Budget Deficit and Economic Growth: A Fiscal Policy Evaluation of Bangladesh[1]

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Abstract

This study examines the relationship between budget deficit and economic growth and evaluates whether budget deficit creates 'crowding-in' effects in private sector investment. This study uses the demand for goods model of the Keynesian framework. Using secondary data for the period 2006-2019, this study shows a positive, but insignificant, relation between budget deficit and economic growth, indicating that monetary policy, fiscal policy, external economic conditions, and various structural factors are influencing both the budget deficit and economic growth independently. On the other hand, the study shows a positive and significant relationship between investment and economic growth, indicating that there is a 'crowding-in' effect on investment, suggesting that encouraging investment can be a strategy to promote the economic growth of Bangladesh. Finally, the study shows a negative, but insignificant, relation between debt and economic growth, reflecting that increasing debt does not directly cause economic growth to decline. Other factors, such as economic policies, external shocks, and structural issues, are influencing both debt levels and economic growth independently.

Key words: fiscal policy, budget deficit, economic growth, Bangladesh

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5.1 Introduction

5.1.1 Background

Bangladesh's economy has been going through a continuous budget deficit since the early 2000s. To finance this deficit, the Government of Bangladesh (GoB) has been borrowing largely from both foreign and domestic sources. During the period of budget deficit, though the economy had been growing consistently high over a decade, crossing the 7.0 percent milestone in FY 2015-16 and the 8.0 percent milestone in FY 2018-19 (MoF 2023a), this growth was less than its potential.

To alleviate poverty and to accelerate the rate of economic growth, Bangladesh has been managing its fiscal policies since 1971. Currently, Bangladesh is considered an emerging economy. The country has made incredible socio-economic progress and has risen to an enviable level compared to its competitors. The average GDP growth during the last fourteen years was more than 6.7 percent. However, the COVID-19 pandemic reduced the growth rate to 3.45 percent in FY 2019-20. Bangladesh successfully managed the COVID-19 pandemic and returned to a high growth trajectory. A record published in June 2023 by the Ministry of Finance (MoF) of Bangladesh shows that in FY 2020-21, Bangladesh achieved the GDP growth of 6.94 percent and 7.10 percent in FY 2021-22. To remain a bit conservative, considering the global sluggish economic condition, the GDP growth rate is expected to be 6.03 percent in FY 2022-23, 1.07 percentage points lower than the previous FY 2021-22. Medium-term forecasts for GDP growth rates are 7.5 percent in FY 2023-24, 7.8 percent in FY 2024-25 and 8.0 percent in FY 2025-26 (MoF 2023a).

World Bank (WB) report (2023) shows that even in times of heightened global uncertainty, Bangladesh has a strong track record of growth and development. This achievement is attainable due to several factors, namely, a robust demographic dividend (WB 2023), strong ready-made garment (RMG) exports, resilient remittance inflows (Rana & Wahid 2017; WB 2023) and stable macroeconomic conditions (WB 2023). Today, Bangladesh is considered a role model to be followed by other nations that are aspiring for development. Since January 2015, Bangladesh has graduated to a lower middle-income country according to the standard of the World Bank. Bangladesh has received the final endorsement from the United Nations to graduate from a least developed country in 2026.

A successful economy is one that combines high output growth, i.e., high GDP growth, low unemployment, and low inflation (Blanchard, 2017).

Macro-economic performance of a country normally depends on judicious formulation, effective implementation and management of national fiscal policies (Rana & Wahid, 2017). To mobilize adequate resources that expedite economic growth and to alleviate poverty, Bangladesh has been pursuing an expansionary fiscal policy. To manage expansionary fiscal policy, government expenditure has exceeded the revenue earnings, and therefore, Bangladesh has experienced a sustainable trend in its budget deficit. In recent years, the volume of the deficit has increased. A report (2021) published by the Economic Relations Division (ERD) of Bangladesh shows that despite the revenue mobilization challenge, Bangladesh performed well in fiscal management by keeping the budget deficit within a reasonable limit of five percent of the nominal GDP.

The relationship between economic growth and budget deficits can be analyzed in terms of how fiscal policies influenced growth and whether deficits helped or hindered economic expansion. The trend of the budget deficit during 2006-2019 shows that the budget deficit remained below five per cent of GDP, a manageable level for a developing economy and higher government spending (especially on infrastructure) correlated with higher GDP growth after 2015. However, a few challenges of a budget deficit on economic growth, such as a low tax-to-GDP ratio, concerns on debt sustainability and inflationary pressures. Low tax-to-GDP ratio (below ten percent) limited the government's ability to finance projects, and heavy reliance on domestic borrowing could crowd out private investment. While external debt remained low, rising domestic borrowing could increase interest burdens. If deficits were to rise beyond five to six percent of GDP, inflation and financial instability risks could increase. In addition, excessive government borrowing could lead to higher inflation, reducing purchasing power.

According to the Ministry of Finance of Bangladesh (2023b), during 2006-2019, the economic growth of Bangladesh remained robust despite moderate budget deficits. The government increased spending on roads, bridges and power plants. Public spending on infrastructure facilitated industrial expansion (especially the garment sector) and led to job creation, boosting demand and private investment. Trends in budget deficit and private investment during 2006-2019 show that private investment as a percentage of GDP increased from 18.4% (2006) to 23.8% (2019). On the other hand, the budget deficit remained below 5% of GDP, suggesting it did not excessively crowd out private investment. Growth in infrastructure spending likely enhanced business opportunities, supporting the

crowding-in effect. Although the budget deficit mostly supported private sector investment, some risks of crowding out existed, such as domestic borrowing pressures, tax revenue constraints, and public-private competition for resources. Government borrowing from domestic banks could limit credit availability for the private sector. Interest rates were kept relatively low, but if deficits had increased further, borrowing costs might have risen. Bangladesh had a low tax-to-GDP ratio (~10%), meaning deficit financing relied on borrowing rather than revenue generation. If revenue collection does not improve, future deficits could put pressure on private investment. Some sectors, such as construction and real estate, saw government projects competing for labor and materials, increasing costs for private investors.

5.1.2 Objective

The main objectives of this study are —

    i. to examine the relationship between budget deficit and economic growth, and

   ii. to evaluate whether budget deficit creates 'crowding-in' effects in private sector investment.

