

INDUSTRIAL GROWTH IN KERALA :
TRENDS AND EXPLANATIONS

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ABSTRACT

The study traces the trends in industrial growth against the backdrop of the overall economic growth in Kerala under the influence of the ongoing economic reforms and evaluates it against the performance of Karnataka, Tamilnadu and all-India. The analysis reveals that a phase of growth revival has set in the overall economy since the late eighties. Though the manufacturing industry has improved its growth performance over time, the growth rates recorded during the nineties are not higher than the corresponding figures for the eighties. The relatively low growth profile of the manufacturing industry, when the general economy is growing remarkably well, appears a riddle of the recent growth trends under the reform process in Kerala. It is argued that inadequate growth of investment has constrained the pace of modernisation of old units and establishment of new units based on 'state-of-art' technology needed for the survival and growth of industries in a globally competitive environment. The study suggests that the lack of a clear and pragmatic approach of the state in its response to the reform process and a positive attitude in its own policies for encouraging private investment makes Kerala a less investor friendly location for manufacturing industry. It underlines the need for a new vision and strategy, which could fully utilise Kerala's comparative advantage in human resources, and place greater emphasis on developing knowledge-based and service industries, for accelerating the growth of income and employment in industry.

JEL Classification: R11, O47

Key words: India, Kerala economy, industrial stagnation, manufacturing growth, economic reforms, service industry.

Introduction

Although Kerala is a small state-region in a large multi-regional economy its remarkable experience in development has received an enviously large space in the literature. This is not due to Kerala's achievement in economic growth but to wit, due to lack of it! A thought provoking finding¹ of a pioneering study on Kerala's development policy conducted more than two decades ago by the Centre for Development Studies stimulated studies on various issues on Kerala's development including the 'discovery' of the much acclaimed "Kerala model" of development. The central theme implicit in Kerala's experience and the "Kerala model", of development is the capability of a society with relatively low income to achieve high quality of living levels. This has been subjected to severe scrutiny and the debates and discussions are still alive in the literate². An important aspect of the debate has been the limit to development arising from the relatively poor growth rates in the productive sectors of the economy.

The critics of Kerala's experience and "Kerala model" of development have highlighted that the poor growth performance of commodity producing sectors like agriculture and industry has resulted in the slow down in the rate of growth in employment and income

generation within the state. It also has reduced the rate of growth in government revenue and thereby investment in economic sectors and expenditure on welfare programs. All these have tended to threaten the sustenance of the achievements already made in health, education and other human development spheres and the further efforts to improve the quality of life and capability of the people. Thus viewed, there is a development crisis in the state. And a view is gaining ground that the accelerated growth of industry is one of the effective ways of resolving the crisis.

In validating the relevance of this view, a number of intriguing questions come up for scrutiny. Has there, in fact, been a prolonged performance-crisis in the economy and its major commodity producing sectors? What factors have led to the performance crisis? What is the growth potential particularly, in the industrial sector? What should be the vision on the type, pattern and direction of industrial development in the state? On pragmatic consideration, answers to these questions have to be sought within the framework of the recent paradigm drift in the development policy of Central government. This paper is an attempt to review the recent growth trends in the industrial sector operating under the influence of the ongoing economic reforms to provide a perspective for seeking answers to some questions relating to Kerala's development.

As the theoretical literature³ gives stress on the upward shift of manufacturing in the process of economic development, the scope of our study is limited to the analysis of growth trends in income generation (value-added) by manufacturing activities in the industrial sector. The analysis is carried out in a comparative framework in the sense that growth trends in Kerala are traced over time and evaluated against the performance of neighbouring states (Karnataka and Tamilnadu) and all-India average.

The period of analysis is chosen in such a way that it would capture growth trends of the manufacturing industry operating under the policy framework of liberalisation and globalisation introduced since 1991. Indeed, there is a time lag in the reflection of the growth-effect of economic reforms and hence, the analysis ideally should cover the period after say, mid-nineties. However, that option is not open to us, as the period will be too short to avoid distorted estimates due to short-run fluctuations. The study period should also enable tracing the trend in industrial growth under the earlier policy of regulations for comparative purpose. Besides, the period should be long enough to indicate the secular trend to provide a perspective for assessing potential growth. Keeping all these considerations in view, we have selected a 17-year period from 1981-82 to 1997-98 dividing it into two sub-periods (phases) viz. (a) 1981-82 to 1990-91 and (b) 1991-92 to 1997-98 for the analysis. The choice of the terminal year is constrained by the fact that the relevant data with 1980-81 as the base year are not available beyond 1997-98.

The analysis of the growth behaviour of industrial income apparently seems to be a simple and straightforward issue. However, there is no unique way of examining the matter. For, there are different sources of data and hence there could be different rates of growth of the same phenomenon leading to somewhat different conclusions on the growth behaviour. The problem assumes complexity as different scholars use different types of growth rates varying from mean of year-to-year percentage changes to exponential growth rate. As our interest is on the secular behaviour, the preferred choice is on the annual growth rates estimated by fitting a semi-log ($\ln Y_t = a + bt + e$) trend⁴ for the total period. And for the sub-period growth rates we use a kinked exponential fit⁵ ($a+b1 (D1t+D2k) + b2 (D2t-D2k)+ et$). In cases where the problem of auto-correlation is present, we use the Cochrane-Orcutt method to make our results more robust.

The analysis is not confined to portray the macro profile of growth but it also traces growth trends at micro levels of 2-digit industry-groups. Thus, the study situates the relative growth trends in income generation by Kerala's manufacturing industry at macro as well as micro levels operating under the influence of the ongoing economic reforms.

MACRO LEVEL GROWTH TRENDS

The literature on economic growth has generally postulated a close correspondence between industrial growth and overall growth of an economy. A very recent cross-country analysis⁶ has established that industrial performance correlates with the overall performance of an economy and therefore is the key sector in explaining the sustainability of different regional patterns in overall productivity and employment growth. We, therefore, trace the growth profiles of income generation by manufacturing in Kerala against the backdrop of the trends in the state's overall economic growth.

Growth trends in net state domestic product (NSDP)

The analytical description of growth behaviour of the overall economy of Kerala is given by showing the trends in the net state domestic product (NSDP). A caveat needs to be added here. The estimates of net domestic product do not account for the income received from the emigrants' remittances and to that extent do not correctly reflect the actual economic position of the state-regions. This has serious implication in respect of Kerala, which receives substantial inflow of remittances from its emigrants working in other states and outside the country, especially in the Gulf countries. To get a realistic picture of the economic prosperity of Kerala, therefore, the estimates of NSDP have to be blown up by a factor representing the emigrants' remittances in each year. In the absence of reliable year-to-year estimates of emigrants' remittances to Kerala and the neighbouring states, we are forced to proceed the analysis on the

basis of the conventional NSDP estimates provided by the CSO despite their inherent limitation to reflect the actual economic status of the state-regions especially that of Kerala.

We have traced the comparative picture of the movement in the index of net domestic product at 1980-81 prices for Kerala and all-India in graph A. It is seen that Kerala has moved along with all-India on a stagnant path in the seventies. The all-India average picked up momentum in growth and moved up at a faster rate relative to Kerala since the mid-eighties. The acceleration in the growth movement in Kerala took place later. Incidentally, the movement trend in the net domestic product as depicted in the graph provides some empirical support to the a-priori division of the total period into two distinct phases with the break in 1991⁷. It also endorses the finding of earlier studies⁸ on economic stagnation in Kerala since the seventies.

