The Impact of Decentralization on Economic Growth:
An Investigation with Special Reference to Small Industries in Kerala

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1. Introduction

Decentralization, which entails transfer of fiscal, political and administrative responsibility and authority to the lower level of government, has been recognized as a development strategy since the last decades of the 20th century on the assumption that it improves allocative and productive efficiency along with quality, transparency, accountability and legitimacy of the government (Falleti 2004, World Bank 1998). It is assumed that compared to centralization, decentralization brings public services closer to people providing them more avenues to participate actively in decision-making process (UNDP 1962, Litvack and Sedden: 1998). These are some of the factors that created public opinion in favour of decentralization, leading to transition of monocentric political models to polycentric structure of governance in several countries (Eaton, et al 2010). World Bank estimates of the year 1978 indicate that all but 12 of the 75 developing and transitional countries had embarked on a process of political devolution (Crook and Manor, 1998:, Johnson 2003). India too lined up on this process in 1992 with the 73rd constitution amendments that accorded statutory recognition to state governments to pass Panchayat Raj Act. Subsequently Kerala, a state which initiated decentralization process with the formation of the first Administrative Reforms Committee in 1958, enacted Panchayat Raj Act in 1994 (GOK 1994). The introduction decentralization in Kerala might be one of the reasons for its significant progress in various sectors but no serious attempt has been made to analyze this aspect. Hence, this paper attempts to examine the impact of decentralization on economic development of Kerala.

The study begins with a short theoretical discussion of on decentralization and its impact on economic growth. The third section explains the method of analysis, the fourth section deals with empirical analysis and the last section recapitulate the major findings.

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2. Theory of Decentralization

The concept of decentralization appeared first in 1950s with Riggs (1956) and Maddick (1963) which has been further elaborated by Rondinelli and Nellis (1986:5), Martinez_Vazquz (2011), Walker (2002: 63), Ozmen (2014) and others along with institutions like the United Nations (1962). According to Walker (2002) decentralization is "the transfer of political power, decision making capacity and resources from central to subnational levels of government". Ozmen (2014) and, Rondinelli (1999) expressed almost same views on decentralization; "transfer of responsibilities and authority from higher to lower levels of government". World Bank (1998:4) specified decentralization as the assignment of fiscal, political and administrative responsibilities to lower levels of government and is occurring worldwide for different reasons, at different paces, and through different means. While fiscal decentralization refers to the set of policies designed to increase revenues or fiscal autonomy of subnational governments, political decentralization refers to the set of constitutional amendments and electoral reforms designed to open new spaces for the representation. Administrative decentralization may entail the devolution of decision–making authority over these policies, but this is not a necessary condition (Falleti 2004, World Bank 1998).

The essence of decentralization, according to Hiskey (2006), is restructuring principal-agent relationships designed to bring optimal outcome for the principals. It is about changing one or more principal-agent relationships that concerns the task of governance. In a specific network of coordination, governments are principals and agents at the same time. For example, central government is the agent of the states (here states are principals) which are the agents of the citizens (here citizens are principals). In other words, citizens are principals and their elected representatives are agents. The local governments have better means (in the form of information) to be responsive and better (electoral) incentives (Paul and Leruth 2006). While one agent is for one locality under polycentric system (decentralization) limited number of agents is for a large number of principles under monocentric (federal) system. Limited number of agents for large number of principals creates serious coordination problem (Tommasi and Weinschelbaum 1999).

Wallace Oates (1972, 1999) suggested that welfare gains from diversifying outputs in accord with local preferences and conditions are better than non-diversifying outputs. It is stated that " For a public good–the consumption of which is defined over geographical subsets of the total population, and for which the costs of providing each level of output of the good in each jurisdiction are the same for the central or for the respective local government–it will always be more efficient for local governments to provide the Pareto-

efficient levels of output for their respective jurisdictions than for the central government to provide *any* specified and uniform level of output across all jurisdictions" (Oates 1972 :35). Precisely, total welfare of the society can be augmented by addressing local preferences instead of applying a "one size fits all" approach which usually goes along with centralization.

