

# Foreign Aid and Female Education: The Case of Bangladesh

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*In a developing country like Bangladesh, which is one of the most promising emerging economies, it is absolutely crucial that investment is being made in order to groom the labor force of tomorrow. Achieving universal primary education is the second United Nations Millennium Development Goals (MDG). However, research reveal that the enrolment rate in education for both male and female will lead one to believe that Bangladesh is far behind its contemporaries. This is why the trend of the percentage of foreign education going into the education sector in Bangladesh can be concerning. Foreign aid to education for females can change their lives and the long run benefits will bring fruition to the economy. This paper discusses the trends of female education over 26 years seen in Bangladesh. With the help of Augmented Dickey Fuller (ADF) and Phillips-Perron (PP), Co-integration and Granger Casualty test, a robust effect of foreign aid on the female education of Bangladesh has been determined.*

## Field of Research: Economics

### 1. Introduction

Education, like food and shelter, is a basic human right. Education not only gives one the ability to read and write but also allows an individual to see the world with a fresh new perspective. The importance of a proper education for a country is one that cannot be stressed enough- it prepares the youth of today to become leaders of tomorrow. However, education is perceived differently in different nations of the world.

Developed countries paint a very rosy picture and have also set the bar very high for the developing nations to follow through. They did not earn the right to be called 'developed' overnight. Among other things, they recognized the importance of having a substantial education system and made all possible arrangements to implement it. Developed countries paint a very rosy picture and have also set the bar very high for the developing nations to follow through. They did not earn the right to be called 'developed' overnight. Among other things, they recognized the importance of having a substantial education system and made all possible arrangements to implement it. Among the 30 Organisation for Economic Co-Operation and Development (OECD) countries reporting data in 2012, seven countries, including the United States of America (USA), spent over 6.0 per cent of their Gross Domestic Product (GDP) on total education expenditures: New Zealand (6.9 per cent), the Republic of Korea (6.7 per cent),

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Norway (6.5 per cent), Israel (6.5 per cent), the USA (6.4 per cent), Iceland (6.4 per cent), and the United Kingdom (UK) (6.3 per cent).

According to United Nations International Children's Emergency Fund (UNICEF) statistics for the year 2012 show that in most developing countries, public school is not free. While 67 million primary-school-age children are still denied the right to education, illiteracy is highest amongst females. Alamgir (2014) reported that 52.1 per cent of the women (past the age of 15 years) in Bangladesh are illiterate. This statistic, however, is concerned with secondary education; in order to reach fruition, a nation should start with its primary education. For a developing nation like Bangladesh, education is a key player that can make major difference to the future the people of this country will see. Female education will not only contribute to pursuing development but will also enable Bangladesh, as a nation, to strengthen its economy and have long last socio-economic effects. In certain countries in the sub-Saharan Africa and in parts of Asia where the custom of bride price is practiced, higher female education is associated with a higher bride price payment received; this motivates parents to invest in girls' education (Ashraf *et al.*, 2014). Well being of women can also be pursued through education. Marital harmony and fertility patterns have been linked with the education for women (Isen and Stevenson, 2010).

If great concern that for decades women belonging to the lower income background in the subcontinent, more often than not, have to forgo their right to education. A popular belief on this side of the world is that women are born to bare children and raise a family solely, and not to earn a degree and contribute to the household income. The fact that women are capable of doing both is a not one that is accepted by the society. However, there is a whiff of change in the horizon; the authors are hopeful about the fact that female education is gaining momentum in our country, and foreign aid can help reach the goal and bring extraordinary changes to Bangladesh.

Foreign aid is the transfer of funds, good and service and even technical advice or training s to a country, from another country or an organization. The European Union (EU) and the USA are two of the biggest contributors of foreign aid to OECD countries. According to the OECD (2015), the EU and the USA donated \$87.64 billion and \$31.08 billion to the OECD countries respectively. When foreign aid is received by a country in need, the allocation of this foreign aid is a decision made by the government of that country. While the amount varies from one country to another, even from one year to another for the same country, the sectors that get prioritized remain more or less the same. Education is the backbone of a nation, and thus, it is one of the top sectors that is in constant need of development, regardless of how developed a country is as a whole. Since foreign aid is an additional means of funds, it can make a considerable difference in the education sector of Bangladesh.