Annual growth rates in NSDP in different periods are shown in table 1. The secular growth rate in net domestic product of Kerala has been far below the national average. However, the growth record of 6 per cent per annum in NSDP for the period since 1991-92 is an encouraging sign. There is clear evidence of growth revival in Kerala economy during the post-reforms era. It is also evident from the table that in terms of secular trend, Kerala has a low growth profile as compared to neighbouring states of Karnataka and Tamilnadu. However, its growth achievement since 1991-92 is comparable. This is a promising sign of Kerala's potential for economic growth under the liberalisation policy

The rate of growth in absolute value of net state domestic product has a limitation to measure the economic progress of a state-region, as it is not adjusted for the size of population. The growth behaviour in per capita income is a more appropriate criterion.

Table 1. Annual growth rates of Net Domestic Product

Period	Kerala	Karna- taka	Tamil nadu	All India
1971-2 to 1980-1	3.43	-	-	3.44
1981-2 to 1990-1	4.83	5.39	5.35	5.36
1991-2 to 1997-8	6.05	5.46	6.26	5.64
1971-2 to 1990-1	2.88	-	-	4.30
1981-2 to 1997-8	4.90	5.41	5.65	5.38

Note: All are statistically significant at 5 per cent level.

Source: Calculated using CSO data on National Accounts Statistics collected from EPW Research Foundation and RBI Handbook of Statistics.

Growth trends in per-capita income

Estimates of annual growth rates in per capita net domestic product (income) of Kerala are compared with the corresponding figures for Karnataka, Tamilnadu and all-India in table 2. The secular trend in the growth behaviour of Kerala is more or less same as that of all-India and neighbouring states. Kerala's economic progress measured in terms of growth in per-capita net state domestic product since 1991-92 is more impressive than that of neighbouring states and all-India average. However, it must be noted that even then in 1996-97 the level of real per capita income (at 1980-81 prices) in Kerala (Rs.2363) stands below that of Karnataka (Rs.2641), Tamilnadu (Rs.2880) and all-India (Rs.2761). Needless to say, the real picture may be more promising if the migrants' remittance is also accounted for in the estimates of per capita income in Kerala.

Table 2. Annual growth rates of per-capita Net Domestic Product

Period	Kerala	Karna- taka	Tamil nadu	All India
1981-2 to 1990-1	3.39	3.51	4.37	3.23
1991-2 to 1996-7	5.10	4.02	4.90	3.80
1981-2 to 1996-7	3.57	3.65	4.58	3.36

Notes and Source as in table 1

On the whole, the analysis of growth trends in net state domestic product indicates that the phase of stagnation is over and a phase of revival in economic growth has set in Kerala now⁹. In terms of a general conclusion, the post-reforms era is witnessing the revival of economic growth in Kerala. Here, an interesting question comes up. Which economic sectors have contributed relatively more towards the growth-revival of Kerala economy? To shed some light on this question, we examine growth rates of NSDP by economic activity.

Growth behaviour of NSDP by economic activity

For the analytical purpose in view, we have divided the state economy into three sectors, namely, (1) agriculture (2) industry and (3) services and estimated the annual growth rates recorded by each (see table 3). It may be noted here that construction activity is included in the service sector.

Table 3 Annual Growth rates in Net Domestic Product by economic activity

Period	Kerala			All India		
	Agriculture & allied	Industry	Service	Agriculture & allied	Industry	Service
1981-2 to 1990-1	3.67	4.55	4.35	3.21	6.71	6.38
1991-2 to 1996-7	5.86	5.04	7.91	3.17	6.85	6.47
1981-2 to 1996-7	4.45	4.52	5.53	3.29	6.77	6.64

Notes and Source as in table 1

It is seen that the service sector has recorded the highest average annual growth rate for the period since 1991-92. It is higher than the average for Karnataka and Tamilnadu also¹⁰. It stands to reason that the revival in economic growth in the nineties, as reflected in the growth rate of NSDP, is largely accounted by the service sector¹¹. It is seen that though the service sector is growing at a significant rate for all-India also, it is accompanied by a significant growth rate of industry.

The role of service sector in the growth of Kerala economy is further evident from the table 4 wherein we have decomposed the total growth rates into the contribution of individual sectors. This is accomplished using the methodology suggested by Chenery and Syrquin (1986)¹².

Table 4. Sectoral contribution to total NDP growth, Kerala

Period	Agriculture and allied	Industry	Services
1981-2 to 1990-1	31.87	17.43	50.70
1991-2 to 1996-7	29.27	11.68	59.05
1981-2 to 1996-7	31.32	14.30	54.38

Source as in table 1

It is observed that the contribution of service sector to total growth has increased significantly in the nineties. The contribution of industry is relatively marginal. It may be noted that the tertiary sector even when defined in the conventional way (i.e. excluding construction) occupies the largest share (45 per cent) in net domestic product in 1997-98 in Kerala. This is higher than the average (42 per cent) at all-India. In variance with the conventional growth theory, the tertiary (service) sector is expanding fast without the secondary sector (industry) achieving remarkable improvement in growth and size in Kerala.

Growth trends in manufacturing

Against the backdrop of the foregoing growth trends in the overall economy, we analyse the growth behaviour of Kerala's manufacturing sector. There are many ways of looking at growth trends in income generation by manufacturing in an Indian state. The easiest one is to look into the data on the manufacturing component of the net state domestic product. The secular trends in the movement of net domestic product by manufacture in Kerala and all-India are depicted in graph B. It is seen that the movement has been on a stagnant growth-path till the mid-eighties both in Kerala and all-India. In the case of all-India, we see acceleration in the movement thereafter. However, the acceleration has taken place only towards the close of the eighties in Kerala.

We have recorded annual growth rates in net domestic product by manufacture at 1980-81 prices in table.5. The emerging picture is one of stagnation in growth rate of the manufacturing sector in Kerala in the seventies. The growth performance has improved overtime though the nineties has not seen the growth rate significantly higher than what it was in the eighties. The strikingly disappointing trend is the fact that the growth rates have been below the all-India averages for all the periods under review.

Table 5. Annual Growth rates in Net Domestic Product by Manufacture

Period	Kerala	Karnataka	Tamilnadu	All India
1971-2 to 1980-1	2.77	-	-	4.37*
1981-2 to 1990-1	4.25*	15.1*	3.78*	6.52*
1991-2 to 1996-7	4.91*	12.31*	5.34*	7.15*
1981-2 to 1996-7	4.42*	14.4*	4.21 *	6.50*
1971-2 to 1996-7	3.78*	-	-	5.91*

Note: * indicates significance at 5 percent level.

Other notes and Source as in table 1

The table also gives a comparative picture of the growth trends in Kerala relative to Karnataka and Tamilnadu since 1981-82. It is observed that the secular growth trend of income generation in Kerala does not compare well with Karnataka though it matches with Tamilnadu. And, the growth rate recorded in the nineties is far behind that of Karnataka and all-India. This is not a promising sign of the growth performance of the manufacturing industry in Kerala

Here, it may be relevant to note that the CSO has computed a new series of net domestic product (with 1993-94 as base) for recent years. And, the growth rates (in terms of the mean of year-to-year percentage changes) calculated from the data in the new series shown in table 6 are higher in magnitude than the figures based on the old series (with 1980-81 as base) during the later part of the nineties.

