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Does Public Borrowing Crowd-out Private Investment? The Bangladesh Evidence

Md. Alauddin Majumder*

Abstract

The main intention of the study is to investigate the crowding-out effect of public borrowing on private investment in the Bangladesh context. An investment function with three independent variables, namely, public borrowing, GDP and interest rate has been estimated by analyzing the unit root test, co-integration test and the error correction model. The main findings of the study do not corroborate the crowding-out hypothesis in Bangladesh, rather, provide the evidence of crowding-in effect. This result has important implications for fiscal management. To avoid unnecessary inflation and external indebtedness (triggered by reliance on Bangladesh Bank funds and foreign sources, respectively) associated with deficit financing, government can rely on domestic sources other than Bangladesh Bank for meeting the deficit without hurting private investment as long as excess liquidity prevails in the financial system.

Keywords: Crowding-out Effect, Crowding-in Effect, Public Borrowing, Private Investment.

JEL Classification: E22, E62, H63

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1. Introduction

In view of a stagnant and narrow tax base, Bangladesh's economy is characterized by poor growth of revenue income which in turn forces the government to rely on continuous borrowing from both internal and external sources to finance the budgetary deficit. Besides, the other public sector corporations, owing to relatively weak financial position, also borrow from different sources.[1] Due to recurrent borrowing, Bangladesh government has already become burdened with public debt amounting to BDT 1960 billion in FY06 which is equivalent to 47.1 percent of GDP (BB 2006).[2] If borrowing by the public sector corporations were considered, the figure would be even higher. However, the comparable figures for India, Pakistan and Sri Lanka are far above 50 percent

The public sector has long been accused of indulging in excessive borrowing from domestic sources and thus stifling growth. The claim deserves serious attention in the context of the country's crying need to generate faster employment growth. Although growth rate of Bangladesh economy in recent years seems to have been quite decent, meeting one of the most important millennium development goals- halving poverty by 2015- necessitates that the growth rate go significantly higher.[3] Moreover, the unemployment situation is yet to be on a favourable trajectory.[4] It is now discernible that in the present situation the economy should aim at reaching growth momentum.

In this backdrop, an empirical analysis of the claim of the adverse impact of public borrowing is urgently needed. It is intuitive that if there are sufficient liquidity in the financial system public borrowing may not affect private investment. The issue of the

[1] The poor financial condition of the public sector corporations may be illustrated by the substantial losses incurred by them every year. For example, their net loss was estimated at around BDT 45 billion (equivalent to about 1 percent of GDP) in the first eight months of FY06.

[2] The breakup between internal and external sources is roughly 16.6 and 30.5 percent of GDP respectively.

[3] A calculation made in 2000 showed that halving poverty by 2015 required the Bangladesh economy to grow at a yearly rate of 7 percent throughout the period from 2000 to 2015. Statistics indicates that till to date the rate never reached that level (the highest yearly growth rate in this period was 6.7 in 2005-06), warranting a rate of more than 8 percent in the coming years.

[4] According to Labour Force Survey, 2002-2003, unemployment rate by education level ranged from 3.4 percent for uneducated people to 9.5 percent for highly educated people.

inflationary consequences are however distinct, and these are not investigated in what follows below.

This study is devoted to an empirical investigation of crowding-out effect. Additionally, focus will be given on the policy implications in light of the findings of the study. The paper is arranged as follows: the first section introduces the study; the second section describes the theoretical debate and mechanism of the crowding-out effect; the present scenario and trends of public borrowing and private investment are portrayed in the third section; the findings of the related literature are reviewed in the fourth section; while the fifth section concerns the methodology and data description. The estimation followed by interpretation is offered in section six, and the final section consists of a summary and conclusion.

2. A Historical Background[5]

The issue of public borrowing is an issue of much debate and historical division between the two main schools of economic thought, namely, classical and Keynesian. While classical economists take a much conservative stance on public borrowing, the Keynesians are extremely flexible towards the same. One may have the clear idea about the position of the classicals regarding public borrowing from their basic belief "that government is the best which governs the least". The classical economists suggest keeping public undertakings such as borrowing as minimum as possible. In their view by borrowing public authority accumulates resources for its own use leaving private sector with less. This phenomenon is popularly termed as crowding-out of private investment. According to them, as public expenditure is less productive than private expenditure, the increased output as a result of the loan-financed public expenditure does not fully offset the negative impact of the crowding-out of investment on output, thus reducing GDP. Adam Smith and David Ricardo found fiscal stabilization efforts to be of little use. Public borrowing was seriously opposed by the English economist R. G. Hawtrey. He stated before the Macmillan Committee in 1930 that whether it came out of taxes or loans from savings, the increased government expenditures would merely replace private

