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Trend of Foreign Currency Earnings by the Garment Sectors in Bangladesh

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Abstract

This study was an attempt to know the trend of foreign exchange earnings on garment sectors in Bangladesh. Secondary data was used for the period 1983-20013 to estimate this trend. Different statistical methods and trend models were used to perform the analysis. An upward trend of exchange earning has been observed over the study period. The semi-log trend model was found to be the best fitted model for the foreign exchange earnings on garment sector in Bangladesh. The results showed significantly upward trend with a growth rate 30.918 percent in this sector. Thus it is gratifying that the garment industry of the country is expanding day by day and to increase the growth rate, Bangladesh government need to take proper action for better economy.

Key Words: Trend, Foreign currency, Economy, Garment sector, Bangladesh

Introduction

Bangladesh is a developing country with few large and some moderate size industries of different kinds. Among these, the fast growing ready-made garment (RMG) industries are the most prospective ones, earning the major portion of the country's foreign currency and providing employment to a large number of female and male workers. This industry has successfully transformed Bangladesh into an export-oriented economy (Mohammad Ismail Bhuiyan 2013).

The Bangladeshi garment sector is a leading garment manufacturing industry in the world that has been growing constantly during the last decades. It occupies a unique position in the Bangladesh economy. By taking advantage of an insulated market under the provision of Multi Fibre Agreement (MFA) of GATT, it attained a high profile in terms of foreign exchange earnings, exports, industrialization and contribution to GDP within a short span of time (Nehal Ahmed 2007). Readymade Garment (RMG) is the leading sector of Bangladesh in terms of employment, production and foreign exchange earnings which about 78 percent (Nehal Ahmed 2007 and Shamsul Hoque 2007) of the yearly foreign currency earning of the country and two thirds of country's labour force (approximately 4 million) (BGMEA 2015) is engaged in this sector, of which almost 85% are women (Sadid Nure Mowla 2013). It has empowered some 1.5 million female workers with economic power and independence which in turn has earned for the economic recognition as an emerging nation (Montero D 2015). To a creditable extent, it has been able to relieve the country from the burden of unemployment and at the same time contribute to the empowerment of women. Thus this sector is playing a vital role in socioeconomic development of the country.

Materials

Time series data on foreign exchange earnings on garments sector in Bangladesh for the period (1983-2013) were collected from Bangladesh Garment Manufacturers and Exporters Association (BGMEA). To carry out the objective of the study different statistical measures and trend models were used to analyze the data.

Methods of Determining Trend

To search a suitable model of foreign exchange earnings on garment sector the following trend models have been considered (S.C. Gupta Third Edition, Taj Uddin 2013 and Saleem Abid 2014).

(a) Exponential trend: $Y_t = \beta_0 . e^{\beta_1 t}$

(b) Logarithmic trend: $Y_t = \beta_0 + \beta_1 lnt$

(c) Parabolic trend/Quadratic trend: $Y_t = \beta_0 + \beta_1 t + \beta_2 t^2$

(d) Straight-line trend: $Y_t = \beta_0 + \beta_1 t$

(e) Semi-log trend/Growth trend: $log_e Y_t = \beta_0 + \beta_1 t$

Where, Y_t is the amount of foreign exchange earnings on garment sector in Bangladesh at time t (1983-2013).

These models are fitted separately to the annual data using regression analysis methodology. From these fitted models the most appropriate one is selected according to the following rule:

$\mathbf{R^2 -}$ Criteria

It is known that one of the measures of goodness of fit of a regression model is R^2, which is defined as:

$$R^2 = \frac{RSS}{TSS} = 1 - \frac{ESS}{TSS}$$

R^2 thus defined, of necessity lies between 0 and 1. The closer it is to 1, the better is the fit. But there are problems with R^2. First, it measures in-sample goodness of fit in the sense of how close an estimated Y value is to its actual value in the given sample. There is no guarantee that it will forecast well out of sample observations. Second, in comparing two or more R^2 , the dependent variable , must be the same. Third, the more importantly, an R^2 can be increased when more explanatory variables are added to the model. Therefore, there is very temptation to play the game of "maximizing the R^2" by simply adding more variables to the model. Adding more variables to the model may increase R^2 but it may also increase the variance of forecast error (Taj Uddin 2013).

Adjusted $\mathbf{R^2}$ Criteria

Each additional repressor variable added to the model increases R^2. Thus, since R^2 can be made larger simply by adding more predictor variables to the model, a modification of R^2 has been proposed. This adjusted R^2 does not automatically increase when new predictor variables are added to the model. In fact, the adjusted R^2 may actually decrease, because the decrease in ESS may be more than offset by the corresponding decrease in the error degrees of freedom.

$$\bar{R}^2 = 1 - \frac{ESS/(n-k)}{TSS/(n-1)}$$

Here $\bar{R}^2 \leq R^2$, showing how the adjusted R^2 penalizes for adding more regressors. For comparative purposes, therefore, $\bar{R}^2$ is a better measure than R^2.

Rate of Growth

An exponential model (Jeromi 1993) was used to estimate growth rates for different segments of continuous time-series based on prior differentiation of rule-periods. The rate of growth implicit in the semi-log trend is derived by solving the following equation (Taj Uddin 2013 and Saleem Abid 2014).

$$log_e(1 + r) = \beta_1$$

Where, β_1 is the slope of the semi-log trend equation and r is the annual rate of growth.

