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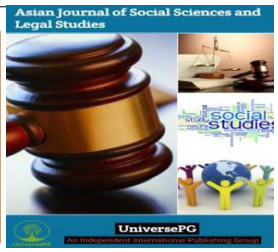

Labor Demand and Export-Oriented Industrialization of Bangladesh

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ABSTRACT

This thesis based on the findings of a study on labor demand and export-oriented industrialization in Bangladesh at the time of 1992-93 to 2016-17. For this persistence, secondary data from different sources (BBS, WDI, EPB, BER, WB, BB, etc) for the time duration 1992-2017 has been composed and analyzed through econometric tools. The test approves that the disturbance terms are normally distributed. To detect that the data suffer from multicollinearity, heteroscedasticity, and autocorrelation problem, the diagnostic test has been adopted. From the diagnostic test, it is detected that while the data free from heteroscedasticity and autocorrelation problems, however, the data suffer from severe multicollinearity problem. The multi-collinearity problem is removed using remedial measures. The Unit root test has been detected to test the stationarity of the composed data. Among different unit root test, ADF-test is adopted. The test displays that the data are stationary at the first difference level for export-oriented industrialization and the second difference level for labor demand. The Johansen co-integration test is adapted to test whether the data are cointegrated at any level. The test results approve that six variables are cointegrated on labor demand and one variable cointegrated on export-oriented industrialization. The Granger causality test under VAR (Vector Autoregressive Regression) framework displays the variable has a unidirectional causal relationship with the dependent variable where all independent variables lead, and the dependent variable follows. However, these relationships have found a statistically significant positive impact of labor demand and export-oriented industrialization in Bangladesh. Thus, there is a dynamic relationship between domestic labor demand, export, and economic progress in Bangladesh.

Keywords: Employment, Labor, Export, RMG, Exchange rate, Industrialization, Growth rate, and Bangladesh.

INTRODUCTION:

As a sufficient labor country, the scene of the entire economy of Bangladesh depends on the structures of the labor market. In economics, the labor demand of an employer is the number of labor-hours that the employer is willing to hire founded on the different exogenic variable quantity it is faced- lined with, such like the wage rate, the unit charge of capital, the market determined retailing price of its output, etc (Van, 2009; Adnan, 2018). In fact, the demand for employment is not appropriate enough to generate the job opportunity for the current unemployed as well as underemployed workers. Hence, the economy faces an excess supply of labor. However, this sector is playing a noteworthy part in advance Bangladesh to the current position. In the world of globalization, economic development is highly correlated with the use of human capital (Khan and Ullah, 2017; Islam and Hossain, 2014). It stimulates economic growth through increasing the level of workers' efficiency and productivity (Jajri and Ismail, 2010; Mitchell, 2008)

The key objectives of the study are to find out Labor Demand and Export-Oriented Industrialization of Bangladesh as follows: To present the situation of labor demand and export-oriented industrialization in Bangladesh; to investigate econometrically the impact on labor demand of many exogenous variables

in our economy; to assess the impact of export-oriented industrialization on the economic growth of Bangladesh; to examine the average of existing of labor based on them wages by the study (Michael, 2017). Labor demand and export-oriented industry-alization as one of the major components of econo-mics activities play a central role in providing nutrition, employment, and foreign exchange earn-ings in the economy of Bangladesh (Ahmad and Khan, 2007; Krainara, 2007).

Bangladesh is well recognized across the globe for its stunning success in the ground of readymade garment industries (BGMEA, 2013). It comprises about 80% of the entire export of Bangladesh. It has stayed able to make employment opportunities for millions, ease poverty, accelerate industrialization, appeal foreign direct investment, activate business, and generate an encouraging image of Bangladesh abroad (Rasiah and Nazeer, 2016). A good number of examines have been completed on numerous problems going from gender discrimination, the influence of globalization in the garment trade of Bangladesh (Tran and Norlund, 2015).

