



Bangladesh's Balance of Payments: an Econometric Analysis

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Abstract:

The study was conducted at the Department of Economics, University of Chittagong, Bangladesh between December 2010 and April 2011. Balance of payments plays the most important role in a country's economy. As a developing country, Bangladesh cannot claim that its performances are satisfactory. The objective of this analysis is to develop some ideas about the balance of payments of Bangladesh. It is expected that trade liberalization would promote economic growth from the supply side by leading to a more efficient use of resources. Trade liberalization could lead to faster import growth than export growth and hence the supply side benefits may be offset by the unsustainable balance of payment position. This study uses 36 year observation of GDP, import, export and exchange rate of Bangladesh to estimate their effect on trade balance. Our conclusion is that Bangladesh should relax restrictions on imports more slowly than barriers to exports.

Key words: trade balance, export, import, terms of trade, GDP

Introduction

Balance of payment is a statistical statement designed to provide, for a specific period of time, a systematic record of an economy's transactions with the rest of the world. Its major components are the current account and the financial account. The spending of foreign currency is debit and it is a negative item. If a transaction earns foreign exchange for the nation, it is

recorded as a plus item and it is a credit. Generally speaking, imports are debits and exports are credit.

If credits are more, i.e. exports are more, than it is a positive sign for the economy and it is known as a favorable balance of payment. If debits are more, i.e. imports are more, than it is a negative sign for the economy and it is known as an unfavorable balance of payment. Bangladesh has had an unfavorable balance of payment for many years due to its dependency on imports.

Apart from the dependency on imports, there are some other reasons:

- Global Recession since 2008
- Deteriorating law and order situation which stops investment
- Slow growth of production
- Low exports
- Electricity shortage/Mismanagement which result in low crops
- Energy crisis causing low output and closure of many industrial units, which reduces the exports
- Political instability
- Fiscal policies
- Trade restrictions in developed countries
- Limitless export of primary commodities
- Depreciation of Bangladeshi Taka.
- Inflation
- Low foreign exchange remittances

Balance of payments

A balance of payments (BOP) sheet is an accounting record of all monetary transactions between a country and the rest of the world. These transactions include payment for the country's exports and imports of goods, services and financial capital, as well as financial transfers. The BOP summarizes international transactions for a specific period of time, usually a year, and is prepared in a single currency, typically the domestic currency of the country concerned. Sources of funds for a nation such as exports or the receipts of loans and investment are recorded as positive or surplus items. Uses of

funds, such as for imports or to invest in foreign countries, are recorded as negative or deficit.

When all components of the BOP sheet are included, it must sum to zero, and there can be no overall surplus or deficit. For example, if a country imports more than it exports, its trade balance will be in deficit, but the short fall will have to be counter balance in other ways- such as by funds earned from its foreign investment, by running down reserves of by receiving loans from other countries.

While the overall BOP sheet will always balance when all types of payments are included, imbalances are possible on individual elements of BOP, such as the current account. This can result in surplus countries accumulating hoards of wealth, while deficit nations become increasingly indebted. Historically there have been different approaches to the questions of how to correct imbalance and also there have been debates on whether these constitute an issue governments should be concerned about. With record imbalances held up as one of the contributing factors, during the financial crisis of 2007-2010, plans to address global imbalance were high on the agenda of policy makers for 2010.

An actual balance sheet will typically have numerous sub headings under the principal divisions. For example, entries under current account might include:

- Trade – buying and selling of goods and services.
- Exports – a credit entry.
- Imports – a debit entry.
- Trade balance – the sum of exports and imports.
- Factor income – repayments and dividends from loans and investments.
- Factor earnings – a credit entry.
- Factor payments – a debit entry.
- Factor income balance – the sum of earnings and payments.

Especially in older balance sheets, a common division was between visible and invisible entries. Visible trade recorded imports and exports of physical goods (entries for trade in physical goods excluding services is now often called the merchandise balance). Invisible trade would record international buying and selling of services and sometimes

would be grouped with transfer and factor income as invisible earnings.

