sector accounted for a negative growth rate (-2.0) in the same period. The increase in the growth rate of industry in SDP in this region during the post-economic reform period is because of the increase in the mining activity in Kadapa district especially during the period 2005-07 (Table 3.4). For the manufacturing sector, data clearly shows that except Rayalaseema, in the other two regions, average annual growth rates of registered manufacturing sector in DDP increased in the second period over the first period (Table 3.5).

3.8 Rayalaseema has seen the slowest transformation of the economy. Over a period of time, the contribution of industry, manufacturing and the services sector to the total domestic product registered a decline. Its growth rate, especially that of the manufacturing sector has been the lowest in fact it has been negative (-2.0).

4. The registered manufacturing sector

4.1 The analysis of the growth rates in the previous section shows that the structural transformation has not been in favor of the manufacturing sector at the state level. It is in this context, it becomes crucial to look at the performance of the registered manufacturing sector. The period chosen for analysis is 1980-81 to 2008-09. 2008-09 is the latest year for which the Annual Survey of Industries (ASI) data are available at the district level. 1980-81 to 1992-93 is taken as the initial phase of liberalization and 1993-94 to 2008-09 as the later phase of liberalization. Structural ratios like per worker productivity (O/L), capital output ratio (K/O) and capital intensity (K/L) are analyzed to look at the performance of the registered manufacturing sector.

4.2 Table 4.1 clearly shows the dominance of registered manufacturing in the total manufacturing output of the state, regions. Based on the percentage share of registered manufacturing at two points of time 1993-94 and 2008-09, we ranked the regions and the growth centres. While CA ranked third in total manufacturing in 1993-94, it moved to second position in 2008-09, Telangana moved from second to first position and Rayalaseema moved from first position in 1993-94 to third position in 2008-09 (Table 4.2).

4.3 A comparative investigation of the behavior of the critical structural ratios reveal that per-worker productivity/labour productivity (O/L) of the registered manufacturing sector remained constant at 0.1 during the pre-economic reform period and it increased in all the three regions and the state as whole during the post-reform period. The increase in labour productivity is the highest in Coastal Andhra (from 0.1 in pre-reform period to 0.7 in post-reform period) (Table 4.3).

4.4 The case of capital output ratio (K/O) reveals that it registered a decline in Telangana in the post-reform period as compared to the pre-reform period. On the basis of this evidence we can say that in Coastal Andhra and Rayalaseema more of capital has been used to produce a unit of output in the post-reform period compared to pre-reform period. The reason for this could be that capital innovations on balance served more to replace other factor inputs rather than the output (Table 4.3).

4.5 Does technological variation explain the above mentioned inter-regional differences in labour productivity of registered manufacturing sector? Taking capital intensity, measured in terms of capital per worker as the indicator of technology, we attempt to examine this question.

4.6 It is a well-known fact that different industries use different levels of technology in production. Simultaneously, it could also be reasonably assumed that a high technology industry would be so, irrespective of its location in one region or the other. Nevertheless, there could be differences from region to region due to, firstly, the factors within the same product growth that a region specializes in production, and secondly, perhaps because of the choice of technology - capital intensive vs. labour - that the entrepreneur may decide to adopt depending on the labour market situation. Thus regions with high capital intensity accounted for an increase in labour productivity in the post-reform period. Coastal Andhra is a case in point to illustrate the above explanation (Table 4.4).

5. Agro-based and Non-agro based industries

5.1 Since registered segment now comprises of a considerably large part of total manufacturing in the state (accounting for 71 per cent) and also a huge part of the unregistered sector is found to be linked with the registered sector, it would be significant at this juncture to go into some added

particulars as regards the product structure of this sector. This is taken care here in respect of two features of the product groups. In the first case, we try to broadly classify industries into two groups-agro-based and non agro-based, the former consisting of product group 15 to 25 and later 26 to 37, according to the National Industrial Classification (NIC) 1998. Subsequently, we have tried to identify major product groups (at 2-digit level) of different regions and growth centres in order to examine industrial diversification and specialization across the regions. We make use of the location quotients and coefficients of specialization/diversification to further sharpen our analysis.

