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4. Determinants of Total Factor Productivity in Organised Textile Sector of India in Post-Reforms Period

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Introduction

Economic development is a multidimensional process influenced by economic and non-economic factors. The pattern of economic development is determined by capital-output ratio, availability of skilled labour force, capital stock, technology etc. Development can be largely attributed to the rapid growth of industrial productivity. The factor which affects the productivity directly or indirectly must be promptly analyzed (Kuznets, 1966). Productivity growth is a key determinant of growth. Economic growth without a sustained rise in productivity cannot be effective in raising the standard of living (Balakrishnnan et.al 1998). Analysis of partial and total factor productivities can provide a clear roadmap for a formulation of policies and improvement in productivity level. Add to this, such measurement provides a tool for assessing the contribution of an individual sector in the dynamic economy (Kumar, 2001).

The attempt has been made in this study to identify the determinants of total factor productivity in the Indian textile industry. These research papers have been divided into following sections. Section 1 above deals with introduction. Section 2 presents a brief profile of the textile sector of India. Section 3 deals with a review of the literature to identify the research gaps. Section 4 elucidates objectives data source, methodology and scope. Section 5 shows the model, model specification test and discussion of the results. In section 6, the various inference and conclusions of the study have been summarized.

Section II

Profile of Textile Sector

The textile industry is largely rural-oriented and labour intensive. It can be a panacea for the vicious problem of Indian economic development. This industry is diverse and heterogeneous with an exceptional significance in the Indian economy. With high labour intensity, low capital

requirement and relatively low technology, it has been the suitable choice for country like India for developing a road to industrialization. The textile sector has made a multi-direction contribution. It contributes about 14% of industrial production and 4% of GDP of the country. The industry also creates employment opportunities for about 45 million people and accounts for 12% of the export of the country (Ministry of Textile). Due to its forward and backward linkages with other sectors, it is driver of rural growth and development.

Section III

Review of Literature

The work on productivity in the manufacturing sector of India in pre reforms period have been done by Dadi and Hashim (1973), Brahamananda (1982), Ahluwalia (1985), Golder (19986). In the post-reform period, Dholikhia and Dholikhia (1993), Pradan and Barak (1998) Unel (2003) have carried work in this area. However, different studies provided divergent results due to variables, methodology, base year and estimation techniques. Pradhan and Barik (1999) made an attempt to study the total factor productivity in eight selected industries of the organized manufacturing sector of India. The result reveals that only the pulp and paper industry could register increased in total factor productivity. Unel (2003) studied the productivity growth of the Indian manufacturing sector and concluded that total factor productivity (TFP) growth in aggregate manufacturing and many sub-sectors accelerated in post-reforms. Bishwanath Golder (2004) found higher total factor productivity in the post-reform period in organised manufacturing sector of India. Sampath and Sarvankumar (2004) also show higher total factor productivity growth in the post-reform period when compared to pre-reforms period. Anbumani and Saravanakumar (2008) estimates shows that total factor productivity was higher in the pre-reform period but shown a declining trend in post-reform period. Datta (2014) study shows higher total factor productivity in the pre-reform period. Bhandari (2014) results of the nonparametric technique reveal that total factor productivity decline in the post-reforms period. It was found that productivity growth was mainly due to improved in an efficiency level in pre-reform period. The study points out that technical efficiency play significant role in pre-reform period in increasing total factor productivity.

Section IV

Objectives of the Study

1. To understand the structure and contribution of textile industry in India.

2. To identify the determinants of total factor productivity in the organized textile sector.

3. To suggest measures based on finding for improving productivity performance.

Sources of Data and Methodology of the Study

The main data source is the Annual Survey of Industries (ASI) published of the Central Statistical Organization (CSO). This study is based on secondary data. The study used Ordinary Least Square (OLS) for estimating the coefficient of the economic model. When performing OLS analysis several factors need to be examined such as multicollinearity, heteroskedasticity, and autocorrelation. The technique of Variance Inflation Factor (VIFs) was used to examine the multicollinearity. Presence of autocorrelation was identified by the Durbin-Watson test. Unit root test to check the stationery were applied on time series data. ASI data provides information on nominal value at current prices. To mention the homogeneity and estimate the real value, all the relevant variables have been deflated. Single deflation method is used by the base year price indices. The wholesale price index is obtained from Index Number of wholesale price in India with base year 1993-94=100.

Scope of the Study

The scope of the study is restricted to the organized manufacturing sector of the textile industry in India. The present study is confined to identifying determinants of total factor productivity. The study covered the period from 1991 to 2015. The scope of the study is also restricted only to quantitative variables. The study is restricted only to two digits industrial classification of the textile industry.

Section V

Empirical Model

In this study, four variables have been identified to analyze the determinants of total factor productivity. The following log-linear model is estimated

$$lnY_t = \beta_0 + \beta_1\ ln\ L + \beta_2\ lnCI + \beta_3 lnGFC + \beta_4 lnP + U_t$$

Where Y is a real value added over the period of time, L is a number of workers, CI is a capital intensity, GFC is a value of the gross value of capital, P is portability and U is an error term.