Table 6. Annual % changes in NSDP by manufacture (New Series) at 1993-94 prices

Year	Kerala			All-India		
	Total Mfg	Registered Sector	Unregistered Sector	Total Mfg.	Registered Sector	Unregistered Sector
1994-5	20.77	14.71	26.92	10.72	13.40	6.03
1995-6	12.36	20.48	4.91	15.22	15.18	15.3
1996-7	-2.16	-3.22	-1.04	6.23	5.86	6.92
1997-8	7.99	5.84	10.21	5.02	5.64	3.89
1998-9	7.18	9.78	4.64	n.a.	n.a	n.a
Mean Values						
1994-5 to 96-7	10.32	10.66	10.26	10.72	11.48	9.42
1994-5 to 97-8	9.74	9.55	10.25	9.30	10.02	8.04
1994-5 to 98-9	9.23	9.51	9.13	n.a.	n.a.	n.a

Source: Calculated using C.S.O data.

It seems that Kerala's growth rate in NSDP by manufacture looks highly impressive in the recent years when the new series of NSDP data is used for calculation¹³. A word of caution is, however, warranted. The observations are too few to draw a firm conclusion on the growth-trend. The mean value of year-to-year percent changes for the total manufactures in Kerala appears only equals to and not significantly higher than, the national average. And in the registered sector the average growth rate in Kerala is slightly lower than all-India. In short, the growth record of Kerala's manufacturing industry in the more recent years is indeed impressive when the estimation is made on the basis of CSO's new series of NSDP and yet it is not high enough to vouch for a remarkable growth performance under the ongoing economic reforms¹⁴.

Thus far, the analysis has been based on the data on net state domestic product by manufacturing sector as a whole. As manufacturing activity is carried out both in the registered (formal) and unregistered (informal) sectors, and the major chunk of output must have come from the former, a detailed look into the growth behaviour of the registered manufacturing sector is warranted. This is done by analysing growth rates in net value added (NVA) by manufacturing in the factory sector based on the data from the Annual Survey of Industries (ASI).

Growth behaviour of manufacturing in factory sector

The data in the Annual Survey of Industries relate to the industrial units registered under the Factory Act, 1948. It covers factory units engaged in manufacturing, electricity, gas, and water supply, warehousing, repair services etc. spread over 25 two-digit industry-groups. Strictly speaking, manufacturing in the factory sector is to be defined to refer to activities confined to first 18 two-digit industry groups of ASI-factory sector. We have re-constructed the ASI data for the manufacturing industry as defined above for our analysis. It must be

noted that there would be differences in the growth rates estimated on the basis of NSDP data for the registered manufacturing sector and ASI data on value-added by manufacturing in the factory-sector because of the differences in the definitions used by the two data sources¹⁵.

We compare in table 7 the annual average growth rates in net value-added by the manufacturing industry and note some disturbing features. In particular, we note that the secular growth rate of Kerala is lower than that of Karnataka, Tamilnadu and all-India when we consider the registered segment (factory sector) of manufacturing. More significantly, its record of growth rate even in the second phase (1991-92 to 1997-98) representing the post-reforms era is lower than that of Karnataka and all-India. The lack of growth buoyancy in value-addition (income) by manufacture in Kerala in the nineties is clearer when we compare it with its own growth performance in the eighties. The relevant growth rate during 1991-92 to 1997-98 is not higher than what it was during 1981-82 to 1990-91. Interestingly, the growth rate in value-addition during the nineties is not higher than the eighties in Karnataka and Tamilnadu also.

Table 7. Annual growth of NVA by manufacturing in factory sector.

	1981-2 to 1990-1	1991-2 to 1997-8	1981-2 to 1997-8
Kerala	5.77	5.39	5.65
Karnataka	7.71	7.24	7.55
Tamilnadu	7.94	7.08	7.66
All India	6.51	9.06	7.79

Notes as in table 1

Source: Calculated using data from various issues of Annual Survey of Industries.

Here, there is no intention to draw a general conclusion that economic reforms based on the logic of liberalisation and globalisation are not growth promoting in the manufacturing sector. However, it must be said that there are regional variations in the growth-promoting impact of the ongoing economic reforms. We would also like to underline the inadequate empirical evidence to support the generally presumed growth-stimulating effect of the ongoing economic reforms in the manufacturing industry at-least in the case of Kerala.

Having found the relatively low growth profile of income generation by the manufacturing industry at macro level in Kerala and that too at a time when the general economy is growing fast relative to neighbouring states and all-India, the immediate temptation is to traverse the tough terrain of an explanation. This is but a task of tall order and requires an understanding of the growth dynamics at micro-level industries. We therefore turn to trace the growth trends in specific industries that constitute the core of manufacturing in the factory sector.

INDUSTRY-WISE GROWTH TRENDS

This is done by estimating the growth rates of net value added by the 2-digit industry-groups engaged in manufacturing in ASI factory sector. Here, it is useful to have in mind a picture of the relative shares of specific industries in the aggregate industrial income. Therefore, we first highlight the salient features of the industrial structure of Kerala as compared to neighbouring states and all-India.

Structure of manufacturing industry

We have shown in table 8 the share of each 2-digit industry-group in the aggregate value-added by manufacture in the factory sector of Kerala, its neighbouring states and all-India in 1997-98. It is seen that dominant industry-groups in Kerala even today belong mainly to

agriculture/forestry based and chemical based branches. More specifically, the top three industry-groups viz. 20-21 (food products), 30 (basic chemicals) and 31 (rubber, plastic, petroleum), taken together account more than one half of the total value-added by manufacture at the close of the nineties. Although the aggregate share of industry group 35+36 (non-electrical machinery, and electrical machinery) accounts for 10 per cent of the total net value-added, the industrial structure in Kerala does not have a fair share of capital goods industry.

It is interesting to note that the industrial-base defined in terms of the location quotient (LQ)¹⁶ of Kerala is somewhat different from what it is in the neighbouring states. The striking difference lies in the fact that even today the industrial base of Kerala is lop-sided (less diversified) and lacks capital goods production. In the case of Karnataka and Tamilnadu the capital goods sector enjoys a significant place in the industrial-base which acts as a source of technological dynamism and growth stimulus. Keeping in perspective the differential nature of Kerala's industrial structure/base relative to neighbouring states, we look at the relative growth trends in net value added by two-digit manufacturing industries

Growth trend in 2-digit industry groups

We have recorded in table 9 the annual growth rates in net value-added by manufacture in the 2-digit industry groups of the factory sector for the sub-periods (phases)¹⁷ using the kinked exponential fit. It is discernible that some industry-groups have recorded better annual average growth rates during the nineties as compared to the eighties in Kerala, but the number is proportionately less as compared to all-India. Besides, the performing industries in Kerala are mainly the traditional industry-groups. Here, particular mention may be made of the remarkably high growth of food products and paper & paper products, which have

achieved growth rates higher than the eighties and also higher than all-India averages.

