

Analysis of Contribution of Total Factor Productivity in Apparel Sector with Special Reference to Sri Lanka

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Introduction:

Productivity is useful as a relative measure of actual output of production compared to the actual input of resources, measured across time or against common entities. The econometric terminology for the productivity can be identified as Total Factor Productivity (TFP). TFP is the output growth which is not explained by the input variables (capital (K) and labor (L)). Being the single largest employer in the manufacturing sector, the apparel industry provides a momentous contribution to the economy of Sri Lanka.

This study aimed to find out whether the influence of TFP on the production of apparel sector in Sri Lanka and to identify the contribution of production factors to TFP of the production and to identify the determinants of TFP in the apparel sector in Sri Lanka.

Methodology

A Sample comprised of 44 garments factories in the Koggala Free Trade Zone located in the southern province was selected for the study. Southern Province is supposed to have the second highest number of garment factories in the country. Primary data were collected by interviews and secondary data were gathered from the past records of the companies. Both descriptive analysis and econometric analysis were used to analyze data. Empirical model of Cobb-Douglas production function and Least Squared (OLS) method were used in the econometric analysis.

The estimated Cobb- Douglas Production Function was,

$$\{\log(Q/L) = A + \alpha \log(K/L)\} \quad (1)$$

Estimated production function used to calculate TFP can be expressed as follows.

$$\{\log TFP = \log Q - \alpha \log K - (1 - \alpha) \log L\} \quad (2)$$

Where, $\log A = TFP$

The secondary objective of the present study was to identify the determinants of TFP and accordingly, the following regression model was tested.

$$[TFP = \beta_0 + \beta_1 EDU + \beta_2 AGE + \beta_3 EXP + \beta_4 INC + \beta_5 EXP^2 + \beta_6 AGE^2 + U]$$

Where,

β_0 = Intercept term

$\beta_1 - \beta_6$ = Slope coefficients

edu = Education level(number of years of schooling)
 age = Age of employees(years)
 exp = Work experience of the employees (number of years)
 inc = Total annual incentive cost of the firm (in Rupees)

Results and discussion

In accordance with the result of the descriptive analysis, the majority of the employees who involved in the production of the apparel sector are females. Another key factor found was that the employees engaged in the apparel production are having low level education. According to the regression output, the estimated Cobb-Douglas production function can be demonstrated as follows.

$$Q = 0.4974 K^{0.7079**} L^{0.2921**}$$

The contribution of TFP, Labor (L) and Capital (K) can be calculated as follows

Table 1: The contribution of TFP, Labor (L), and Capital (K)

	Contribution of TFP	Contribution of L	Contribution of K
Total Contribution	-961.7953	2.072823562	1.863703547
Mean Contribution	-87.4359432	0.188438506	0.169427595

According to the results of the econometric analysis, the contribution of TFP to the production is not significant eventhough factor accumulation has played a major role in the considered time period. On the other hand, the determinants and TFP have given rise to the following results in the regression model.

$$TFP = 57.75315** - 0.0353716 \text{ EDU} - 4.911874** \text{ AGE} + 2.66021* \text{ EXP} + 1.57* \text{ INC} - 0.7743042* \text{ EXP}^2 + 0.0985639** \text{ AGE}^2$$

Results indicate that the educational attainments and age are negatively related with TFP while experience and incentive costs are positively related.

Conclusions, suggestions and policy implications

The results of the descriptive analysis reveal that the majority of the employees who involves in the production of the apparel sector are females and the employees who engage in the apparel production are having low level education.

According to the results of the econometric analysis, contribution of TFP to the production is very low. It implies that, production factors (Input variables) – labor and capital are the highly contributing factors to the production of the apparel rather than TFP.

There is a negative relationship between the education level and TFP in the sense when the educational attainments of employees are lower, the TFP is decreasing. Moreover, the age of the employees and TFP has a negative relationship and what it implies is that when the age of the employees is higher, the TFP is decreasing. Further, results indicate that there is a positive relationship between experience of the employees and the TFP. It emphasizes that the experienced employees are more productive than non-experienced employees. In addition, it was found that there is a positive relationship between incentive costs and TFP what it means is that the higher the incentives provided to the employees higher the productivity.

Finally this study recommends adopting appropriate policy changes in order to improve the production of garment sector by enhancing the TFP. In order to increase the export earnings, the industry should further be developed and it is essential to be more productive so as to face the global competition. Accordingly, TFP of the industry has to be increased.

The industry players should increase the benefits offered to their employees such as incentives and salaries while training and development programs should be offered with new technological solutions. Further it is important to improve the technology utilization of the employees. HR development- development of employees' skills and adaptability, reduction of employee absenteeism and labor turnover would generate a higher productivity in the industry.

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