[5] This section is based on the study by Roger and William (1970).

expenditure even under depression. As against the classical view, the Keynesians see no harm in public borrowing in case of necessity. Their argument is based on the principle of the multiplier that explains how a change in the public expenditure generates a greater change in output. They, however, were not unaware of the crowding-out effects of public borrowing. Keynes (1936) himself hinted at such effects in "*The General Theory*" by mentioning the multiplier limitation arising from possible adverse reactions on private investment, "confused" business psychology, and a tendency of the marginal propensity to consume to decline with rises in employment. However, their treatment of the crowding-out effect is quite different from that of the classicals. The Keynesians consider the issue for ensuring the smooth and optimum performance of the borrowing activities of government. The classicals, by contrast, raise the issue against undertaking any extent of public borrowing. The noteworthy thing is that in the two frameworks conclusions were drawn under different set of assumptions. For instance, resources of an economy are assumed to be fully employed in the classical framework. High flexibility in wages and prices leave no room for any unemployment for larger time horizon. The Keynesian paradigm, on the other hand, allows existence of unemployment in economy even in the long-run. The extent to which the assertion of one or the other school will be replicated in the real world depends upon how close the actual situations are to the background assumptions.

Theoretically, the process of crowding-out generally works as follows: once public authorities borrow from the domestic market, there emerges a fund crisis (due to excess demand) which raises interest rate leading to the reduction of private investment.[6] Apart from this, there are some other channels, as already indicated in the words of Adam Smith, through which crowding-out can occur.[7] For example, the type of public expenditure has important bearing on private investment. If the borrowed fund is spent to produce goods and services which are considered a substitute for privately produced goods and services, the confidence in the private investors is eroded, resulting in reduced

[6] This process again highlights underlying assumptions of the classical model, namely that there exists no excess liquidity in the financial system at the prevailing market interest rate.

[7] These additional channels remain effective regardless of the categories of public borrowing (domestic, external, from central bank or from other sources). A basic parameter via which all the channels motivate the minds of private investors is the expected internal rate of return.

private investment. On the other hand, in the case where the public entity borrows to provide something which complements private sector products, the borrowing might have every possibility to be followed by a crowding-in effect rather than crowding-out effect even in a tight money market environment.[8] Public borrowing can be seen by private investors as a warning signal of the government becoming bankrupt within the foreseeable future. They may also fear that government will impose higher taxes in future in order to facilitate the repayment and servicing of the loan.[9] In that case private investors will become less enthusiastic to invest.

However, policy makers have to know whether public borrowing is followed by any crowding-out effect on investment, through whatever channel, and to what extent and whether the detrimental effect of such actions outweighs the benefit coming from the use of borrowed money, as is argued by the classicals.

3. Public Borrowing and the Private Investment Scenario in Bangladesh

This section will briefly analyze first the present scenario and trend of that part of total public borrowing which is sourced from domestic lenders other than the Bangladesh Bank, and then the dynamics of private investment in Bangladesh economy.

It may be argued that internal public borrowing from sources other than Bangladesh Bank ought to be at the centre of the discussion since the crowding-out effect, if any, is mainly generated from this part of total borrowing. Borrowing from external sources, not impacting on domestic fund, has little involvement in affecting private investments. Domestic borrowing from Bangladesh Bank also does not have any such effect as it merely causes money creation without distorting the fund available to private sector.[10]

[8] In Bangladesh, examples of publicly produced goods substituting for privately produced goods are cement, yarn, cloth, transport services etc., while goods under public production complementing private sector output include the infrastructural services such as roads & highways, canals, law & order, public administration, provision of clean air, water and public utilities.

[9] The issue of higher future tax follows from the Ricardian Equivalence Theory. However, it is a popular belief that such fear is not credible if the projects financed by the borrowing are expected to generate a sufficient income stream to cover the repayment of principal and interest.

[10] Borrowing from external sources or from BB may indirectly causes crowding-out effect. Please see footnote 7.

Hence, the sources of borrowing directly relevant to the crowding-out effect include scheduled banks, Non-Bank Depository Corporations (NBDC) and National Savings Directorate (NSD) certificates.[11]

Table 1: Domestic Public Borrowing from Sources other than BB (in billion BDT)

Fiscal year (1)	By government itself (2)	By other public sector corporations[12] (3)	By the public sector as a whole (4)	Column (4) as % of GDP (5)
2000	50.33	2.44	52.77	2.23
2001	51.37	12.00	63.38	2.50
2002	45.07	-0.86	44.21	1.62
2003	59.13	0.09	59.22	1.97
2004	49.26	14.65	63.91	1.92
2005	23.53	23.57	47.10	1.27
2006	-3.44	39.96	36.52	0.88

Source: Prepared by the author on the basis of data from various issues of Bangladesh Economic Review, Economic Trends and documents provided by National Savings Directorate (NSD).