Table 8. Industrial Structure/ Base of manufacturing in 1997-8
Shares in total value added by manufacture at current prices

Industries	Kerala LQ	Kerala	Karnataka	Tamilnadu	All India
Food products (20-21)	2.4	22.2	11.8	11.7	9.3
Beverages, tobacco etc. (22)	1.5	4.8	6.5	2.3	3.1
Cotton textiles (23)	1.7	7.2	3.7	15.9	4.3
Wool, silk, fibre (24)	0.1	0.2	8.5	0.4	3.8
Jute & other veg. Fibre (25)	1.0	0.9	0.0	0.1	0.9
Textile products (26)	0.4	1.1	6.7	7.4	2.5
Wood & wood products (27)	3.0	0.9	0.1	0.1	0.3
Paper & paper products (28)	2.0	5.5	3.8	4.1	2.8
Leather & leather products (29)	0.1	0.1	1.1	3.3	0.9
Basic chemicals (30)	1.0	18.9	6.5	10.1	18.6
Rubber, plastic, petroleum (31)	2.9	17.7	2.9	6.1	6.2
Non-metallic minerals (32)	0.7	3.2	7.2	5.6	4.5
Metal & alloys (33)	0.2	2.9	4.0	5.0	16.0
Metal products, & parts (34)	0.4	1.1	2.2	2.2	2.5
Machinery & equipment (35-36)	0.6	9.4	28.4	14.7	14.5
Transport equipment (37)	0.3	2.6	5.5	9.5	8.0
Other manufacturing (38)	0.6	1.1	1.0	1.4	1.8

Note: Industry codes are given in brackets. LQ = Location Quotient.

Source as in table 7

However, the growth rates of the capital goods and modern manufacturing industries both in the eighties and the nineties are relatively low as compared to all-India. In addition, most of the industry-groups, which have been doing better at all-India level in the nineties, are growing slow in Kerala. The decline in the rate of growth of industry groups 31 (rubber, plastic etc), 35+36 (machinery) and 38 (other manufactures) illustrates this point.

As for the relative growth performance compared to neighbouring states in the post-reforms era, the top performing industries in Kerala are different from the ones in Karnataka and Tamilnadu. There is another striking shade in the comparative picture. This is Kerala's relatively poor performance in the capital goods and modern manufactures as compared

Table 9. Annual growth rates (exponential) of Net Value Added in 2-digit industry-groups of factory manufacturing in Kerala and All India

Ind. Code	Kerala		Karnataka		Tamilnadu		All India	
	1981-2 to 1990-1	1991-2 to 1997-8	1981-2 to 1990-1	1991-2 to 1997-8	1981-2 to 1990-1	1991-2 to 1997-8	1981-2 to 1990-1	1991-2 to 1997-8
20-21	5.75*	12.86*	6.48	8.05*	7.98*	6.15*	6.20*	9.40*
22	13.46*	-2.05	5.74	2.70	0.29	25.47*	7.02*	6.71*
23	6.86*	3.27	0.35	0.40	10.09*	1.03	2.41*	1.06
24	X	X	19.4*	25.87*	9.59*	4.24	9.09*	7.70*
25	X	X	X	X	X	X	-0.41	4.90*
26	-15.14*	-12.76	21.81*	21.76*	23.3*	17.42*	18.93*	8.73*
27	-13.86*	-10.89	-6.5	-14.21	-1.67	-12.60*	2.70	-2.83
28	6.76	15.49*	8.72*	5.13*	6.07*	5.78	5.45*	7.74*
29	X	X	26.19*	10.27*	14.02*	5.77	10.97*	10.67*
30	11.6*	4.92*	26.31*	7.55	19.40*	3.47	22.57*	13.7*
31	5.41*	0.10	-9.18	16.15	3.16	8.88*	0.684	8.12*
32	5.91*	2.84*	9.99*	-2.14	7.75*	7.39*	8.27*	5.19
33	6.68*	9.66	2.38*	-0.30	3.19	10.69*	3.53*	15.8*
34	-4.03	6.28	6.13	15.00*	1.34	13.51*	3.58*	10.17*
35+36	7.41*	2.86*	9.20*	5.33*	5.91*	8.14*	5.54*	7.91*
37	-3.09	9.31*	4.66	10.61*	5.19*	9.82*	4.51*	15.00*
38	17.83*	-1.17	10.23*	-7.87	21.05*	10.56	12.5*	16.53*
Mfg	5.77*	5.39*	7.71*	7.24*	7.94*	7.08*	6.51*	9.06*

Note: X=negligible. * indicates significance at 5% level. For decoding industrial classification see table 8.

Source as in table 7

to neighbouring states. It is also significant to note that Kerala has recorded sharp decline in the growth rate in respect of industry-groups 30 (basic chemicals) and 31 (rubber, plastic etc.) in the nineties as compared to the eighties. The impact of this deterioration must have been damaging to overall growth performance in Kerala, as these are major constituents of its industrial structure.

On the whole, the analysis of growth trends of 2-digit industry-groups gives us an insight into the relatively low growth rates observed at the macro-level. It seems that the relatively low growth rate during the post-reforms period is the net outcome of the remarkably high growth rates in a few and depressingly low growth rates in a large number, of manufacturing industries in Kerala. In striking contrast, the

relatively better macro growth performance of the manufacturing industry in Karnataka and Tamilnadu is accounted by the good performance record of a wider set of industries including capital goods and modern manufactures.

The findings on the recent growth-trends of 2-digit industry groups lend support to draw a general conclusion. The growth-effect of the on-going economic reforms based on liberalisation and globalisation varies across the industries and how the macro growth profile of a particular region get shaped will depend upon the types of industries in its industrial structure. Here there is an implicit indication of the approaches (e.g. the relevance of industry-structure) for explaining the observed growth-trends in income generation by the manufacturing industry in Kerala.

Indeed, it is beyond the scope of this paper to provide a detailed examination of the factors responsible for the relatively slow growth of the industrial sector in Kerala. However, it may not be fully meaningful for policy to leave here the descriptive analysis of the growth trends in isolation. We may, therefore, seek an approach towards explaining the relative lag in industrial growth rate observed in Kerala at a time when its general economy is witnessing remarkable growth as compared to the neighbouring states and all-India during the post-reforms period.

LAGGING INDUSTRIAL GROWTH: AN EXPLANATION

In this regard we first examine *a-priori* relationship between economic reforms and industrial growth in a regional economy. One of the ingredients of the reform process is external liberalisation (globalisation). This is the shift from a restrictive and inward-oriented to a liberal and outward-oriented foreign-trade regime. The liberal trade regime implies unrestricted import and sharp reduction in the customs-

tariff of commodities. Therefore, there is the potential danger of dumping and unfair competition from MNCs adversely affecting the survival and growth of domestic industries. This may lead to a process of “de-industrialisation” in some state-regions. The gravity of this “negative” effect of the reforms on a specific region-state will depend upon the commodity composition and reduced tariff structure of the imports and the product-structure of the industrial structure of the state-region. If the given region’s industrial structure is composed of products that are “freely” importable under the reform-process, it runs the risk of a falling into a crisis of de-industrialisation. The resolution of the crisis lies partly in increased investment on plant modernisation, product diversification and technological innovation to make local industries globally competitive.

Viewed in the above perspective, Kerala is placed in a disadvantageous position because of the nature of its industrial structure. For, the products of its many industries (e.g. chemical and rubber based industries), are unable to meet the stiff competition from the imports on reduced tariff resulting into financial losses and sometimes even lock-out of local production. It is interesting to note here that proportionately a large number of 2-digit product-groups in Kerala recorded relatively slow growth rate as compared to neighbouring states in the post-reforms period (see table 9). Most of these industries are the ones set up earlier under the protective umbrella of import-substitution trade-regime. With the removal of protection under the reform-process, they may have been made non-competitive to survive and grow under the globalisation. This may be particularly true in those industries which miss to make investment for plant-modernisation, technology up-gradation and product diversification. Detailed case study of specific industries is needed to assess the full dimension of the problem. In the absence of such micro-level studies, we may analyse the relative growth-rates in the fixed capital

investment of 2-digit industries in Kerala as compared to all-India to shed some light on the issue.