Smith (1985) introduced a new proposition regarding decentralization which has been developed on the foundation of normative principle. According to Smith lower level government are more capable of handling public services effectively than the centralized governments and proposed that the public services should be entrusted to the lowest level of government. Ostrom et al., (1961) and Buchanan and Tullock, (1962) proposed of public choice theory of decentralization. The essence of this proposition is that under conditions of reasonably free choice, the provision of some public goods is more economically efficient when a large number of local institutions are involved in rather than involvement of one provider; the central government. Precisely, the theory of decentralization has been developed on the assumption that it improves quality, transparency, accountability and legitimacy of the governance which in turn influence productive and allocative efficiency of the system (Baland and Plateau 1996; IFAD 2001; Ostrom 1990; Wallace Oates (1972, 1999), Smith (1985), North (1993), Dick-Sagoe (2012), Rondinalli (1989) and Hiskey (2006).

3. Industrial development and economic growth

The impact of industrialization on economic development is apparent from the experience of European countries and United States of America right from the industrial revolution. The current understanding of economic growth is largely based on the neoclassical growth model developed by Robert Solow (1956), which recognized the role of industrialization on economic growth. Solow model is used to describe the attributes of supply side economic growth which assumes that economic growth can be more effectively created by lowering taxes and decreasing regulation. In the Solow model, capital accumulation is a major factor contributing to economic growth. The annual supply side growth rate of an economy is determined by its labor force growth rate and increases worker productivity. Growth in labour production- measured as an increase in output per worker- results from increase in the capital accumulation (Fagerberg 1994). Capital accumulation will continue until economy reaches its steady state and the capital-labour ratio remains constant. Steady state economic growth assumes that the capital/labor ratio remains fairly constant and growth results from better capital leading to increase in worker productivity and increase in the labor force. In the steady state, per

capita income growth is due to exogenous technological change (Kniivilä 2007). The Solow model developed in the context of large industries need not be true for small industries. However, small industries played a significant role in reducing impact of global economic crisis (de Barros 2009, Vandenberg 2009). Hence, it is relevant to examine the role of small industries in economic growth.

4. Method of Analysis

The impact of small industrial growth on economic development of Kerala has been tested in the light Solow model. Secondary data regarding growth of small industries collected from government sources from 1981-82 to 2014-15 is used for empirical analysis. The growth performance of small industries in terms of number of units, employment generation, capital investment, value of goods and services produced is estimated in the outset. Further, analysis has been carried out by dividing data into two time period; pre-decentralized (1981-82 to 1995-96) and decentralized periods (1996-97 to 2014-15). Growth performance of three factors *labor, capital, and technology* are tested to better understand the impact of industrial development on economic growth. Capital investment and value of goods and service at constant prices are used for analysis. Indices of industrial prices (IIP) and whole sale consumer prices are respectively used to deflate capital investment and value of goods and services produced by small industries.

The empirical analysis is carried out in the light of Cobb-Douglas production function. The simplest form of Cobb–Douglas production function with two factors of production is of the form:

$$Y = A\,L^{\alpha}K^{\beta} \qquad\qquad (1)$$

Where Y = Output; L = Labour input, K = Capital; *A*, *α*, and *β* = (1−α) are positive constants; α is the contribution of labour to output. β = 1- α is the contribution of capital to output. In Cobb-Douglas production function, technology is assumed to be determined exogenously. This production function, expressed in exponential form, must be converted to a logarithmic form for estimating α and β. When converted to log-linear from it appears as:

$$Ln\,Y = Ln\,A + \alpha\,Ln\,L + \beta\,Ln\,K + U,$$

where α is output elasticity of labor (L) and β is output elasticity of capital (K) , U is random error. A semi log model with year as the explanatory variable is used to estimate

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compound growth rate. If $(\alpha + \beta) = 1$, the production function exhibits constant returns to scale; if $(\alpha + \beta) < 1$, the production function exhibits decreasing returns to scale and if $(\alpha + \beta) > 1$, the production function exhibits increasing returns to scale. It is required to take the natural logarithm of both sides of the model to create linear model.

