



Performance of Tamilnadu Registered Manufacturing Under Various Policy Regimes: 1980-2013

KEYWORDS

J.PRIYA RUBI

Research Scholar, Sarah Tucker College, Tirunelveli.

ABSTRACT *The study makes an attempt to analyze the performance of Tamil Nadu manufacturing industry in terms of number of units, gross value added and employment across the selected two-digit level industries and to examine the efficiency of Tamil Nadu manufacturing in terms of labour productivity and capital productivity across selected two-digit level industries for the period 1980-2013. The study reveals that economic reforms have been positive impact on output growth in Tamil Nadu manufacturing during the most recent period 2001-13. The growth rate of employment has been positive in all the industries except chemical industry during the a period of consolidation of economic reforms but it has been better in three industries out of six during a period of consolidation of economic reforms compared to during the phase of major changes in economic policy. The better performance has been found a period of consolidation of economic reforms in respect of wage rate in all industries under considered and growth of employee's compensation has been in consonance with output and labour productivity growth. From the analysis the study concludes that the performance of Tamil Nadu manufacturing has been right during a period of consolidation of economic reforms.*

INTRODUCTION

In developing countries like India with a high ratio of population to natural resources, manufacturing industry provides hope for enhancing productivity and raising the standard of living of the people. Even in countries where the population – pressure is lower, successful exploitation of population and natural resources demands the growth of manufacturing industry.

Developing countries, in their effort to find solution to the problem of over population, unemployment, underemployment, poverty and insecurity prefer the path of rapid industrialization. Through, tertiary sector is gaining importance manufacturing sector. The industrial sector possess a relatively higher marginal propensity to save and invest, thereby contributing significantly to the achievement of a self-sustaining economy. Industrialization leads to an increase in per capita income and provides goods to meet high-income demands. It provides avenue for employment of new skilled labour force. It enables diversification in accordance with market requirement at higher stages of development. It helps in earning foreign exchange because income elasticity of demand for industrial products is much higher than that for agricultural products.

The desire for industrialization in developing countries, as Hans singer has pointed out, goes much beyond its direct economic benefits. He says that "it has an impact on the general level of education skill, way of life, inventiveness, habits and store of new demand and the like".

In India, the idea that the state has a prominent role to play in the development of industries found it earliest articulation in the report of the National Planning Committee (1938), Under the Chairmanship of Jawaharlal Nehru. This was reiterated in the industrial policy Statement of 1948.

The Industrial Policy Resolution of 1948 categorized industries into four: a) Defense and Strategic industries are to be in the exclusive domain of the government. b) Existing units in basic and key industries can continue in the private sector. However no fresh private investment in these sec-

tors is to be allowed. c) Twenty important industries are to be allowed in the private sector and under strict supervision of the state and d) All industries not covered by the above three categories will be allowed in the private sector under general supervision of the state.

Industrial progress has been an important feature of Indian economic development since 1951. The process of industrialization lunched as a conscious and deliberate policy under Industrial Policy Resolution (IPR) of 1956 and vigorously implemented under the Five Year Plans, involved heavy investments in building up of capacity over a wide spectrum of industries.

The Industries development and Regulation Act (1951) prescribed the requirement of industrial licenses. However, the rationale given in the First Plan for State intervention has been that private enterprise may not be either willing or capable of investing in certain sectors due to lack of resources and magnitude of risks.

The Second Plan proposed massive industrialization in the public sector with emphasis on heavy industry. The adoption of the goal of a socialistic pattern of society demanded that "the commanding heights of the economy" should be controlled by the State.

The industrial Policy Resolution 1956 expanded the three lists which existed in IPR 1948. The essence of the policy continued with minor modifications for almost two decades. Thus while the public sector has the primary responsibility for rapid industrialization in the key sectors, the private sector has a complementary and supplementary roles.