Growth trends in fixed capital

The estimate of annual growth rates in fixed capital in 2-digit industry-groups in Kerala and all-India are traced in table 10. It appears that the rate of growth in fixed capital in Kerala's manufacturing sector as a whole is far less than all-India average particularly during the post-reforms period. And interestingly, only one industry-group viz. 20-21 has had the benefit of significantly higher growth in fixed capital in Kerala. This industry group (food products), as said earlier, has also recorded higher secular annual growth rate in NVA as compared to all India average. It is also instructive that the growth rate in fixed capital has been significantly lower than all-India average in the cases of capital goods and modern manufacturing industries, where the growth rate in value-added by manufacture has been much below the all-India average.

To generalise, there is symmetry by and large between the growth performance of fixed capital and value-addition. The industry-groups, which recorded higher growth rate in fixed capital, have shown better growth performance in value-addition in the nineties as compared to the eighties. And the industry-groups, which recorded poor growth performance in value-addition, are mainly the ones, which have exhibited lower annual growth rate in fixed capital during the nineties as compared to the eighties. The available pieces of evidence thus suggest a positive causal relationship, at least association, between the growth-rates of fixed capital and income generation in the manufacturing industries.

In the case of Kerala it is plausible that the inadequate capital investment for modernising the old industrial units and setting up new industries based on modern technology could be one of the important

Table 10. Annual growth rates (exponential) of Fixed Capital in 2-digit industry-groups Manufacturing industries in Kerala and All-India

Ind. Code	Kerala		All India	
	1981-2 to 1990-1	1991-2 to 1997-8	1981-2 to 1990-1	1991-2 to 1997-8
20-21	10.25*	21.78*	8.30*	13.65*
22	7.16*	11.85*	11.99*	15.29*
23	2.67	16.76*	23.7	19.73*
24	X	X	9.48*	17.31*
25	X	X	7.79*	2.65
26	-10.3	25.46	13.57*	24.72*
27	-4.79	12.07	3.85*	15.57*
28	-8.89	11.68*	3.49*	14.86*
29	X	X	10.06*	13.97*
30	9.73*	2.62	21.36*	17.01*
31	4.02*	9.30	-3.27	13.79*
32	11.82*	8.69	11.65*	9.89*
33	9.20	10.09*	8.07*	10.80*
34	3.87	1.30	9.62*	17.49*
35-36	3.21*	4.41	8.01*	10.00*
37	7.47*	-4.55*	4.10*	13.01*
38	8.52	-18.70	11.74*	15.77*
Mfg.	3.19*	8.78*	7.84*	13.69*

Notes and source as in table 9

causes for the relatively slow growth rates of manufacturing industries in the post-reforms period. And, the relatively low growth rates of fixed capital imply the shyness of capital-investment to flow into Kerala's manufacturing sector.

Shyness of Capital-flow

The table 11, showing Kerala's share relative to Karnataka and Tamilnadu in all-India industrial investment proposals etc. in the nineties, gives evidence of the shyness of capital to flow into Kerala's industry. The relative shares of Kerala in the investment proposals and FDI approvals are very insignificant as compared to that of neighbouring states. Here it is relevant to note that the recent CII study on "How the States Are Doing?" has placed Kerala at a very low rank (13th among 18 states) in terms of investment climate. It stands to reason that some region-specific factors make Kerala less investor-friendly and inhibit the flow of capital from within and outside the state for industrial investment. The inadequate capital-investment in turn makes the industry lag in growth-rate even when its general economy is growing remarkably well in Kerala relative to neighbouring states and all-India. Then a question comes up for inquiry. What are these region-specific factors that make Kerala a less-investor friendly location for industrial investment? Obviously, a detailed study of the supply constraints in the markets for inputs like land, labour, fuel and infrastructure and above all the state policies is needed to identify the major region-specific factors limiting the inflow of industrial investment into Kerala. We may however make here some general observations on the behaviour of two important factors only viz., labour and state policy that influence the nature of investment climate.

Table 11. States' Share (%) in all-India industrial investment proposals (Aug. 1991 to Apr. 2000)

Region	IEM	LoI	Total investment proposal	FDI*
Kerala	0.90	2.39	1.07	0.30
Karnataka	4.61	8.83	5.10	7.55
Tamilnadu	6.34	10.10	6.77	5.27
Andhra Pradesh	7.12	9.67	7.41	4.14
Others	81.03	69.0	79.6	82.6

Note: * = Figures from August 1991 to December 1999. IEM= Industrial Entrepreneur Memorandum, LoI = Letter of Intent, and FDI= Foreign Direct investment.

Source: Government of India, SIA Statistics

Labour problem

In the popular perception and even in some academic discussions the labour problem is more often seen as the major factor responsible for the shyness of capital-investment to move into industry in Kerala. It has been argued in some circles¹⁸ that the labour, unionised under political patronage, is militant in behaviour and is successful in bargaining for higher wages and opposing modernisation by using pressure-tactics. The labour militancy results in industrial unrest and high wage-cost with low productivity. To the entrepreneur, the production cost is made higher and the rate of return on investment is reduced as compared to other competing regions. Besides, there is the high “psychic” cost of managing the labour relations in an environment of multiple unions with rivalries for short-run gains. The entrepreneur tends to form the perception of Kerala as a “labour-problem state” and attaches high risk-premium to it

as a location for industrial investment. This perception, when spreads among entrepreneur class, projects a less investor-friendly climate (environment) and limits industrial investment in Kerala.

Indeed, there is a forceful logic in the above argument, which has been scrutinised in the literature though without leading to a consensus view. Without entering into this debate we may put on board some facts on wages and industrial disputes in the recent years in the organised manufacturing sector in Kerala. On the basis of the data from the ASI, we have worked out in the table 12 wages per man-day paid to the workers in the manufacturing sector as a whole since 1980-81.

Table 12. Wage rates in registered Manufacturing sector (in Rs.)

Year	Nominal wage rates				Product wage rates			
	Kerala	Karnataka	Tamilnadu	All India	Kerala	Karnataka	Tamilnadu	All India
1980-1	22	24	24	24	23	25	25	25
1981-2	26	24	25	27	26	24	25	27
1982-3	29	31	27	29	28	30	26	28
1983-4	31	35	30	33	28	32	28	30
1984-5	33	37	32	43	28	32	27	37
1985-6	38	43	35	40	31	34	28	32
1986-7	41	45	38	44	32	35	30	34
1987-8	44	51	42	48	32	37	30	35
1988-9	52	61	33	55	35	40	22	36
1989-90	52	63	52	59	31	37	31	35
1990-1	56	70	57	67	30	38	31	37
1991-2	68	77	64	72	33	38	31	36
1992-3	72	91	71	81	32	40	32	36
1993-4	73	91	72	88	30	37	30	36
1994-5	83	99	82	99	31	37	31	37
1995-6	107	119	94	115	36	41	32	39
1996-7	107	118	101	122	35	39	33	40

Note: Wage rates are obtained by dividing the total wages to workers by total mandays workers

Source as in table 7

It appears, nominal wage paid to workers in Kerala is not higher than what it is in the neighbouring state of Karnataka and all-India in almost all the years. Interestingly, Kerala is not favourably placed vis-à-vis Tamilnadu in terms of wage-cost for industrial location. Perhaps, the product-wage rate is a more reliable indicator than money-wage rate to reflect upon the comparative labour-cost advantage of the regions. We have also given in table 12 the information on product wage obtained by deflating money wage by output prices. Here again, the relative position of Kerala is not much different from that of nominal wage. The popular notion of relatively higher wage in Kerala does not have clear empirical support as far as the manufacturing sector as a whole is concerned.