There exists a research gap in this context. While this has been covered for other countries like Nigeria, no studies, as far as our knowledge goes, has been conducted on the relationship that foreign aid can have on female education of Bangladesh. Based on this research paper, the authors expect this relationship to be very strongly positive and for foreign aid to have robust effects on female education of Bangladesh.

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The main objective of this paper is to analyze the effects of enhanced female education that is the most likely outcome of proper channeling of foreign aid. When extra funds in the form of foreign aid is given to the education sector of any country, developed or developing, the most prominent effect is the rise in enrolment of students, be it for primary or secondary education. With more funds, the government primary and secondary schools can accommodate more students. The authors can expect to find an upward trend-line, again, in both developed as well as developing countries. As more students will have access to an education, our country can have a stronger grip on a brighter future.

There has been many new ways introduced in the way foreign aid's effectiveness in the education sector can be assessed. First and foremost, the authors can look into the disbursement of these funds. The Non Government Organizations (NGOs) are one of the big players here. This can ensure a proper and more justified channeling of funds. The portion of foreign aid that goes into education also works towards improved classrooms, better and more qualified teachers, up-to-date material and the overall environment. When foreign aid is making a change in some of these aspects, if not all, the authors can say that the education sector is improving because of foreign aid's contribution to it.

Official Development Assistance (ODA), which is used as a proxy for foreign aid in this study, was developed by the Development Assistance Committee (DAC) of the OECD in order to measure aid. While the governments of the aid receiving countries and the donors have taken necessary steps in attempts to make the implementation of aid effectiveness more successful over the years, often times foreign aid is also thought to be wasted. A huge level of inefficiency and corruption can be expected to exist here and this is why it's an area of concern. Any kind of lasting change cannot be done overnight. The authors will be looking into how foreign aid has come a long way since the late 1980s till today and what effects it has on the education, and in turn, on the economy. As a lower middle income developing nation, Bangladesh has many countries to look up to. as of 2016, Sri Lanka has an adult female literacy rate of about 92.64 per cent, and granted, the authors cannot expect to reach this in one go, however, can certainly aspire to walk on similar footsteps if not the same ones.

To the best of my knowledge, there are no empirical time series studies which explicitly address the relationship between foreign aid and female education in Bangladesh. By looking at this relationship and filling in the gaps, Bangladesh can work towards building a more skilled labor force. If the country can become successful in enhancing its female education, it will definitely make room for sustainable economic growth in the future. These research questions have not been answered in any studies previously and that's why the researchers want this work to reflect on the situation that exists in Bangladesh. The following two questions are addressed in this study

1. How can foreign aid affect the education of women in Bangladesh?
2. Is there a long run economic relationship between foreign aid and female education in Bangladesh?

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Augmented Dickey Fuller (ADF) and Phillips-Perron (PP), Co-integration and Granger Casualty test have been used in this paper to find the relationship between foreign aid and female education in Bangladesh. By using these tests and variables, the authors expect to achieve results that have not been obtained before. The authors believe a study as such will further lay the groundwork for future research in the future for Bangladesh or other developing countries. The expected result is that foreign aid will play a role in enhancing the education for women in Bangladesh. The extent to which this will affect the women who avail education and the economy itself are also discussed later in this paper. If these hypotheses stand correct, the authors expect more foreign aid to go into education for women, be it primary, secondary or tertiary, as education can make the women of a nation empowered and independent.

The rest of the paper is organized as follows; Literature Review is provided in Section 2, while Section 3 gives an overview of the Bangladesh Scenario. Next is Methodology and Data Set which is Section 4 and following that is Section 5 which shares the Results obtained. After that this paper has the Discussion on Results Obtained in Section 6 and Section 7 provides Conclusions and Policy Recommendations. Finally, Section 8 has the Reference for this paper.

### **2. Literature Review**

There has been much work on the foreign aid aspect and its effects on an economy in general. However, foreign aid's effect on specific sectors such as education is relatively new. While our fundamental knowledge of macroeconomics tells us that there is an expected positive relationship between foreign aid and the female education of a developing country like Bangladesh, researchers are yet to find out specific implications of it.

In spite of education being as important as it is, nationally and internationally, aid to education is only bringing modest results. Generally, as aid that comes from bilateral organizations (country to country) is different from aid that comes from multinational organizations such as the United Nations (UN) and the World Bank (WB). Both public as well as private aid to education has remained less than substantial despite the economic and social development education promises a nation. Allocating funds from the total aid received by a government is also a factor that needs to be considered here; foreign aid is redirected to different sectors of an economy as the recipient country sees fit. As a result, in many developing countries, education sector can be neglected.

