

An Empirical Investigation of Budget and Trade Deficits: The Case of Bangladesh

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ABSTRACT: This study attempts to investigate the evidence of twin deficits hypothesis, that is, the simultaneous existence of fiscal and foreign trade account deficits in Bangladesh. In this regard this paper examines the causal relationship between budget deficit and trade deficit based on annual time series data from 1972-73 to 2011-12 fiscal year. Applying the VAR and Granger Causality after successfully running ADF and PP unit root test and cointegration rank test this paper reveals that budget deficit Granger cause trade deficit and vice versa but the relationship does not stand for the long-run dynamics. In fact, the long run relationship depends on overall macroeconomic environment and performances of other relevant variables. Policy implication is that Government should reduce budget deficit to improve the trade account balance.

Keywords: Twin deficits; Bangladesh; Budget deficit; Trade deficit; Granger causality; VAR

JEL Classifications: F11; F32; F41; H62

1. Introduction

Bangladesh has produced herself to the world in 1971 from the womb of bloods and earns freedom for the prosperity of future generations following a historic war of independence. Immediate after independence, Bangladesh was also called as “the bottom less baskets” by political economists, but now she becomes the development magic hero before them. Along with consistence performances at most of the macroeconomic variables, Bangladesh has been suffering from fiscal account deficit and foreign trade account deficits since birth, simultaneous existence of which known as twin deficit in economic literature.

Bangladesh goes through on an average of 5% deficit in budget, and an increasing trend of foreign trade deficit since 1971. Foreign trade deficit account scores highest 8% of GDP to lowest 2% of GDP for the last four decades, when budget deficit account fluctuates between minimum 3% to maximum 7.9%. But in the recent years trade deficit is up-surfing along with budget deficit mainly due to huge cost carried out to import petroleum products from the world market to meet up domestic demand of fuel for the power sector. The direction of influence between trade deficit and budget deficit is not apparently clear. This casts our attention to identify the direction or causality if any between these two macroeconomic phenomena.

The aim of the study is to examine empirically the conventional view that the budget deficit significantly affect trade account balance, that is ,to find out if there exists any causal relationships

between fiscal deficit and foreign trade deficit or not, if do so whether it is unidirectional or bidirectional or both.

The Keynesian income-expenditure approach explained the mechanism behind the twin deficit theoretically. A rise in budget deficit will cause a rise in domestic absorption, so the domestic income. When the domestic income increases, it will encourage imports and eventually will reduce the surplus in the trade balance. That is how the public sector and external sector deficits become twins. In addition, the Keynesian open economy model states that an increase in the budget deficit will cause an increase in the aggregate demand and domestic real interest rates. High interest rates will lead to net capital inflow and result in appreciation of domestic currency. Higher value of the domestic currency will then adversely affect net exports, and thus there will be worsening in the foreign trade account.

Economists have shown concern over the state of the simultaneous occurrence of budget deficits and trade deficits in the last two decades. Although Keynes conceptualized about it before others, the connection between budget deficit and trade deficit came into question merely by 1980's with the increase of both deficits in the USA. The intense relationship between budget and trade deficits has been (and is still being) experienced by not only USA but also by many developed and developing economics. Fleming (1962), Mundell (1963), Kearney and Monadjemi (1990) have argued that large government budget deficits might increase trade deficits via different ways. According to the Mundell-Fleming model, an increase in the budget deficit will put upward pressure on interest rates thus causing capital inflows and this cause exchange rate to appreciate. Therefore, the trade account balance deteriorates. Recent theoretical macroeconomic models yield divergent predictions about the relationship that exists between the stance of fiscal policy and the economy's performance on trade deficits.