5.1.3 Justification

The relationship between budget deficit and economic growth is a complex and debated topic in economics and varies across developing countries. While budget deficits can contribute to growth under certain conditions, their impact is intertwined with a host of other economic and structural factors. Sound fiscal management, effective governance, and a holistic understanding of a country's economic landscape are crucial for achieving sustainable economic growth despite budget deficits. However, the debate about the effects of government budget deficit on economic growth remains unsettled. On the one hand, a budget deficit does not necessarily cause low economic growth. Other factors, such as private sector activities, exports, and global economic conditions, also play significant roles. Van and Sudhipongpracha (2015) argued that deficit spending is assumed to complement business investment and stimulate economic productivity.

On the other hand, a deficit is believed to trigger high tax rates, which can decrease productivity and deter private investment. In addition, a persistent and significantly high budget deficit over time, that is, in the long run could potentially lead to concerns such as inflation,

increased borrowing costs, and reduced investor confidence, which might negatively impact on economic growth. Rana & Wahid (2017) show that an increased budget deficit may create an adverse impact on the macro-economic performance of the country and result in a negative impact on the acceleration of the rate of economic growth. However, a lower budget deficit might contribute to more stable economic growth, but it's not a definitive rule. Other structural and external factors can influence growth as well. While budget deficits can contribute to economic growth by stimulating demand, funding public investments, and reducing poverty, their impact is contingent on factors such as the quality of spending, crowding-out effects, external influences, and overall fiscal sustainability.

This study uses the demand for goods model of the Keynesian framework. Using secondary data for the period 2006-2019, this study shows a positive, but insignificant, relation between budget deficit and economic growth, indicating that monetary policy, fiscal policy, external economic conditions, and various structural factors are influencing both the budget deficit and economic growth independently. On the other hand, the study shows a positive and significant relationship between investment and economic growth, indicating that there is a 'crowding-in' effect on investment, suggesting that encouraging investment can be a strategy to promote the economic growth of Bangladesh. Finally, the study shows a negative, but insignificant, relation between debt and economic growth, reflecting that increasing debt does not directly cause economic growth to decline. Other factors, such as economic policies, external shocks, and structural issues, are influencing both debt levels and economic growth independently.

The remainder of this paper is divided into four sections. Section 2 reviews the literature. Section 3 describes the research design and methodology. Data, variables and findings are presented in Section 4. Finally, Section 5 offers a conclusion.

5.2 Literature review

The relationship between budget deficit and economic growth is one of the most debatable issues among economists and policymakers in both developing and developed countries. In a developing country, the issue is more important as it pursues growth in its development policy. Researchers and economists have conducted various empirical studies to understand how budget deficits affect the country's economic performance. Budget deficit occurs when the government's total expenditures exceed its total

revenues (Alt & Chrystal 1983). But a large deficit does not always indicate imprudent fiscal behavior. It is widely said that to cope with wartime situations and economic downturns, a government may choose to incur a deficit as a strategy (Shaviro 1997). In addition, the government uses a variety of fiscal instruments to achieve social stability and promote economic growth. Each choice of fiscal instrument has a different impact on a country's economic performance. One of the fiscal measures commonly used by governments to intervene in the economic sphere is their own expenditures (Thoa et al, 2013).

Economic literature shows three major theoretical frameworks, which describe a positive or negative relationship or neutrality between budget deficit and economic growth (Ahmad 2013). One of these is Keynesian theory, which shows a positive relationship between budget deficit and economic growth. Keynesian theory describes how governments' expenditures affect economic productivity. Keynesian economists argued for an 'expansionary fiscal policy' or a 'crowding-in' effect of budget deficit, which is due to an increase in domestic production and private investment (Modigliani 1977 & Seccareccia 1994). Government budget deficit can lead to an increase in aggregate demand. This eventually stimulates saving and private investment (Eisner 1989). The argument shows that budget deficits have a positive influence on economic productivity (Coggington 1976). However, these crowding-in effects occur only when a deficit results in more public infrastructure, such as roads, airports, railway networks, and public utilities (Aschauer 1989 & Carlsson et al 2013). Similarly, by reducing social conflict and by developing human and technological capital for future economic activities, social welfare and education programs can enhance growth (Kelly 1997).

The second one is neo-classical theory, which explains the opposite relationship between budget deficit and economic growth. Neoclassical economists argue that crowding-in effects only exist in the short run (Elmendorf & Mankiw 1998). It is also argued that by choosing budget deficits, the government shifts tax burdens to the future generation (Bernheim 1989). As a result, personal savings are likely to decline, even though current private consumption is bound to increase. In this scenario, interest rates are expected to rise in order to restore equilibrium in the capital market. The rise in interest rates would, in turn, trigger a decline in private investments (Plosser 1982). These negative consequences reduce the ability of the Government to influence economic activities. Neoclassical economists refer to these fiscal measures as the 'financial crowding-out'

effects of a budget deficit (Buiter 1977, and Buiter & Patel 1992). Apart from the financial effects, through a government's budget deficit, the 'resource crowding-out' effects can also be caused. When the government sector expands through deficit spending, the costs of essential economic resources, such as skilled labor and raw materials, will also increase. As a result, it would be difficult for the private sector to flourish (Yellen 1989).

The third theory is known as the Ricardian theory, which shows that there is no relationship between budget deficit and economic growth. While Keynesian economists and neoclassical economists have contradicting views about the relationship between deficit and growth, Barro (1989) proposes the 'Ricardian equivalence' theorem, which puts forward that the relationship is neutral. It is said that an increase in budget deficits today must be compensated by an increase in future taxes, which in turn, leaves the interest rates and private consumption unaffected (Cunningham & Vilasuso 1994). This theorem, assessed by Barro (1990), examines the effects of government deficits on investment and growth in 98 countries from 1960 to 1985. Findings show that government spending programs in those countries had no direct relationship with economic productivity. Rather, a key factor influencing the deficit-growth relationship is the type of government services and programs. Another study done by Barro (1991) shows that spending on public infrastructure is likely to have a more positive impact on a country's economic progress compared to welfare programs and agricultural subsidies. Similarly, another study on 30 developing countries between 1970 and 1980, argues that government budget deficits in the education sector have 'long-lasting effects on economic prosperity' (Bose et al, 2007). Based on these studies, public investments in public infrastructure and education are regarded as 'growth-enhancing' government expenditures.