5.2 Agro-based products have always dominated the Indian as well as the state's manufacturing industry in terms of employment, employing majority of workers working in the sector. Around 61 percent of the workers are employed in agro-based industries in 2008-09 at the state level. Though the shares of employment declined in 2008-09 when compared to 1982-83 in CA, Telangana and RS, we still observe that the major chunk of employment is created by agro-based industries. Rayalaseema witnessed a huge decline in the share of workers in 2008-09; it declined by almost half compared to 1982-83 in 2008-09 compared to 1982-83 (Table 5.1).

5.3 When we take a close look at the NVA of the agro-based industries |t the state level, we find that their share in gross value added in manufacturing has, however, declined to less than half in 2008-09 compared to 1982-83. Share of NVA of agro-based industries declined in all the three regions in 2008-09 compared to 1982-83 and the decline is highest in Rayalaseema where the share declined by nearly 18 percentage points (Table 5.1). In aggregate, we can conclude that agro-based industries contribute less to gross value added (25 percent) than to employment (61 percent) in 2008-09 compared to 1982-83 reflecting lower productivity.

5.4 In case of non agro-based industries, Rayalaseema stood first amongst the regions in the share of number of workers in 2008-09, while Rangareddy topped within the growth centres in the same year. Interestingly, Rayalaseema has the highest share of NVA in 2008-09 and it increased by almost two and a half times when compared to 1982-83 (Table 5.2).

5.5 Inter-Regional Differences in Structure and Specialization: Top 5 industries

5.5.1 Just like the case of the composition of manufacturing industry in terms of agro-based and non agro-based groups, industrial structure of regions differs in terms of product groups at more disaggregated (2-digit) level. We look here at the top five industry groups with regard to their contribution to employment in registered manufacturing in Andhra Pradesh to see to what degree the product groups featuring in this group differ from region to region. We also work out to see the degree of specialization or diversification of the manufacturing sector in the state, as represented by the percentage of employment asserted by the five top industries. We carried out this analysis for the year 2008-09.

5.5.2 The regions show diverse patterns in employment as far as the largest product group is concerned. At the state level, manufacture of food products and beverages (15), manufacture of tobacco (16) and manufacture of non-metallic mineral products account (26) account for a major share of employment. Out of these product groups, as high as 76 percent of employment comes from the manufacture of food products and beverages, followed by non-metallic and mineral products (around 63 percent). In CA, food products and beverages account for around 41 percent of employment. In Telangana, 42 percent of registered manufacturing sector employment is provided by the manufacture of tobacco products. Non-metallic mineral products contribute nearly 44 percent of employment in Rayalaseema. Industries with significant domination though with smaller proportion of total employment are non-metallic mineral products in CA (11 percent) and in Telangana (7.7 percent) (Table 5.3).

5.5.3 The above features advocate a high degree of specialization in the product structure of the three regions. The same is also revealed by the high proportion of total employment accounted for by the largest five industry groups. Among the three regions, Rayalaseema had over 75 percent of their registered manufacturing employment concentrated in top five groups - (i) manufacture of food products and beverages, (ii) manufacture of tobacco and tobacco products (iii) manufacture of basic metals (iv) manufacture of chemicals (v) manufacture of non-metallic mineral products. CA comes close to Rayalaseema with 67 percent and Telangana with 66 percent of the employment. As such no region shows diversified industrial employment

structure. Interestingly, the largest group which accounted for similar share in total employment in registered manufacturing in the state is food products.

5.6 Industrial Base and Specialization

5.6.1 Industrial base of a state has been identified in terms of the group of industries which claim a higher share in the region's industrial structure than in the industrial structure of the state as a whole and is measured by location quotients of individual industries. Location quotient is one for an industry if its share in the region is the same as in the state, is less than one if this share is lower and more than one if it is higher than in Andhra Pradesh. Industries having quotient value of one or higher are considered to constitute the industrial base of the state/region or growth centre.

5.6.2 At this juncture, it must be noted that the location quotients measure industrial base of a region only relative to the industrial structure of the state. Those industries which have a higher share in the region does than in the state's industrial structure constitute this base and these industries need not necessarily be the largest in the region. Location quotient, in fact, reflects the region's relative specialization vis-à-vis the industrial structure of the state and is acknowledged in terms of value of the quotients, and defines industrial base in a relative and not in absolute sense. In other words, it also means that more industrialized regions would have a wider industrial base in terms of having a larger number of industries with value of location quotients higher than one.