Objectives of the study

In Bangladesh, import, export, and exchange rate, are the most important economic variables in recent times as they help in balancing the balance of payment. The world is getting globalized, which means that it has both good and bad effects on an economy. But every developing or lesser developed country is concerned about it and tries to take part in the global competition and to achieve expected growth and development. The key objectives of the study are as follows:

- To find out the impact of trade liberalization on export growth and import growth.
- To find out the impact of terms of trade on trade balance.
- To find out the impact of GDP and exchange rate on trade balance.
- To show the impact of trade liberalization on trade balance and balance of payment.
- To show the impact of import liberalization and exchange rate on growth.
- To suggest policy measures for the improvement of trade policy.

Review of Literature

Most of the relevant literature has been found in articles on similar aspects of balance of payment. On the basis of the information acquired, an attempt has been made to make an overview of the existing literature.

Developing countries like Bangladesh should relax restrictions on imports more slowly than barriers to exports, according to research by Amelia Santos-Paulino and Professor Tony Thirlwall, published in the February issue of the *Economic Journal*. This is because it takes longer for exporters to respond to trade liberalization than it does for imports to flood in, potentially causing seriously disruptive balance of payments difficulties. (Cf. Hossain 2006)

This study is the first major attempt to estimate in a rigorous and systematic way the impact of trade liberalization not only on export growth but also on import growth, the trade balance and the balance of payments. Previous studies have ignored the fact that if liberalization leads to a flood of imports, the balance of payment consequences may seriously disrupt economies because deficits cannot easily be financed.

Hossain and Alauddin (2005) examine the process of Bangladesh's trade liberalization and its impact on the growth and structure of exports, imports, GDP and other macroeconomic variables with particular emphasis on export. By using econometric investigation based on the ARDL and the ARDL co-integration techniques they empirically found trade liberalization has had a positive impact on the growth, that is, both anti-export bias reduction and import-GDP ratio have significantly impacted on exports in the long run.

Balance of Trade and Bangladesh Economy

The economy of Bangladesh is that of a developing country. Its per capita income in 2008 was estimated at US\$ 1500 (adjusted by purchasing power parity). According to the International Monetary Fund (IMF) Bangladesh ranked as the 48th largest economy in the world in 2009, with a GDP of US\$ 256 billion. The economy has grown at the rate of 6-7% p.a. over the past few years, more than half of the GDP belonging to the service sector, with nearly half of Bangladesh being employed in the agriculture sector.

Remittances from Bangladeshi workers overseas, mainly in the Middle East are the major source of foreign exchange earnings; exports of garments and textiles are the main sources of foreign exchange earnings. GDP's rapid growth due to sound financial control and regulations has also contributed to its growth. However, foreign direct investment is yet to rise significantly. Bangladesh has made major strides in its human development index. (Asian Development Bank (ADB), 2006)

Balance of Trade of Bangladesh

Trade balance is the difference between Export and Import. (Cf. Carbaugh 2004) Though liberalization has taken place, still the condition of balance of payment in Bangladesh is not satisfactory. There are many reasons for this problem such as: the ICT sector is not strong enough, our export items are limited, lack of skillfulness etc. The scenarios of balance of payments conditions are given below:

Table: Trade balance and Current account balance of Bangladesh

Year	Export (crore taka)	Import (crore taka)	Trade balance (crore taka)	Current account balance (million US \$)
1990/91	6027.2	11187.7	-5160.5	-981
1991/92	7419.8	13275.6	-5855.8	-605
1992/93	8821.5	13819.8	-4998.3	-618
1993/94	9873.9	13754.0	-3880.1	-420
1994/95	13697.0	21856.4	-8159.4	-975
1995/96	14452.1	25464.6	-11012.5	-795
1996/97	17155.4	29018.7	-11863.3	-698
1997/98	22940.8	31891.6	-8950.8	-489
1998/99	24561.9	34101.7	-9539.8	-503
1999/00	24741.5	37202.2	-12460.7	-337
2000/01	30647.6	43694.9	-13047.3	-1018
2001/02	30211.9	51844.3	-21632.4	240
2002/03	33788.5	50640.0	-16851.5	328
2003/04	43709.8	63036.3	-19326.5	176
2004/05	53283.1	76995.4	-23712.3	-557