A few studies such as, studies done on Bangladesh for the period 1975-2015 (Abdullah et al 2018) and 1981-2017 (Biplob 2019), study on Liberia (Onwioduokit & Inam 2018) supported Keynesian hypothesis, that is, these studies found a positive correlation between budget deficits and economic growth. Other studies focus on the deficit-growth relationship in developed countries, as well as the nature of public services and programs that precipitate budget deficits. Aschauer (1989) found that infrastructure investments by the American federal government facilitated private capital accumulation in the United States from 1953 to 1986, which is consistent with the research findings by Bahmani-Oskooee (1999). This study shows that government budget deficits related to infrastructure and

capital projects cause 'crowding-in' rather than 'crowding-out' (Bahmani-Oskooee 1999). A similar argument is shown in Argimon et al. (1997). Using data from 14 OECD countries between 1978 and 1989, the study shows that government expenditures have significant crowding-in effects on private investment, through the positive impact of infrastructure on economic productivity. Apart from infrastructure and government capital projects, social security policy and social safety net programs are also considered to be growth-promoting expenditures (Kelly, 1997). This suggests that countries may simultaneously pursue growth-oriented and social welfare policies.

However, several studies challenge the 'crowding-in' hypothesis of Keynesian economics. In 17 developed countries between 1949 and 1981, Guess & Koford (1986) find that government budget deficits did not affect inflation, economic productivity, and private investment. Landau (1983) and Kormendi & Meguire (1985) conducted similar studies that examined the relationship between government expenditures and economic growth rates in more than 50 countries. No significant relationship between deficit and growth was found in these two studies. A large number of single-country studies also defy the Keynesian assumption. For instance, a study on Pakistan's economy between 1978 and 2009 (Fatima et al, 2012) and a study on Bangladesh's economy between 1981 and 2011 (Rana & Wahid, 2017) reveal a negative relationship between budget deficit and economic growth. A similar result was also found in Namibia (Amwaama 2018) and Nigeria between 1980 and 2011 (Awe & Funlayo 2014), which shows that budget deficit negatively affects growth rates both in the short run and in the long run. Study shows both in the short and long run, government budget deficits did not appear to affect economic productivity in three Middle Eastern countries such as, in Saudi Arabia from 1960 to 1996 (Ghali 1997), the United Arab Emirates between 1973 and 1995 (Ghali & Al-Shamsi 1997), and Tunisia from 1963 to 1993 (Ghali 1998) as well.

Empirical studies reviewed in this section show mixed results about the effects of government budget deficits on economic growth. However, it is important to note that different components of government expenditures have different economic effects. In research works that highlight the positive relationship between deficits and economic productivity, government spending on public infrastructure is commonly found to promote growth. Not only does a country's infrastructure capacity enhance the private sector's productivity, but it also attracts foreign investments into the country (Cheng & Kwan, 2000; Asiedu, 2002 & Kirkpatrick et al., 2006).

5.3 Research design and methodology

The Keynesian framework is used in this study to see whether a positive relationship exists between budget deficit and economic growth. In addition to that, using this framework, the study will see whether budget deficit creates 'crowding-in' effects in private sector investment. All these assessments are done using both qualitative and quantitative methods. For quantitative analysis, the Ordinary Least Squares (OLS) method is applied, and the solver macro of the Microsoft Office Excel 2007 software is used. A qualitative method, such as an analytical framework, is also used in this study to see the relationship between budget deficit and economic growth and 'crowding-out' effects in private sector investment.

5.3.1 Theoretical framework

To evaluate the fiscal policy, this study uses the Keynesian framework following Amwaama (2018), Onwioduokit & Bassey (2014) and Osoro (2016). The Keynesian framework considers demand for goods models to analyze the relationship between budget deficit and economic growth and budget deficit and the 'crowding-in' effect. These models include three types of equations, such as identities, behavioral equations and equilibrium conditions.

In an open economy, the demand for goods is the sum of consumption, investment, government spending and net exports (Blanchard, 2017). The identity of demand for goods,

$Z \equiv C + I + G$

(A) Goods market equilibrium, $Production = Demand\ for\ goods$

$i.e.\ Y = Z = C + I + G + NX$ (1)

where,

$Y = Production$

$Z = Demand\ for\ goods$

$C = Consumption = c_0 + c_1 Y_D = c_0 + c_1(Y - T)$

$$c_0 > 0, 0 < c_1 < 1, Y_D = disposable\ income\ and\ T = tax$$

$I = Investment = \delta + \gamma i\ , \gamma < 0$

$$i = nominal\ interest\ rate$$

$G = Government\ Expenditure$

$$NX = Trade\ Balance = X - M$$

$$X = Export = s + \sigma\varepsilon\ ,\ \sigma > 0$$

$$\varepsilon = real\ exchange\ rate = \frac{EP}{P^*}$$

$$E = nominal\ exchange\ rate$$

$$P = domestic\ price\ for\ domestic\ goods$$

$$P^* = foreign\ price\ for\ domestic\ goods$$

$$M = Import = m + \mu Y_D = m + \mu(Y - T), \mu > 0$$

Replacing all behavioral equations in Equation 1 and solving and rearranging gives

$$Y = \frac{A}{\theta} + \frac{1}{\theta}[\gamma i + \sigma\varepsilon + BD) \tag{2}$$

where,

$$\theta = 1 - c_1 + \mu;\ A = c_0 + \delta + s - m\ \ and\ BD = G - (c_1 - \mu)T$$

(B) Financial/money market equilibrium, $Demand\ for\ money = Supply\ of\ money$

$$i.e\ M^D = M^S$$

where,

$$M^D = Demand\ for\ money = kY + \lambda i$$

$$k > 0, \lambda < 0$$

$$M^S = m_1\frac{B}{P} + m_2 i$$

$$m_1, m_2 > 0\ and\ B = International\ reserve\ held\ by\ the\ Central\ Bank$$

Replacing M^D and M^S, gives

$$i = \psi\frac{B}{P} + \varphi Y \tag{3}$$

where, $\psi = \dfrac{m_1}{\lambda - m_2}\ and\ \varphi = -\dfrac{k}{\lambda - m_2}$

