

Effects of Trade Openness and Industrial Value Added on Economic Growth in Bangladesh

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Abstract: This study is an attempt to study the empirical relationship among trade openness, industrial value added and economic growth in Bangladesh. Annual time series data set (1981 to 2015) are utilized to detect the connections among the indicators of interest. Unit root test was applied to determine the time series properties of the variables: Gross Domestic Product (GDP), export, import and industrial value added while Ordinary Least Squares (OLS) technique of estimation and Granger causality test were employed to find out direction of causality. The results from the econometric model indicate that imports have a negative relationship while exports positively influence economic growth. The industrial value added also has positive influence on economic growth. It is recommended that Bangladesh should engage in export promotion and import substitution with a view to strengthening the economy and consequently enhance the living standards of its population.

Keywords: Industrial Value Added, Trade Openness, Economic Growth, Bangladesh

1. Introduction

According to the study of Hultman (1976), a country's trade is closely related to its stage of development and degree of industrializations. Since nation advances economically, the structure of its foreign trade alters to correspond with shifting pattern of resource endowment and comparative advantage. Openness to trade has been well-thought-out as an essential factor of economic growth and a well debated issue in the recent growth literature. Developing nations of the world followed restraining trade policies but with passage of time and emergence of globalization, all the nations realized the need to liberalize their economies in terms of trade openness. Trade of a country is a key determinant of the enlargement of a country's industrialization. Moreover, development experienced by a country brings some changes in trade structure on the basis of endowments and comparative advantage (Hultman, 1967).

During the period between 1971 and 1982, four military coups occurred, which continued until the close of 1990. Therefore, the socio-economic conditions were vulnerable between 1971 and 1990. This is, in turn, one of the important reasons for which the democracy of Bangladesh and the process of industrialization have been negatively affected

repeatedly. However, the 1982 measures were followed by further comprehensive changes in 1985, 1986 and in 1991 (Hossain and Karunnaratne, 2001).

An empirical analysis by Adenikinju and Olofin (2000) suggested that development of industrial sector can be determined by trade openness and policies of trade. There are a number of ways through which a positive link between industrial sector growth and trade policies can be explained. Scale efficiency is increased through expanding the scope of domestic industrial sector as well as an open trade regime increase high competition in world market, which further motivates firms in a country to follow and take up modern technology. In addition, an open trade regime relaxes constraints caused by foreign exchange as observed in case of developing nations. It also causes high development in technological progress. (Lucas, 1988; Grossman & Helpman, 1989; 1991; & Romer, 1994). However, some other potential gains from trade sector reforms include: opportunities to access intermediate and capital goods embodying better technologies; stimulation of productive performance, better resources allocation and exports; access of local producers and consumers to less expensive and higher quality goods from abroad (Winter, 2004). However, many observers such as Noland and Pack (2003) and Milner (2006), among others, believed that domestic policies were largely unrelated to

trade while institutional development, macroeconomic management, education, health, infrastructure etc. may now be the main obstacles to reaping the benefits of trade reform in developing economies.

Although, the Bangladesh economy has been classified as one of the Next 11 emerging economies in the world (O'Neil, 2001), the standard of living of majority of its citizens have remained low. This has been a source of concern to stakeholders. The paper would provide further empirical evidence that would guide the Government and policymakers on how to drive economic growth in Bangladesh with a view to improving the welfare of its citizens.

2. Literature Review

Empirical Studies to date by and large support the hypothesis that openness of trade leads to economic growth and vice versa. However, some studies show that there is no causal relationship between the growth of trade openness and the growth of Gross Domestic Product (GDP), for example, Narayan and Smyth (2005) and Abhayaratne (1996).

The theoretical and empirical literature regarding the openness of trade, industrial developments and economic growth has a number of contributions by recent development economists. The results achieved by these contributors at national and international levels are discussed below.

Ahmad and Dutta (2004) studied the relationship between growth of industrial sector and trade sector policies in Pakistan. The empirical analysis was carried out by using the annual time series data over the period 1973-1995 and applying the cointegration and error correction methods of estimation. Major findings suggested a long run and stable relationship among industrial value added, capital stock, real exports and import tariff on collection rate and ratio of secondary school enrolment.

