# Does trade openness cause economic growth in Bangladesh?

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## Abstract

Bangladesh has followed a restrictive trade policy immediately after its liberation. But the system was proven wrong, and gradually it opened up its market to others and started to improve its foreign trade. This paper investigates the impact of trade openness on Bangladesh's economic growth using annual time-series data for the period from 1972-73 to 2015-16. The paper uses such econometric tools as unit root test, cointegration test and error correction model to investigate the relationship between the variables. This study revealed a positive association between export and GDP but the opposite relation between import and GDP and recommended to enhance export earnings.

**Keywords**    Export, Import, Remittances, Economic Growth, Econometric analysis, Bangladesh

**Paper type**    Research paper

## 1. Introduction

After successfully attaining the targets of MDG, the Bangladesh government is now trying to achieve approximately all the goals and aims of SDG. Moreover, Bangladesh will celebrate its 50th year of independence in 2021 and prepared eight goals to achieve by 2020-21. The country has successfully fulfilled the poverty alleviation target of Vision 2021 and has maintained a GDP growth rate above 6%. The share of foreign trade and remittance is mentionable in this achievement. Though the current account of the balance of payment of Bangladesh is in deficit mode, the country has already known as the next Asian Tiger. (Basu, 2015). But success is not achieved over a day. After the early age of independence, Bangladesh followed a protective trade policy with high tariffs and non-tariff barriers and overvalued the exchange rate arrangements. (Raihan, 2008) But since the 1980s, the Bangladesh government started to follow a liberal trade policy to achieve a more competitive trade balance, and then success started to come.

The degree of an alliance of Bangladesh's economy with the global economy has increased gradually, as reform and liberalization measures are being pursued. However, indeed, no economy is fully opened or closed in terms of trade restrictions. The degree of trade openness depends on government—foreign trade policy, remittance flow, and business cost. The degree of openness of the Bangladesh economy has experienced a mixed trend in the last ten years. According to World Bank statistical data, Bangladesh's trade to GDP ratio for 2019 was 36.76%, a 1.49% decline from 2018; in 2018, it was 38.24%, a 2.94% increase from 2017. Therefore, this article intended to explore how trade openness influences economic growth. Moreover, this paper focuses on remittance as it is considered as one of the most influential variables for economic growth. Officially in 1976, Bangladesh started to export human resources mainly in Middle East countries. The number of human resources exported from this county is 461829, and the country has earned USD 15316.91 million in the fiscal year 2014-2015 (Bangladesh Bank, 2014).

The organization of this paper is as follows. The paper begins with an introduction in section 1. Section 2 represents an overview of recent trends in trade openness, remittance, and economic growth of Bangladesh. After that, section 3 provides a review of the existing literature. Section 4 describes data and methodology, section 5 represents empirical results, and section 6 concludes the paper with some recommendations.

## 2. Present scenarios of trade openness, remittance, and economic growth

Economic growth can be achieved and accelerated by upholding exports of different goods and services, reducing dependency on imports, and increasing the number of migrated human resources. In Bangladesh, immediately after independence in 1971, the government gradually wanted to become a self-sufficient nation. To do this, the government imposed a high restriction on imports. As a reaction to that, Bangladeshi exportable goods were also faced with restrictions imposed by other nations. However, the Bangladesh government undertook a tremendous footprint during the 1980s to promote its foreign trade. The government gradually reduced tariff rates and abolished quota restrictions. An increasing trend in export earnings led to a significant declining trend in trade deficit since 1992. A closer investigation at the country's trade statistics affirms that in 1989-90 exports were exceeded by imports by 120%. This percentage gradually fell to 56% in the year 1996 and 62% in 1997. The trade deficit decreased by 10 % in the FY 2015-16 against the previous year, making it the lowest in six years. It stood at $6.27 billion, down from $6.96 billion in 2014-15. The fall in global