Replacing Equation 3 into Equation 2 and solving & rearranging gives

$$Y = \alpha_1 + \alpha_2\frac{B}{P} + \alpha_3\varepsilon + \alpha_4 BD \tag{4}$$

(C) External sector equilibrium or the Balance of Payment (BoP),

$$B = A_2 - \theta_0 Y + \theta_1 \varepsilon + \theta_2 i$$

Replacing BoP into Equation 4 gives

$$Y = \delta_0 + \delta_1 \varepsilon + \delta_2 i + \delta_3 BD \tag{5}$$

where,

$$\delta_0 = \frac{P\alpha_1 + A_2\alpha_2}{P + \theta_0\alpha_2}; \ \delta_1 = \frac{P\alpha_3 + \theta_1\alpha_2}{P + \theta_0\alpha_2}; \ \delta_2 = \frac{\theta_2\alpha_2}{P + \theta_0\alpha_2} \ and \ \delta_3 = \frac{P\alpha_4}{P + \theta_0\alpha_2}$$

Replacing $i = r + \pi$ into Equation 5, gives

$$Y = \delta_0 + \delta_1 \varepsilon + \delta_2 (r + \pi) + \delta_3 BD \tag{6}$$

where, $r = Real \ interest \ rate \ and \ \pi = Rate \ of \ inflation$

Equation 6 shows the relationship between budget deficit and aggregate output of the economy. Using Equation 6, the change in growth rate of GDP can be measured.

5.3.2 Model specification

Following Amwaama (2018), the empirical model for GDP, Y, of this study is

$$Y = F(Debt, Budget \ Deficit, Investment) \tag{7}$$

The long-run relationship between budget deficit and economic growth can be specified as,

$$Y_t = \beta_0 + \beta_1 Debt_t + \beta_2 Budget \ defict_t + \beta_3 Investment_t + \varepsilon_t \tag{8}$$

The long-run relationship between budget deficit and economic growth can be specified as,

In Equation 8, β_0 is constant, $\beta_1 < 0, \beta_2 < 0, \beta_3 > 0$ are the coefficients of the independent variables $Debt, Budget \ defict$ and $Investment$, respectively. The stochastic error is ε_t and t is the time trend over the period of analysis.

Variable '$Debt$' is expected to negatively affect economic growth as it is used to finance a deficit, which leads to either an increase in taxes or a reduction in government expenditure, which eventually reduces output. Variable 'Budget deficit' is expected to negatively affect economic growth as deficit finance can either be debt-financed or through the collection of taxes. Variable 'investment' is expected to positively affect economic

growth, because an increase in government expenditure (budget deficit) directed towards investment stimulates economic growth.
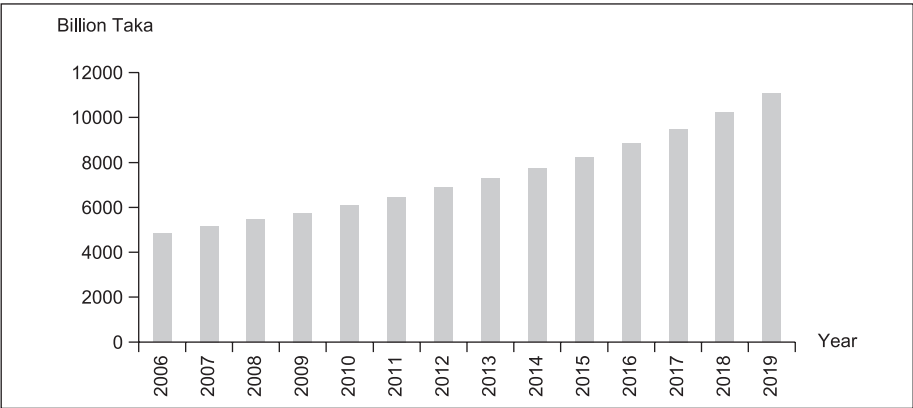
5.4 Data, variables and findings

All data used in this study were collected from secondary sources, mainly from various issues of the Bangladesh Economic Review (BER) published by the Finance Division of the Ministry of Finance, Bangladesh. In addition to that, different documents, such as books, journals, government circulars, acts, rules and regulations, various reports, newspapers, and research papers, are also used as secondary data. The data range of this study is 14 years from 2006 to 2019. The year used here is the Fiscal Year (FY), where FY 2005–06 is expressed as 2006 and so on. This study uses three independent variables, such as debt, Budget deficit and investment, and where dependent variable is GDP.

5.4.1 Qualitative analysis

This study uses GDP at constant price (real GDP) as the dependent variable of the model, which is drawn from BER (MoF 2023a) and measured in billion Taka. The GDP is calculated using the base year 2006. Data shows that between the period 2006 and 2019, the average GDP at constant price is Taka 7394.1 billion per year, and the standard deviation is Taka 1952.6 billion. The GDP at constant price during 2006-2019 is shown in Figure 5.1. The yearly data in Figure 5.1 shows an increasing trend of GDP in Bangladesh during 2006-2019.
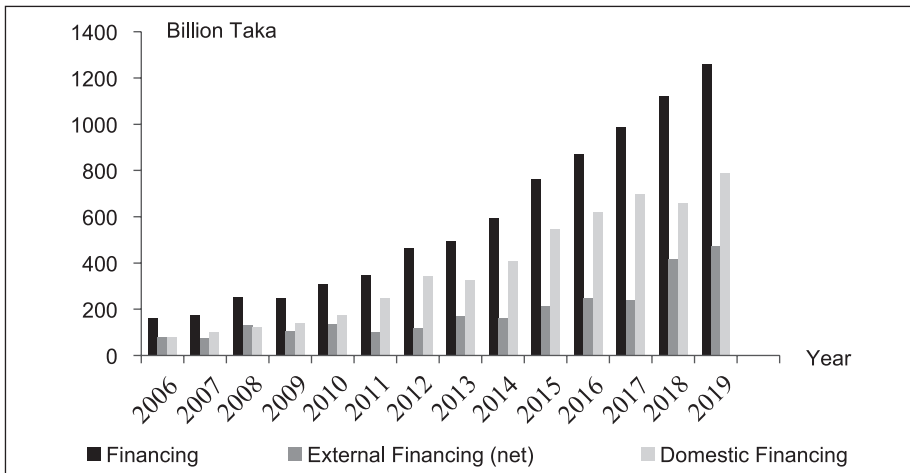
Figure 5.1: GDP at constant price (2006-2019)

Source: Author's calculation.