2005/06	69195.0	96243.5	-27048.5	824
2006/07	850309.0	1118664.0	-268355	936
2007/08	985931.0	1496722.0	-510791	576

From the above table it is seen that in FY 1990/91 the trade balance was Tk. -5160.5 crore, which decreases to Tk. -3880.1 crore in FY 1993/94. But afterwards the trade balance of Bangladesh is getting worse, with Tk. -21632.4 crore in FY 2001/02 and Tk.-510791 crore in FY 2007/08. The current account balance of Bangladesh was -981 million US dollar in FY 1990/91, 240 million US dollar in FY 2001/02 and 576 million US dollar in FY 2007/08. It can be seen that after 1993/94 the trade balance has been consistently low. But in 2006/07 and 2007/08 it fluctuated highly. Therefore we can claim that globalization does not bring positive results for trade balance yet. (Cf. Aziz 2008)

Methodology of the study

There are many components that affect the trade balance of an economy and Balance of payment also has many indices. The effects of trade balance can be checked in different ways. In this paper we will examine by econometric method the effect of some variables, especially Balance of payment, on the trade balance. The methodology and description of data are as follows:

To explain the influence of balance of payment and other factors on the trade balance of Bangladesh we use the “Autoregressive model” and the sample period for investigation is “1972/73 to 2007/08. The empirical study will employ annual, time series secondary data collected from different sources.

For all types of study, reliability of data is a crucial issue. The statistical data base system is not strong in our country as a developing country and consequently careful attention was given while compiling printed materials of the BOI, different government institutions, concerned ministries and concerned corporate offices, research journals, ADB data and statistics, websites and all other sources. All these sources of data are recognized and accepted and the provided information has been used widely in the country. So data and

information of the sources incorporated in this analysis are reliable.

The Model

The study explains the effect of Balance of payment and other factors on the trade balance of Bangladesh. In this model the explanatory variables are terms of trade (TT), GDP (Y) and Exchange rate (EXR). The dependent variable is trade balance. It is known that trade balance has many indices such as import liberalization, anti export bias reduction, trade liberalization etc. The model can be shown as follows:

$$TB_t = \beta_1 + \beta_2 TT_t + \beta_3 Y_t + \beta_4 ExR_t + u_t \dots \dots \dots (4.1)$$

Whereas u_t is the error term and it is indicating time, β_1 is the scalar parameter and β_2 to β_4 are the slope coefficient of the respective variables.

The lin-log form of the model (4.1) will be used for empirically estimated and the form is:

$$TB_t = \ln\beta_1 + \beta_2 \ln(TT_t) + \beta_3 \ln(Y_t) + \beta_4 \ln(EXR_t)_+ u_t \quad (4.2)$$

It should be noted that the trade balance (TB_t) is not in log form, because some of the values of the variable are zero.

Variable Definition and Data Sources

1. TB = Trade balance of Bangladesh (Export-Import) (Millions of US \$)

Source: www.adb.org/statistics

2. $\ln(TT_t) = \log$ Form of terms of trade. In this study we considered real export and real import with base year “1988-1989”

Source: Statistical Year Book of Bangladesh, Export Promotion Bureau. *Economic Review of Bangladesh* of several years.

3. $\ln(Y_t)$ = Natural log of real GDP registered with millions of dollars. Real GDP is the monetary value of all final goods and services produced in a country in a given period with a base year price. Here, FY – “1995/96” is considered as base year and all value of GDP converted to this base year.

Source: Statistical Year Book (1973-2008), *Economic Review of Bangladesh* of several years.

4. $\ln(EXR_t)$ = Natural log of average nominal Exchange rate with Vs dollar. This variable is also considered as an index of Trade balance.

Source: *Bangladesh Economic Review* – 2008.

Expected sign of the Estimated Coefficients

1. $\beta_2 > 0$; because if terms of trade increase, then the trade balance must be increased i.e. the relationship between the terms of trade and trade balance is positive.