The empirical test of the role of the budget deficits in causing the trade deficits has been a subject of disagreement. Do the budget deficits affect the trade deficits? If so, to what extent and through which channels do budget deficits affect the trade deficits? The issues involved have important policy implications. If the basic reason for rising trade deficits is indeed the escalating budget deficits. In this case, policy makers may focus on curtailing the budget deficits in order to resolve the trade deficit problem. This policy adversely affects several sectors such as manufacturing industries and agriculture. However, if such a view concerning the "causal" role of the budget deficits is incorrect, then reductions in the budget deficits may not resolve the trade deficits dilemma and, moreover, attention will be diverted from more relevant and urgently needed policy options. Although our study does not take in all thoughts of the twin deficits problem, we found that the topic is interesting and different results for different countries may be got.

2. Literature Review

There is an extensive theoretical and empirical literature that has examined the relationship between trade deficits and budget deficit and among other specified macroeconomic variables. Although there are so many studies in the literature on twin deficit hypothesis, there barely exists any consensus. We can simply classify them as studies supporting twin deficit hypothesis and studies concluding against twin deficit hypothesis. And most of them are headed toward two famous theoretical doctrines: The Keynesian Twin Deficit Doctrine and The Ricardian Equivalence Hypothesis (REH).

Historically, the so-called twin deficits hypothesis arose during the "Reagan fiscal experiment" in the 1980s, noticeable period of strong appreciation of the dollar with unusual shift hike in current account deficits. By and large, the existing studies on twin deficits phenomenon are mainly focused on the interrelationships and/or commoving relation in a bi-variate framework between budget deficits and trade balances (or Current account balances). Darrat (1988) shows the existence of bi-directional (Granger) causality between the government deficit and the trade balance during the period of floating exchange rates. According to Darrat this indicates that policy makers of U.S. may have responded with added government spending because of domestic hardships caused by the trade imbalance. Abell (1990) estimates a VAR system with several relevant explanatory variables. Using first - differenced data, Abell finds little support for the government deficit as a primary explanatory variable for the trade deficit measure. The results suggest the absence of the causal underpinnings of the twin deficits story. It is notable that the data sample – monthly observations from 1979 to 1985 - presents only a limited picture of the historical behavior of the two deficits and the associated

variables. He finds that the budget deficit influences the trade deficit indirectly rather than directly. The main set of linkages involves causality from budget deficits to higher interest rate, foreign capital inflows, an appreciation of the exchange rate, and, lastly, to the trade deficits. Islam (1998) analyzes twin deficit hypothesis in the context of Brazil for the period from 1973 to 1991. His result also supports the bi-directional relationship between budget and trade imbalances. Similarly in the case of Morocco, Mansouri (1998) using cointegration tests and error correction models states, that there is a bi-directional short and long run causality between fiscal and external deficits. In the case of Canadian economy, Normadin (1999) points out that there is a bi-directional causal relationship between the twin deficits. Ricardian Equivalence Hypothesis exhibits that change in the budget deficit will be fully offset by change in savings. That is, a reducing tax does not affect households' lifetime wealth because future taxes will go up to offset current tax decrease. So, current private saving rises when taxes fall (or accordingly budget deficit rises): households save the income received from the tax cut in order to pay for the future tax increase. So, a budget deficit would not cause a twin deficit. The empirical studies by Miller and Russek (1989), Dewald and Ulan (1990) and Kaufmann *et al.* (2002) also find supportive evidence on the Ricardian equivalence theorem, in which fiscal and external deficits are uncorrelated. Bhattacharya's (1997) empirical work employs a VAR model and sets out to examine the factors affecting the trade balance of the United States over the period 1976:i to 1995:iv. The main findings of his paper are: (i) the growth differential of the United States with respect to the rest of the world is not statistically significant in explaining the trade balance; (ii) neither the direct nor the indirect effect of the federal budget deficit on the trade deficit are statistically significant; and (iii) an appreciation of the real dollar leads to a deterioration of the trade balance in the medium term. Onafowora and Owoye (2006) applied cointegration technique for Nigeria and found evidence of a positive relationship between trade and budget deficits in both the short and long-run. Acaravci and Ozturk (2008) reject the Ricardian Equivalence Hypothesis and support the Keynesian view that there is a long-run relationship between budget deficit and current account imbalances for Turkey.