Total borrowing of the government that is total financing (excluding grant) is used for *Debt* variable, which is a sum of external financing (loan and repayment) & domestic financing (bank loan and non-bank loan) and drawn from the BER (MoF 2023a). Data shows that between the period 2006 and 2019, the average borrowing of the government is Taka 523.8 billion per year and the standard deviation is Taka 353.0 billion. Total financing, external financing and domestic financing during 2006-2019 are shown in Figure 5.2.

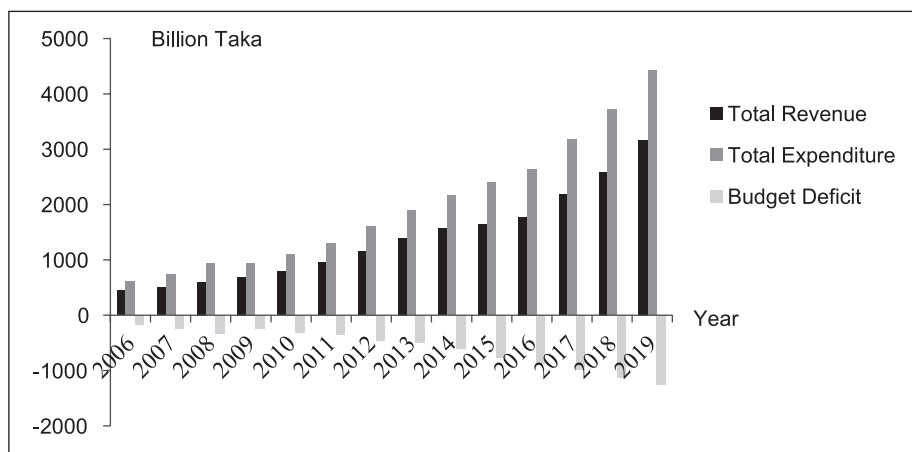*Figure 5.2: Total financing, external financing and domestic financing (2006-2019)*

The yearly data in Figure 5.2 show an increasing trend of total borrowing in Bangladesh during 2006–2019. Figure 5.2 also shows there is a sharp increase in total borrowing during 2013–2019. It shows that in 2006, the domestic and external borrowing were almost equal. But, from 2007, there has been an increasing trend of domestic borrowing and fluctuations in external borrowing. The most notable thing is that during 2009-2019, domestic borrowing was much higher than external borrowing.

The difference between total revenue and total expenditure of the government is used for the *Budget defict* variable. Total revenue uses in this variable are the sum of tax revenue that includes both National Board of Revenue (NBR) & non-NBR tax revenue and non-tax revenue. On the other hand, total expenditure uses here is the sum of revenue expenditure that is, non-development revenue expenditure (currently known as 'operating expenditure'), Annual Development Program (ADP) expenditure and other expenditure that includes expenditure on food, capital and development (except ADP) and all are drawn from the BER (MoF 2023a). Data shows that between the period 2006 and 2019, the average budget deficit of the

government is Taka 586.1 billion per year, and the standard deviation is Taka 355.3 billion. Total revenue, total expenditure and budget deficit during 2006-2019 are shown in Figure 5.3.

Figure 5.3: Total expenditure, total revenue and budget deficit (2006-2019)
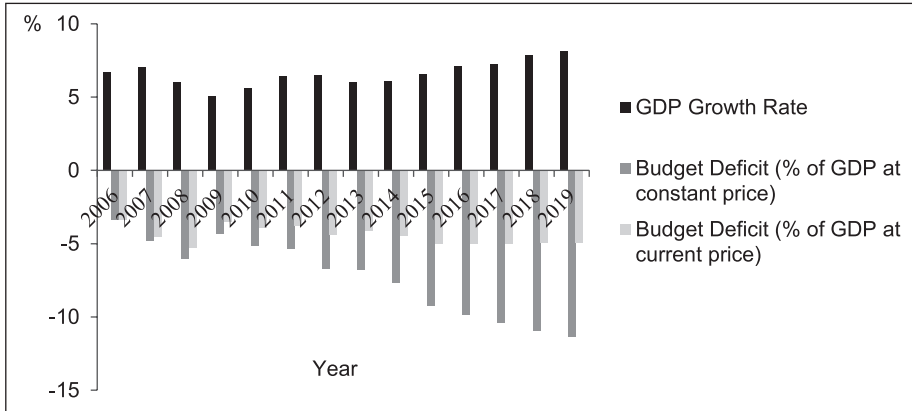

Source: Author's calculation.

Figure 5.3 shows that during 2006–2019 there is an increasing trend of total revenue, total expenditure and budget deficit in Bangladesh. It shows that during 2006–2011, both total revenue and total expenditure were almost the same; as a result, the budget deficit was almost the same in these years. But, a sharp increase is seen in both total revenue & total expenditure during 2012–2019, resulting in a sharp increase in budget deficit. The widening of total revenue is due to tax reform policy and budget deficits due to an increase in total expenditure of the GoB that aimed at stimulating economic growth of Bangladesh. It would be noted that due to expansionary fiscal policies during 2012-2019, total expenditure of the GoB has significantly increased to stimulate economic activities and growth, particularly in infrastructure development, social safety net programs, and public services by keeping the budget deficit within a reasonable limit of 5 percent of the nominal GDP. In terms of real GDP, the budget deficit of Bangladesh varies from 7 per cent to 11 per cent (MoF 2023a), which indicates that the economic health of Bangladesh needs to increase as the better indicator of the economic health of a country depends on real GDP compared to nominal GDP.