In April 1964, the Government Of India appointed a Monopoleis Inquiry commission "To inquire into the existence and effect of concentration of economic power in 'Private hands'. The commission was requested to look into the Prevalence of monopolistic and restrictive practices in important sector of economic activity, the factors responsible for these and the legal solutions for them. The commission looked at concentration of economic power in the area of

industry, and examined industry, wise and product, wise and product, wise concentration. It drafted a law to control monopolies and recommended the setting up of a permanent monopolies and Restrictive Trade Practices Commission. On this basis, an Act was passed and a Monopolies commission was appointed by the government in 1969.

In July 1969, an Industrial Licensing Inquiry committee was appointed to examine the shortcomings in licensing policy. The committee felt that the licensing policy had not succeeded in preventing the practice of Pre-empting capacity by large houses; It had not ensured development of industries according to announced licensing policies; it did not prevent investment in non-priority industries etc..In 1969, the MRTP Act was passed by the Government and following the report of Industrial Licensing policy Inquiry Committee, a number of new restrictions were put on the large industrial houses in the industrial licensing policy announced in 1970.

The foreign Exchange Regulation Act (FERA) was thoroughly revised and amended in 1973. It brought a great change in the foreign investment policy of the government. The main aim of the Act was to regulate foreigner exchange transactions to limit the use of foreign exchange resource which apparently constrained the freedom investors.

The industrial policy statement of 1973 has been made in the context of a series of socialist policies, including bank nationalization (1969) and the monopolies and Restrictive Trade practices Act (1969). While it reiterated the philosophy of the IPR 1956, the statement made licensing stringent for large industrial house. The recognition of the concept of joint sector has been another development. A Secretariat of Industrial Approval (SIA) has also been established to provide single-window clearance.

The Industrial Policy Statement of 1977 announced by the Janata Government emphasized the importance of small and cottage industries and reserved certain industries for these sectors. A tiny sector (investment limit Rs.1 lakh) also has been recognized. The statement has a strong bias against large scale and heavy industries. The establishment of the District Industries Centre's has been another notable reform. These DICs are to function as the nodal points for raw material distribution, credit facilities and marketing for small scale and cottage industries. Borrowing by large scale industries for expansion/modernization has been severely restricted. They have to find resources from internal accruals. The geographic dispersal of industries through a system of incentives has another innovative measure introduced in this statement.

The Industrial Policy statement of 1980 was drafted by the new Congress Government and it sought to reverse the ideological bias of the 1977 statement by reaffirming its faith in the IPR 1958. However, the statement was outward looking in its commitment to liberalization of licensing, export and production. The period 1981 – 1982 to 1990 -1991 could be considered as mild liberalization period. The policy statement advocated a co-ordinate development of small, medium, and large –scale industries. Industries sickness has been sought to be addressed by devising an early warning system.

The New Industrial Policy of 1991 (NIP 1991) announced in the wake of the liberalization and stabilization policies marks a virtual departure from the IPR1956 and the 'Li-

cense Permit Raj'. The emphasis has been an deregulation and opening up of the economy.

Subsequent to the New Industrial Policy (NIP) of 1991, several procedural changes have been made. The Foreign Exchange Regulation Act (FERA) has been replaced by the Foreign Exchange Management Act (FEMA) with effect from June 2000.

A study of the Union Planning Commission on the status of the business regulatory environment for the manufacturing sector has ranked Tamil Nadu one among top nine States. Six parameters have been taken into account for the study, and Tamil Nadu comes out on top in five of the six parameters. The five parameters are finance and tax-related compliances; infrastructure and utility-related approvals; land and building-related approvals; environmental clearances and other business regulatory compliances. Tamil Nadu has been placed in the group of low-ranking States with respect to labour law-related compliances, according to the study report available on the website of the Planning Commission (<http://planning.commission.nic.in>).

The study, covering 28 States during September 2013-January 2014, was conducted in the context of the Planning Commission's identification of improvement of the business regulatory environment as a key factor for achieving growth in the manufacturing sector.

In the economy of Tamil Nadu, the share of the secondary sector is 30.24 per cent, of which share of manufacturing is 20.74 per cent, says the State Planning Commission. A perusal of the report also reveals that there is no top-ranking State that has done exceedingly well in all the six parameters. Just like Tamil Nadu, others scored lower rating in one parameter or the other.