5.6.3 Industrial base of Coastal Andhra is comparatively wide consisting of 8 out of 12 industries having location quotient more than one. Telangana comes next with 6 industry group having a higher than one location quotient. Rayalaseema has the narrowest industrial base with only 3 product groups having a location quotient greater than one (Table 5.4).

5.6.4 Let us now see how similar or different the industrial structure of a region is vis-à-vis that of the state as a whole. To arrive at this, shares of different industries in the total industrial employment in a region are compared with the corresponding shares at the state level. We make use of coefficient of specialization to sum up the differences between the two. When the value of this coefficient is zero, then the industrial structure of the region is exactly similarly diversified as that of the state as a whole. If

it is one, then that region has one industry which is present in that region only. In between, values of coefficient show the degrees of specialization of regions in relation to the industrial structure of the state.

5.6.5 When we consider specialization coefficient, we observe that Rayalaseema has the lowest specialization coefficient for almost all the product groups excepting manufacture of tobacco products and manufacture of non-metallic mineral products. Telangana has the highest specialization coefficient of 0.32 for manufacture of rubber and plastic products followed by a specialization coefficient of 0.26 for manufacture of tobacco. Interestingly, CA has specialization coefficients of 0.16 and 0.12 only for two product groups - manufacture of food products and beverages and manufacture of tobacco products. It is surprising to note that basic metals have a specialization coefficient of only 0.04 (Table 5.5). This implies that no forward linkages are taking place in CA despite the presence of the large scale Iron and Steel industry in Visakhapatnam.

6. Conclusions

6.1 Amidst various findings, as mentioned above, regions have performed differently in terms of growth of manufacturing industries and changes in their structure. It is quite clear from the analysis that there are regional inequalities. Even after a decade of economic reforms, we find that industrial activity is concentrated and divergent in few product groups; industrial base is narrow, high degree of specialization takes place only in five product groups, i) manufacture of food products and beverages, (ii) manufacture of tobacco and tobacco products (iii) manufacture of basic metals (iv) manufacture of chemicals (v) manufacture of non-metallic mineral products. Within the regions, Rayalaseema has the narrowest industrial base and also the lowest specialisation coefficient. Telangana has the highest specialization coefficient for manufacture of rubber and plastic products followed by manufacture of tobacco. CA has higher specialization coefficients for manufacture of food products and beverages and manufacture of tobacco products. In Rayalaseema, it is observed that the registered manufacturing accounts for a negative growth rate in the post-reform period while the growth rate of industry registered the highest increase during this period. The increase in the growth rate of industry in this region is due to the increase in the mining activity in Kadapa district during recent years. The shares of industry, manufacturing and services in DDP are highest in

Telangana in 2006-07 compared to 1993-94. Among the three regions, Coastal Andhra registered an increase in the growth rate of manufacturing sector in the post-reform period as compared to the pre-reform period. As far as the structural ratios are concerned, Telangana performed better in post-reform period in capital-output ratio, while, Coastal Andhra performed better in terms of labour productivity and capital intensity.

6.2 Overall it can be concluded that the regional inequalities in industrial activities have increased in the post-reform period when compared to the pre-reform period. Within the regions while Telangana, Coastal Andhra and Rayalaseema have performed reasonably well in industrial activities while the manufacturing and the registered manufacturing sector fared well in Coastal Andhra. Rayalaseema witnessed poor performance in the registered manufacturing activity in the post-reform period. The increase in the growth rates of SDP from industry both in CA and Telangana can be attributed to the increase in the construction activities while it is due to the increase in mining activity in Rayalaseema.

References

Baran, P. (1957), 'The Political Economy of Growth', New York, Monthly Review Press.

Barro, R.J. and X. Sala-i-Martin (1990), 'Economic Growth and Convergence across the United States', NBER Working Papers 3419, National Bureau of Economic Research, Inc.