The GDP Growth Rate and Budget deficit, both in percentage of GDP at constant price (real GDP) and percentage of GDP at current price (nominal GDP) during 2006–2019 are shown in Figure 5.4. An increasing trend of both GDP growth rate and budget deficit in Figure 5.4 shows the

relationship between economic growth and budget deficit during 2013–2019, which supports the Keynesian Framework.
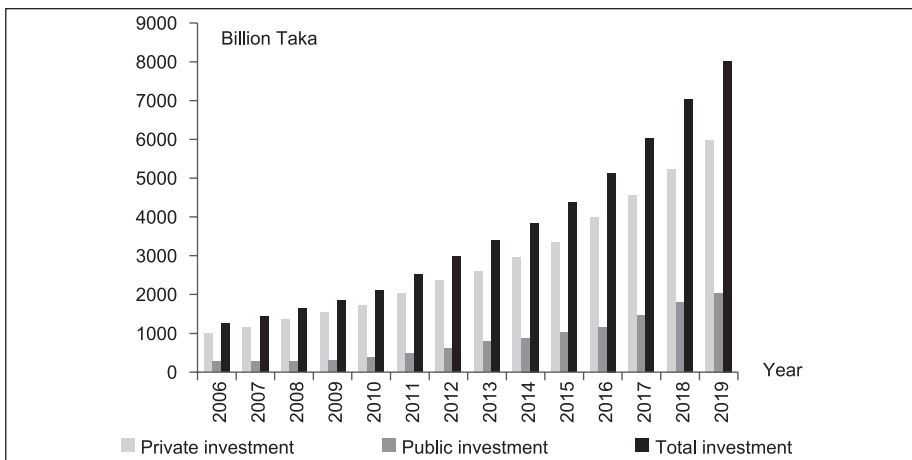
Figure 5.4: GDP growth rate, Budget deficit both in percentage of GDP at constant price and percentage of GDP at current price (2006-2019)

Source: Author's calculation.

Total investment of the economy is used for *Investment* variable in the model, which is a sum of public investment & private investment and drawn from the BER (MoF 2023a). Data shows that during 2006–2019, the average total investment is Taka 3684.5 billion per year and the standard deviation is Taka 2171.4 billion. Total investment, public investment and private investment during 2006–2019 are shown in Figure 5.5.

Figure 5.5: Total investment, public investment and private investment (2006-2019)

Source: Author's calculation.

Figure 5.5 shows an increasing trend in total investment, public and private investment. It shows a sharp increase in total investment during 2010–2019, which is due to a sharp increase in private sector investment. The public sector investment shows a sharp increase during 2016-2019, and it's mainly due to a few mega projects (such as the Padma multi-purpose project) taken by the GoB during that period. The increasing trend of private sector investment in Figure 5 supports the 'crowding-in' hypothesis of the Keynesian Framework.

The summary statistics of the variables and 14 years (2006–2019) data used in this study are shown in Table 5.1.

Table 5.1: Summary statistics of the variables (2006-2019)

Variable	Unit	Average	Maximum	Minimum	Standard Deviation
GDP at constant price	Billion Taka	7394.1	11057.9	4823.4	1952.6
Debt	Billion Taka	523.8	1221.4	137.1	353.0
Budget Deficit	Billion Taka	586.1	1259.3	161.9	355.3
Investment	Billion Taka	3684.5	8026.7	1216.1	2171.4

Source: Author's calculation.
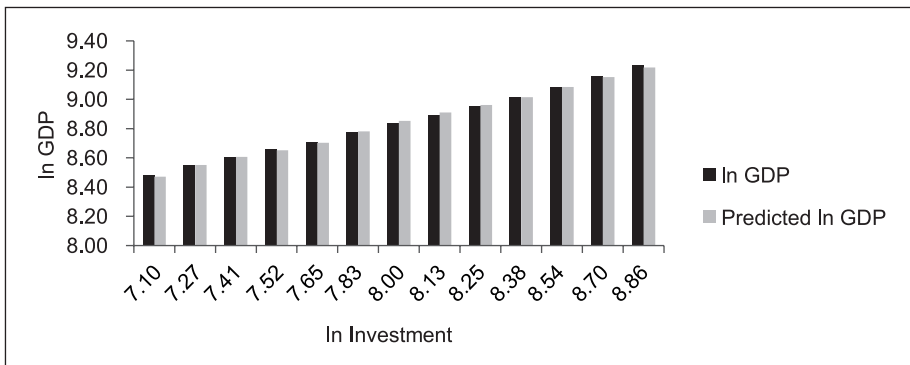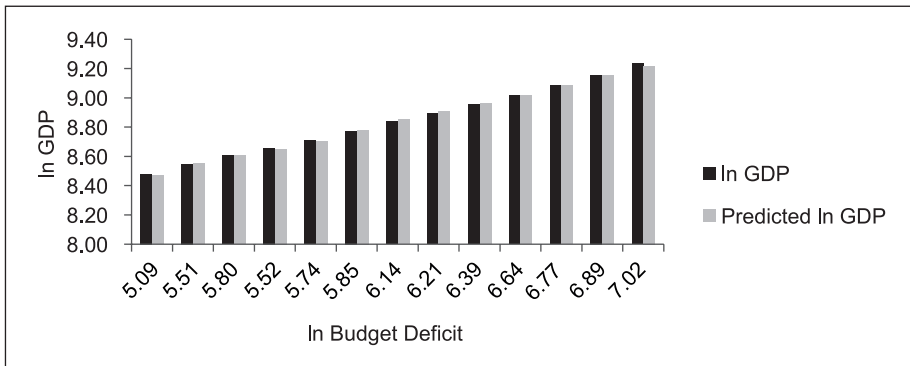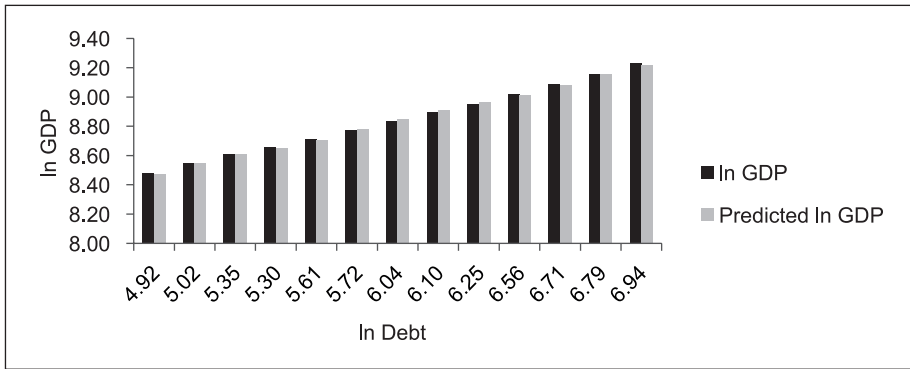
5.4.2 Quantitative analysis