Musungu (2010) worked with the factors that affect the enrolment of girls in secondary education because he found that of more than 110 million children not in school across the world, approximately 60 per cent are girls. By the age of 18, girls will have received an average of 4.4 less education than boys. In today's fast changing world, this is not the ideal situation. When girls and women are being deprived of this basic right, they are invariably being pushed into a life that will make them more prone to fall into a poverty cycle, unhealthy living conditions and poor sanitation, low levels of income and generally, unfulfilled dreams; sadly, their children are likely to see the same life as them. Availability of schools and their quality can be made to be different through foreign aid. Musungu suggested that the availability of foreign aid can positively change the enrolment and participation of girls in secondary schools.

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Riddell (2012), while working with effectiveness of aid to education, realized that aid has played a key role in increasing the number of enrolment in primary education, however, it has been less successful when it comes to improving the quality of education received. For a developing country like Bangladesh, if an increased rate of enrollment is pursued without paying attention to quality, chances of aid having any significant effect on the education scene will get smaller with time. Ascencios (2015) stated that educating girls is a confirmed way to raise economic productivity, while lowering infant and maternal mortality rates, improving nutritional status and health, reducing poverty, and wiping out HIV/AIDS and other diseases. The benefits of educating the women of a nation are numerous and often times cannot be quantified, however, that is no reason for it to be taken for granted.

It was found that primary education provided to girls does not really benefit them until they are much older (Mocan & Cannonier 2012). Since foreign aid is given in a form of assistance to developing nations in order to build a brighter future, this makes the case for the female education even stronger. The long run benefits that can be seen in the horizon should not be ignored either by the government or the people, especially of a developing nation. The latest aid figures for education in Bangladesh estimated by the Global Education Monitoring (GEM) Report, United Nations Educational, Scientific and Cultural Organization (UNESCO) show that there has been a substantial drop in aid to education between 2013 and 2014 (Unb 2016). Aid to education in Bangladesh was US\$ 148 million in 2002-3 which stood at US\$ 528 million in 2013. The figure came down to US\$ 449 million in 2014. Now, this is a statistic that worries economists.

To the best of our knowledge, there has been a considerable amount of work done in exploring foreign aid and its implications on the economic growth of a nation, however, there hasn't been any empirical work done on its implications and effects on the female education of a developing nation such as Bangladesh. Hence, the authors would like to conduct a study that will answer the research questions put forward; how can foreign aid affect the education of women in Bangladesh, and if there is a long term relationship between foreign aid and female education.

### 3. Bangladesh Scenario

In the year 2000, it was seen that the highest rate of illiteracy among women was seen in the South Asian Countries. While it was about 55 per cent on average among the South Asian Countries, it was below 5 per cent among the developed countries. Bangladesh, while a promising emerging economy, tends to have a shadow overcast above it by its thriving contemporary countries. 19 million children are of primary school age (ages 6-10) out of a population of 130 million in Bangladesh. On one hand, children belong to schools, however, the adult illiteracy rate is also one that should not be taken lightly.

The situation in our country is such that almost half are girls. Tremendous efforts in the past decade have been successful in getting more girls into school, resulting in gender parity in enrolments in primary and lower secondary schools; this percentage of girls declines in the later secondary years. After adding the girl dropouts to the number of girls who have never enrolled, there are still about 1.5 million primary school age girls out of school. The poor quality of education not only results in low achievement levels for girls and boys, but the limited options

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for girls and women within the greater society further exacerbate the problems of inadequate schooling for girls.

In spite of having achieved gender parity in primary school enrolments, Bangladesh has a long way to go in order to achieve gender equity, access to quality education for all girls, completion of basic education with acceptable competency levels and relevant life skills and equal roles for women and girls in society.

UNICEF has identified some key issues that need to be addressed in order to achieve significant progress in the female education scene in Bangladesh. They are as follows:

- **Perceptions of lesser value and limited roles of girls:** Gender discrimination starts from birth and continues throughout life in Bangladesh. Lesser value and limited roles of girls and women are embedded in the socio-economic system. Girls' education, very broadly defined, can play a part in changing these norms and practices.
- **Quality of basic education:** As the statistics illustrate, neither girls nor boys are receiving an education of an acceptable standard. By age 11 only just over a quarter have achieved the expected minimum competencies of primary school.
- **Equity and access:** Reaching the 10 per cent of girls who never enroll in school remains a challenge. The exclusion of nearly 1.5 million girls is a violation of the basic human right to education. While in general there is high awareness in Bangladesh of the value of education, there are some groups of girls and boys who never enroll.