Specification Test of the Model

The study followed appropriate test before proceeding to estimate the result through the ordinary least square method. Specification test of the model was conducted to know whether

the time series data have a unit root. The Ramsey Regression Equation Specification Error Test (RESET) was applied and p-value which was obtained was 0. 645, which suggest specification was adequate not to reject the model. The model was also tested for heteroskedasticity by using the Breusch-Pagan test which showed the p-value of 0. 763, which clearly indicated that there was no heteroskedasticity present in the specified model. Any model is considered to be good fitted when an error is normally distributed. Our analyses also show that the model has good normality distribution with p-value being obtained of 0.71. Lagrange Multiplier (LM) Autocorrelation Test was used to test the existence of autocorrelation. The model shows the absence of autocorrelation as the estimated p-value 0.345. Autoregressive Conditional Heteroskedasticity (ARCH) Test was also conducted and the study found no ARCH effect present. In order to assess the multicollinearity, Variance Inflation Factor (VIF) was calculated. It was found that the VIF is less than 10 indicating the absence of multicollinearity.

Discussion of Result

In this study, four variables have been identified to analyze the determinants of labour productivity. The result of the ordinary least square method has been discussed below.

Table No: 01: Determinants of Labour Productivity (Panel Data Models)

Independent Variable	Coefficient	Std. Error	t-ratio	p-value	Significance
Constant (A)	8.634	4.109	1.3098	0.186	*
Labour (L)	0.454	0.234	0.674	0. 19	*
Gross Fixed Capital (K)	0.256	0.056	5.469	0. 35	**
Profitability (P)	-4.532	2.346	-1.765	0.12	*
Capital Intensity (CI)	0.345	. 5.435	1.675	0.32	*
Adjusted R^2	0.87				
F-statistics	6.24				
Durbin-Watson	2.45				
** Significant at 1 % and * Significant at 5 % level					

Note: The values in parentheses below the coefficients show the t-statistics, and the values in the parentheses of F-statistics show the probability values. (2) *, **, show the 1 per cent and 5 per cent level of significance respectively.

Source: Author own calculation based on ASI data using E-view software

The F- statistic confirms that the model is correctly specified as the value of F- Statistics is less than 0.05 at significance level. The adjusted R^2 value is 0.87 which indicates that 87 percent of the variation in total factor productivity can be explained by five independent

variables. The dependent variable (Y) can be measured by Gross Value Added or Net Value Added. In our analysis, we have considered the gross value added as a better index of output. Golder (1986) shows that the depreciation charges fixed by tax authorities are highly arbitrary. The result shows that the number of workers engaged and gross capital formation are positively related with total factor productivity. Total number of the person engaged relates to all persons engaged by the factory whether for wages or not, in work connected directly or indirectly with the manufacturing process and include all administrative, technical and clerical staff as also labour in the production of capital assets for factory's own use. Output elasticity of labour indicates that a one unit increased in labour would lead to 19 percent increase in total factor productivity. Similarly output elasticity of capital shows that one unit increased in capital would lead to 35 percent change in output. Gross fixed capital formation is measured by the total value of a producer's acquisitions, fewer disposals, of fixed assets during the accounting period plus certainly specified expenditure on services that add to the value of non-produced assets. Similarly, one percent change in gross fixed capital formation will change the total factor productivity by almost 35 percent. Further, the capital intensity which shows average availability of capital per labour also influences total factor productivity. It is expected to have a positive relationship with labour productivity. In our study as expected, it had a positive effect on total factor productivity. When there is one unit change in capital intensity, the total factor productivity increased by 32 percent. According to ASI methodology profit is obtained by deducting compensation of employees from net income. Profitability is positively related in determining the total factor productivity however compared to other variables it has the least significance in determining the total factor productivity in the textile sector of India. One percent change in profitability can lead to 12 percent increase in total factor productivity.

Section VI

Inference from the study

1. The study clearly shows that the coefficient of labour is not statistically significant. This clearly indicates a decrease in the efficiency of labour in the post-reform period. It also suggested that most of the labour is underemployed in the textile industry.

2. The total factor productivity is significantly related to capital intensity. The higher capital-labor ratio shows that there is a possibility of a greater level of machine led

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production in the textile sector. This may be partly due to organised manufacturing textile sector is capital intensive in nature when compared to the decentralized sector.

3. India is labour abundant country and textile sector is considered as labour intensive in nature. However, the econometrics result shows that output elasticity of labor is comparatively less as compared to capital. This indicates that the issues relating to labour reforms, skill and training in the textile sector have to be addressed with proper policy measures.

Conclusion

In this study attempt has been made to estimate the total factor productivity. The study draw important conclusion that variables such as labour and capital, capital intensity, gross fixed capital and profitability are significant in determining the total factor productivity. The major limitation of the study is that it is restricted to only organised manufacturing sector of India which account for very less output of total textile sector. This study also limits itself to quantitative variables. The research can be extended to decentralized sector and adding other quantitative and qualitative variables.

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