A more refined way of assessing the relative competitiveness of a region for industrial location lies in tracing the movement of “efficiency wage”. On the lines suggested by Kaldor¹⁹ the index of money wages is divided by the index of labour productivity to arrive at the efficiency wage and the resultant ratios are shown in table 13. The movement in the ratio does not present Kerala as a location whose location-advantage is eroded by increasing wage with unmatched (low) productivity. The trend indicates increasing competitiveness of Kerala for industrial location though the neighbouring states are placed relatively better at margin in this regard²⁰.

It must be noted that the foregoing observations on wage relatives are based on the macro-level data for the registered manufacturing sector. Of-course, there may be variations across industries. And the macro picture of lower wage scenario in Kerala may be due to the dominance of low-wage labour-intensive traditional industries in its industrial structure. It is plausible that wages are relatively higher in such industries as capital goods which have low shares in the aggregate output in Kerala as compared to Karnataka and Tamilnadu. Without a detailed study of

the relative wages occupation-wise and product-group wise, no firm conclusion on the relative labour-cost disadvantage due to labour-militancy in Kerala can be drawn.

Table 13. Efficiency Wages (Workers) in registered Manufacturing

Year	Kerala	Karnataka	Tamilnadu
1981-2	1.00	1.00	1.00
1982-3	0.88	1.07	0.93
1983-4	0.90	0.90	0.97
1984-5	0.82	1.09	0.86
1985-6	0.95	0.95	0.93
1986-7	0.91	0.97	0.92
1987-8	0.83	0.96	0.97
1988-9	0.84	0.96	0.87
1989-90	0.66	0.78	0.80
1990-1	0.88	0.76	0.72
1991-2	0.80	0.68	0.75
1992-3	0.75	0.75	0.76
1993-4	0.89	0.72	0.64
1994-5	0.93	0.65	0.65
1995-6	0.80	0.70	0.67
1996-7	0.85	0.61	0.67
1997-8	0.89	0.64	0.78

Note: Efficiency wages are obtained by dividing the index of money wages by the index of labour productivity.

Source as in table 7

With regard to the popular perception of labour militancy disturbing industrial peace in Kerala, the incidence of industrial strike/lock-out and the consequent mandays lost need to be examined. Here it suffices to say that the data on the number of strike/lockout, mandays lost and other

relevant variables as reported in the Labour Year Book no longer present Kerala as location with high incidence of industrial unrest²¹. It is also relevant to note that Kerala has scored 8th rank among 18 states and is placed much above Karnataka (11th rank) in terms of labour factor performance in a very recent CII study. There is no intention to assert here that there are no labour problems in Kerala. Indeed there are complex cases of strikes and other forms of labour struggles in particular industries and at particular times. In particular, the rough behaviour of head-load workers (“*attimari*”), the struggle of construction workers at the construction-sites for regular jobs in the factory, organised pressures for job-reservation for the locals etc. are problematic to the entrepreneurs. This unpleasant situation is but manifestation of the acute unemployment and not necessarily the reflection of “militancy” as an attribute of labour-class in Kerala.

In the light of the above general observations on the relative incidence of industrial wages and strikes in Kerala it does not appear realistic to continue perceiving Kerala as a labour-problem state. It seems that labour-unions and political parties giving patronage to them have relaxed their rigid views and have become more pragmatic than dogmatic in their approaches to capital-labour relations. As pointed out by Heller Patrick, “the collective power of the working class has been incorporated within the state and militant mobilisation has been given way to mediated coporatist arrangements” in Kerala²². If a holistic view is taken, there are no clear empirical evidence to assert that the labour-militancy is the major factor that continues to inhibit entrepreneurs, existing and potential to make capital investment in Kerala industry. What then is the main factor that makes an inclement investment climate in Kerala industry?

Perhaps, a critical scrutiny of the policy-approach of the state and the attitude of the bureaucracy towards market-liberalisation and private

sector investment including multinational corporations in Kerala industry may provide an answer. We may make some general observations in this regard²³.

State's policy and bureaucracy

One of the important ingredients of the reform-process is the internal liberalisation, which means removal of government controls and regulations and leaving the entry and operation of private sector enterprises into industry on the logic of market forces. Thus, the entrepreneurs do not now require most licenses and permits, which were mandatory prior to the reform-process, from the central government. However, this process of liberalisation has not fully percolated down into the administrative systems of the state and local-self governments in many states. Kerala can be regarded as one such state. This view may be elaborated below.

The state's industrial policy has been saddled with instability and discontinuity in the basic thrust, as the governance of the state has been alternating between two groups (coalition) of political parties led by the Congress and the Marxists. The lack of continuity in the basic thrust has created a sense of uncertainty among investors leading to a cautious approach towards investing in Kerala industry.

The policy thrust in any given period has reflected not only the ideological stance of the ruling political parties but also how it has manipulated region-specific factors to the benefit of certain class in the context of industrialisation. To illustrate, 1991 UDF's industrial policy has set aside the strategy of public sector led industrialisation and preferred the liquidation and privatisation of the public sector undertakings. In contrast, 1998 LDF policy adopted a pro-public sector thrust and stressed the conversion of loss-making public sector

undertakings into performing assets and revival of sick units. To illustrate the differential approach on region-specific factors, 1991 policy took note of the entrepreneurs' perception on labour militancy and declared restrictive labour practices including "*attimari*" as criminal offences. On the other hand, the 1998 LDF policy did not consider the labour-problems adversely affecting the industrial growth and did not come in the way of the rights to strike and class struggle of the labour.

The state policy in all the periods, irrespective of the political colour of the ruling parties, offered fiscal incentives, tax concessions and other assistance of the types and levels available in the neighbouring states. However, the response of the investors has been relatively poor in Kerala because of the administrative inefficiency and delayed delivery of the benefits. More often than not the policy promises were never fulfilled in time and creditability of the government was put to stake.

The last point takes us to comment upon the bureaucracy. Notwithstanding the liberalisation policy of the reform-process, at present a number of different "clearances" are to be secured and a number of different agencies are to be approached for this at the state and local self-government levels. In general, the bureaucracy treats anyone approaching for "clearance" or "assistance" with suspicion and puts forward procedural blockades instead of resolving investors' problems with a constructive approach.

In short, there is no co-ordinated commitment by the political parties and there are no clear-cut and consistent state-policies on the role of market-liberalisation, competition and the private sector investment including foreign investment in accelerating industrial growth in Kerala. Added to this is the inertia of bureaucracy resulting in a negative attitude. The lack of pragmatism in state policies and credibility of the bureaucracy creates the crisis of confidence in the investors-existing and

potential, from within and outside – and leads them to consider Kerala as a less-friendly location for industrial investment relative to the neighbouring competing regions.

It seems, the resolution after a detailed review, to solve the problems in the state's response to the reform-process and in its own policies and practices relating to private sector is urgent. Perhaps that is more critical than the "labour problems" for improving the investment climate and the consequent flow of capital-investment to stimulate industrial growth, in Kerala. With this observation we have reached a stage to conclude the discussions in this paper by giving a brief summary of the main findings.

