The Causal Relation between Revenue and Expenditure of Bangladesh

Abstract

Bangladesh is a developing country that has been experiencing budget deficits since its independence in 1971. It means the government spending has been exceeding the government revenue. This phenomenon calls for a study of government spending or expenditure and government revenue. This study tries to establish a causal relation between expenditure and revenue of governments of Bangladesh. To accomplish this, this study uses the Vector Autoregressive (VAR) model and the Granger Causality model on the data for the financial year from 1993-1994 to 2017-2018. The study reveals that in the context of Bangladesh, total revenue affects total expenditure, whereas total expenditure does not affect total revenue.

1. INTRODUCTION

Bangladesh has strived significantly to be an open market economy and, hence, the economy is affected by the global economic system. There are different sorts of economic activities which are a combination of national and international community actions. These are exports, imports, foreign direct investment and foreign aid. The economy of Bangladesh is a local government-oriented market economy. So, the effective and efficient use of the government budget can contribute to the economic growth of Bangladesh. The relationship between a country’s expenditure and revenues opens up a topic of debate in microeconomics. Government expenditure plays a vital role in the economy, especially for a developing country like Bangladesh. It is also called the machine of economic development in every sector of the economy.

The government of Bangladesh has faced a budget deficit since its birth. It may decrease the Gross Domestic Product (GDP) as well as the Gross National Product (GNP) of Bangladesh. The budget deficit is a key factor in economic growth, which could reduce national savings and economic growth. The fiscal budget deficit depends on many factors, such as revenue, operating expenditure ratio, crowding financing availability of the domestic or external private sector, debt operating expense ratio, etc.

Bangladesh government’s revenue comes from two sources – direct tax revenue and indirect tax revenue. The tax collected by the National Board of Revenue (NBR) is direct tax revenue, and the tax collected by others is known as indirect tax revenue. Non-tax revenue is considered as other income. The taxes collected by the NBR include personal income tax and firms’ income tax or income tax from other entities described in the Income Tax Ordinance (ITO) 1984. Indirect tax is collected by the Custom and Excise Department that is not directly imposed on the taxpayer, which includes import duty, export duty, excise duty, customs duty,
value-added tax (VAT) and turnover tax etc. Non-NBR collected revenues are license fees, permits, specific service fees, proceeds from the sale of government assets, rent, interest, return on investment made by the government, fines and forfeitures, etc.

There is a trend of an increase in government expenditure. It is critical to prepare a careful budget and good fiscal policy to ensure a stable economy for Bangladesh. The Bangladesh government should give more attention to the revenue collection by the NBR. The Bangladesh government spends public money on providing a variety of facilities and benefits for the public. Government expenditures are of two types, i.e., development expenditures and operating expenditures. Development expenditures are the spending on infrastructure, social services, security for defense services, general administrative services and economic services. Non-development, i.e., operating expenditures, are the salaries of public servants, supplies and services, investment and routine expenditure. The study tries to establish a causal relationship between the revenue and expenditure of Bangladesh from the financial years 1993-1994 to 2017-2018.

2. LITERATURE REVIEW

Scholars and researchers have conducted many studies and research about the causal relationship between the country’s revenue and expenditure. To investigate this causal relationship, many hypotheses can be taken. These are (i) the hypothesis of revenue and expense, (ii) the hypothesis of expense and revenue, (iii) the hypothesis of fiscal re-adjustment, and (iv) the hypothesis of fiscal freedom.

The hypothesis of revenue and expenses states that increased revenue may create a problem with budgetary balance. This assumption points out that this increased revenue could command the expansion of the expenditure of the government of Bangladesh. This assumption concludes that there exists a unidirectional causal relation from revenue to expenditure. Holding onto this assumption, the deficit budget may be financed by increasing revenue.

The hypothesis of expense and revenue is just the opposite of the first hypothesis. This hypothesis recommends that the government raise funds to make up for its expenses, which leads to the reverse consequence of the first hypothesis. This hypothesis also concludes a unidirectional causal relation from expenditure to revenue. According to this hypothesis, a country should first spend and then raise taxes to cover the cost (Eita and Mbaajima, 2008).

According to the hypothesis of fiscal re-adjustment, there exists a bi-directional causal relationship between government revenue and government expenses. The hypothesis of fiscal freedom states that there is no causal relationship between revenue and expense.

Hock Sen and Kian Ping, 2005, state that there is a long-run relationship between government revenue and government expenses. Ajinetet al. (2001) conclude that a bi-directional causality exists between government revenue and government expense. Mithani et al. (1999) show that a unidirectional casual influence exists from government expenditure to government revenue, supporting the expense and revenue hypothesis in the short run. Sri Yana (2009) shows that there was a strong long-run relationship between tax revenue and government expenditure from 1970 to 2007 in Indonesia.