Although the present study does not include all thoughts and way of analyzing of the twin deficits problem but we can see that the topic is interesting and different results for different economies.

3. Theoretical Framework of Twin Deficits

Following the well-known Keynesian macroeconomic framework of national income identity, we get

$$Y \equiv C + I + G + (X - M) \dots \dots \dots (1)$$

Where $NX = X - M$.

Y = private consumption, I = investment, G = government purchases of goods and services

NX = trade balance, X = export, M = import.

Next we turn to the derivation of the very important relation between output and disposable income. Now we have to recognize that part of income is spent on taxes (TA) and that the private sector receives net transfers (TR) in addition to national income. Disposable income (YD) is thus equal to income plus transfers less taxes.

$$YD \equiv Y + TR - TA \dots \dots \dots (2)$$

Disposable income, in turn, is allocated to consumption and saving (S).

$$YD \equiv C + S \dots \dots \dots (3)$$

Combining identities (2) and (3) allows us to write consumption as the difference between incomes, plus transfers minus taxes, and saving.

$$C + S \equiv YD \equiv Y + TR - TA \dots \dots \dots (4)$$

Or $C \equiv YD - S \equiv Y + TR - TA - S \dots \dots \dots (5)$

Last identity says that consumption is disposable income less savings or alternatively, that consumption is equal to income plus transfers less taxes and saving. Now we use the right-hand side of equation (5) to substitute for C in identity (1). With some rearrangement we obtain.

$$S - I \equiv (G + TR - TA) + (X - M) \dots \dots \dots (6)$$

And rearranging again we get

$$(X - M) \equiv (S - I) + (TA - G - TR) \dots \dots \dots (7)$$

In words, equation (7) states that the trade account surplus is equal to budget surplus plus saving investment balance. Assuming that government fixes spending (G), and cuts taxes (T), thereby creating a deficits. Equation (7) indicates that, as a result, either the trade deficit (X-M) must take place or the saving investment balance will distort, or both. Note that this conclusion follows directly from accounting and does not depend on any behavioral theories. Whether the impact of budget deficits falls on (X-M) or (S-I) is an open question. Economists trained in the traditional Keynesian theory have pointed to the budget deficits as the major cause of the trade deficits.

4. Research Methodology

4.1 Research Model

In order to analyze the short-run dynamics and long-run relationships and to justify the causal link between trade deficit and budget deficit, we employ the following model:

$$TD_t = f(BD_t), \text{ ceteris paribus}$$

The function can be presented in an econometric model as follows:

$$TD_t = \alpha_0 + \alpha_1 BD_t + u_t \dots \dots \dots (1)$$

Where TD_t = trade deficit

BD_t = budget deficit

α_0 is constant, α_1 is model coefficient and u_t is the random error term.

Based on the above equation we use unit root test, cointegration test, Granger causality test following Vector Auto-regression Model (VAR) form $U(\text{VAR}) = (\text{TD}, \text{BD})$

4.2 Econometric Estimation Techniques

This paper is mainly based on the Vector Auto Regressions (VAR), because independent variables are the lagged values of dependent variables. Time series econometric methods of both VAR and VEC Granger causality tests/block exogeneity tests were applied to find the causal relationship between trade deficit and budget deficit.

4.3 Unit Root Test

Before working with time series data it is important to check whether data are stationary or not. Stationary in the series statistics means that basic statistical properties are independent of time. It implies that with the change of the time mean, variance and standard deviation remain the same. One of the vital assumptions in classical regression model is the sum of residual is zero and statistical parameters are time invariant. But this rigid assumption is always true. When it is violated the problem of non stationarity arises. A time series is covariance stationary if its mean and other covariance are unaffected by a change of time origin. This type of stationary is termed as weak stationary in the literature. A strong stationary process is one where mean and variance are finite. Unit root tests are very well known and established procedures to test stationarity.

Time-series, say TD_t and BD_t are non-stationary in levels but stationary in first differences i.e. $TD_t \sim I(1)$ and $BD_t \sim I(1)$.