The exponential trend equation of the form $X=Ae^{bt}$ is estimated based on the least square principle. The major advantage of the statistical approach enables to test the statistical significance of the estimated growth rate. Besides, it has the advantage of being a summary measure derived from a series of observations. Hence the present study is made on the basis of the model $X=Ae^{bt}$

5. Empirical Analysis

The growth performance of small industries in terms of total number units, employment generation, investment and value of goods and services produced has been examined in the outset. The number of units of small industries increased from 21977 in 1881-82 to 249696 in 2014-15. Employment generation increased from 160426 to 1274385 during this period. During the period of study, capital investment at constant price increased from Rs 22788.66 lakhs to Rs 193239.00 and value of goods and services produced at constant increased from Rs 52946.26 lakh to Rs 728472.2 Lakh. Growth performance of small industries in two time periods has been tested subsequently. The summary results of this analysis are given in Table 1.

The results of the analysis indicate that the growth performance of small industries was better in pre-decentralization than in post-decentralization. The trend growth rate of number of units in pre-decentralization was 13.67 percent and that in post decentralization period was 0.98. Corresponding compound growth rates in this period are 0.15 percent and 0.01 percent respectively. The trend growth rates of employment generation during the period of pre-decentralization and post decentralization are 11.12 percent and 0.28 percent respectively. Corresponding compound rates in are 0.118 percent and 0.003 percent. The trend growth rates of capital investment are 6.64 percent and 4.59 percent. Corresponding compound growth rates of capital investment are 0.07 percent and 0.05 percent respectively. Finally, the trend growth rate of value of goods and services produced in pre-decentralization period was 8.63 percent and that of post decentralization period was 4.63 percent. Corresponding compound growth rates are 0.09 percent and 0.05 percent. Figures 1-4 depict overall performance of these variables in pre and post decentralization periods. Having analyzed the growth performance of small

industries in two time periods, the impact of decentralization on economic growth has been analyzed. The results of the analysis are summarized in Table 2.

Table 1 Summary result of estimated trend equations of small industries of Kerala in pre and post decentralization period

Variables	Time Periods	Descriptions		
		Model	Annual Trend growth rate %	Annual compound growth rate
1	1981-82 to 1995-96	Ln (no of SSI units) = 9.83 + 0.1367t* (.0013) Adj R2 = 0.99	13.67	0.1464
	1996-97 2014-15	Ln (no of SSI units) = 12.19+ 0.0098t (.0061) Adj R2 = 0.0058	0.98	0.0099
2	1981-82 to 1995-96	Ln (Employment) = 11.91 + 0.1112t* (.0014) Adj R2 = 0.99	11.12	0.1176
	1996-97 2014-15	Ln (Employment) = 13.74 + 0.0028t (.0089) Adj R2 = 0.053	0.28	0.0028
3	1981-82 to 1995-96	Ln (Capital) = 9.94 + 0.0664t* (.0050) Adj R2 = .93	6.64	0.0686
	1996-97 2014-15	Ln (Capital) = 11.10 + 0.0459t* (.0078) Adj R2 = .79	4.59	0.0469
4	1981-82 to 1995-96	Ln (Production) = 10.76 + 0.0863t* (.0053) Adj R2 = .95	8.63	0.0901
	1996-97 2014-15	Ln (Production) = 12.18 + 0.0463t* (.0104) Adj R2 = .51	4.63	0.0475