food and oil prices have led to near-static import costs, which reduced the trade deficit. Once Bangladesh's economy depended on "jute" as its 'primary produce' to boost the economy. The scenario changed after the 1980s, from when RMG and knitwear products hold the lion share of the country's foreign trade. The export of (RMG) and knitwear account for 75% of total exports.
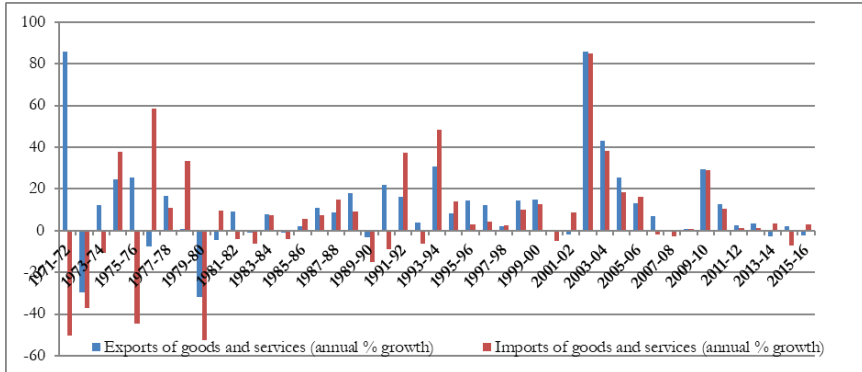


Figure 1: exports and imports of goods and services (annual % growth)
Source: Self-compiled

Figure 1 shows the annual growths of imports and exports of different goods and services (annual % growth) from FY 1971-72 to FY 2015-16. It is found that the current account follows a trend of deficit in Bangladesh, but the trend has diminished in recent years. The leading cause is the fall in global food and oil prices. Since remittance is likely to rise in the future, we hope that Bangladesh also will be able to enjoy a surplus in the balance of payments accounts shortly.

Like many other developing nations, Bangladesh has abundances of human resources. Along with this, the force of globalization and trade openness makes Bangladesh one of the world's vital human resources suppliers. The cross-border movement of Bangladeshi skilled and unskilled workers is worth mentioning (Ray, Sinha, & Chaudhuri, 2007). Almost 58 percent of the remittance came from six Middle-East countries in FY-2016-2017. Remittance in Bangladesh averaged 1185.78 Million dollars for the last five years (2012 – 2017). Figure 2 shows the remittances reached a record high 1491.36 Million dollars in July 2014 and an all-time low of 853.73 Million dollars in September 2017. This significant fall was due to a slump in oil price and devaluation in different currencies like Euro, British Pound, and Malaysian Ringgit against the USD.
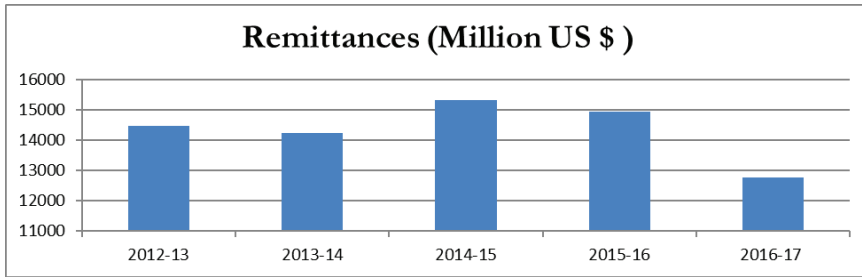
Figure 2: Remittances inflow in Bangladesh (Million USD)
Source: Self-compiled

Bangladesh has successfully maintained an annual average GDP growth rate of 6% or above over the last five years. Figure 3 shows during the FY 2012-'13 to FY 2016-'17, GDP was recorded highest 167771.3759 Million USD in the FY 2016-'17. Moreover, recently, in 2018, Bangladesh begins its graduation process from LDC's to developing nations. An increasing trend is also found in export earnings and import payments. Export earning was increased by 7628.4 million USD from the year 2012 to 2017. Correspondingly import payment was increased by 9457.2 million USD.

Thus, the increasing export earnings and GDP trend support the conventional wisdom of the positive influence of export earnings on economic growth. But the increasing trend of import payment does not support the increasing trend of economic growth. Thus, data and graphical evidence are not enough to justify the objective of this paper. Therefore, more reliable evidence is required to reach a solid conclusion. This study will employ econometric tools to provide such evidence.
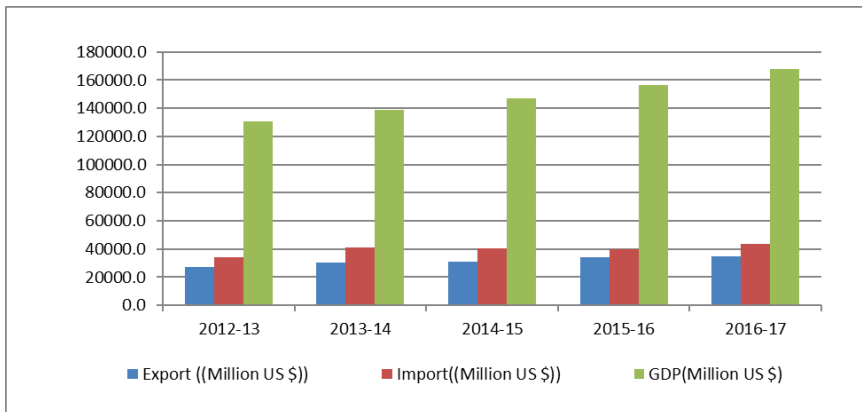