Another major problem in the education scenario of Bangladesh is the fact that the Out-of-school rate for girls is higher than that of boys; according to UNICEF (2013). Youth as well as adolescents in Bangladesh are faced with many personal and social challenges and stigmas. These come in the form of drug addiction, HIV and other sexually transmitted infections, physical and sexual abuse, child trafficking and exploitation, violence and discrimination in many forms. To empower them to handle these challenges they should be equipped with relevant knowledge and psychosocial skills. Adequate education and training will allow them to overcome these challenges and lead a healthy and productive life.

Bangladesh has a literacy rate of 70 per cent as of 2016. While the number itself is close to that of India's (74 per cent), the vast difference in economic factors such as population for instance, needs to be taken into account. Economic growth, poverty reduction, and Human Resources Development (HRD) have been key strategic thrusts of the Government of Bangladesh over the past two decades. The Government of Bangladesh's HRD priorities were placed on basic education, covering primary education (grades 1–5) and Non-Formal Education (NFE), and later extended to cover grades 6–8 in secondary education. During the early 1990s, only 35 per cent of the country's adult population was literate, and heavily skewed between males and females (44 per cent versus 22 per cent) as well as between urban and rural areas. The primary education Gross Enrolment Rate (GER) was only 68 per cent, and the cycle dropout rate was as high as 60 per cent according to Asian Development Bank's (ADB) evaluation study:

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Education Sector in Bangladesh: What Worked Well and Why under the Sector-Wide Approach (2010).

The Government of Bangladesh's commitment to improving basic education was reflected in its adoption of the Education for All (EFA) agenda in the early 1990s, which provided the basis for assistance from various Development Partners (DPs). It is consistent with the MDGs, which aim to halve poverty and achieve substantial HRD improvements by 2015. Their main goals are as follows: (i) Assess the combined performance of the ADB and other key DPs' assistance in the Bangladesh education sector during 1989–2007, including the DPs' combined performance in the ongoing Subsector-Wide Approach (SWAP) modality jointly adopted in the Second Primary Education Development Program (PEDP-II); and (ii) Apply a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis to identify positive and negative factors during the design and implementation stages- both within and beyond DPs' control-to explain the reasons behind what worked well and what did not work well.

The relationship between ADB and Bangladesh is one that has been getting stronger with passing time. In the year 1991, Bangladesh had a national poverty rate of 51 per cent and that was almost halved in 2010 when it came down to 31.5 per cent. With the assistance from international organizations such as ADB, Bangladesh has proven to rise above and defeat the label of "International Basket Case." ADB regards Bangladesh to have an inclusive and broad-based growth. ADB has been assisting Bangladesh with the development of its agriculture, education, energy, and finance sectors, to name a few. By investing in the education sector of a thriving emerging economy like Bangladesh, ADB is helping it deal with its current poverty situation; not only is this coming to aid of those struggling to make ends meet now, but is also acting as a stepping stone for the generations to come.

In spite of assistance from organizations such as ABD, the education is still well beyond its full capacity. Aid to education in Bangladesh was US\$ 148 million in 2002-2003 and stood at US\$ 528 million in 2013. In the year 2014, this figure fell to US\$ 449 million. Aid to basic education in Bangladesh was \$19/child in 2013, but it came down to \$13/child in 2014. This calls for certain reforms in the education sector of Bangladesh.

### 4. Methodology and Data Set

The existence of unit root has been tested to check the stationarity of the variables. Financial and macro variables are well known for their non stationarity. Firstly, Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) test were performed to test the existence of unit root and found some of the variables are non stationary and thus cannot be regressed without making them stationary. Then, co-integration test to find out possible linear combination of the variables that can be considered stationary. Finally, given co-integration was found, Granger Casualty test was used to check the possible direction of causality.