+Values in the parentheses are standard errors
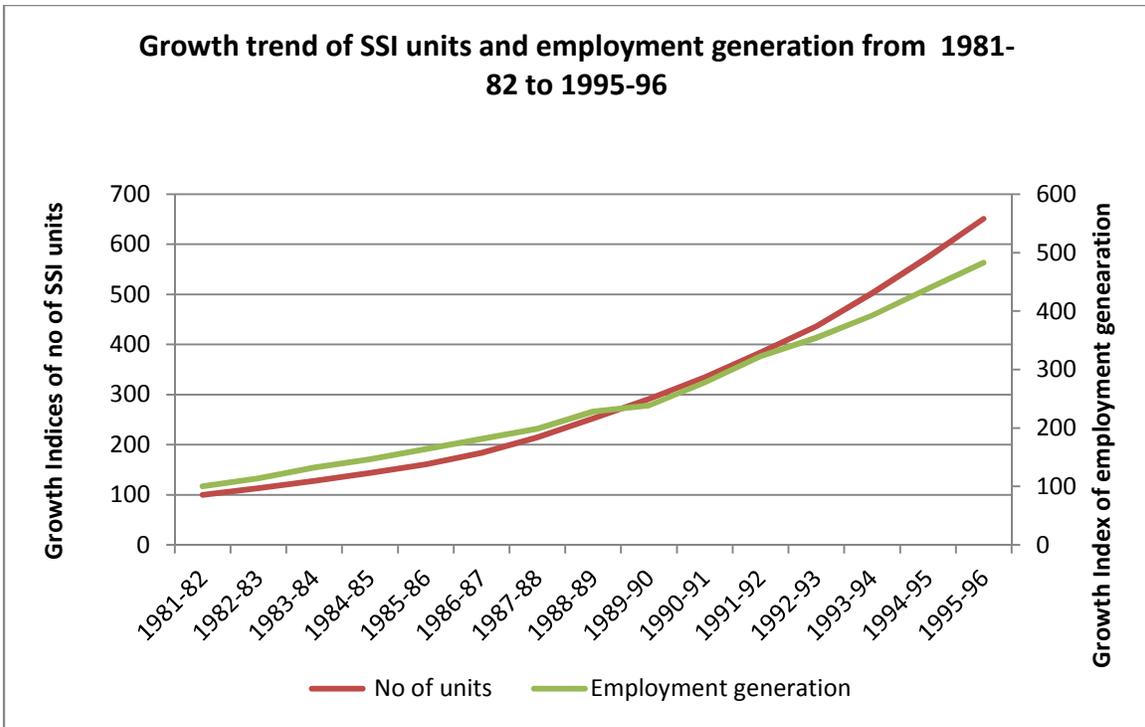* Values are significant at 5% probability level
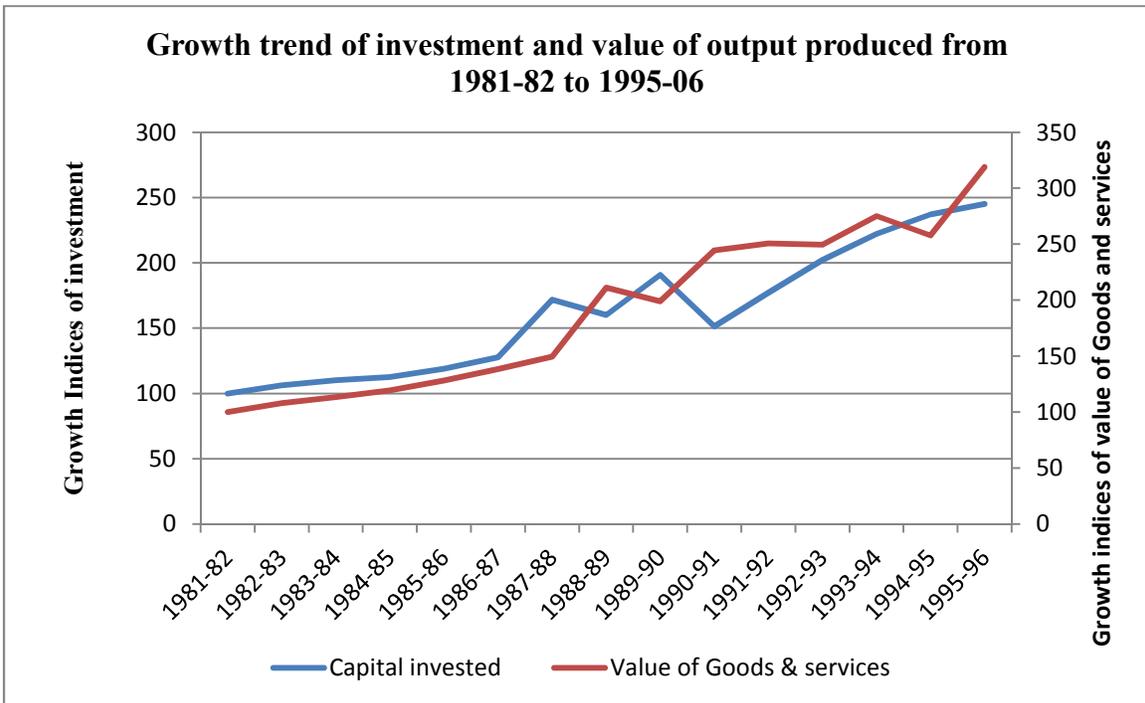
Growth trend of SSI units and employment generation from 1981-82 to 1995-96