Liberalization is considered as an important element in the reform policy. The main aim of new industrial policy of 1991 has to achieve sustainable growth in productivity, self – reliance, gainful employment and growth with equality. The proponents of new economic policy 1991 are of the conviction that liberalization will usher healthy competition and that turn will lead to improvements in productivity and there by higher growth. On the other hand, apprehensions are also voiced regarding the ability of Tamil Nadu manufacturing industry to withstand external competition in the liberalized regime. Hence it is necessary to study performance of the Tamil Nadu manufacturing industry during before and after liberalization period. Therefore, the study makes an attempt to analyze the performance of Tamil Nadu manufacturing industry in terms of number of units, gross value added and employment across the selected two-digit level industries and to examine the efficiency of Tamil Nadu manufacturing in terms of labour productivity and capital productivity across selected two-digit level industries for the period 1980-2013.

II METHODOLOGY OF THE STUDY

The study is based on secondary data. The basic data for the study will be collected from the Annual Survey of Industries (ASI) report published by the Central Statistical Organization (CSO) Government of India. Data are available for period 1980-81 to 2012 – 13. Six two-digit industries namely (i) Food Industry, (ii) Cotton Industry, (iii) Chemical Industry, (iv) Rubber Industry, (v) Machinery Industry and (vi) Transport Industry have been selected according to their weight (share) in value added in TNRMI. There are 15 sub-groups at the two-digit level industrial classification. The

six selected industry's weights, food industry weight has been 7.0 per cent, cotton industry weight has been 6.7 per cent, chemical industry weight has been 2.0 per cent, rubber industry weight has been 10.6 per cent, machinery industry weight has been 29.4 per cent and transport industry weight has been 23.2 per cent. The selected industries together share 78.9 per cent of total value added Tamil Nadu registered manufacturing Industry (TNRMI).

The study period (1980-81 to 2012-13) has been divided into three sub periods namely, a phase of piecemeal and ad hoc policy changes (1980- 81 to 1990-91), a phase of major changes in economic policy (1991-92 to 2000-01) and a period of consolidation of economic reforms (2001-02 to 2012- 13).

Growth rates are perhaps the most commonly used measure in economic enquiry. The sub-period growth rates are usually measured by running regressions separately for each period. In the case of independent estimation, however the trend line is likely to discontinue and hence, some time-disparity may arise in between growth rates of the sub-periods and whole period. Boyce (1986) has suggested a method of kinked exponential model for removing the inconsistency in the case of exponential trend equations, based on the elimination of the discontinuity between sub-periods by imposing linear restriction.

For the three sub-periods by adding the three separate linear trends

$Y_1 = a_1D_1 + b_1D_1t$, $Y_2 = a_2D_2 + b_2D_2t$ and $Y_3 = a_3D_3 + b_3D_3t$, one can obtain a discontinuous linear model as indicated below:

$$Y_t = a_1D_1 + b_1D_1t + a_2D_2 + b_2D_2t + a_3D_3 + b_3D_3t + u_t \dots (1)$$

Where $D_1 = 1$ for the first period

= 0 otherwise

$D_2 = 1$ for the second period

= 0 otherwise

$D_3 = 1$ for the third period

= 0 otherwise

The possibility of discontinuity could be eliminated by two linear restrictions so that the first two lines intersect at the break point K_1 and second and third lines intersect at the second break point K_2 . In mathematical terminology it is like

$$a_1 + b_1K_1 = a_2 + b_2K_1 \dots \dots \dots (2) \text{ and}$$

$$a_2 + b_2K_2 = a_3 + b_3K_2 \dots \dots \dots (3)$$

After solving equation 1 with these restrictions 2 and 3, one can easily get the restricted model as

$$Y_t = a_1 + b_1 (D_1t + D_2K_1 + D_3K_1) + b_2 (D_2t + K_2D_3 - K_1D_2 - K_1D_3) + b_3 (D_3t - K_2D_3) + u_t$$