2. $\beta_3 < 0$; Since Bangladesh is a developing country, if GDP (Y_t) increases more than the import increase, the trade balance decreases i.e. the relationship between trade balance and GDP is negative.

3. $\beta_4 < 0$; If exchange rate increases, then import price increases. Since in Bangladesh import is higher than export, the trade balance decreases, i.e. the relationship between the trade balance and exchange rate is negative.

Empirical Analysis

In the previous part we discussed the model and the variables as well as the data sources. So, our model is an autoregressive model which is a lin- log function as follows:

$$TB_t = \beta_1 + \beta_2 \ln(TT_t) + \beta_3 \ln(Y_t) + \beta_4 \ln(EXR_t) + u_t$$

We took the logarithm value of all variables except trade balance (TB_t) by using an econometric program, SPSS (Version 14.0), then we have run OLS (Ordinary least square) method. Because of this study uses the time series data, so Unit Root Test and Co-integration test should be checked out. But the sample size is not large enough to test co-integration as well as unit root test. That is why Unit Root Test and co-integration test are not considered in this study.

Descriptive statistics of major variables:

The descriptive statistics of TB_t , $\ln TT_t$, $\ln Y_t$, $\ln EXR^t$ (meanings to the variables are given above) are as follows:

Table (5.1): Descriptive statistics

	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
						Statistic	Statistic			Statistic	Statistic	Std. Error	Std. Error
TB	36	1959.14	-2642.41	-483.27	-61056.59	-1696.0163	78.80353	472.83210	223570.196	.044	.393	-0.334	.768
$\ln TT$	36	1.26	-1.46	-0.20	-27.62	-0.7672	.06737	.40545	.164	-0.269	.393	-1.525	.768
$\ln Y$	36	94	10.50	11.45	385.88	10.7189	.03938	.23751	.056	1.860	.393	3.033	.768
$\ln EXR$	36	2.17	2.06	4.23	122.90	3.4139	.10302	.61812	.382	-0.682	.393	-0.374	.768
Valid N (listwise)	36												

From the table it can be seen that the frequency distribution of all variables is not normal. The skewness coefficient is less than unity, except for $\ln Y_t$ variables, generally taken to be fairly extreme (Chow 1988, 109). Statistician Kendall (1943) calculated the expected normal kurtosis equal to $3(n-1)/n+1$; where, n=sample size. According to this rule, in a Gaussian distribution, a kurtosis coefficient of 2.8378 for these data can be calculated for all the major variables respectively. Kurtosis generally either much higher or lower than the above calculated values indicates extreme platykurtic. In this data set the value of -0.334, -1.525, 3.033,-0.374, for TB_t , $\ln TT_t$, $\ln Y_t$, $\ln EXR^t$, respectively fall under the extreme platykurtic distribution. Generally values for skewness zero and kurtosis value 3, indicate that the observed distribution is perfectly normally distributed. Therefore skewness and platykurtic frequency distribution of major variables TB indicates that the distribution is not normal.

Analysis of results

Estimated results with ordinary least square method have been reported in Table (5.1)

Table: Regression Results Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error				Lower Bound	Upper Bound
1	(Constant)	22408.010	4263.180		5.256	.000	13724.197	31091.824
	LnTT	1901.002	210.301	1.630	9.039	.000	1472.633	2329.372
	LnGDP	-1706.845	335.451	-.857	-5.088	.000	-2390.135	-1023.554
	LnEXR	-1274.211	199.359	-1.666	-6.392	.000	-1680.292	-868.130

Dependent Variable: TB

From the table, it can be said that the estimated coefficients have all expected signs. The coefficient of the terms to trade is 1901.002 implying that a one percent increase in terms of trade increases the trade balance by 1901.002 percent. Similarly a one percent increase in GDP decreases the trade balance by 1706.845 percent. Again, a one percent increase in exchange rate decreases the trade balance by 1274.211 percent. Here, the 't' value of the coefficient of terms of trade is 9.039, which is significant, that is clear that in terms of trade increase, trade balance also increases. Similarly, the 't' value of the coefficient of GDP is -5.088, which is significant, that is if GDP increases trade balance decreases.