Figure 1

Growth trend of investment and value of output produced from 1981-82 to 1995-06

Figure 2

Growth trend of SSI units and employment generation from 1996-97 to 2014-15

Figure 3

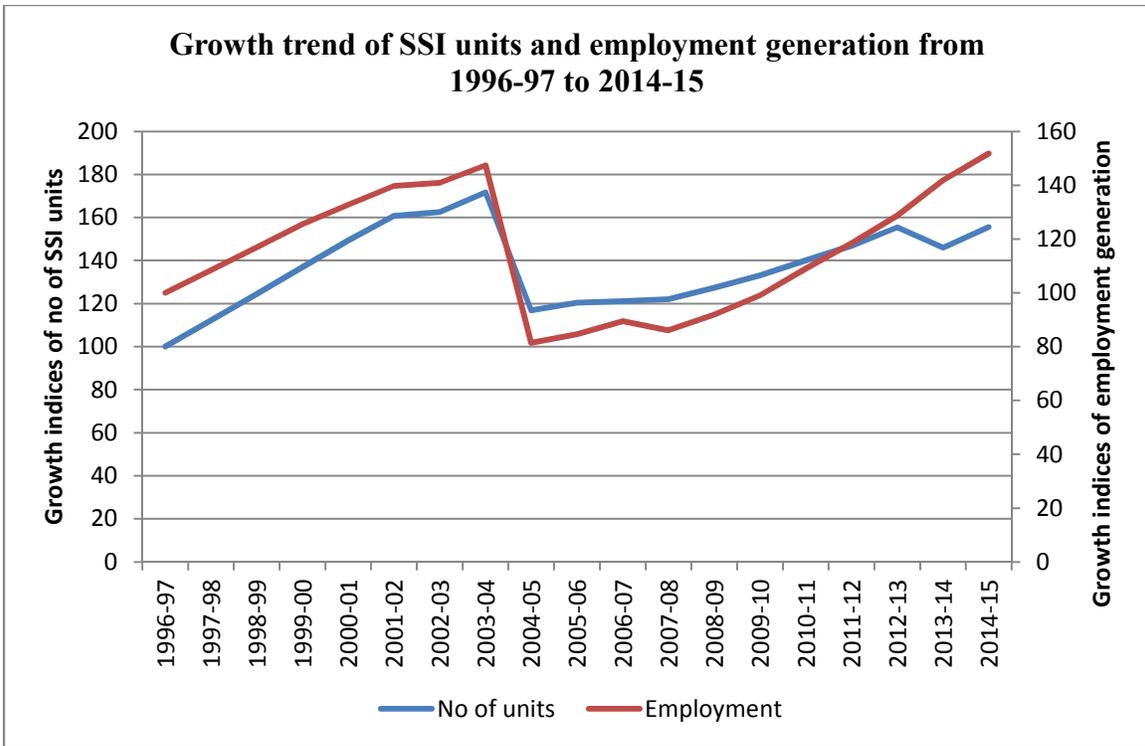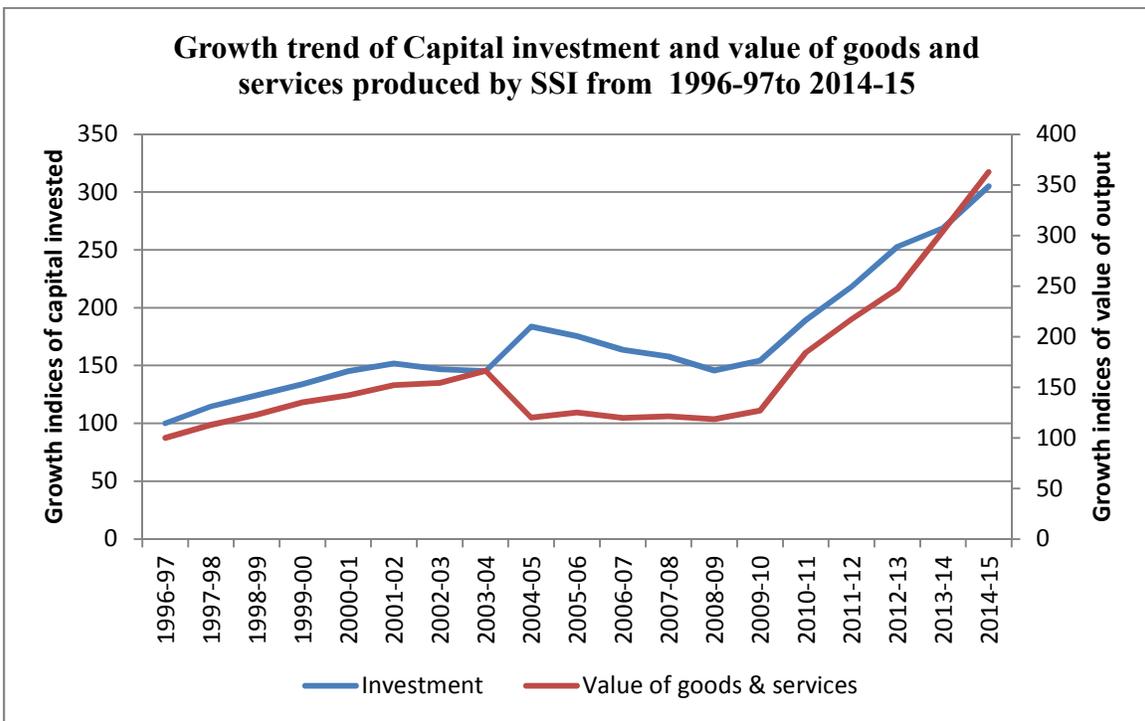**Growth trend of Capital investment and value of goods and services produced by SSI from 1996-97 to 2014-15**

Figure 4

Table 2 Summary result of estimated trend equations showing impact of decentralization on Economic growth

Time Periods	Description	α+β	Return to scale
	$\ln Y = \ln A + \alpha \ln L + \beta \ln K + U$		
1981-82 to 1995-96	Ln (output) = 1.1614 + 0.8293 Ln L* - 0.0934LnK (0.5950) (0.1772) (0.2865) Adj R2 = 0.9422	0.74	< 1
1996-97 to 2014-15	Ln (output) = - 3.4418* + 0.7879 Ln L*+ .9303LnK* (0.41130 (0.0808) (0.0575) Adj R2 = 0.9640	1.72	> 1

+Values in the parentheses are standard errors
* Values are significant at 5% probability level