Figure 3: Export, Import and GDP (Million USD)
Source: Self-compiled

## 3. Review of literature

It is believed that trade openness will ensure a win-win situation for all countries. According to World Economic Outlook, since 1870, there was no support for claiming a positive growth-openness relationship before the 1970s. The correlation was negative during 1920-1940. Moreover, it was observed that national trade policy was indirect from 1990 to 2003 as it was designed depending on the other contemporary nations' trade policies, especially current and potential trading partners. According to IMF brief note released in November 2001, "Integration into the world economy has proven a powerful means for countries to promote economic growth, development, and poverty reduction." The strategic relation between trade openness and economic growth has drawn the attention of various researchers all over the world. This paper attempted to review some of them here.

The export-led growth hypothesis was investigated by Fountas (1995) in Ireland. As the data are integrated of order one, the study further employed Engle-Granger Cointegration Tests. The econometric analysis didn't provide any favor in the case of export-led growth and long-run affiliation between growth and export earnings for the period from 1950 to 1990. But for the period 1981-1994, the study used monthly industrial production data as a proxy of real GDP and found a long-run relation between export earnings and economic growth. This article concluded with the recommendation that the country needs to promote its export policies to promote economic growth.

Clarke and Ralhan (2005) focused on direct and indirect causality between exports and economic output for two South Asian countries, Bangladesh and Sri Lanka. They investigated a sample of 43 years from the year 1960 to 2003 for both countries and employed the Granger-causality test and VAR method. The study found that in multivariate system export did not Granger-cause economic output for one-period of time, but at a more extended period, Granger-causality was bidirectional.

Nath and Al Mamun (2005) used quarterly data of two variables, namely export and industrial production, covering the period 1976 to 2003 for Bangladesh. They used industrial production as a proxy variable of GDP or economic growth as quarterly GDP data was not available. In this study, the Engle-Granger cointegration test showed a positive long-run relationship between export and industrial production, though it was absent in the short run. Again, the ECM showed unidirectional relations in the long run, from exports to industrial production.

Ahmed and Uddin (2009) empirically analyzed the relation among export, import, remittance and economic growth for the period 1976-2005 for Bangladesh. Using annual data and converting the variables into the real term, they further employed different econometric tools. As the data are stationary at their first difference, they used the cointegration test and found a long-run association among all the variables. The Granger Causality Test results marked that export growth, import growth and remittance growth cause GDP growth in the short-run, and the causality is unidirectional. Results did not show any reverse causality among the variables.

A study by Li, Chen, and San (2010) graphically presented the dependence of GDP on foreign trade for East China. They used statistical data of 28 years (1981-2008) and employed a two-step causality test put forward by Engle and Granger. The result found a mutual long-run causal relationship between GDP growth and total export but no reciprocal long-run relationship between GDP growth and total import.

Taghavi, Goudarzi, Masoudi, and Gashti (2012) tried to discover the impact of export and import on Iran's economic growth covering the period 1962-2011. They employed various econometric analyses, like the Johansen cointegration test, VAR, Impulse response function, etc. The study concluded that economic growth positively responds to export, whereas it negatively responds to imports.

Meraj (2013) focused on globalization and trade openness and its effects on Bangladesh's economic growth. The author used time-series data of 35 years (1971-2005), where the base year of the data was the year 2000. The author used two cointegration methods, ARDL bounds testing approach and Johansen cointegration test. The result of Johansen cointegration test showed a long-run association among exports, imports and GDP of Bangladesh. The result of Granger causality test showed bi-directional causality from export to GDP, but no evidence of causality from imports to GDP and vice-versa.

Akhter (2015) used yearly data for the period from 1982 to 2012 and revealed that the impact of export on economic growth was positive, and an opposite scenario was found in the case of import.

Interestingly Bakari (2018) investigated the relation between citrus export and Tunisian economic growth. The author found that the share of citrus in total exports fluctuated in different years, but its contribution was crucial. He used yearly time series-data (1970-2016) and employed various econometric tests. As the variables were integrated of order 1, he employed Johanson Cointegration Test and did not find any relationship between citrus exports and economic growth. Empirical results also showed positive

unidirectional causality from citrus exports to economic growth in the short run.