In time series analysis, non stationary data may lead to spurious regression unless there exists at least one Co-integrating relationship. The Johansen procedure is applied to test for co-integration. This method provides a unified framework for estimation and testing of co-integration relations in the context of Vector Autoregressive (VAR) error correction models. For this

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approach one has to estimate an Unrestricted Vector of Autocorrelation of the form:

$$\Delta x_t = \alpha + \theta_1 \Delta x_{t-1} + \theta_2 \Delta x_{t-2} + \theta_3 \Delta x_{t-3} + \dots + \theta_{k-1} \Delta x_{t-k+1} + \theta_k \Delta x_{t-k} + u_t$$

Where  $\Delta$  is the difference operator,  $x_t$  is a  $(n \times 1)$  vector of non-stationary variables (in levels) and  $u_t$  is also the  $(n \times 1)$  vector of random errors. The matrix  $\theta_k$  contains the information on long run relationship between variables. If the rank of  $\theta_k = 0$ , the variables are not co-integrated. On the other hand if rank (usually denoted by  $r$ ) is equal to one, there exists one co-integrating vector and finally if  $1 < r < n$ , there are multiple co-integrating vectors. Two tests for co-integration, namely the Trace Test and the Maximum Eigen Value Test are used (Johansen & Juselius 1990). The trace statistic evaluates the null hypothesis that there are at most  $r$  co-integrating vectors whereas the Maximum Eigen Value Test, evaluates the null hypothesis that there are exactly  $r$  co-integrating vectors in  $x_t$ .

According to co-integration analysis, when two variables are co-integrated then there is at least one direction of causality. Granger-causality, introduced by (Granger 1969, 1980, 1988), is one of the important issue that has been much studied in empirical macroeconomics and empirical finance. Engle & Granger (1987) have indicated that the existence of non-stationary, can give misleading conclusions in the Granger causality test. It is only possible to infer a causal long run relationship between non stationary time series when the variables are co-integrated.

If  $y$  and  $x$  are the variables of interest, then the Granger causality test determines whether past values of  $y$  add to the explanation of current values of  $x$  as provided by information in past values of  $x$  itself. If past changes in  $y$  does not help explain current changes in  $x$ , then  $y$  does not Granger cause  $x$ . Similarly, researchers can investigate whether  $x$  Granger causes  $y$  by interchanging them and repeating the process. There are four likely outcomes in the Granger causality test: (1) neither variable Granger cause each other, (2)  $y$  causes  $x$  but not otherwise, (3)  $x$  causes  $y$  but not otherwise, (4) both  $x$  and  $y$  Granger cause each other. As a proxy for foreign aid, Official Development Aid (ODA) will be used; Female Literacy Rate will be the proxy for female education. In this study the causality test between ODA and Female Literacy Rate will be conducted. For this the following two sets of equation will be estimated:

$$x_t = \alpha_0 + \alpha_1 x_{t-1} + \dots + \alpha_l x_{t-l} + \beta_1 y_{t-1} + \dots + \beta_l y_{t-l} + u_t$$

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \dots + \alpha_l y_{t-l} + \beta_1 x_{t-1} + \dots + \beta_l x_{t-l} + v_t$$

For all possible pairs of  $(x, y)$  series in the group. The reported F-statistics are the Wald statistics for the joint hypothesis  $\beta_1 = \beta_2 = \beta_3 = \dots = \beta_l = 0$

As explained earlier this paper examines the long run relationship and the direction of causality between foreign aid and female education of Bangladesh. Although numerical representations of the relationships between activity and electricity use are possible, a simple relationship has



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been considered in this study based on considerations of simplicity. This relationship is at a high level of aggregation (between foreign aid and female education) and takes a simple functional form (linear) such that one principle variable, foreign aid, is capable of explaining much of the variation in the other, female education, as they both change with the passage of time. For female education use the authors have used the data of female literacy rate and the data has been taken from different issues of Statistical Yearbook published by Bangladesh Bureau of Statistics (BBS). The data for foreign aid to Bangladesh has been collected from World Development Indicators (WDI). It should be mentioned here that since Bangladesh got her independence in 1971, the article concentrates over the period 1988-2014 for which 26 observations are available at most. Eviews 7.0 has been used to run.

### 5. Results

Unit root tests were conducted to determine the order of integration of the data series for each of the variables. Table 2 shows the ADF statistics and corresponding critical values of all the variables in their level and first differenced forms.