The results of the analysis exhibits increasing returns to scale (α+β = 1.72) during the post-decentralization and decreasing returns to scale (α+β = 0.72) during the pre-decentralization. According to Solow, increasing returns from industrial production indicates economic growth. In post-decentralization, output elasticity of labor increased by 0.7879 and output elasticity of capital increased by 0.9303, which are positively significant. The positive coefficients of both labor and capital indicate that increase in any one of these two variables would lead to increase output. However, it appears in pre-decentralization, output elasticity of labour was (0.8293) significant and capital elasticity was not significant (-) 0.0934. The total factor productivity in pre-decentralization was 1.16 and that in post decentralization was (-) 3.44. Precisely, small industries depicted better performance in terms of labor and capital productivity during the period of decentralization indicating that decentralization has significant impact on economic growth.

6. Limitation of the Study

It is customary to use Cob Douglas production function to examine economic performance in two time periods. However, Cobb-Douglas production functions with two variables, labor and capital, has the limitation to measure influence of other inputs.

General Cobb–Douglas production function is very much capable of handling multiple inputs (Vilcu 2011). The model can be written as:

$$Y = AI_1{}^{\alpha 1} I_2{}^{\alpha 2 \cdots} I_n{}^{\alpha n}$$

This function can be estimated as a linear relationship using the following expression:

$$\ln(Y) = \alpha_0 + \sum \alpha_i \ln(I_i)$$

        Where: Y = Output,
        I_i = Inputs
        αi = Model coefficients

A production function for small industries has been formed connecting output and most relevant inputs subject to the general principles of cobb Douglass models. The functional form is given below:

$$G = f(L,K,H, G,M) \quad Q = A\, L^{\alpha 1}\, K^{\alpha 2}\, H^{\alpha 3}\, G^{\alpha 4}\, M^{\alpha 5} + U_i$$
Where $A > 0$ and $\alpha i > 0$, for all $i \in \{1, \ldots, n\}$.
L = labour,
K = capital
H = human capital
G = Self-government
M = materials and supplies
Q = product
U_i = stochastical disturbance term
$$Q = A\, L^{\alpha 1}\, K^{\alpha 2}\, H^{\alpha 3}\, G^{\alpha 4}\, M^{\alpha 5} + U_i$$
$$\ln Q = \ln A + \alpha_1 \ln L + \alpha_2 \ln K + \alpha_3 H + \alpha_4 \ln G + \alpha_5 \ln M$$

Taking logarithms on both sides of equation Cobb-Douglas production function reduces to a log-linear relationship between output of production and factors of production. Therefore, it essentially takes the form of a multiple regression equation. If all inputs and the output are expressed in monetary terms, the coefficients of independent variables may be used for interpreting the importance of the independent variables in explaining the variation in the dependent variable. Empirical analysis using this model will be carried out in the next stage.

7. Conclusions

Though the discussion on decentralization was instigated in early 1950s, it has been accepted as a development strategy right from early 1960s. As a better alternative to monocentric political system, all but 12 of the 75 developing and transitional countries had embarked on a process as early as 1978. The transition from monocentric to polycentric development strategy enabled several nations to exploit potential of their local resources at maximum, which was instrumental in accelerating their economic growth. India embarked on decentralization with the 73rd constitution amendments which enabled Kerala to enacted Panchayat Raj Act in 1994**.** Economic growth of Kerala initiated right from 1957 but decentralization was instrumental in accelerating its development process. However, no serious attempt has been made in investigating the impact of decentralization on economic development of Kerala. Current study is an earnest attempt in this direction by taking performance of small industries as the proxy of economic growth.

It is apparent from the analysis that the trend growth rates small industries in terms of number of units, employment generation, capital investment and value of goods and services was better during pre-decentralization (1981-82 to 1995-96) than during decentralization (1996-97 to 2014-15). The compound growth rates of all these variables depicted almost same trend. Output elasticity of labour was positively significant during pre-decentralization but this sector experienced decreasing returns during this period. However, output elasticity of labour and capital in post-centralization are positively significant. Further, small industries experience increasing returns during this period. In sum, decentralization has positive impact on economic growth of Kerala

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