Al-khulaifi (2012) finds a relationship between government revenue and expenditure in Qatar from 1980 to 2011 and concludes a unidirectional causality which supports the revenue and expense hypothesis. Al-Qudair (2005) finds a bidirectional causal relationship between

3. CONCEPTUAL FRAMEWORK

The government of Bangladesh has been facing budget deficit since its birth. This means that government expenditure has been exceeding government revenue on a constant basis. Government expenditure is mainly divided into two groups, such as development expenditure and operating expenditure. Government revenues are mainly divided into two groups, such as tax-revenue and non-tax revenue.

For Bangladesh, the deficit budget plays a vital role from the viewpoint of counter-cyclical fiscal policy. The budget deficit has some advantages and disadvantages. It can create money supply to fulfill the demand and reduce excess consumption. It encourages the private sector to accumulate net worth for the private sector. More infrastructure and business output can increase the economic growth of Bangladesh. From the viewpoint of disadvantages, it can increase taxes that may be the burden of future generations. Another disadvantage is that it may create inflation.

4. DATA

This study uses time-series data of government budgets of Bangladesh for 25 financial periods. The secondary published data of the government budget of Bangladesh is collected from various sources like the Bangladesh Economic Review, the Bangladesh Bureau of Statistics (BBS), and the Ministry of Finance (MoF). This study uses data from 1993-1994 to 2017-2018. The objective of this study is to establish a causal relationship between revenue and expenditure of the Government of Bangladesh.

5. EMPIRICAL ANALYSIS

Figure 1 exhibits the revenues and expenditures of Bangladesh from 1993-1994 to 2017-2018.

Figure1: Revenue and Expenditure of Bangladesh.
The numbers are increasing with a positive trend for both expenditure and revenue, which implies an uptrend in the size of the economy. The rate of increase has been accelerating at an increased rate since 2008-2009. Figure 1 also depicts that the government revenue has not been able to keep pace with the government expenditure and has been increasing slowly in comparison to the expenditure.

5.1 Unit Root Test

The unit root test illustrates a wider version of the standard Dickey-Fuller test using a simple AR(1) model:

\[ y_t = \rho y_{t-1} + \delta x_t + e_t \quad \text{(1)} \]

where, \( y_t \) is a time-series (in this case, total revenue and total expenditure), \( \rho \) denotes an optional exogenous regressor (a constant), \( \rho \) and \( \delta \) are the parameter to be estimated, and \( e_t \) is the residual or errors. Table 1 illustrates that both variables – total revenue and total expenditure – have a unit root, and both are non-stationary.

### Table 1: Output of Unit Root Test

<table>
<thead>
<tr>
<th></th>
<th>Total Revenue</th>
<th>Probability</th>
<th>Total Expenditure</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF test statistic</td>
<td>7.78</td>
<td>1.00</td>
<td>9.87</td>
<td>1.00</td>
</tr>
<tr>
<td>Test critical values 1%</td>
<td>-3.75</td>
<td>-3.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test critical values 5%</td>
<td>-3.00</td>
<td>-3.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test critical values 10%</td>
<td>-2.63</td>
<td>-2.63</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.2 Vector Autoregressive (VAR) Model

The following two equations have been estimated to find out the causal relationship between revenue and expenditure:

\[ \text{Total Revenue}_t = \alpha_0 + \beta_1 \text{Total Revenue}_{t-1} + \beta_2 \text{Total Revenue}_{t-2} + \beta_3 \text{Total Revenue}_{t-3} + \gamma_1 \text{Total Expenditure}_{t-1} + \gamma_2 \text{Total Expenditure}_{t-2} + \gamma_3 \text{Total Expenditure}_{t-3} + u_t \quad \text{(2)} \]

\[ \text{Total Expenditure}_t = \delta_0 + \theta_1 \text{Total Revenue}_{t-1} + \theta_2 \text{Total Revenue}_{t-2} + \theta_3 \text{Total Revenue}_{t-3} + \pi_1 \text{Total Expenditure}_{t-1} + \pi_2 \text{Total Expenditure}_{t-2} + \pi_3 \text{Total Expenditure}_{t-3} + v_t \quad \text{(3)} \]

where, \( u \) and \( v \) are uncorrelated.