<b>Table 1: Augmented Dickey Fuller Unit Root Test for the Variables</b>			
<b>Panel 1: Levels</b>			
	ADF Statistics (Only Constant)	ADF Statistics (Constant & Trend)	Decision
ODA	-1.601308	-1.565848	Non Stationary
Female Literacy Rate	-0.729202	-1.788207	Non Stationary
<b>Panel 2: First Differences</b>			
	ADF Statistics (Only Constant)	ADF Statistics (Constant & Trend)	Decision
ODA	-60236222	-6.604245	Stationary
Female Literacy Rate	-5.495551	-2.938435	Stationary without constant; Non Stationary with constant
Note: All regression is estimated with and without trend. Selection of the lag is based on Schwartz Information Criterion (SIC). Eviews 5.0 software automatically selects the most significant lag length based on this criterion.			

<b>Table 2: Mackinnon critical values for rejection of hypothesis of a Unit Root</b>				
Critical Value	Levels		First Differences	
	No Trend	With Trend	No Trend	With Trend
1%	-3.646342	-4.262735	-3.653730	-4.273277
5%	-2.954021	-3.552973	-2.957110	-3.557759
10%	-2.615817	-3.209642	-2.617434	-3.212361

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Here it is mentionable that unit root tests have non-standard and non-normal asymptotic distribution which are highly affected by the inclusion of deterministic terms, e.g., constant, time trend etc. A time trend is considered as an extraneous regressor whose inclusion reduces the power of the test. However if the true data generating process were trend stationary, failing to include a time trend also results in a reduction in power of the test. In addition, this loss of power from excluding a time trend when it should be present is more severe than the reduction in power associated with including a time trend when it is extraneous, argued Lopez et al. (2005).

For getting more robust result, Phillips Perron test has been conducted and obtained the uniform results for the variables.

<b>Table 3: Phillips Perron Unit Root Test for the Variables</b>				
<b>Panel 1: Levels</b>				
		PP Test Statistics (Only Constant)	PP Test Statistics (Constant & Trend)	Decision
ODA		13.13911	8.247082	Stationary
Female Rate	Literacy	1.827654	-0.940577	Non Stationary
<b>Panel 2: First Differences</b>				
		PP Test Statistics (Only Constant)	PP Test Statistics (Constant & Trend)	Decision
Female Rate	Literacy	-5.191227	-5.897164	Stationary
Note: All regression is estimated with and without trend. Selection of bandwidth is based on Newey-West Bandwidth Criterion. Eviews 7.0 software automatically selects the most significant bandwidth based on this criterion.				

One of the most important issues in conducting the unit root test is to select the appropriate lag length. One approach is to include a relatively long lag length and select the model by the usual t-test. If the t-statistics on lag  $p$  is insignificant at some specified critical value, the regression should be repeatedly estimated using a lag length  $p-1$  until the lag is significantly different from zero. The stationarity property of the variables have been checked by taking different lags and they yield homogenous results that means foreign aid is stationary at level whereas the variable female education is stationary in the first differenced form.

It is clear that the variable “Female Literacy Rate” is non stationary in its level and stationary in the first differences whereas “ODA” is stationary in level. The above results also imply that the variables would yield spurious results unless the variables are co-integrated. These results, however, allow to proceed the next stage of testing for co-integration. The Johansen co-integration test indicates that two series have one co-integrating relationship for both 1 and 2 orders of VAR. Both the maximal Eigen value test and the trace test indicated one co-integrating relationships at 95 per cent significance level. The Johansen test result of this study is insensitive to the inclusion of intercept and/or trend. Results of Johansen test for co-integration (VAR order 2 and no intercept; no trend) is given in the following table on the next page:

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<b>Table 4: Johansen Test for Co-integration (Maximum Eigen Value Test)</b>					
	Null Hypothesis	Alternative Hypothesis	Statistics	95% Critical Value	Conclusion
Female Literacy Rate and ODA	None	At Most One	10.47 (1.58)	11.03 (4.16)	One Cointegrating Relationship

<b>Table 5: Johansen Test for Co-integration (Trace Test)</b>					
	Null Hypothesis	Alternative Hypothesis	Statistics	95% Critical Value	Conclusion
Female Literacy Rate and ODA	None	At Most One	27.84 (1.58)	12.36 (4.16)	One Co-integrating Relationship

As the main purpose of the study is to examine the causal relationship between the concerned variables, to avoid complicity, a simple equation has been regressed by omitting the other exogenous variables which has been reflected by a high coefficient and intercepts value. At the same time, the inclusion of other variables tend to give us more than one co-integrating relationships.