4.5 ADF Test

The purpose of the unit root test is to determine whether the series is consistent with I (1) process with a stochastic trend, or it is consistent with I (0) process, that it is stationary, with a deterministic trend. Therefore we can write the standard ADF model for data set to estimate:

ADF model for unit root test can be written as:

$$\Delta TD_t = \alpha_0 + \alpha_1 TD_{t-1} + \sum_{i=1}^n b_i \Delta TD_{t-i} + u_t \dots \dots \dots (2)$$

$$\Delta TD_t = \alpha_0 + \alpha_1 TD_{t-1} + \sum_{i=1}^n b_i \Delta TD_{t-i} + \delta_t + u_t \dots \dots \dots (3)$$

Where $\Delta TD_t = TD - TD_{t-1}$, $i=1,2,\dots,n$. and α_0, α_1, b are the parameters to be estimated and u_t the white noise error.

4.6 Phillips-Perron Test

Dicky Fuller test assumes that the errors are statistically independent and have a constant variance. To remove that, Phillips and Perron (1988) developed a generalization of the dicky-Fuller procedure allowing fairly mild assumptions concerned the distribution of the errors. They incorporated corrections to the autocorrelated residuals. Phillips-Perron equations to be estimated are as follows:

$$\Delta TD_t = a_0 + (a - 1)TD_{t-1} + \gamma \left(t - \frac{T}{2} \right) + \sum_{i=1}^p \beta_i \Delta TD_{t-1} + u_t \dots \dots \dots (4)$$

$$\Delta BD_t = a_0 + (a - 1)BD_{t-1} + \gamma \left(t - \frac{T}{2} \right) + \sum_{i=1}^p \beta_i \Delta BD_{t-1} + u_t \dots \dots \dots (5)$$

In both ADF and PP models the null hypothesis is the series contains a unit root or in other words it is assumed that the series is non stationary. If ADF or PP test statistic is higher than then critical values of fuller table in difference significance level, we reject the null hypothesis and the alternative hypothesis of stationary will be established.

As mentioned earlier, if two or more time series are non stationary and their linear combination is stationary than their relationship is termed as cointegration in the literature. Cointegration refers to long run equilibrium relationship among variables. The main purpose is to find out the co integration among variables.

4.7 The Cointegration Rank Test

If two or more time series are non-stationary and their linear combination is stationary then their relationship is termed as cointegration in the literature. Cointegration refers to long run equilibrium relationship among variables. The test examines the presence or otherwise of cointegration between the series of the same order of integration through forming a cointegration equation. The basic idea behind cointegration is that if, in the long-run, two or more series move closely together, even though the series themselves are trended, the difference between them is constant. It is possible to regard these series as defining a long run equilibrium relationship, as the difference between them is stationary. A lack of cointegration suggests that such variables have no long-run relationship: in principal they can wander arbitrarily far away from each other (Dickey et. al., 1991). We employ the maximum likelihood test procedure established by Johansen and Juselius (1990) and Johansen (1991). Specifically, if TD is a vector of n stochastic variables, then there exists a p-lag vector auto regression with Gaussian errors of the following form: Johansen’s methodology takes its starting point in the vector auto regression (VAR) of order P.

$$TD_t = \mu + \Delta_1 TD_{t-1} + \dots + \Delta_p TD_{t-p} + \varepsilon_t \dots \dots \dots (6)$$

Where

TD_t is an nx1 vector of variables that are integrated of order commonly denoted (1) and ε_t is annx1 vector of innovations.