For the present study, the following double kink exponential model has been used. This model is

$$\ln Y_t = a_1 + b_1 (D_1t + D_2K_1 + D_3K_1) + b_2 (D_2t + K_2D_3 - K_1D_2 - K_1D_3)$$

$$+ b_3 (D_3t - K_2D_3) + u_t$$

Here, the breaks in the year 1991-92 and 2000-01, and the three sub-periods 1980-81 to 1990-91, 1991-92 to 2000-01 and 2001-02 to 2011-12. K_1 and K_2 are the two break points, hence $t = 9$ at K_1 and $t = 19$ at K_2 and t is time period and b_1 , b_2 and b_3 are the parameters to be estimated on the basis of observed data. Growth rate for the sub-period has been calculated by $[\exp (b) - 1]$.

In the empirical literature on manufacturing industry, output is measured in terms of either value of gross output or value added. In the present study, the measure of output is gross value added is more relevant, however net value added figure as given in ASI has the limitation to the extent that the depreciation figures do not reflect the actual capital consumption. Gross value added at current price is the increment to the value of goods and services contributed by deflating (single deflation) gross value added at current prices by the general wholesale product price index (with 2004-05 as the base). At the disaggregate level in the six two digit industries, gross value added at current prices have been deflated by the respective wholesale product price indices (with 2004-05 as the base).

Labour input is generally measured in terms of the total number of man- hours worked or the average number of persons employed. 'The use of man- hours worked' is often regarded as a better measure as it includes number of workers as well as the working hours in a day. However, it has been pointed out that the consumption of man – hours in ASI is carried out by multiplying the number of workers in a shift by eight and both by the actual duration of the shift and then aggregating such products across factories. So, the resultant series do not measure the actual man hours worked. Therefore, total number of employees has been taken as the measure of labour input. Labour productivity has been measured as gross value added per employee.

Perpetual Inventory Method has been used for measuring capital stock. For the construction of capital stock series, the bench mark year has been taken as 1970-71. With bench mark year deflated (for 2004-05 prices) capital stock, gross investment at constant prices (2004-05 prices) have been added cumulatively. For construction gross investment at constant prices, gross investment at current price has been deflated by wholesale price index of plant and machinery.

In other words, the gross fixed capital stock services $\{K_t\}$ has been constructed as:

$$K_t = K_0 + \sum_{t=1}^n I_t$$

where,

K_t is the gross fixed capital stock at constant prices in period t .

I_t is the gross investment in fixed capital at constant prices in period t .

The gross investment in fixed capital stock at constant prices is computed as follows:

$$I_t = (B_t - B_{t-1} + D_t) / P_t$$

Where,

B_t is the book value of fixed capital in the year t.

D_t is the depreciation in the year t.

P_t is the price index of machinery and machinery parts

III RESULTS AND DISCUSSION

3.1 Growth of number of Units

During the 33-years period of study (1981-82 to 2012-13) compound growth rate of cotton industry in number of units has been 6.05 per cent per annum (refer table 6.1). Rubber industry has taken next rank with 4.46 per cent per annum. It has been followed by chemical products (3.28 per cent), food industry (1.66 per cent), machinery industry (0.17 per cent) and transport (-4.20 per cent)

During a phase of piecemeal and ad hoc policy changes (1980-81 to 1990-91) period transport has registered a compound growth rate of 8.64 per cent per annum in number of units. Second place has been taken by rubber industry for which growth rate is 6.17 per cent. For cotton, machinery, chemical and food industries the compound growth rate have been 5.92 per cent, 5.82 per cent, 4.14 per cent and 2.89 per cent per annum respectively.

During a phase major changes in economic policy (1991-92 to 2000-01) period cotton has registered a compound growth rate of 8.05 per cent per annum in number of units. Second place has been taken by chemical industry for which growth rate is 4.59 per cent. Rubber and food industries the compound growth rate of less than 2 per cent per annum. For machinery and transport industries negative growth rate of -6.22 and -13.84 per cent per annum.