Carmen and Pilar (2004) investigated the role played by manufacturing sector imports on real GDP and employment in China. Using quarterly time series data set over the period 1979-2002 and applying dynamic econometric technique of estimation and study found a positive and long run relation between economic growth index and index of trade openness. Similarly, many studies concluded that trade performance of developing countries is less dependent on natural factors endowment and comparative advantages given the imperfect competition, economies of scale, and technological spillovers. Rather it is a function of technological spillovers, strategies followed for trade and industrialization (Verspagen, 1992).

It has been argued that openness is a better measure of economic growth than export alone. If only export is used it is implicitly assumed that import does not contribute to economic growth. Import of capital goods and energy can accelerate economic growth (Sinha & Sinha 1999, 1996 & Krueger, 1998, 1997).

Njikam (2009) tried to analyse trade openness and development of industrial performance in Cameroon, while trying to explore whether a relation exists between

infrastructure and industrial performance during the two time periods, before and after trade openness. This study utilized the annual values during the import-substitution era (1986-94) and immediately after trade reform (1995-2003) for a sample of 29 industrial sectors. By using panel data techniques this study found that development in infrastructure leads to enhanced productivity of industrial sector and in trade openness agenda, better quality of infrastructure must be given priority.

Barua and Chakraborty (2006) analyzed the industrial sector performance in India. The study analyzed high market and openness effects on industrial and exports performance. Major conclusion drawn suggested that liberalization leads to high price cost margins and reduction in concentration of industries lowers producer surplus and hence boosts consumer welfare.

Adebayo (2006) investigated the relationship between policies of trade openness and economic growth performance in Nigeria. This study applied Vector Auto Regression technique and used annual time series data set. Major findings suggest that sustained economic growth in Nigeria can be achieved by implementing a comprehensive trade openness programme. Another analysis conducted by Iqbal and Zahid (1998) concluded that Pakistan had gained welfare effects through trade openness. Similarly, Mohsin M. H (2001) found evidence that trade openness has helped to eradicate poverty in Pakistan. An evidence of positive relationship has been found for the South Asian region including Pakistan by Kemal, A. R., Musleh ud Din, Usman Qadir, F. Lloyd, and S. Colombage Sirimevan (2002).

Khan and Qayyum (2007) also found a positive and robust relationship between trade and financial sector policies with economic growth. But successful outcomes demand that economy be competitive along with strong institutional framework. However, developing nations like Pakistan, must adopt the policies to improve trade performance as well as industrial performance. Guerrieri (2002) stated that at world level trade can be beneficial but it is not necessary for all the countries to get the benefits individually, at national level benefits of trade openness are dependent upon a number of endogenous factors. Specialization pattern plays an important role on the benefits and macroeconomic stability is pre requisite to getting the maximum gains from trade liberalization.

Abbas (2014) analysed the impact of trade openness and liberalisation on economic growth in developing countries during the period of 1990–2011 using the panel fixed effect model. The results showed that trade liberalization has a negative impact on economic growth of the selected countries whereas real exports make a significant positive impact on it.

Positive impact of trade openness on the scopes of economic growth has been confirmed in numerous scientific studies (Ulasan, 2012; Gries & Redlin, 2012; Tahir & Azid, 2015). Musila and Yiheyis (2015) found that trade openness positively affected economic growth in Kenya over the period 1961–2009. Granger Causality tests showed that a

change in trade openness influences the long-term rate of economic growth through the interaction with physical capital growth.

Mamun and Nath (2005) examined the export-output relationship in Bangladesh using time series data. More specially, they examined the time series evidence of export-led-growth in Bangladesh. The unit root test (Augmented Dickey-Fuller) results show that the quarterly data on industrial production index, exports of goods and services, and exports of goods only are integrated of order one, i.e. $I(1)$. The Engle-Granger cointegration test results show that there is a long run equilibrium relationship between industrial production and exports. The estimated cointegrating equation also indicates that there is a significant and positive long-run relationship between exports and industrial production in Bangladesh. The error correction model (ECM) and Granger casualty test results show that there is no causal relationship between export growth and industrial growth. The results also show that there is positive long-run equilibrium relationship between export and industrial production, and there is no evidence of short-run causal relationship between these two variables. They state that the long run causality seems to run from exports to industrial production.