This VAR can be rewritten as

$$\Delta TD_t = \mu + \eta TD_{t-1} + \sum_{i=1}^{p-1} \tau_i \Delta TD_{t-1} + \varepsilon_t \dots \dots \dots (7)$$

Where

$$\Pi = \sum_{i=1}^p A_{i-1}$$

and

$$\tau_i = - \sum_{j=1}^p A_j$$

To determine the number of co-integration vectors, Johansen and Juselius (1990) suggested two statistic tests; the first one is the trace test (λ trace). It tests the null hypothesis that the number of distinct cointegrating vector is less than or equal to q against a general unrestricted alternatives $q = r$. the test calculated as follows:

$$\lambda \text{ trace } (r) = -T \sum_{i=r+1} \ln(1 - \hat{\lambda}_i) \dots \dots \dots (8)$$

Where, T is the number of usable observations, and the $\hat{\lambda}_i$ are the estimated eigenvalue from the matrix. The Second statistical test is the maximum eigen value test (max) that is calculated according to the following formula:

$$\lambda \text{ max}(r, r + 1) = -T \ln(1 - \lambda_{r+1}) \dots \dots \dots (9)$$

The test concerns a test of the null hypothesis that there is r of co-integrating vectors against the alternative that r + 1 co-integrating vector.

4.8 The Error Correction Model:

If cointegration is proven exist, then the third step requires the construction of error correction mechanism to model dynamic relationship. The purpose of the error correction model is to indicate the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. The greater the co-efficient of the parameter, the higher the speed of adjustment of the model from the short-run to the long-run. For this model

$$\Delta TD_t = a_1 + a_2 \Delta BD_t - \rho \hat{u}_{it-1} + v_{it} \dots \dots (10)$$

$$\Delta BD_t = b_1 + b_2 \Delta TD_t - \rho \hat{\epsilon}_{it-1} + \epsilon_{it} \dots \dots (11)$$

4.9 VAR and Granger-Causality

In this paper, the convention of traditional and recent developments in regards to the use of causality test was followed. In the case of stationary and noncointegrated data set, standard Granger causality tests (VAR and Pair-wise) and in the case of stationary/ non-stationary and cointegrated data set VECM Granger non causality/block exogeneity tests were employed to find causality. Econometrics software STATA has been used to process data. Granger causality tests are conducted to determine whether the current and lagged values of one variable affect another. One implication of Granger representation theorem is that if two variables, say TD, and BD are co-integrated and each is individually I(1), then either TD must Granger-Cause or BD must Granger-cause TD.

$$TD_t = a_0 + a_1 \sum_{i=1}^n a_i \Delta TD_{t-1} + a_2 \sum_{j=1}^n a_j \Delta BD_{t-1} + e_{1t} \dots \dots (11)$$

$$BD_t = b_0 + b_1 \sum_{i=1}^n b_i \Delta BD_{t-1} + b_2 \sum_{j=1}^n \Delta TD_{t-1} + e_{2t} \dots \dots (12)$$

5. Empirical Analysis and Results

5.1 Unit Root Test Result

To check the stationary and determine orders of integration, we use both augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests . From the table 1 we can see the result of the Unit Root Test analysis using ADF. The result shows that both the variable, TD and BD are non stationary at level including both the cases of intercept and intercept-trend. But Stationary at first difference level at all 1%, 5% and 10% level of significances.

Table 1. ADF test of stationary

| Name Of Test Variables | Augmented Dickey-Fuller Test (ADF) | | | | | |
|-------------------------------|------------------------------------|-----------|-------------------|---------------------|-------------------|--------|
| | At Lag 1 | At level | | At First difference | | |
| | | Intercept | Intercept & trend | Intercept | Intercept & trend | |
| TD | Test statistics | 1.458 | -0.445 | -5.213 | -6.225 | |
| | Test critical value | 1% | -3.662 | -4.260 | -4.260 | -4.270 |
| | | 5% | -2.964 | -3.548 | -3.548 | -3.552 |
| | | 10% | -2.614 | -3.209 | -3.209 | -3.211 |
| BD | Test statistics | 3.517 | 1.661 | -3.935 | -5.270 | |
| | Test critical value | 1% | -3.662 | -4.260 | -4.260 | -4.270 |
| | | 5% | -2.964 | -3.548 | -3.548 | -3.552 |
| | | 10% | -2.614 | -3.209 | -3.209 | -3.211 |

Table 2 contains the result of stationarity checking of the model variables by using Phillip-Perron (PP) test; also confirm that both variables are stationary only at first difference.