____ (1992), 'Convergence', Journal of Political Economy, University of Chicago Press, Vol. 100, No. 2, Pp. 223-51.

____ (1995), Economic Growth, New York, McGraw Hill.

Chakravarty, Deepita (2003), 'Industry: Policy and Performance' in C H Hanumantha Rao and S. Mahendra Dev (eds.) Andhra Pradesh Development Economic reforms and the challenges ahead; Hyderabad: Centre for Economic and Social Studies.

Chakravorty, S. and S. Lall (2007), 'Made in India: The Economic Geography and Political Economy of Industrialization', Oxford University Press, New Delhi.

Dholakia, R H (1989), 'Regional Aspects of Industrialization in India', Economic and Political Weekly, Vol. XXIV, No.46.

Chakravarty Deepita and G. Alivelu (2009), 'Industrial Development in Andhra Pradesh: A Regional Perspective' in S. Mahendra Dev, C. Ravi and M. Venkatanarayana (eds.) Human Development in Andhra Pradesh - Experiences, Issues and Challenges, Centre for Economic and Social Studies, Hyderabad.

Elizondo, R.L. and P. Krugman (1992), 'Trade Policy and the Third World Metropolis', NBER Working Papers 4238, National Bureau of Economic Research, Inc.

Hanna, F.A (1959), 'State Income Differentials 1919-1954', Duke University Press, Durham.

Hirschman, Albert O. (1958), 'The Strategy of Economic Development', New Haven, Conn.: Yale University Press.

Hughes, R.B (1961), 'Inter-regional Income Differences: Self- Perpetuation', Southern Economic Journal,Vol 28, No 1, July, pp 41-45.

Kaldor, N. (1967), 'Strategic Factors in Economic Development', Ithaca, New York: Cornell University Press.

Kuznets, S. (1955), 'Economic Growth and Income Inequality', The American Economic Review, Vol. 45, No. 1, Pp. 1-28.

Myrdal, G. (1957), 'Economic Theory and Underdeveloped Regions', London: Duckworth.

Nair, K.R.G (1982), 'Regional Experience in a Developing Economy', Wiley- Eastern, New Delhi.

Nayyar, D (1994), 'Industrial Growth and Stagnation: The Debate in India', Oxford University Press, New Delhi.

Perloff, H.S, E.S. Dunn Jr, E.E.Lampard and R.F. Muth, (1960), 'Regions, Resources and Economic Growth, Resources for the Future', Johns Hopkins Press, Baltimore.

Piore, M.J. and C.F. Sebel (1984), 'The Second Industrial Divide: Possibilities for Prosperity', New York, Basic Books.

Sala-i-Martin (1996), 'Regional Cohesion: Evidence and Theories of Regional growth and Convergence', European Economic Review, Vol. 40, pp1325-1352.

Williamson, J G (1965), 'Regional inequality and the Process of national development', Economic Development and Cultural Change, 13 (2): 3-83.

Table 3.1 : Trend Rate of Growth of State Domestic Product from Industries and Services in AP during 1980-81 - 2010-11 (percent per annum) (1999-2000 prices)

Sector	1980-81 to 1992-93	1993-94 to 2010-11
Industry	6.9*	7.3*
	(0.004)	(0.003)
Manufacturing	8.3*	5.8*
	(0.005)	(0.002)
Registered Manufacturing	9.3*	6.0*
	(0.005)	(0.003)
Unregistered Manufacturing	6.1*	5.4*
	(0.005)	(0.003)
Services	7.2*	7.8*
	(0.002)	(0.001)

Note: Figures in parentheses indicate standard errors; * indicates 5% level of significance.
Source: National Accounts Statistics.

Table 3.2 : Percentage Shares of Industry, Manufacturing and Services in Total Domestic Product in Regions and AP 1993-94 and 2006-07 (1999-2000 prices)

Regions	Percentage shares in DDP (1993-94)			Percentage shares in DDP (2006-07)		
	Industry	Manuf.	Services	Industry	Manuf.	Services
Coastal Andhra	17.9	12.6	44.3	23.1	12.0	47.7
Telangana	16.1	16.5	37.4	28.0	13.0	53.7
Rayalaseema	26.2	17.0	53.4	24.0	7.8	46.2
AP	18.3	14.2	25.4	31.3	14.1	40.4