On the other hand, during a period of consolidation of economic reforms (2001-02 to 2012-13) period it has been found that rubber industry has secured the first position registering a compound growth rate of 6.39 per cent per annum.. It has pushed down cotton, machinery to the next position. For food, chemical and transport parts have registered growth rate of less than 3 per cent per annum.

Table 1
Growth rate of number of units in Registered Manufacturing at two-digit level

(Per cent per annum)

Industry	Period			
	1980-81(a phase of piecemeal and ad hoc policy changes)	1991-01(a phase of major changes in economic policy)	2001-13(a period of consolidation of economic reforms)	1980-13 (Entire Period)
Food	2.89	0.33	2.25	1.66
Cotton	5.92	8.05	3.73	6.05
Chemical	4.14	4.59	0.94	3.28
Rubber	6.17	1.77	6.39	4.46
Machinery	5.82	-6.22	3.66	0.17
Transport	8.64	-13.84	-2.04	-4.20

Source: Computed using ASI data

Note: Growth rate for the sub-periods given above are calculated from kinked exponential model where as growth rate for 1980-13 is calculated from the semi-log trend equation.

Comparison of compound growth rates for number of units has revealed that a phase of piecemeal and ad hoc policy changes period (1980-81 to 1990-91) have positive growth rate of all industries. For food, cotton, chemical, rubber industries have positive growth rate of a phase of major changes in economic policy period. On the other hand, a period of consolidation of economic reforms period industries have negative growth rate.

3.2 Growth of Gross Value Added

Table 2

Growth rate of Gross Value Added of the selected at two-digit industries in TNRMI

(Per cent per annum)

Industry	Period			
	1980-81(a phase of piecemeal and ad hoc policy changes)	1991-01(a phase of major changes in economic policy)	2001-13(a period of consolidation of economic reforms)	1980-13 (Entire Period)
Food	9.61	4.22	5.22	6.02
Cotton	9.12	6.81	4.68	6.76
Chemical	5.93	7.01	-2.29	3.63
Rubber	18.76	-10.10	10.36	3.79
Machinery	9.92	-5.26	14.58	4.98
Transport	9.69	-10.54	5.62	-0.10

Source: Computed using ASI data

Note: Growth rate for the sub-periods given above are calculated from kinked exponential model where as growth rate for 1980-13 is calculated from the semi-log trend equation.

Growth of value added has been the highest in cotton industry (6.76 per cent per annum), followed by food industry (6.02 per cent per annum), machinery (4.98 per cent per annum), rubber industry (3.79 per cent per annum), chemical (3.63 per cent per annum) and transport (-0.10 per cent per annum) during the entire period of study.

Growth of value added in six industries except rubber, machinery and transport have been relatively lower during a phase of major changes in economic policy changes. Growth value added has been negative in rubber (-10.10 per cent per annum), machinery (-5.26 per cent per annum) and transport (-10.54 per cent per annum) among all the six industries during the period 1991-2001. However, growth of value added has been more than five percent per annum in chemical industry during a period of ad hoc policy changes. All the industries have registered growth of gross value added exceeding 9 per cent per annum in a phase of piecemeal and ad hoc policy changes.

Growth of output level has been setting to the right in all the industries except chemical industry during the period of consolidation of economic reforms. Gross value added has registered a remarkable growth of 14.58 per cent per annum, 10.36 per cent per annum, 5.62 per cent per annum 5.22 per cent per annum and 4.68 per cent per annum in machinery, rubber, transport, food and cotton re-

spectively during the period of consolidation of economic reforms. Chemical industry (-2.29 per cent per annum) have registered negative growth rate period of consolidation of economic reforms.

In 1980-81, among the six industries, cotton has provided the highest number of employment followed by food, chemical, machinery transport and rubber. Employment in cotton and chemical industry has not shown any specific trend and it has been fluctuating since 2010-11. In 2012-13, employment has almost doubled in cotton industry.