Although the foreign trade sector of Bangladesh constitutes an important part of its economy, the country suffers from a chronic deficit in its balance of trade. The balance of trade in Bangladesh with the other countries, does not show any hopeful sign for the desired contribution to country's economic development (Rahman, 2003). The trade and industrial policy of Bangladesh undertaken in 1980s have been changing from being highly import substituting and government controlled to being more liberalized and deregulated. To promote export, several measures were undertaken in the 1980s. For example, the government has established the first export processing zone in Chittagong. It has been followed by others measure such as tax holidays, income tax rebates, and other infrastructural benefits to the export oriented industries. In the 1990s, more export processing zones were established in Dhaka, Khulna, and Iswardi. During the early 1990s, Bangladesh being an agrarian economy, had a very weak industrial sector along with poor infrastructural facilities and instability in social as well as political sectors. The development economist of that time and policy makers emphasized the need to strengthen the industrial structure of those days. The objectives included restricting imports and promoting exports. As a result, high tariff policies were adopted to discourage imports in the country.

During the 1960s large scale manufacturing sector started to develop. In those days, focus was on expanding the industrial sector. Policies were introduced to strengthen the industrial base including overvalued exchange rate, export bonuses, preferential credit access to industries with export potential and automatic renewal of import licenses. Until the late 1980s, Bangladesh restricted and protected its trade regime. Imports were far away from domestic markets as a

result of high tariff rates and non-tariff barriers.

Trade policies work only in combination with other appropriate policies. For example, investment has been identified as a key link through which openness affect growth (Taylor, 1998 & Wacziarg, 2001). Trade policies are integrated with economic growth and development strategies. Therefore, the linkage between trade policy and development-cum-industrialization strategy are crucial (Kruger, 1998).

After analysing the review of literature on theoretical as well as empirical side we can summarize that the literature review documented strong evidence in the favour of openness. Openness to trade is an important factor to enhance the industrial growth and overall economic performance.

3. Methodology

A number of studies used time series data set and econometric modelling to observe the possible effect of trade openness on economic growth. Econometric model and variable scheme adopted by Sultan (2008) were followed in this study to achieve the objectives using imports and exports as indicators of trade. This analysis used imports, exports and industrial value added as independent variables, and real GDP as dependent variable while all variables are expressed in logarithm. Annual data set over the period 1981 to 2015 are expressed in US dollars. The data sources include World Development Indicators (WDI), and International Financial Statistics (IFS). The study adopted the unit root test, the Augmented Dickey-Fuller (ADF) statistics is used to examine the time series properties of data. We found all the variables to be stationary at their first difference. Hence Ordinary Least Squares (OLS) estimation method was applied to all the variables at first difference. Finally, the study applied Granger Causality Test to find the direction of causal relation between the variables.

4. Results and Discussion

The results of unit root are reported in Table 1. It is seen from the table that all the variables i.e. exports, imports, GDP and industrial value added are non-stationary at level and are stationary at first difference. That is all the variables are integrated of order one.

Table 1. Unit Root Test Results.

ADF			
Variable	First Level	First Difference	Decision
LNEXPORTS	0.42	8.73	I(1)
LNIMPORTS	0.39	5.79	I(1)
LNGDP	0.94	5.31	I(1)
LNINVA	0.55	4.61	I(1)

Note: * shows significance at 5% level of significance, For testing unit root null hypothesis is that Variable possesses unit root, hypothesis is rejected if the calculated value exceeds ADF critical value at 5% level of significance. At 5% significance the t statistics is -2.96.

Source: Author's Own Calculation

In the second step, correlation among the variables was determined in Table 2. The result presents evidence of strong correlation. Positive correlation exists between industrial value added and exports, GDP and industrial value added which implies that high industrial value added cause GDP to be high. Not a single evidence of negative correlation was found here. Furthermore, serial correlation Breusch-Godfrey Serial Correlation LM (Lagrange Multiplier) test was also

employed to observe the existence or non-existence of autocorrelation. Because the test is based on the idea of Lagrange multiplier testing, it is sometimes referred to as LM test for serial correlation. However, the F-statistic was so high (F Stat = 15.34) and probability was also found to be less than 0.05, so we are right to reject the null hypothesis of autocorrelation at 5% level of significance.

Table 2. Correlation Matrix.

	D(LNGDP)	D(LNEXPORT)	D(LNIMPORT)	D(LNINVA)
D(LNGDP)	1.00	0.24	0.20	0.93
D(LNEXPORT)	0.24	1.00	0.45	0.39
D(LNIMPORT)	0.20	0.45	1.00	0.27
D(LNINVA)	0.93	0.39	0.27	1.00
Serial Correlation LM Test (Breusch-Godfrey Serial Correlation LM Test)				
F-Stat	n*R ²	Probability F-Stat	Probability (Chi square)	
15.34	9.32	0.001	0.009	

Source: Authors Own Calculation

Note: Null hypothesis for testing correlation is existence of autocorrelation.