This paper may justify the importance of labor demand and export-oriented industrialization in Bangladesh. This also helps to analyze which one is more effective on the labor demand and what steps should take to make those significant for the development of the export industrialization (Getahum, 2018; WDI, 2020).

MATERIALS AND METHODS:

The persistence of this thesis paper is to measure labor demand and export-oriented industrialization in Bangladesh. The final results of exogenous variables, secondary time series data sources and covers were considered for the period of years 1992-2017. Over-all, all 26 observations which should be appropriate for capturing the short- run and long-run relationship between the variables.

In this analysis, exogenous variables like-wage rate, GDP, income per capita (IPC), foreign direct invest-ment rate (FDIR), age rate, unemployment rate was considered as variables and employment (EMP) was taken as the dependent variable for labor demand and also analysis that exogenous variables like exchange rates (EXR), employment of industry rate (EMPIR), and trade balance (TB) were measured as variables, and total export rate (EXP) was taken as the dependent variable for export-oriented industria-lization. In this research work, the association bet-ween labor demand and export-oriented industria-lization is promoted by Ordinary Least Square (OLS) method (Anda and Mohamed, 2013).

For short path and long path dynamics ADF Test, Johansen Co-integration Test, VECM are used here and Granger Causality Test is used to see the causation between the variables. Further, Normality, Multicollinearity, Heteroscedasticity, and Autocor-relation are detected by Jerque Bera test, OLS reg-ression, Breusch-Godfrey (BG) test and Breusch-Pagan-Godfrey (BPG) test respectively.

RESULTS:

Table 1: Descriptive test of Log of Total Employment (Source: Test Designed by EViews 10^{+} Student Version Lite).

	LNEMP	WR	LNIPC	LNGDP	LNFDI	AR	UEMP
Mean	16.80552	35.72992	25.06219	14.90528	2.658707	64.63759	3.531385
Median	16.82721	35.57850	24.93155	15.43663	2.658472	63.75378	3.574000
Maximum	17.36284	39.71100	26.24362	17.07540	3.048562	80.96719	5.000000
Minimum	16.28880	31.89800	24.17986	10.20863	2.280442	50.30406	2.200000
Standard Deviation	0.371738	2.423642	0.609527	1.978032	0.260957	9.156083	0.815673
Skewness	0.090341	-0.020889	0.400307	-0.919966	0.116103	0.178081	-0.119019
Kurtosis	1.554802	1.818076	2.059295	2.778537	1.656505	1.900567	1.781195
Jarque-Bera Provability	2.298015 0.316951	1.515248 0.468779	1.653069 0.437563	3.720593 0.155626	2.013807 0.365349	1.446906 0.485074	1.670659 0.433732
Sum.	436.9435	928.9780	651.6169	387.5373	69.12638	1680.577	91.81600
Sum Sq. Dev	3.454732	146.8510	9.288085	97.81527	1.702462	2095.846	16.63307
No. of observation	26	26	26	26	26	26	26

Note: WR - Wage Rate; LNIPC - Log of Income Per Capita; LNGDP - Log of Gross Domestic Product; LNFDI - Log of Foreign Direct Investment; AR - Age Rate; and UEMP - Unemployment.

From the descriptive result (**Table 1**), which is gotten that the mean value of the employment log form is 16. 80552. The mean values for wage rate, income per capita in log form, gross domestic product in log form, foreign direct investment in log form, age rate, and unemployment are 35.72992, 25.06219, 14.90 528, 2.658707, 64.63759, and 3.531385 respectively. That is a sample mean values in this table. The total number of observations is 26. This table also presentations the result of maximum, minimum values. Each value of standard deviation is a measure of the dispersion or scatter of the data. From the above result of Skewness and Kurtosis, the Jarque and Bera (JB) test can be easily counted. Therefore, the result concludes the values of dependent and exogenous variables in a descriptive manner.