SUMMARY AND CONCLUSIONS

The aim of summarising the main findings is to provide a holistic perspective against which the growth potential of industry in Kerala could be assessed. In the perspective, we emphasise that the stagnation in growth-rate observed in the seventies is over and a new phase of growth revival has already set in Kerala economy during the post-reforms period. This is an encouraging sign indicating the potential for industrial growth. However, we note that the growth rates recorded in the manufacturing-industry at macro level as well as in a large proportion of two-digit industry-groups during the nineties are not higher than the corresponding figures during the eighties. Clearly, Kerala experience does not provide empirical support to the growth stimulating effect in the industrial sector generally expected of the ongoing reform-process. In fact, the relatively low growth profile in the manufacturing sector at a time when its general economy is showing remarkable growth performance in Kerala as compared to neighbouring states and all-India is a riddle of the recent growth trends under the reform process. Indeed, the liberalisation of imports, reduction of customs tariff and other free-market characteristics

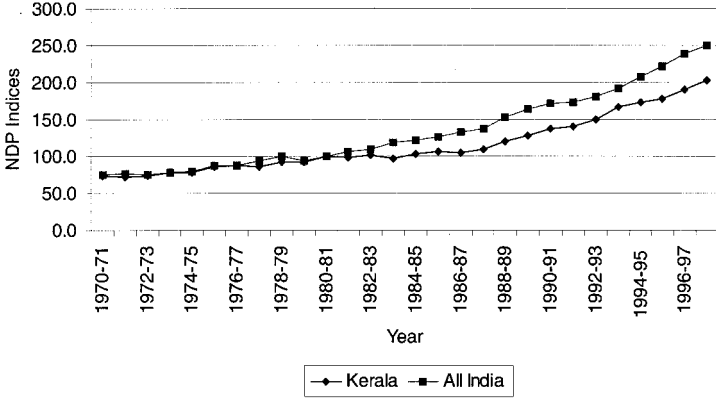
of globalisation integral to the ongoing reform-process must have adversely affected the growth profile of local industrial production. The problem has become more complex due to the lop-sided (less diversified) product-structure and inadequate growth rates in fixed capital investment in the industries. The findings of the study also suggest the shyness of capital from within and outside the state to flow into industrial investment. The inadequate capital investment has constrained the pace of modernisation of old units and establishment of new units and product-lines based on state-of-the art technology needed for the survival and growth of industries in a globally competitive business environment created by the Central government policies pursued during the post-reforms period.

There is an implicit conclusion emerging from the study. A less-investor friendly climate in Kerala limits industrial investment flow into the state. The latter in turn has led to a lag in the relative growth rate of manufacturing income at a time when the general economy is going through remarkable growth buoyancy. What makes Kerala a less-investor friendly location for industrial investment? This emerges as the crucial question needing detailed investigation. There is a suggestion in the study that the popular notion of labour militancy, which leads to high wage-cost and industrial unrest, as the critical factor is not fully based on clear empirical evidence. And, there are indications of an improvement over time of the competitiveness of Kerala in terms of labour cost though the neighbouring states have still an advantage at margin over Kerala in this regard. The study therefore points towards the lack of a clear and pragmatic approach of the state in its response to reform-process and a positive approach in its own policies for encouraging private investment in the industry. These are the more potent problems for review and resolution to improve upon the investment climate and the resultant inflow of capital-investment in Kerala industry.

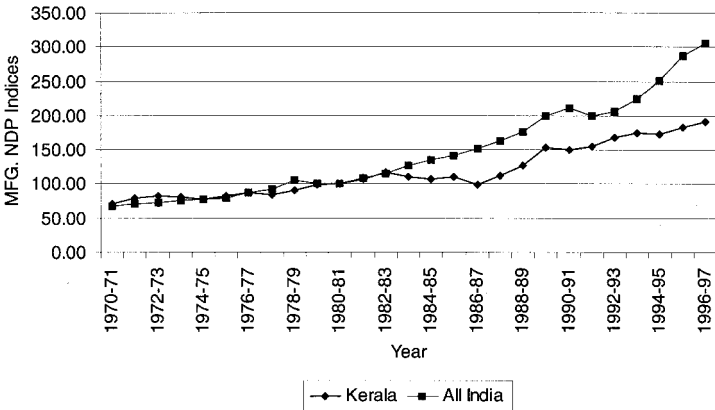
. Another implicit suggestion is the need for a new vision on industrialising Kerala. If the overall economy is performing well despite the lag in manufacturing growth on the basis of the remarkable growth rate of the service sector, it is logical to re-read the old paradigm of industrialisation based on manufacturing and form a new vision on the direction and pattern of industrial development of Kerala. The new vision could be able to take full advantage of Kerala's comparative advantage in knowledge generation and human resources development and on that basis promote knowledge-based and service industries. The new vision could be to transform Kerala as a value-added service provider in a globally competitive environment.

Finally, there is no intention to conclude that Kerala has limited potential for accelerated industrial growth. What is stressed is a change in the very concept of industrialisation to refer widely to growth-acceleration not only in conventional manufacturing industries but also service industries. And, the priority has to be on accelerating the new processes of, what is called, "servitisation"! The new vision should take Kerala deep into "new economy" industries. If a broad consensus is reached on the new vision, region-specific measures need to be identified and implemented to make Kerala more investor-friendly and attract investment from within and outside the state including foreign investment for accelerated growth of income and employment in the "industry".

Graph A
MOVEMENT IN NDP INDICES (1980-1=100)



Graph B
INDICES OF MFG. NDP (1980-1 =100)



Notes

1. The CDS study highlighted that Kerala, a relatively poor state judged by the conventional per-capita income norm has made fairly impressive advances in the spheres of health and education and hence brought out improvements that had made a perceptible difference to the quality of life -- so also to the acquisition of attitudes and skills that could help to accelerate development at the next stage. (See CDS 1979).
2. See for example the series of articles recently appeared in the *Bulletin of Concerned Asian Scholars*, Vol.30.
3. For example, Kuznets (1966) showed that the process of economic development was always accompanied by a shift in the labour force from low productivity agriculture to high productivity manufacturing.
4. Mean values of yearly changes are also calculated and are presented in Appendix when dealing with the macro growth behaviour for readers' information. For obvious reasons there would be difference in the magnitudes of the two types of ratios.
5. Estimated sub period growth rates by running two separate regressions, reported in Appendix, also show a similar direction of change. However, as the number of observations for the second period is very few for a robust regression such growth rates can be misleading. Boyce (1986) has suggested a kinked exponential for removing such inconsistency in the case of exponential trend function. The major advantage of this method is that the sample size and the degrees of freedom can be increased as result of combining the sub periods. The increase in the sample size is definitely an advantage when the sub period estimation is based on a very small sample size.
6. See Pieper (2000).

7. We have tested for the structural break in nineties using a Chow test. The estimated F value (6.21) is significant at 5 percent level showing a structural change in NSDP.
8. For example, see State Planning Board (1989), Kannan and Pushpangadan (1988) and Subrahmanian and Pillai (1987). For a review of the literature on Kerala's industrialisation, see Pillai and Shanta (1997).
9. An earlier study has also noted the revival in Kerala economy in the recent years. See Harilal and Joseph (2000).
10. The corresponding figures for Karnataka and Tamilnadu are 5.79 and 7.60 respectively.
11. Our analysis based on the Chow test also shows a significant structural break in the service sector in nineties. The estimated F value is 15.2 which is significant at 1- percent level.
12. Chenery and Syrquin (1986) had shown that the relation between the aggregate and the sectoral growth can be derived by differentiating with respect to time the definition of total output (the sum of sectoral output) $V = \sum Vi$, and expressing the result in growth rate terms, $gv = \sum pi gvi$, where gvi and gv are the growth rates of Vi and V respectively and the weights are sectoral output shares, $pi = Vi/V$.
13. The increase in the rate of growth in new series is attributable, *inter alia*, to the inclusion of a few activities, which were hitherto not covered under the purview of industrial production boundary.
14. It is relevant to note here that a recent econometric analysis on Kerala economy shows that there is no significant structural break in the growth of industrial sector under liberalisation. See Pushpangadan (2000).