3.3 Growth of employment

During the period of consolidation of economic reforms, rubber industry has more number of employees compared to other industries. All industries except transport have generated more employment in 2012-13 compared to 1980-81. Compound growth rate of employment during 1980-81 to 2012 -13 has been higher in rubber industry (3.76 per cent per annum) and in transport industry has been the minimum (-6.74 per cent per annum).

During a phase of piecemeal and ad hoc period, transport industry has provided the highest number of employment followed by rubber, machinery, chemical and cotton industry.

In second period a phase of major changes in economic policy, cotton industry has more number of employed (6.60 per cent per annum) compared to other industries. Rubber, machinery and transport industries are negative growth rate of employment in a phase of major changes in economic policy period.

Table 3
Growth rate of number of Employees in selected six two-digit industries in TNMRI

(Per cent per annum)

Industry	Period			
	1980-81(a phase of piecemeal and ad hoc policy changes)	1991-01(a phase of major changes in economic policy)	2001-13(a period of consolidation of economic reforms)	1980-13 (Entire Period)
Food	-0.33	1.78	1.34	1.04
Cotton	1.63	6.60	2.00	3.71
Chemical	3.82	3.31	-3.12	1.34
Rubber	5.28	-1.48	9.28	3.76
Machinery	4.38	-8.49	5.70	-0.55
Transport	6.66	-20.13	0.60	-6.73

Source: Computed using ASI data

Note: Growth rate for the sub-periods given above are calculated from kinked exponential model where as growth rate for 1980-13 is calculated from the semi-log trend equation.

3.4 Growth of wage rate

Cotton industry has been the highest wage rate in Tamil Nadu manufacturing industry, the next place has been taken by machinery industry followed by transport industry during followed the period of study. Food, chemical and rubber industries wage rate lowest compared to cotton industry.

Comparison of compound growth rates for emoluments

has revealed that the period of consolidation of economic reforms (2001-2013) growth rate have exceeded a phase of major changes in economic policy period in the case of chemical industry has been negative growth rates.

Further it is rubber industry, which has gained more prominence during consolidation of economic reform period as its growth rate has been the highest among all the six two-digit level industries selected for the study, the next place has been taken by machinery industry.

Table 4
Growth rate of Emoluments in selected six two-digit industries

(Per cent per annum)

Industry	Period			
	1980-81(a phase of piecemeal and ad hoc policy changes)	1991-01(a phase of major changes in economic policy)	2001-13(a period of consolidation of economic reforms)	1980-12 (Entire period)
Food	6.75	0.18	3.31	2.99
Cotton	3.82	-0.50	1.42	1.31
Chemical	5.73	0.35	2.20	0.98
Rubber	6.43	-7.23	10.50	1.97
Machinery	5.65	-9.61	10.28	0.65
Transport	8.72	-21.89	5.20	-5.72

Source: Computed using ASI data

Note: Growth rate for the sub-periods given above are calculated from kinked exponential model where as growth rate for 1980-13 is calculated from the semi-log trend equation.

3.5 Growth of Labour Productivity

The growth rate of labour productivity has been the highest in transport industry (7.11per cent) compared to machinery, food, cotton and chemical industries. Labour productivity growth rate has been marginal in rubber industry. The period wise analysis has shown that in the selected six industries, growth rate pattern have not been uniform over the periods.

Table 5
Growth rate of Labour Productivity of the selected six two-digit industries

(Per cent per annum)

Industry	Period			
	1980-81(a phase of piecemeal and ad hoc policy changes)	1991-01(a phase of major changes in economic policy)	2001-13(a period of consolidation of economic reforms)	1980-12 (Entire period)
Food	9.98	2.40	3.48	4.93
Cotton	7.36	0.19	2.63	2.94
Chemical	2.02	3.57	0.85	2.26
Rubber	12.80	-8.74	0.98	0.03
Machinery	5.30	3.52	8.40	5.57
Transport	2.84	12.01	4.98	7.11

Source: Computed using ASI data

Note: Growth rate for the sub-periods given above are calculated from kinked exponential model where as growth rate for 1980-13 is calculated from the semi-log trend equation.