Ordinary Least Square Result (OLS)

The Ordinary Least Square (OLS) of the specified data is indicated in the following form:

$$LNEMP = 16.53767 + .0001093WR - .0534655LNIPC + .0016071LNGDP + .9899923LNFDI - .0163277AR + .000918UEMP$$

Table 2: Taking Ordinary Least Squares (OLS), LNEMP as Dependent variable (1992-2017)

Variables	Coefficient	Std. error	t-ratio	Prov> F	*R2* value	*F* Statistics
C	16.53767	.1588725	104.09	0.0000	1.0000	65187.42 (6, 19)
WR	.0001093	.0010612	0.10			
LNIPC	-.0534655	.0053863	-9.93			
LNGDP	.0016071	.0007804	2.06			
LNFDI	.9899923	.0062575	158.21			
AR	-.0163277	.0004704	-34.71			
UNEMP	.000918	.0020845	0.44			
Source: (The test is showed by using Stata/SE 15.0 and see the appendices)						

From the regression model gotten above (**Table 2**), holding all other factors constant the total employment is 16.53767, which is positive. The result shows that the wage rate is .0001093, the income per capita is -.0534655 that decreases in LNEMP. The GDP is .0016071, the foreign direct investment inflow is .9899923, and the unemployment rate is .000918 meaning that goes up positive on usual holding another variable constant by LNEMP.

The age rate is -.0163277 suggesting that it goes down unusual holding another variable constant by LNEMP. *We know that* R^2 is a non-decreasing purpose of the number of descriptive variables. The value of R^2 (coefficient of determination) is 1.0000 in the model represents that 100% of the deviation in the dependent variable (LNEMP) is due to exogenous variables included in which authenticates the model.

Here, R^2 explains that there is a durable and linear relationship with the goodness of fit between the multivariable regression of dependent and exogenous variables. Then, all t values like that are significant at 5 percent level. The F value test is also statistically extremely significant at 1 percent, which suggests that the null proposition is rejected. The result also designates that the wage rate, income per capita, the gross domestic product, the foreign direct investment inflow, age rate, and unemployment rate directly affect employment. The income per capita and age rate have not a positive effect on labor demand in Bangladesh.

From the above outcome, the residuals from the linear regression (1) appear to be not asymmetrically distributed. Application of the Jerque-Bera test indications that the JB statistic is about 0.405899 and the probability of finding such a statistic under the normality assumption is about 81 percent. This probability is moderately high. These probabilities were attained from a sample of 26 observations, which seems reasonably high. Therefore, we do not reject the null hypothesis at 1%, 5%, and 10% level of insignificance that the residuals term is normally distributed (Basak *et al*., 2006).

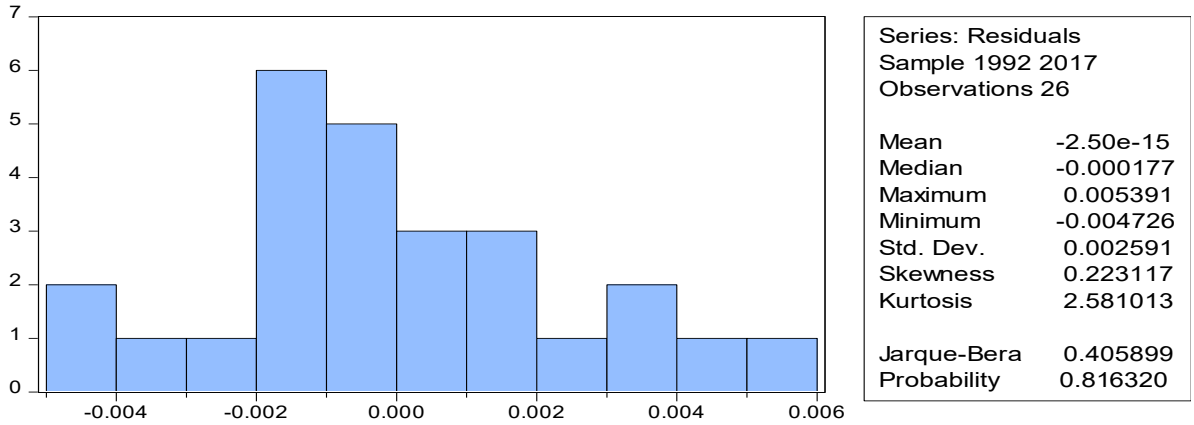

Fig 1: Graph of Jerque-Bera Test of Normality (The test is designed by E-views student 10^{+} lite version).