Table 2 shows the output of the VAR model. VAR exhibits how much of the current values of revenue and expenditure are explained by the past values of total revenue and total expenditure. Table 2 shows that the total revenue of the past 3 years significantly affects the total expenditure. On the contrary, total expenditure does not affect total revenue.
The Causal Relation between Revenue and Expenditure of Bangladesh

Table 2: Vector Autoregressive (VAR) Model of Total Revenue and Total Expenditure

<table>
<thead>
<tr>
<th>Panel A: Dependent Variable: Total Revenue</th>
<th>Coefficient</th>
<th>Z statistic</th>
<th>P - Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Revenue (t - 1)</td>
<td>2.1023</td>
<td>4.8400</td>
<td>0.0000</td>
</tr>
<tr>
<td>Total Revenue (t - 2)</td>
<td>-1.8012</td>
<td>-4.7200</td>
<td>0.0000</td>
</tr>
<tr>
<td>Total Revenue (t - 3)</td>
<td>1.6995</td>
<td>2.9000</td>
<td>0.0040</td>
</tr>
<tr>
<td>Total Expenditure (t - 1)</td>
<td>-0.3526</td>
<td>-1.1400</td>
<td>0.2520</td>
</tr>
<tr>
<td>Total Expenditure (t - 2)</td>
<td>0.0046</td>
<td>0.0200</td>
<td>0.9860</td>
</tr>
<tr>
<td>Total Expenditure (t - 3)</td>
<td>-0.1842</td>
<td>-0.7200</td>
<td>0.4740</td>
</tr>
<tr>
<td>Constant</td>
<td>6.7288</td>
<td>0.4800</td>
<td>0.6300</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel A: Dependent Variable: Total Expenditure</th>
<th>Coefficient</th>
<th>Z statistic</th>
<th>P - Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Revenue (t - 1)</td>
<td>2.2485</td>
<td>4.1500</td>
<td>0.0000</td>
</tr>
<tr>
<td>Total Revenue (t - 2)</td>
<td>-1.9847</td>
<td>-4.1700</td>
<td>0.0000</td>
</tr>
<tr>
<td>Total Revenue (t - 3)</td>
<td>2.0909</td>
<td>2.8600</td>
<td>0.0040</td>
</tr>
<tr>
<td>Total Expenditure (t - 1)</td>
<td>-0.4195</td>
<td>-1.0900</td>
<td>0.2750</td>
</tr>
<tr>
<td>Total Expenditure (t - 2)</td>
<td>0.1272</td>
<td>0.4000</td>
<td>0.6870</td>
</tr>
<tr>
<td>Total Expenditure (t - 3)</td>
<td>-0.0328</td>
<td>-0.1000</td>
<td>0.9190</td>
</tr>
<tr>
<td>Constant</td>
<td>-8.1754</td>
<td>-0.4700</td>
<td>0.6390</td>
</tr>
</tbody>
</table>
5.3 Test of Causal Relation (Granger Causality)

To explore the cause-and-effect relationship between two stated variables (total revenue and total expenditure), this study employed the Granger Causality test. Granger Causality test results are shown in Table 3. This study finds that total revenue leads total expenditure but total expenditure does not lead Bangladesh’s total revenue.

Table 3: Granger Causality Test

<table>
<thead>
<tr>
<th>Regression</th>
<th>Chi-2 Statistic</th>
<th>Probability</th>
<th>Granger Causality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Revenue on Total Expenditure, Null Hypothesis: Expenditure does not lead Revenue</td>
<td>1.8475</td>
<td>0.6050</td>
<td>No</td>
</tr>
<tr>
<td>Total Expenditure on Total Revenue, Null Hypothesis: Revenue does not lead Expenditure</td>
<td>21.2890</td>
<td>0.0000</td>
<td>Yes</td>
</tr>
</tbody>
</table>

6. CONCLUSION AND POLICY IMPLICATIONS

This study used time-series data for the financial years from 1993-1994 to 2017-2018, and it concludes that there is a unidirectional causal relationship between revenue and expenditure of Bangladesh. This study has found evidence that government revenue affects government expenditure. However, evidence for the effects of expenditure on revenue has not been found. Therefore, the government of Bangladesh should focus more on increasing revenue to achieve sustainable economic growth.

Empirical results of this study suggest that the government of Bangladesh should focus more on the higher revenue collection front because revenue will lead expenditure. As a result, Bangladesh will perform better in economic growth, control unemployment, poverty reduction and achieve overall economic development. The Government of Bangladesh may increase revenue collection in the following ways:

- Increase tax coverage, not the tax rate.
- Concel tax evasion and tax voidness.
- Ensure a logical and effective taxing authority.

- Implement an automated tax and VAT system.
- Implement an efficient estate tax with capital gain tax.
- Impose carbon emission tax or pollution tax.
- Increase the area of operations of agriculture, service, and industrial for more revenue collection.

REFERENCES


Tax-revenue and non-tax revenue. Government revenues are mainly divided into two groups, such as constant basis. Government expenditure is been exceeding government revenue on a facing budget deficit since its birth. This hypothesis.