After econometric modelling, the estimation results are given in Table 3, where C is the intercept term, D (LEXPORT), D(LIMPORT), D(LINVA) are the independent variables.

Coefficient of exports possesses positive sign indicating a positive impact of exports on economic growth. That is 1% increase in export causes 0.44% increase in real GDP. The associated probability of D(LNEXPORT) is .005, which is statistically significant at 5% significance level. Industrial value added is an important determinant of economic growth in addition to exports. On the other hand, imports have a negative effect on economic growth. That means 1% increase in import causes 1.09% decrease in real GDP. The coefficients are statistically significant. Industrial value added has positive and significant impact on economic growth. If industrial value added 1% increase causes 1.16% increase in GDP. The P-value for D(LNINVA) and D(LNIMPORT) are significant at 5% significance level. The p-value for all the variables are statistically significant for rejecting the null hypothesis that the true coefficient is zero at the 5% significance level.

Adjusted R² is 0.88 which indicates that 88% variation in LNGDP was explained by the explanatory variables. Values of coefficients suggested that the effect of growth rate of imports has stronger effect on real GDP as compared to growth rate of exports.

Table 3. OLS Regression Results.

Dependent Variable: D(LNGDP)			
Sample (adjusted): 1982-2015			
Included observations: 34 after adjusting endpoints			
Variable	Coefficient	t-Statistic	Prob.
C	3.56	4.13	0.0024
D(LNIMPORT)	-1.09	6.76	0.00553
D(LNINVA)	1.16	14.62	0.0000
D(LNEXPORT)	0.44	2.92	0.0054
R-squared	0.89	Durbin-Watson stat	1.89
Adjusted R-squared	0.88		

Source: Authors Own Calculation

All the variables are non-stationary at their level but are stationary at first difference and hence integrated of same order. Causality between the variables are given in Table 4. The results show bidirectional causality between exports and industrial value added as well as between exports and economic growth, and unidirectional causality flow from economic growth to industrial value added. That means as export promotes the industrial value added and the industrial value added also promotes the export. On the other hand, export promotes economic growth while economic growth also influence export. The result also unidirectional causality flow from economic growth to industrial value added indicating that economic growth promotes industrial value added.

Table 4. Granger Causality Tests.

Hypotheses Testing	F-Statistic (Probability)
D(LNIMPORT) does not Granger Cause D(LNGDP)	1.37 (0.272)
D(LNGDP) does not Granger Cause D(LNIMPORT)	0.13 (0.870)
D(LNINVA) does not Granger Cause D(LNGDP)	2.85 (0.077)
D(LNGDP) does not Granger Cause D(LNINVA)	7.10 (0.003)
D(LNEXPORT) does not Granger Cause D(LNGDP)	4.09 (0.029)
D(LNGDP) does not Granger Cause D(LNEXPORT)	9.37 (0.0009)
D(LNINVA) does not Granger Cause D(LNIMPORT)	0.13 (0.873)
D(LNIMPORT) does not Granger Cause D(LNINVA)	0.93 (0.405)
D(LNEXPORT) does not Granger Cause D(LNIMPORT)	0.24 (0.784)
D(LNIMPORT) does not Granger Cause D(LNEXPORT)	0.31 (0.721)
D(LNEXPORT) does not Granger Cause D(LNINVA)	5.32 (0.012)
D(LNINVA) does not Granger Cause D(LNEXPORT)	9.94 (0.001)

Source: Authors Own Calculation

5. Conclusion and Policy Recommendations

The study has evaluated the impacts of trade openness and industrial value added on economic growth in Bangladesh for the period 1982-2015. The empirical results show that there exist a significant positive relationship between exports and

economic growth, and a significant inverse relationship between import and economic growth. The results also reveal a significant positive relationship between industrial value added and economic growth. The granger causality results show that bidirectional causality exists between export and economic growth as well as between export and industrial value added. Also, there is a unidirectional causality flow from economic growth to industrial value added. Diversification of export, export promotion, and import substitution strategies that can promote sustainable economic growth in Bangladesh. This study creates a field for further research. The research can address why import sometimes play a negative role in economic growth.

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