Table 3: Descriptive test of Log of Total Export, Exchange Rates, Employment in industry Rate, and Trade Balance.

	LNEXP	EXR	EMPIR	TB
Mean	9.136066	60.00615	14.75419	-5.736923
Median	9.001067	60.16500	14.27650	-3.860000
Maximum	10.45322	79.93000	21.06500	-1.520000
Minimum	7.597858	38.15000	9.781000	-17.66000
Standard Deviation	0.885045	14.76412	3.869990	4.241306
Skewness	0.008901	-0.125179	0.358840	-1.062919
Kurtosis	1.834721	1.581433	1.752697	3.363826
Jarque-Bera Provability	1.471374 0.479176	2.247928 0.324989	2.243400 0.325726	5.039190 0.080492
Sum.	237.5377	1560.160	383.6090	-149.1600
Sum Sq. Dev	19.58262	5449.481	374.4206	449.7170
No. of observation	26	26	26	26
Source: EViews $\mathbf{10^{+}}$ Student Version Lite designs the test				

Ordinary Least Square Result (OLS)

The Ordinary Least Square (OLS) of the specified data is indicated in the following form:

$$LNEXP = 6.2849 + .0526026EXR - .0489941EMPIR - .072784TB$$

Table 4: Taking Ordinary Least Squares (OLS), LNEXP as Dependent variable (1992-2017)

Variables	Coefficient	Std. error	t-ratio	Prov> F	*R2* value	*F* statistics
C	6.2849	.2042767	30.77	0.0000	0.9736	270.46 (3, 22)
EXR	.0526026	.0058027	9.07			
EMPIR	-.0489941	.0278769	-1.76			
TB	-.072784	.0175476	-4.15			
Source: (The test is showed by using Stata/SE 15.0 and see the appendices)						

From the regression model gotten above (**Table 4**) that, holding all other factors constant the total employment is 6.2849, which is positive. The result shows that the exchange rates are .05260, employment of industry rates is -.0489941, and trade balance is -.072784 that decreases in LNEXP. We know that R^2 is a non-decreasing purpose of the number of descriptive variables. The value of R^2 (coefficient of determination) is 0.9736 in the model represents that 97% of the deviation in the dependent variable (LNEXP) is due to exogenous variables included in which authenticates the model.

Here, the value of R^2explains that there is a positive and linear relationship with the goodness of fit between the multivariable regression of dependent and exogenous variables. Then, all t values like that are significant at 5 percent level. The F test value is also statistically particularly substantial at 1 percent, which suggests that the null proposition is rejected. The result also designates that exchange rates, employment of industry rates, and trade balance directly affect the employment (Saha *et al*., 2020). The employment of industry rates and trade balance has not a positive effect on export-oriented industrialization in Bangladesh (Stephenson and Hoffbauer, 2010; WTS, 2016).