Ahamad (2018) investigated the impact of international trade on the economic growth of Bangladesh. He used secondary data from different sources and used causal research design. Using Pearson correlation and multiple regression analysis, he found a strong positive relationship between international trade and economic growth.

It is clear from the above review that Bangladesh's case remains relatively unexplored. This study will add value to the existing literature in that respect.

## 4. Methodology

### 4.1. Data Sources
This study has used annual data covering the period 1971-72 to 2015-16. Those data are collected from various secondary sources including Monthly Economic Trends of Bangladesh Bank, and World Development Indicators (WDI). The values of all explanatory variables are given in current USD.

### 4.2. Method
ADF test, Engle-Granger cointegration test, error correction model (ECM), and OLS regression are employed to check the relation between trade openness and economic growth. Some diagnostic tests are also done in this study.

Stationary property of time series data depicts the characteristics that the time series's statistical property does not change over time. ADF parametric test is done to check whether a unit root is present in time series, which was developed by Dickey & Fuller (1979). The test is estimated in the following form:

$$\Delta lnGDP_t = \alpha_1 + \alpha_2 t + \delta lnGDP_{t-1} + \sum_{i=1}^{p} \lambda_i \Delta lnGDP_{t-i} + u_t$$

where, $\Delta lnGDP_{t-1} = lnGDP_{t-1} - lnGDP_{t-2}$, $\Delta lnGDP_{t-2} = lnGDP_{t-2} - lnGDP_{t-3}$ and so forth, t is a time trend, number of lag of dependent variable is p and $u_t$ is the error term.

Two-step Engle-Granger cointegration test (1987) is employed to test the long-run causal relationship between the variables. Suppose all the variables are non-stationary at their level but cointegrated of order 1. In that case, a linear combination of them must be stationary for some value of β, and $u_t$ In other words, when measuring the long-term causalities between GDP and export, import, and remittance, the measured variables are

mutually integrated. Then the following regression can be processed:

$$lnGDP_t = \beta_0 + \beta_1 lnexp_t + \beta_2 lnexp_t + \beta_3 lnrem_t + u_t \ldots \ldots (1)$$

Further ADF test is performed on residuals obtained from the regression to check stationarity. If $u_t$ is stationary, the mutual long-term causalities are proved to exist.

If Engle-Granger cointegration test confirms long-run association between the variables, then the relationship between them can be expressed as error correction mechanism. In the context of this study, the following error correction model can be constructed:

$$d \ln GDP_t = \eta + \sum_{i=1}^{p} \alpha_i d \ln GDP_{t-i} + \sum_{i=1}^{p} \beta_i d \ln exp_{t-i} + \sum_{i=1}^{p} \gamma_i d \ln imp_{t-i} + \lambda ECT_{t-1} + u_t \quad .. (2)$$

where $d, t$ and $p$ denote first difference, time and lag length, respectively. If $\lambda$, the coefficient of error correction term *(ECT)*, is found to be negative with a magnitude of less than 1 as well as statistically significant, then a stable and significant long-run relationship is said to exist.

## 5. Empirical results

### 5.1 Results of unit root tests
The outcomes of the ADF unit root test are presented in Table 1. It appears that none of the variables is stationary at a 5% significance level. Then unit root test is performed on the first differences of the variables, and test results confirmed that all the variables are stationary at first difference (Dickey & Fuller, 1979). As all the variables are integrated of order 1, the cointegration test is then performed.

Table 1: Results of ADF test

| Variable | Level | | | First difference | | |
|---|---|---|---|---|---|---|
| | t-statistics | P-value | Decision | t-statistics | P-value | Decision |
| lngdp | -2.936942 | 0.3735 | NS | -2.938987 | 0.0000 | Stationary |
| lnexp | -2.933158 | 0.7530 | NS | -2.935001 | 0.0000 | Stationary |
| lnimp | -2.933158 | 0.7155 | NS | -2.935001 | 0.0000 | Stationary |
| lnrem | -2.936942 | 0.0780 | NS | -2.938987 | 0.0001 | Stationary |

Note: NS: Non-stationary.