Source: State Domestic Product and District Domestic Product, AP, Several Years

Table 3.3 : Percentage Shares of Registered and Unregistered Manufacturing Sectors in Total Domestic Product in Regions and AP in 1993-94 and 2006-07 (1999-2000 prices)

Region	1993-94			2006-07		
	Manuf.	Registered	Unregistered	Manuf.	Registered	Unregistered
Coastal Andhra	12.6	7.8	4.8	12.0	8.2	3.8
Telangana	16.5	11.5	4.9	13.0	10.7	2.4
Rayalaseema	17.0	7.7	9.3	7.8	2.3	5.5
AP	14.2	8.7	5.4	14.1	10.0	4.1

Source: State Domestic Product and District Domestic Product, AP, Several Years

Table 3.4: Average Annual Growth Rates of Industry, Manufacturing and Services in Total Domestic Product in Regions and AP during 1993-94 to 2000-01 and 2001-02 to 2006-07 (percent) (1999-2000 prices)

Regions/DDP	1993-94 to 2000-01			2001-02 to 2006-07		
	Industry	Manuf.	Services	Industry	Manuf.	Services
Coastal Andhra	6.4	5.9	7.3	11.9	11.0	8.0
Telangana	6.1	5.5	7.7	9.8	8.5	10.2
Rayalaseema	6.2	4.8	6.4	17.8	(-)2.0	7.2
AP	6.1	5.1	7.5	11.5	7.7	9.4

Source: State Domestic Product and District Domestic Product, AP, Several Years

Table 3.5: Average Annual Growth Rates of Registered Manufacturing Sector in Total Domestic Product in Regions and AP during 1993-94 to 2000-01 and 2001-02 to 2006-07 (percent) (1999-2000 prices)

Regions	1993-94 to 2000-01		2001-02 to 2006-07	
	Manuf.	Registered	Manuf.	Registered
Coastal Andhra	5.9	6.7	11.0	12.8
Telangana	5.5	5.4	8.5	8.7
Rayalaseema	4.8	3.6	(-)2.0	0.1
AP	5.1	4.5	7.7	9.0

Source: State Domestic Product and District Domestic Product, AP, Several Years

Table 4.1: Percentage Share of Registered Manufacturing in Regions, 1993-94 and 2008-09

Regions	Percentage share of registered manufacturing	
	1993-94	2008-09
Coastal Andhra	61.9	68.5
Rayalaseema	45.5	30.0
Telangana	70.2	82.0
Andhra Pradesh	61.2	71.1

Source: Calculated from District Domestic Product, Andhra Pradesh

Table 4.2: Rank Orders of Regions in Manufacturing in 2008-09

Regions	Total manufacturing		Registered manufacturing		Unregistered manufacturing	
	1993-94	2008-09	1993-94	2008-09	1993-94	2008-09
Coastal Andhra	3	2	2	2	3	2
Telangana	2	1	1	1	2	3
Rayalaseema	1	3	3	3	1	1

Source: Own calculations based on DDP, AP (2008-09)

Table 4.3: Capital-Output Ratio and Labour Productivity (O/L) for Different Regions of AP - 1980-81 through 2008-09

Regions	K/O		O/L	
	Period I 1980-81 to 1992-93	Period II 1993-94 to 2008-09	Period I 1980-81 to 1992-93	Period II 1993-94 to 2008-09
Coastal Andhra	3.0	4.0	0.1	0.7
Rayalaseema	3.2	3.3	0.1	0.6
Telangana	2.3	1.8	0.1	0.5
Andhra Pradesh	2.5	2.5	0.1	0.5

Source: Calculations based on ASI data, various issues

Table 4.4: Capital-Labour Ratios for Different Regions 1980-81 Through 2008-09

Regions	Capital / Labour	
	Period I 1980-81 to 1992-93	Period II 1993-94 to 2008-09
Coastal Andhra	0.4	2.3
Rayalaseema	0.3	1.8
Telangana	0.3	0.7
Andhra Pradesh	0.3	1.2

Source: ASI, AP, various issues

Table 5.1: Share of Non Agro-based industries in registered manufacturing sector (number of workers and NVA)