The qualitative analysis in Section 4.1 supports the Keynesian Framework for both the relationship between budget deficit & economic growth and the budget deficit & 'crowding-in' effect in the private sector investment. To see the consistency of this result, a quantitative analysis was done for this study. For quantitative analysis, the data set is converted into the natural 'log' form so that any presence of outliers in the data can be removed. Using the OLS procedure, a 'linear regression plot' between GDP & Debt, GDP & Budget deficit and GDP & Investment is derived and presented in Figure 5.6. All relationships derived through the OLS procedure in Figure 5.6 show the relationships between GDP & Debt, GDP & Budget deficit and GDP & Investment are 'best-fit' and show a strong positive correlation with an increasing trend over time. The correlation between dependent and independent variables is shown in Table 5.2.

Table 5.2: Correlation between dependent and independent variables

	ln GDP	*ln Debt*	*ln Budget Deficit*	*ln Investment*
ln GDP	1			
ln Debt	0.993	1		
ln Budget Deficit	0.982	0.986	1	
ln Investment	0.999	0.994	0.982	1

Source: Author's calculation.

Figure 5.6: Linear regression plot between GDP & Debt, GDP &
Budget deficit and GDP & Investment

Source: Author's calculation.

The OLS results of the demand for goods model are obtained from the solver-macro of the Microsoft Office Excel 2007 software, which are presented in Table 5.3.

Table 5.3: Result: demand for goods model

lnY_t		$= 5.419 - 0.027lnDebt_t + 0.023lnBudget\ defict_t + 0.432lnInvestment_t$			
se	:	(0.158) (0.047)	(0.030)		(0.050)
P value	:	0.000 0.577	0.469		0.000
t Stat	:	34.249 − 0.579	0.755		8.621
Multiple R	:	0.999			
R^2	:	0.999			
Adjusted R^2 :		0.998			
DW test	:	0.769			
F test	:	2120.224 $(P-value: 0.000)$			

Note: 'se' denotes standard error.

Source: Author's calculation.

The highly significant constant term of the model suggests that the model is better at explaining variations in the quantity demanded of goods. This term captures the total factor productivity of the economy, which shows the effects of fiscal policy, monetary policy and the influence of the external sector, which are mentioned in the theoretical framework. Coefficients of the variables 'Debt' and variable 'Investment' have expected signs. The result shows that a negative effect of 'Debt' on economic growth, but not significant, implying that the relationship between debt and economic growth is not robust in this model.

On the other hand, the result shows a highly significant positive effect of 'Investment' on economic growth, suggesting a 'crowding-in' effect, which supports data (projected in Figure 5.5) that shows a sharp increase in private sector investment. The finding suggests that encouraging investment can be a strategy to promote growth. The result shows the opposite to the expected sign for 'Budget Deficit.' It shows a positive but insignificant effect on economic growth. Though insignificant, the positive relation between budget deficits and economic growth derived from quantitative analysis is also supported by the Keynesian hypothesis. However, an insignificant effect of budget deficit on economic growth suggests that other factors, such as monetary policy, fiscal policy, external economic conditions, and various structural factors, may be influencing both the budget deficit and economic growth independently.

The residual output (predicted GDP) derived from the OLS procedures in Table 5.4 shows that during 2009–2017, actual GDP is higher than predicted GDP. But, during 2006–2008 and 2018–2019, there exists an output gap where the actual GDP is lower than the predicted GDP, which confirms the presence of inefficiency during 2006–2008 and 2018–2019.

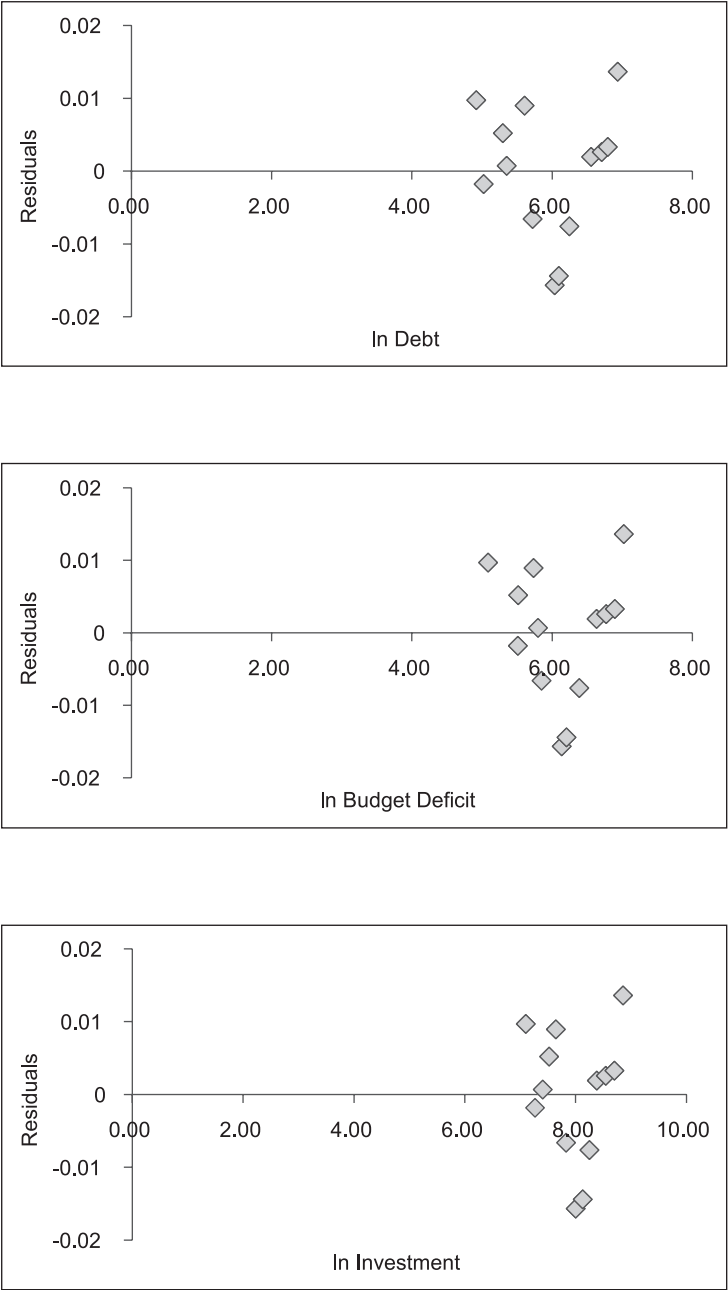**Table 5.4: Residual output**

(in billion Taka)