5.2 Lag Selection

Selection of appropriate lag is more important for cointegration test and of course for Granger causality test. In this paper, we have used AIC, FPE, SIC and HQ criteria to select appropriate lag length. Running with STATA we've chosen the lag length supported by majority of the criteria using Varsoc command at length four.

Table 2. PP test of stationary

| Name Of test Variables | Phillips-Perron test (PP) | | | | | |
|-------------------------------|---------------------------|-----------|-------------------|---------------------|-------------------|--------|
| | At Lag 1 | At level | | At First difference | | |
| | | Intercept | Intercept & trend | Intercept | Intercept & trend | |
| TD | Test statistics | | -0.399 | -2.126 | -8.646 | -9.457 |
| | Test critical value | 1% | -3.655 | -4.251 | -3.662 | -4.260 |
| | | 5% | -2.961 | -3.544 | -2.964 | -3.548 |
| | | 10% | -2.613 | -3.206 | -2.614 | -3.209 |
| BD | Test statistics | | 3.359 | 1.103 | -9.489 | -8.057 |
| | Test critical value | 1% | -3.655 | -4.251 | -3.662 | -4.260 |
| | | 5% | -2.961 | -3.544 | -2.964 | -3.548 |
| | | 10% | -2.613 | -3.206 | -2.614 | -3.209 |

5.3 Cointegration Rank Test

After examining the stationarity of the variable at I(1) we are ready to check the rank of cointegration between the variables which shows the presence of long term relationship between TD and BD. Employing the Johansen and Juselius multivariate cointegration test following maximum eigen value statistics and trace statistics (Table 3 and 4). We find out that both the variables are cointegrated at one percent and five percent level of significance at rank one (1).

Table 3. Unrestricted Co-integration Rank Test (Trace)

| Unrestricted Co-integration Rank Test (Trace) | | | | |
|--|-------------|-----------|----------------|----------------|
| Hypothesized | | Trace | 0.05 | 0.01 |
| No. of CE(s) | Eigen value | Statistic | Critical value | Critical value |
| None* | | 40.6955 | 15.41 | 20.04 |
| At most 1 | 0.65547 | 2.3345 | 3.76 | 6.65 |
| At most 2 | 0.06279 | | | |
| Trace statistics is significance at no rank implying that the null hypothesis of no rank is rejected .At at rank 1,the null hypothesis of “not rank 1” is rejected verifying 1 rank. | | | | |

Table 4. Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

| Unrestricted Cointegration Rank Test (Maximum Eigenvalue) | | | | |
|---|-------------|-----------|----------------|----------------|
| Hypothesized | | Max Eigen | 0.05 | 0.01 |
| No. of CE(s) | Eigen value | Statistic | Critical value | Critical value |
| None* | | 38.3610 | 14.07 | 18.63 |
| At most 1 | 0.65547 | 2.3345 | 3.76 | 6.65 |
| At most 2 | 0.06279 | | | |
| Max eigen statistics is significance at no rank implying that the null hypothesis of no rank is rejected .At at rank 1,the null hypothesis of “not rank 1” is rejected verifying 1 rank | | | | |

5.4 Error Correction Result (ECM)

Since we found that variables, TD and BD, are cointegrated at rank 1, so we need to check the dynamic stability and short term error correction. Using VARSOC command of STATA we select the appropriate lag length is four to run error correction model. Although the error correction coefficient contains negative sign and significant at two percent level but it is greater than absolute value 1. So, it shows unambiguous evidence of short term error correction. Except for BD at lag 2 and 3, none of the correction shows significant result (table 5).