Regions	No of workers				NVA			
	1982-83	1993-94	2000-01	2008-09	1982-83	1993-94	2000-01	2008-09
CA	82.53	64.80	65.32	63.33	49.07	45.27	47.56	27.96
Telangana	72.45	69.32	69.42	63.55	30.45	34.32	27.40	24.65
Rayalaseema	74.15	56.85	50.80	35.38	68.93	44.17	22.37	16.11
AP	76.61	67.00	67.14	61.17	38.98	38.95	34.31	25.28

Table 5.2: Share of Non Agro-based industries in registered manufacturing sector (number of workers and NVA)

Regions	No of workers				NVA			
	1982-83	1993-94	2000-01	2008-09	1982-83	1993-94	2000-01	2008-09
CA	17.47	35.20	36.68	36.67	50.53	54.73	52.44	72.04
Telangana	27.55	30.68	30.56	36.45	69.55	65.68	72.60	75.36
Rayalaseema	25.85	43.15	49.20	64.62	31.07	55.83	72.63	83.89
AP	23.38	33.00	32.86	38.83	61.02	61.04	65.69	74.72

Table 5.3: Share of Top five industries in terms of workers in registered manufacturing (2008-09)

Regions/Industry	15	16	24	26	27	Total of five
CA	41.05	4.58	1.04	11.22	9.63	67.52
Telangana	11.40	42.38	2.04	7.69	2.39	65.90
Rayalaseema	23.06	1.65	3.57	43.91	3.98	76.17
AP	75.51	48.61	6.65	62.82	16.00	41.92

Source: Calculations based on ASI data, AP, 2008-09

Table 5.4: Location Quotient of different product groups in different regions (2008-09)

Regions/Industry	15	16	17	20	21	24	25	26	27	28	29	35
CA	1.63	0.28	1.38	1.72	1.45	0.30	1.28	0.54	1.81	0.60	1.33	1.75
Telangana	0.45	2.62	0.67	1.21	1.31	1.69	0.64	0.37	0.45	1.89	1.38	0.77
Rayalaseema	0.92	0.10	0.96	0.08	0.24	1.02	1.08	2.10	0.75	0.51	0.29	0.49

Source: Calculations based on ASI data, AP, 2008-09

Table 5.5: Coefficient of specialization of different product groups in different regions (2008-09)

Regions/Industry	15	16	17	20	21	24	25	26	27	28	29	31	35
CA	0.16	0.12	0.04	0.00	0.01	0.02	0.01	0.10	0.04	0.01	0.01	0.00	0.01
Telangana	0.14	0.26	0.04	0.00	0.01	0.02	0.32	0.13	0.03	0.02	0.02	0.01	0.00
Rayalaseema	0.02	0.15	0.00	0.00	0.01	0.00	0.02	0.23	0.01	0.01	0.01	0.01	0.00

Source: Calculations based on ASI data, AP, 2008-09

Appendix 1
Classification at 2-digit level (NIC 1998)

15 Manufacture of Food Products and Beverages
16 Manufacture of Tobacco Products
17 Manufacture of Textiles
18 Manufacture of Wearing Apparel Dressing and Dyeing of Fur
19 Tanning and Dressing of Leather Manufacture of Luggage, Handbags, Saddler, Harness and Footwear
20 Manufacture of Wood and Products of Wood and Cork, Except Furniture, Manufacture of Articles of Straw and Plating Materials
21 Manufacture of Paper and Paper Products
22 Publishing, Printing and Reproduction of Recorded Media
23 Manufacture of Coke, Refined Petroleum Products and Nuclear Fuel
24 Manufacture of Chemicals and Products
25 Manufacture of Rubber and Plastic Products
26 Manufacture of Other Non-Metallic Mineral Products
27 Manufacture of Basic Metals
28 Manufacture of Fabricated Metal Products, Except Machinery and Equipments
29 Manufacture of Machinery and Equipments N.E.C
30 Manufacture of Office, Accounting and Computing Machinery
31 Manufacture of Electrical Machinery and Apparatus N.E.C.
32 Manufacture of Radio, Television and Communication Equipments and Apparatus
33 Manufacture of Medical, Precision and Optical Instruments, Watches and Clocks
34 Manufacture of Motor Vehicles, Trailers and Semi-Trailers
35 Manufacture of Other Transport Equipment
36 Manufacture of Furniture; Manufacturing N.E.C.
37 Recycling