15. On this point see Appendix I of Ahluwalia (1991).
16. This is an economic base study concept and is a measure of the relative concentration of a given industry in a given region as compared to national aggregate of income (value-added) or employment or any other relevant variable. It is defined as $LQ = [(v_{ij}/v_j)/(V_i/VN)]$ where v = value-added (income), i = i^{th} industry, j = j^{th} region and N = nation(all-India). Industries with value of location quotient greater than unity ($LQ > 1$) constitute the industrial base of the state.
17. The sub period growth rates estimated using separate regressions for individual industries are also given in appendix.
18. See for example, State Planning Board (1984) and Kannan (1998).
19. See Kaldor (1970).
20. This is evidently not because of a high nominal wage in Kerala but due to the low capital intensity resulting in an underestimation of labour productivity. Capital intensity in Kerala is found to be growing at an insignificant rate.
21. The number of industrial disputes in Kerala has decreased from 68 in 1983 to 35 in 1997, while that of Karnataka and Tamilnadu decreased from 59 to 26 and 242 to 232 respectively. Also the mandays lost ratio (mandays lost as a percentage of total workable mandays) has declined from 0.72 to 0.36 in Kerala during the same period, while in Karnataka and Tamilnadu it decreased from 2.70 to 1.09 and 1.26 to 0.90 respectively.
22. Heller Patrick (1995)
23. For a detailed discussion see Subrahmanian (2000).

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APPENDIX

Appendix Table 1

Annual growth rates of Net Domestic Product

Period	Kerala	Karnataka	Tamilnadu	All India
1971-2 to 1980-1	(3.87)	-	-	(3.22)
1981-2 to 1990-1	3.53 (3.85)	5.07 (4.92)	5.20 (5.12)	5.39 (5.57)
1991-2 to 1997-8	5.92 (6.43)	4.94 (4.91)	6.01 (6.14)	6.42 (6.37)
1971-2 to 1990-1	(3.59)	-	-	(4.49)
1981-2 to 1997-8	4.90 (4.70)	(5.40)	(5.35)	5.38 (5.53)

Note: Figures in brackets show mean of year to year percentage changes. Sub-period growth rates are based on exponential function, using separate regressions. All are statistically significant at 5 per cent level.

Source: Calculated using C.S.O data

Appendix Table 2

Annual growth rates of per-capita Net Domestic Product

Period	Kerala	Karnataka	Tamilnadu	All India
1981-2 to 1990-1	2.15 (2.47)	3.15 (2.94)	3.78 (3.63)	3.26 (3.34)
1991-2 to 1996-7	5.11 (5.32)	3.25 (3.16)	4.96 (4.95)	4.78 (4.80)
1981-2 to 1996-7	(3.30)	(3.54)	(3.93)	(3.48)

Notes and Source as in table 1

Appendix Table 3

Annual Growth rates in Net Domestic Product by economic activity in Kerala

Period	Agriculture	Industry	Services
1981-2 to 1990-1	2.02 (3.35)	3.73 (4.47)	4.09 (4.27)
1991-2 to 1996-7	5.51 (5.39)	3.29 (4.21)	8.08 (8.65)
1981-2 to 1996-7	(4.02)	(4.19)	(5.52)

Notes and Source as in table 1

Appendix Table 4
Annual Growth rates in Net Domestic Product by Manufacture

Period	Kerala	Karnataka	Tamilnadu	India
1971-2 to 1980-1	2.47 (2.79)	-	-	4.57 (4.08)
1981-2 to 1990-1	3.42 (4.24)	14.63 (16.1)	4.40 (5.13)	7.29 (7.70)
1991-2 to 1996-7	3.34 (3.32)	11.37(11.6)	6.66 (6.82)	9.37 (9.07)
1981-2 to 1996-7	(4.20)	(15.3)	(4.85)	(7.27)
1971-2 to 1996-7	(3.82)	-	-	(6.16)

Notes and Source as in table 1

Appendix Table 5
Annual growth of NVA by manufacturing in factory sector.

	1981-2 to 1990-1	1991-2 to 1997-8	1981-2 to 1997-8
Kerala	6.40 (7.10)	6.41 (4.19)	(7.15)
Karnataka	8.90 (11.71)	9.17 (7.54)	(10.30)
Tamilnadu	7.43 (9.40)	6.25 (5.61)	(7.30)
All India	6.74 (7.92)	9.83 (9.66)	(7.85)

Notes as in table 1

Source: Calculation based on data from various issues of ASI

Appendix Table 6
Annual Growth rates (exponential) of Net Value Added in 2-digit industry-groups of factory manufacturing in Kerala and All India

Industry Code	Kerala		Karnataka		Tamilnadu		All India	
	1981-2 to 1990-1	1991-2 to 1997-8	1981-2 to 1990-1	1991-2 to 1997-8	1981-2 to 1990-1	1991-2 to 1997-8	1981-2 to 1990-1	1991-2 to 1997-8
20-21	6.66*	14.32*	10.87	15.09*	8.93*	7.67*	8.19*	10.27*
22	13.38*	1.12	8.37	6.92	3.53	30.67*	7.01*	6.69*
23	8.64*	8.85	1.97	2.99	10.70*	2.01	3.24*	2.67
24	X	X	20.08*	26.95*	8.11*	1.85	8.89*	7.37*
25	X	X	X	X	X	X	-0.63	4.54*
26	-7.67*	2.89	17.81*	15.21*	20.98*	13.64*	13.23*	7.30*
27	-9.99*	7.49	1.17	-1.75	0.31	-9.43*	3.74	-1.16
28	10.56*	21.59*	10.62*	8.19	4.01*	2.46	3.28*	7.49*
29	X	X	29.24*	15.16*	10.31*	-0.19	8.99*	6.22*
30	13.39*	7.21*	28.03*	10.32*	20.88*	5.86	21.22*	12.00*
31	5.66*	0.49	-6.09	21.12	1.49	6.19	2.16	8.77*
32	3.59*	-1.65	12.60*	2.16	5.38*	3.57	6.66*	4.03
33	6.56*	9.46	25.64	2.62	1.78	8.44	4.39*	7.22*
34	-2.23	8.97	7.47	17.15*	-0.13	11.14*	3.89*	10.68*
35-36	7.49*	4.19*	10.36*	7.21*	5.16*	6.94*	6.45*	8.21*
37	-10.45	8.73*	4.45	10.28*	5.59*	10.45*	4.99*	15.77*
38	12.53*	-6.47	9.20*	-9.52	17.88*	5.45	11.30*	14.60*
Mfg.Total	6.40*	6.40*	8.90*	9.17*	7.43*	6.25*	6.74*	9.83*

Note: X=negligible. For decoding industrial classification see table 8. * indicates significance at 5 per cent level. Other Notes as in table 1.

Source as in table 5

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