### 5.2. Results of co-integration test
Table 2 represents the result of the Engle-Granger cointegration test (Engle & Granger, 1987). As the results reveal, the test statistic of -2.99 is smaller than the critical value at the 5% level of significance. Thus, the null hypothesis of no cointegration can be rejected. The rejection of the null hypothesis provides evidence in support of the long-run association between the variables under consideration.

**Table 2: Results of co-integration test**

| Data-based value of the test statistic | Critical value (at 5%) | Results |
|---|---|---|
| -2.996203 | -2.943427 | Reject $H_0$ (the residual has a unit root) |

## 5.3. Results of error correction model

Table 3 contains the summary result of the error correction model. It can be seen from the table that the coefficient of the error correction term is significant at the 10% level of significance as the probability value is found 0.07. Moreover, the coefficient has an appropriate sign and magnitude. Notably, the coefficient -0.21 indicates that any deviation from long-run equilibrium will be eliminated at a speed of 21% per year.

**Table 3: Error correction model**

| Variable | Coefficient | Std. error | t-statistic | Probability |
|---|---|---|---|---|
| ecm(-1) | -0.212626 | 0.114527 | -1.856548 | 0.0726 |

## 5.4. Results of OLS regression

This study has used 44 observations that are good enough to get a good result in regression analysis. The results of the OLS regression, shown in table 4, imply that export earnings can influence GDP positively, whereas the effect of import payment on GDP is negative. The regression result indicates that if export earnings increase by 1%, then the country's GDP will increase by 1.8% annually. And, a 1% increase in import will influence GDP to decrease by 1.16% annually. Here the effects are statistically significant and support the traditional pearls of wisdom. Although the coefficient of remittance has expected sign, it is found to be statistically insignificant. The value of R-squared indicates that the model fits the data very well. (Gujarati, 2009).

## Table 4: Regression results

| Variable | Coefficient | Std. Error | t-statistic | Prob. |
|---|---|---|---|---|
| C | 6.502246 | 1.280166 | 5.079221 | 0.0000 |
| lnexp | 1.800791 | 0.416236 | 4.326365 | 0.0001 |
| lnimp | -1.157870 | 0.520786 | -2.223312 | 0.0329 |
| lnrem | 0.060690 | 0.153105 | 0.396395 | 0.6943 |
| R-Squared | 0.940446 | Adjusted R-squared | | 0.935191 |

## 5.5. Diagnostics tests

The normality test is performed to check whether the data set is normally distributed or not. Jarque-Bera test statistic is found to be 0.062663 which corresponds to a p-value of 0.97. That means the null hypothesis of data being normally distributed cannot be rejected. White test is performed to check the existence of heteroscedasticity. The test statistic suggests that the

variables under consideration are not heteroscedastic. To see if there has been any structural break in the economy, this study has applied the Chaw Break Point test for the year 1998-2001. The test results showed that the model is found structurally stable over time for this study. The results of all diagnostic tests are presented in Table 5.

**Table 5: Results of diagnostic tests**

|  | Histogram Normality test | White Heteroskedasticity test | Chow Breakpoint test |
|---|---|---|---|
| Critical value | 0.969154 (5%) | 23.6848 (5%) | 13.84(1%) |
| Calculated value | 0.062663 (with *df* 2 ) | 22.22325 | 12.07612 |
| Decision | normally distributed | free from Heteroskedasticity | Model is structurally stable over time |

## 6. Summary and conclusion

This paper tries to examine the effects of trade openness on Bangladesh's economic growth using annual data for the period from 1971-72 to 2015-16. The ADF test is employed to check the stationary property of the time series data. As all the variables are integrated of order 1, the Engle-Granger cointegration test is performed to check long-run cointegration among the variables. The study found a long-run association between the dependent and explanatory variables. Then, an error correction model is employed, and the coefficient of error correction term found to be of correct sign and magnitude. Particularly, the estimated coefficient indicates that any deviation from long-run equilibrium is corrected at a speed of 21.27% each period. Finally, the OLS regression shows a positive association between export and GDP. On the contrary, the import is found inversely associated with GDP. Although this study is producing similar findings to previous works in terms of overall results, it is new and unique in that it incorporates recent data. The study only includes export, import and remittance as the explanatory variable, which is a limitation of this study. Further research can be accomplished by having more explanatory variables and more time-frequency of the data set.

The findings have important policy implications for Bangladesh. Since export is found to be growth-enhancing for this country, necessary steps should be taken to promote export. For domestic promising export-oriented industries, special incentives can be granted. An attempt should be taken to reduce import dependence as far as possible. In that connection, import of consumer products must be brought under serious consideration.

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