The granger causality test has been done for 4 different lag intervals (lag 1, lag 2, lag 4 and lag 4) and the result shows that there is causal relationship running from ODA to Female Education. However the results of causality test for lag 2 are reported in the following table:

<b>Table 6: Granger Causality Tests</b>			
Hypothesis	F-Statistics	P-Value	Granger Causality
ODA does not Granger Female Literacy Rate	5.75175	0.02063	ODA causes Female Education
Female Literacy Rate does not Granger Cause ODA	0.03392	0.96095	

The Granger causality test has been conducted to describe the causal relationships between the variables.

Now summarizing results that are provided so far it can be seen that non stationarity among macroeconomic variables are somewhat expected. Test of co-integration tells that female education is co-integrated with foreign aid. This effect is carried onto other results as well. Results of Granger causality test (which is the test of precedence) tell that foreign aid can lead

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to enhanced female education. After running the following tests: Augmented Dickey Fuller (ADF) Unit Root Test for the Variables, Phillips Perron (PP) Unit Root Test for the Variables, Johansen Test for Co-integration (Maximum Eigen value Test), Johansen Test for Co-integration (Trace Test) and Granger Causality Tests, the robust results suggest that foreign aid enhances female education.

These results also imply that the variables would yield spurious results unless the variables are co-integrated. So before applying co-integration test, it needs to be checked whether the variables are stationary or not in the first differenced form. Due to better distribution of foreign aid as well as better public expenditure, between the years 1999 to 2005 Pakistan has made progress in improving educational outcomes as measured by enrolment, literacy and retention rates (Malik and Naveed 2012). As this study has not been done before from the viewpoint of Bangladesh, the authors can say these results are new; from the results obtained, it can be concluded that the hypotheses, that foreign aid can enhance female education in Bangladesh, stands. The results also prove that there is in fact a long term relationship between foreign aid and female education in Bangladesh.

## 6. Conclusion

The study has investigated the direction of the causal relationship between female enrolment as a component of female education and foreign education in Bangladesh during the period of 1988-2014. The empirical findings of Granger Causality are running from foreign aid to female education in Bangladesh. As previously a research regarding the relationship between these two variables was not done before, this is new knowledge that can be used for further research in the future. It shows that it is the foreign aid that derives the female enrolment and not vice versa.

The terms “development” and “growth” are not synonymous or interchangeable. Generally speaking, “growth” or economic growth refers to an increase of the economy’s capacity to produce goods and services and is measured in terms of an increase in the GDP. It is no secret that it is absolutely vital for a nation to desire economic growth- it will aid many of its core problems, if not all. Development on the other hand, is not as absolute a term as economic growth. Development, or economic development, refers to the well-being of the economy. In saying that, all the different aspects that contribute in the well-being of the people of a country are taken into account. Education is of the essence here. Education is often times looked at like the one chance to relief the poor of their miseries and defeat poverty.

Education, while a basic right for all, is more important for women. It is evident that the female enrolment in a developing country like Bangladesh is suffering; the drop-out rate is also one that is a matter of concern. Education for males will enable them to be financially secured in the future and provide for their families in the future. Education for females, however, is going to play a major role in changing their lives for good.

Foreign aid to education for females in Bangladesh could change the fate and situation they were born to. It must not be ignored, or even underestimated for that matter, the way foreign aid could make a difference to the education sector. Allocation and disbursements of these funds,

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both public and private, need to be overlooked in order to ensure there is minimized inefficiency and no scope for corruption.

After conducting Augmented Dickey Fuller (ADF) and Phillips-Perron (PP), Co-integration and Granger Casualty test to find the relationship between foreign aid and female education in Bangladesh, it can be said that there is a robust relationship between foreign aid and female education in Bangladesh, and thus the research questions have been answered.

However, it must be taken into consideration that this study faced a lot of limitations. Firstly, the sample size is very small. Secondly, a bivariate model has been used for this study. Finally, other factors such as availability of primary and secondary schools in remote areas, trainings provided to teachers, and study materials used should be taken into account. These factors can affect the education for women. Future research can focus on a multivariate model to study the relationship between foreign aid and female education in Bangladesh and other developing Asian countries to come up with more effective policies.

Since this study is the first of its kind to be done in the context of Bangladesh, there is no frame of reference to which the results can be compared to. However, like mentioned previously, similar researches conducted in other developing countries have also established positive causal relationship.

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