Again, the 't' value of the coefficient of exchange rate (EXR) is -6.392, which is significant, that is if exchange rate increases, the trade balance decreases. If all other variables remain constant, the estimated regression equation is as follows:

$$TB_t = 22408.010 + 1901.022 TT_t - 1706.845 Y_t - 1274.211 EXR_t$$

Table: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.867(a)	.752	.729	246.02520	.752	32.426	3	32	.000	1.010

a Predictors: (Constant), LnEXR, LnGDP, LnTT**b Dependent Variable: TB**

From the Table it can be said that the fitted line is reasonably good, where the goodness of fit, R^2 value is 0.752. That is, almost 75.2% of the variation in the trade balance (TB) in Bangladesh is explained by log of terms of trade (LnTT), log of

GDP (LnY) and log of exchange rate (LnEXR). The adjusted R² is 0.729 (R²).

Table: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5888048.053	3	1962682.684	32.426	.000(a)
	Residual	1936908.810	32	60528.400		
	Total	7824956.863	35			

a Predictors: (Constant), LnEXR, LnGDP, LnTT

b Dependent Variable: TB

According to table the value of the F – statistic is 32.426, which indicates that R^2 is statistically significant.

The 'F' Test:

The null and alternate hypotheses are:

$$H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$$

$$H_a : \beta_1 = \beta_2 = \beta_3 = \beta_4 \neq 0$$

(i.e. $\beta_1, \beta_2, \beta_3, \beta_4$, are not simultaneously zero)

The calculated 'F' value is 32.426 while the critical values for F are 3.32 at 5% and 5.39 at 1% level of significance. As a result the null hypothesis cannot be accepted. That is the estimated equation is significant.

Diagnostic test

The diagnostic tests confirm the validity of the inference. In the presence of multicollinearity, although BLUE, the OLS estimators have large variance and covariance, making precise estimation difficult. In the presence of serial or auto-correlation or heteroskedasticity, though estimated parameters are unbiased, their standard errors are substandard and so are the t-ratios.

Conclusions and Policy Implications

The most successful countries are those where import restrictions have been relaxed more slowly than barriers to exporting. The International Monetary Fund, World Bank and the world trade organization should pay much more attention than they do at present to the balance of payments

consequences in the case of trade liberalization when they design their liberalization programs. Bangladesh should relax restrictions on imports more slowly than barriers to export. This is because it takes longer for exporters to respond to trade liberalization than it does for imports to flood in, potentially causing seriously disruptive balance of payments difficulties.

In Bangladesh researches find that, on average, export growth has increased less than import growth, leading to an increase in the trade deficit – enough to trigger financial crisis. The adjustment necessary to rectify the trade deficit has decreased GDP growth below what it otherwise would have been if a balance between export and import had been maintained. These results have important policy implications for the sequencing of trade liberalization to keep a balance between export and import so as to avoid balance of payment crisis. This sequencing is as important as the sequencing of internal and external financial liberalization.

Future expectations:

- Foreign direct investment (FDI) may increase if there is political stability and continuation of policies.
- If the IMF, World Bank and Asian Development Bank release their loans for Bangladesh as promised, then our balance of payment may show some improvement.
- Friends of Bangladesh have promised significant monetary support, which will certainly have a positive effect.
- Imports are expected to decrease. If this happens, it will have a positive effect on balance of payment, since this is relying on foreign elements and support. If this is accomplished, then the balance of payment deficit will decrease.

Suggestions:

- Bangladesh must increase its production so that surplus can be exported.
- Bangladesh does not need to enter the IMF and World Bank programs.
- New water reservoirs need to be made.
- Pro Active Export policy and better marketing of surplus goods.

- Electricity and Gas crisis needs to be solved urgently so that open mills and factories give more production and closed units open again.
- Bangladesh needs a leadership with competence, clear understanding of the issues, ability to negotiate with the super powers so that it could come out with a most suitable package.

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