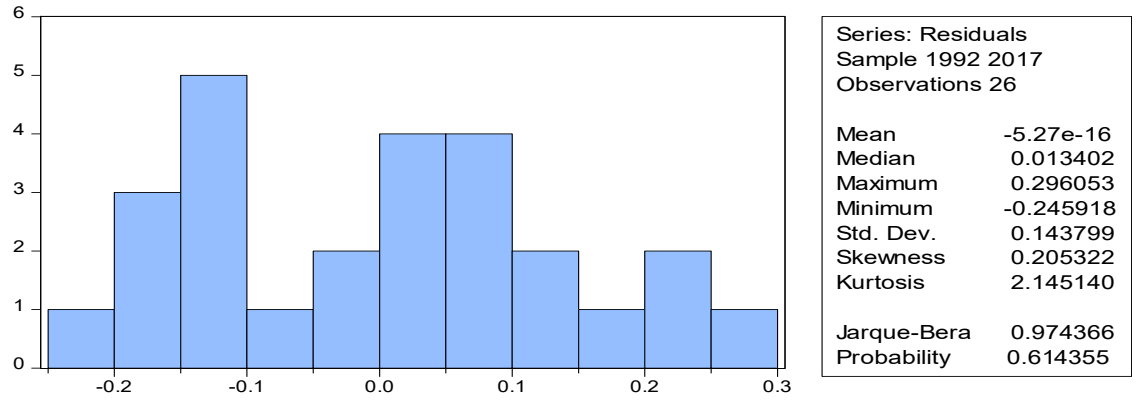

Fig 2: Graph of Jarque-Bera Test of Normality (The test is designed by E-views student 10^{+}liteversion)

From the above outcome, the residuals from the linear regression (1) appear to be not asymmetrically distributed. Application of the Jerque-Bera test indications that the JB statistic is about 0.974366 and the probability of finding such a statistic under the normality assumption is about 61 percent. This probability is moderately high. These probabilities were attained from a sample of 26 observations, which seems reasonably severe. Therefore, we do not discard the null proposition at 1 %, 5 %, and 10 % level of insignificance that the residuals term is usually distributed.

DISCUSSION:

The findings disclose that the Ordinary Least Square (OLS) methods confirms that the positive correlation regression analysis and is a non-decreasing purpose of the number of descriptive variables. The value of (coefficient of determination) in the model represents that 100% of the deviation in the dependent variable is due to exogenous variables included in which authenticates in these models. Therefore, the value of explains that here is a durable and linear relationship with the goodness of fit between the multivariable regression of dependent and exogenous variables.

To test the normality of the disturbance terms Jerque-Bera (JB) normality test is accepted. The Jerque-Bera (JB) normality test approves that the disturbance terms are normally distributed. The Unit Root Test has been detected to test the stationarity of the collected data. The Johansen co-integration test adopts to test whether the data are cointegrated at any level in these models. The VECM method observes to the short-run and long-run relationship of the independent variables together with dependent variable.

And the Granger Causality test under VAR (Vector Autoregressive Regression) framework demonstrations the variable has a unidirectional causal relationship with dependent variable where all independent variables follows. On the base of findings of the research study, it may be resolved that earnings from labor demand and export-oriented industrialization show positive growth per annum during the whole study period (Yamagata, 2006). It is also concluded that instability in exports of the readymade garments, exchange rates, and economic growth rates enlarged in the recent past (Zohir, 2001; Nahid *et al*., 2019). Well labor demand industrialized and systematic export promotion program is needed for exports which will have a significant impact on both industrial and economic development (Afaf *et al*., 2015).

CONCLUSION:

Thus, the growing rate in labor demand and export-oriented industrialization of Bangladesh for future years will be satisfactory. These experimental findings can be significant source of evidence for the

manufacturers, traders, laborers, exporters, policy makers and researchers to build basis for further research in this sector. This investigation focused on the current situation; to investigate econometrically of many exogenous variables, to evaluate the impact of export-oriented industrialization, to observe the average of existing of labor constructed on their wage, classify the problems, resolutions and, comm.-endations founded on the study, and effect on economic position of labor demand and export-oriented industrialization in Bangladesh (YAO and YU, 2009). The analysis of the petition for labor showing that engaged with labor was one-third of all labor and its export percentage grew up which have solely passed the low-cost of Bangladesh until now. Moreover, the government should maintain an export friendly environment to sustain economic growing in the future. On the foundation of findings of the research study, it may be resolved that earnings from labor demand and export-oriented industrialization show positive growth per annum during the whole study period. These experimental findings can be significant source of evidence for the manufacturers, traders, labourers, exporters, and researchers to build basis for further research in this sector.

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CONFLICT OF INTERESTS:

The researcher declares no possible conflict of interest concerning the study, data collection and analysis, authorship and publication of this present article.

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