During a phase of piecemeal and ad hoc changes period, growth rate of labour productivity of rubber industry (12.80 per cent) has been the highest. Food industry has occupied the next position (9.98 per cent) followed by cotton industry (7.36 per cent). For machinery growth rate of labour productivity and chemical industries have labour productivity growth rate of 2.84 per cent and 2.02 per cent respectively.

During the phase of major changes in economic policy period, labour productivity growth rates of food, cotton and rubber industries have declined. On the other hand, rubber industry growth rate which secured first position during a phase of piecemeal and ad hoc policy changes period has become negative. Food industry which has shown the second position growth rate of labour productivity during the phase of piecemeal and ad hoc policy changes period has experienced a steep fall during a phase of major changes in economic policy period. Chemical and transport industries have experienced increase in labour productivity growth rate.

3.6 Growth of Capital Productivity

During the entire period of study, the six two-digit industries have shown a declining growth rate. Growth rates of capital productivity during a phase of piecemeal and ad hoc policy changes and phase of major changes in economic policy and a period of consolidation of economic reforms have turned out to be negative. For a consolidation of economic reform period rubber, machinery, transport industries has been shown growth during 1.69 per cent, 7.00 per cent and 1.76 per cent respectively.

Table 6
Growth rate of Capital Productivity of the selected six two-digit industries

(Per cent per annum)

Industry	Period			
	1980-81(a phase of piecemeal and ad hoc policy changes)	1991-01(a phase of major changes in economic policy)	2001-13(a period of consolidation of economic reforms)	1980-12 (Entire period)
Food	-0.44	-5.68	-1.97	-3.05
Cotton	-1.99	-5.79	-2.47	-3.68
Chemical	-5.75	-1.25	-2.10	-2.80
Rubber	-2.86	-5.82	1.69	-2.63
Machinery	-1.14	-7.61	7.00	-1.29
Transport	-0.71	-8.41	1.76	-3.12

Source: Computed using ASI data

Note: Growth rate for the sub-periods given above are calculated from kinked exponential model where as growth rate for 1980-13 is calculated from the semi-log trend equation.

IV POLICY IMPLICATIONS

Growth of output level has been setting to the right in all the industries except chemical industry during the period of consolidation of economic reforms. Gross value added has registered a remarkable growth of 14.58 per cent per annum, 10.36 per cent per annum, 5.62 per cent per annum 5.22 per cent per annum and 4.68 per cent per annum in machinery, rubber, transport, food and cotton respectively during the period of consolidation of economic reforms. On the whole, comparative analysis across the three times period has revealed that LPG policy has shrunk

growth of value added at the all industries except cotton and chemical during the phase of major changes in economic policy and enhanced during a period of consolidation of economic reforms. On the whole it is inferred that economic reforms have been positive impact on output growth in Tamil Nadu manufacturing during the most recent period 2001-13.

The adoption of LPG policies has not only to promote but also to maintain employment growth in manufacturing sector of India. In fact, the growth rate of employment has been positive in all the industries except chemical industry during the a period of consolidation of economic reforms but it has been better in three industries out of six during a period of consolidation of economic reforms compared to during the phase of major changes in economic policy. Liberalization policy may intensify enhancing employment growth in future through that a tactics adopted under the banner of LPG.

The period wise analysis of labour productivity has shown that in the selected six industries, growth rate pattern have not been uniform over the periods but it has been positive and more than 2 per cent per annum in cotton, food and transport industries during the consolidation of economic reforms. Hence, the performance of Tamil Nadu manufacturing in terms of labour productivity has been satisfactory during consolidation of economic reforms.

The better performance has been found a period of consolidation of economic reforms in respect of wage rate in all industries under considered and growth of employee's compensation has been in consonance with output growth. On the whole, it can be concluded that growth of wage rate has been better in all industries in the state after reform process came into force and also growth of wage rate did respond well in consonance with labour productivity growth.

From the analysis the study concludes that the performance of Tamil Nadu manufacturing has been right during a period of consolidation of economic reforms.

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