Table 1. Trend Models for the Exchange Earning on Garment Sectors in Bangladesh

Types of model	Estimated Co-efficient			R^2	$\bar{R}^2$	F −Value
	β_0	β_1	β_2			
Linear	-1557820.29	783.631		0.872	0.760	91.330
Semi-log/growth trend	-226.250	0.117		0.992	0.983	1598.2
Logarithmic trend	-11879632.07	1564168.01		0.871	0.750	90.995
Exponential trend	0.01812	0.889		0.991	0.982	1596.91
Parabolic trend (Quadratic trend)	-7757.23	-211.29	11.96	0.873	0.762	92.473

*Significant at 5% level

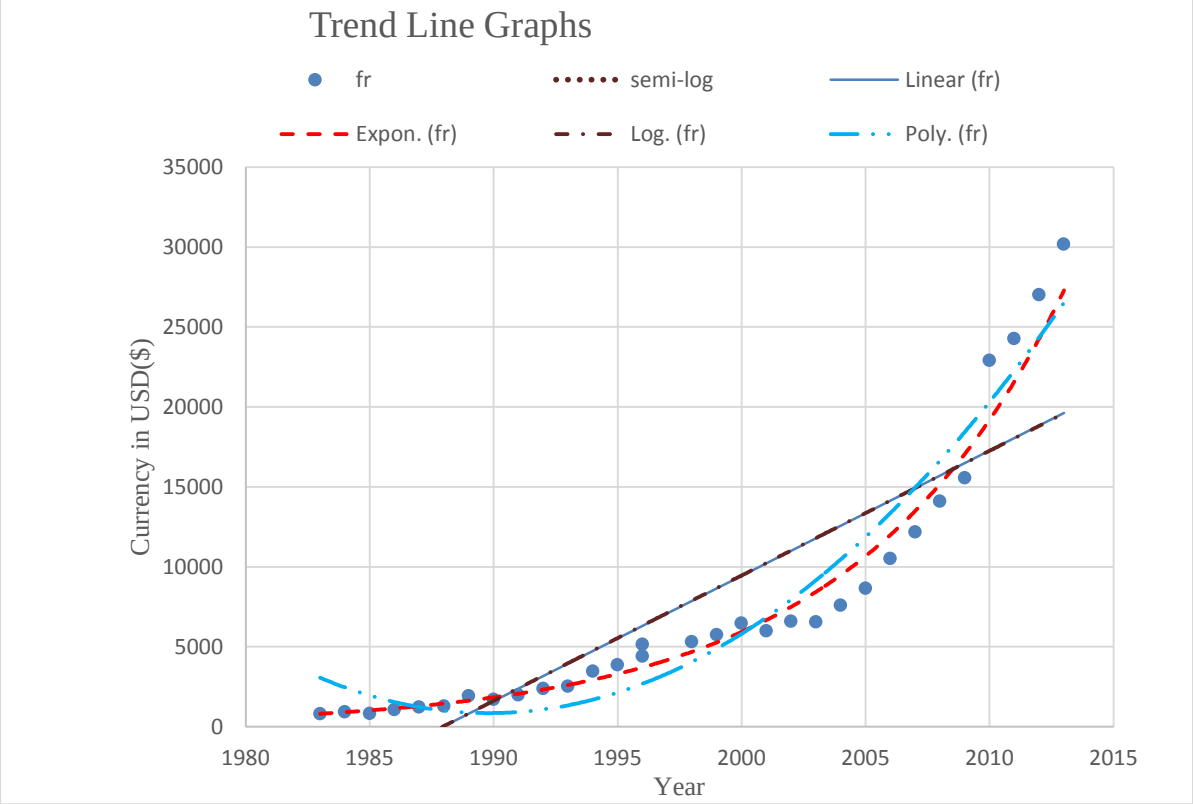

Figure 1. Trend line graphs of the foreign currency earnings by the garment sectors

Results and Discussion

The trend models for the exchange earning on garment sectors in Bangladesh during the year 1983-2013 was shown in Table 1.

Results showed that the value of $\bar{R}^2$ is the highest as well as *F* value for semi-log trend model; the semi log trend model appeared to be the most appropriate for the trend pattern of the series.

Therefore the semi-log trend model for the exchange earnings from the garment sector in Bangladesh is,

$$\log_e Y_t = -226.25 + 0.117t$$

Where Y_t is the amount of exchange earnings (in million US dollar) of garment sector in Bangladesh and t is time (in year).

From the graph (Figure 1) represent that foreign currency earning shows an upward trend during the study period. The above results of regression analysis clearly revealed that over the past 30 years the amount of foreign currency earnings by garment sector of Bangladesh has trended up significantly.

Growth Rate of foreign currency earnings

We tried to estimate the growth rate based on trend equations. We found that the rate of growth based on the semi-log trend (appropriate trend in this study) is 0.30918, indicated that the growth rate of the amount of foreign currency earnings from the garment sectors in Bangladesh between 1983 and 2013 had been 30.918 percent per year.

Conclusion

This study has investigated using the time series data to achieve its objective. The several trend models were used and found that the semi-log trend model was more suitable for foreign currency earnings in garment sectors of Bangladesh. For the time period 1983-2013 it is found that the foreign currency earning is significantly upward trend with a growth rate of 30.918 percent per year. Therefore, it can be recommended that the government and non-government organization should take sufficient initiative to maintain this growth and further improvement of this sector for better economic development of the country. It is hopeful that the findings of this research may be considered by the government and private policy makers while formulating both short and long term policies for the development of garment sectors as well as the economy of Bangladesh.

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Conflict of interest

The authors declared that there is no conflict of interest for this study.

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