Table 5. The Vector error correction model result at lag 4 (Period 1972 to 2011-12)

| Vector Error correction results | | |
|---------------------------------|-------------------|-------------------|
| Lag | DTD | DBD |
| DTD(-1) | .1697279 (0.814) | -1.89938 (0.106) |
| DTD(-2) | .1648724 (0.751) | -1.243122 (0.149) |
| DTD(-3) | .1492667 (0.707) | -.040579 (0.944) |
| DBD(-1) | -.8573054 (0.038) | -.3971374 (0.555) |
| DBD(-2) | -.864899 (0.004) | -.3300354 (0.504) |
| DBD(-3) | -.5229908 (0.022) | -.1813312 (0.583) |
| Constant | -1.931022 (0.822) | -5.056376 (0.303) |
| ECM(-1) | -2.014264 (0.019) | .7692442 (0.118) |
| R-square | 0.8299 | 0.8199 |
| Chi-statistics | 131.7686 | 122.889 |
| Chi-statistics (Prob.) | 0.0000 | 0.0000 |
| RMSE | 50.2374 | 28.7981 |

P value ()

5.5 VAR and Granger Causality

Applying Granger Causality test using up to four lag periods as selected using VARSOC in STATA, we examine the research hypotheses. After running VAR in STATA we test the Granger Causality between trade deficit and budget deficit. The result shows that Chi-square statistics is significant for both hypotheses implying that the null hypotheses of (1) budget deficit does not Granger cause trade deficit and (2) trade deficit does not Granger cause budget deficit are rejected (table 6). From this findings we can also intuitively the null hypothesis (4) budget deficit and trade deficit are not independent and reject the null hypothesis (3) causality does not run in both directions. It also verifies the existence short run relationship between trade deficit and budget deficit.

Table 6. Result of Granger Causality test

| Granger Causality Wald Test | | | | |
|------------------------------|-------------|----------------|----|-------------|
| Null hypothesis | Observation | Chi2-statistic | df | Probability |
| BD does not Granger cause TD | 36 | 18.55 | 4 | 0.001 |
| TD does not Granger cause BD | 36 | 15.11 | 4 | 0.004 |

6. Concluding Remarks

To sum up at last, the above analysis explores the casual relationship between budget deficit and trade deficit from the period 1972-73 to 2011-12 fiscal years. Although the study exposes the short run bidirectional causality between budget deficit and trade deficit, it does not establish any long run dynamic relationship between these two variables. The evidence that is obtained through causality testing justifies the view that fiscal deficits significantly contribute to a deterioration of the trade balance. Therefore, it can be recommended to the fiscal authorities to reconsider existing budget framework to achieve trade balance at least for the short term. And the appearance of huge fluctuations and high trend of deficits of both the variables for last five years, specially the high trends of budget deficit which remarks one-third of the total budget delivered great burden to the macro economy of Bangladesh. Because of the existence of many macroeconomic channels through which budget deficit influences trade deficit and vice versa, and none of these channel variables have been included in the model, it calls for reexamining the twin hypothesis involving them. It is also mentionable that due to trade liberalisation on 1990 decade and inception of flexible exchange rate regime in June 2003 created two structural breaks in the economy which are not considered in the present study and it may opens broad scope of further research.

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Appendix

Data, Definitions and Sources

Data collection is a challenging job in Bangladesh. Although monthly, quarterly and yearly data series are available for trade deficit but quarterly and monthly data series for the budget deficit are not available, we use annual data series for the period 1972-73 fiscal years to 2011-12 fiscal years for both variables.

- Budget deficit data series are taken from budget summery books from 1972 to 2012 for each year published by The Ministry of Finance of Bangladesh. There are two types of estimation of budget deficit .One including grant, other one is excluding it. We use the data series excluding grant because of insistence record of grant at several budget estimation.
- There are three types of trade deficit data series are being published by the Bangladesh Bank (BB), Bangladesh Bureau of Statistics (BBS) and Export Promotion Bureau (EPB). BB calculates trade deficit data on free on board (FOB) method, EPB estimates export data on FOB and import data on cost on freight (CIF) method. We use the BBS data set from its publication namely, Foreign Trade Statistics Book.
- Here it is mentionable that data set for the fiscal year 2011-12 is taken as projected and the rest are based on revised data for each year. And also mentionable that the above referenced data series books are stored in BB library, Dhaka.
- Both data series are taken in the form of Billions of Taka.