Year	Predicted GDP	Actual GDP	Output Gap
2006	5215.30	4823.4	-391.90
2007	5357.96	5163.8	-194.16
2008	5554.71	5474.4	-80.31
2009	5732.61	5750.6	17.99
2010	5988.47	6071.0	82.53
2011	6329.20	6463.4	134.20
2012	6782.57	6884.9	102.33
2013	7116.70	7299.0	182.30
2014	7496.40	7741.4	245.00
2015	8081.72	8248.6	166.88
2016	8758.68	8835.4	76.72
2017	9466.85	9479.0	12.15
2018	10344.70	10224.4	-120.30
2019	11291.32	11057.9	-233.42

Source: Author's calculation.

To see whether all these findings of quantitative analysis are logical, diagnostic tests of the model have been done. First, the standard errors of the model are low, indicating that there is no multicollinearity. An overall *F test* test shows that the sample data used in this study provides sufficient evidence to conclude that the regression model fits the data better. A good fit of the time series data is also confirmed by $Multiple\ R$, $R^2\ and\ Adjusted\ R^2$. The Durbin-Watson test for autocorrelation confirms there is no correlation among residuals. Residual plots of independent variables (debt, budget deficit and investment) in Figure 5.7 show an accuracy of the specified model, which provides that the OLS estimators are unbiased and confirms the absence of heteroscedasticity and outliers of the data set.

In brief, it can be concluded that results of quantitative analysis are consistent with qualitative analysis and support the Keynesian Framework for both the relationship between budget deficit & economic growth and the budget deficit & 'crowding-in' effect in the private sector investment.

Figure 5.7: Residual plot of Debt, Budget deficit and Investment

Source: Author's calculation.

5.5 Conclusion and recommendation

Bangladesh has been pursuing an expansionary fiscal policy to mobilize adequate resources that expedite economic growth and to alleviate poverty. To manage expansionary fiscal policy, government expenditure has exceeded the revenue earnings, and therefore, Bangladesh has experienced a sustainable trend in its budget deficit. In recent years, the volume of the deficit has increased. Some argue that the sustainable trend of budget deficit in Bangladesh results from inflationary pressure on the economy. Others argued that the large budget deficit due to widened government expenditure is crowding-in effect in the private investment in Bangladesh and adversely affecting economic growth. The relationship between budget deficit and economic growth is a complex and debated topic in economics and varies across developing countries. The debate about the effects of government budget deficit on economic growth, however, remains unsettled.

This study investigates the relationship between budget deficit and economic growth, in addition to examining whether budget deficit creates 'crowding-in' effects in private sector investment. To examine whether a positive relationship exists between budget deficit & economic growth, this study uses the Keynesian framework. Using this framework, the study also explains whether budget deficit creates 'crowding-in' effects in private sector investment. All these assessments are done using both qualitative and quantitative methods. The Ordinary Least Squares (OLS) method is applied, and the solver macro of the Microsoft Office EXCEL 2007 software is used for quantitative analysis. To see the relationship between budget deficit & economic growth and 'crowding-in' effects, a qualitative analysis is used in this study.

Using secondary data during the period 2006–2019, the study shows that a positive, but insignificant, relation between budget deficit and economic growth indicating other factors, such as monetary policy, fiscal policy, external economic conditions, and various structural factors, may be influencing both the budget deficit and economic growth independently. On the other hand, this study shows a positive and significant relation between investment and economic growth. It implies that increasing investment is likely to have a positive and measurable impact on Bangladesh's economic performance and indicates that there is a 'crowding-in' effect on investment. This result has a few implications. First, in the last few years, the GoB has been encouraging Small and Medium Entrepreneurs (SMEs), promoting investment investment-friendly environment so that it can lead to the creation of new businesses and expansion of existing ones, which,

in turn, generates more employment opportunities and income for the population. Second, increased investment in research and development in Bangladesh fosters innovation and technological progress, making the economy more productive and competitive. Third, initiatives have been taken to invest in infrastructure projects (such as transportation & communication networks), which enhances the overall efficiency of the economy, making it more attractive for businesses to operate and invest. Fourth, higher levels of investment stimulate aggregate demand, leading to increased production and economic growth. Finally, GoB has been considering the positive and significant relation between investment and economic growth when crafting economic policies. Moreover, GoB has been implementing a common strategy to promote economic development and job creation by encouraging and facilitating investment, both from domestic and foreign sources, though foreign sources are still limited.

However, the study shows a negative, but insignificant, relation between debt and economic growth. It reflects that increasing debt directly does not cause economic growth to decline, indicating other factors, such as economic policies, external shocks, or structural issues, may be at play and could be influencing both debt levels and economic growth independently.

The empirical results of this study suggest that encouraging investment can be a strategy to promote the economic growth of Bangladesh. Second, though the budget deficit does not directly cause economic growth to rise, monetary policy, fiscal policy, external economic conditions, and various structural factors are influencing both the budget deficit and economic growth independently. Similarly, increasing debt directly does not cause economic growth to decline in Bangladesh. Rather, economic policies, external shocks, and structural issues are influencing both debt levels and economic growth independently.

In conclusion, the relationship between budget deficit and economic growth in Bangladesh is influenced by multifaceted factors. While a high budget deficit may not necessarily hinder economic growth, the effectiveness of deficit-financed expenditures, macroeconomic stability, and supportive policies is crucial. Prudent fiscal discipline is necessary to maintain a balanced approach to fiscal management, aiming to reduce the budget deficit over time. This could involve rationalizing expenditures, enhancing revenue collection through tax reforms, and improving the efficiency of public spending. To ensure long-term fiscal sustainability, debt sustainability is also important, and hence, careful management of public debt is needed. Finally, it is important to prioritize investments that align with development goals so that they can generate high economic returns.

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