Table-1 summarizes the size of yearly domestic public borrowing from other than Bangladesh Bank in absolute and relative terms. The data reveals that amid fluctuations till FY03 the amount of loan taken by the government itself in absolute terms sharply went down in the subsequent years and reached a negative figure of -3.44 billion BDT in FY06.[13] In the case of other public sector the same trend is observed till FY03, but afterward the amount kept on rising. The public sector as a whole, on the other hand, demonstrated regular cyclical behaviour over the entire period from FY00 to FY06 finishing with a slowdown since FY04 onward. In relative terms, borrowing as a percentage of GDP followed a pattern similar to that of borrowing by government itself, and came down to as low as 0.88 in FY06 from 2.23 in FY00. It is evident from the pattern in the data that the financial reliance of public authorities on domestic sources other than Bangladesh Bank, on balance, has gradually tapered off over the recent years.

[11] NSD certificates are, namely, 5-Years Bangladesh Sanchayapatra, 3-Monthly profitable Sanchayapatra, Pensioner Sanchayapatra, Wage Earner Development Bond, 3-Years National Investment Bond, Bangladesh Prize Bond, Post Office Savings Bank, Postal Life Insurance, U.S.Dollar Premium Bond, U.S.Dollar Investment Bond. These certificates are generally used to raise funds from the general public.

[12] Other public sector corporations mean State Owned Enterprises (SOEs) such as BTMC, BJMC, BPC etc.

[13] In our discussion borrowing means net borrowing. Thus borrowing figure becomes negative when repayment is greater than fresh borrowing.

There is, however, a caveat to be kept in mind that of late, borrowing by other public sector has been on the rise, manifesting growth rate of about significant 65 percent per annum in the recent two years, i.e., FY05 and FY06.[14]

Table 2: Trend in Private Investment

Fiscal year (1)	Amount in billion BDT (2)	Growth over previous year (3)	Column (2) as % of total investment (4)	Column (2) as % of GDP (5)
2000	370.10	8.88	67.81	15.61
2001	401.50	8.48	68.60	15.84
2002	458.40	14.17	72.49	16.78
2003	517.20	12.83	73.52	17.21
2004	593.70	14.79	74.22	17.83
2005	679.20	14.40	74.69	18.32
2006	777.00	14.40	74.78	18.67

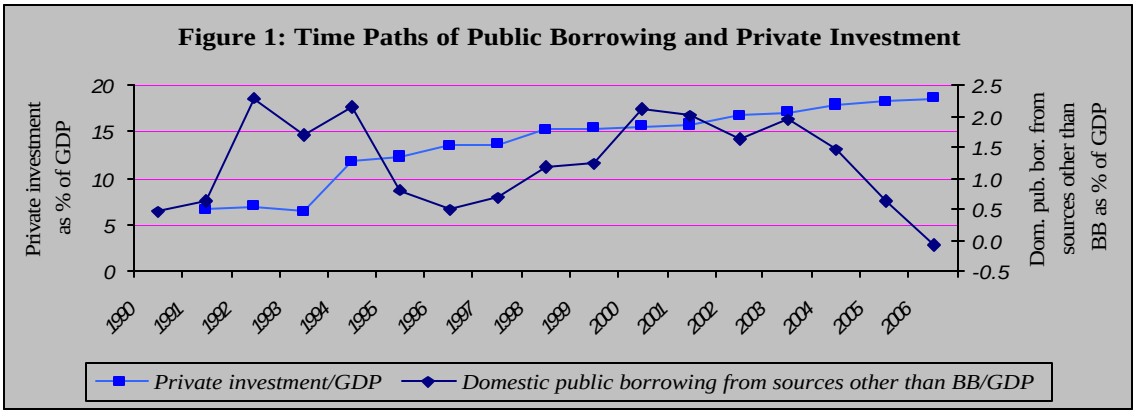
Source: Prepared by the author on the basis of data from various issues of Bangladesh Economic Review.

Trend in the private sector investment is outlined in Table-2. Yearly growth of private investment is seen to hover around 14 percent during the period from FY02 to FY06 after remaining at 8.88 and 8.48 percent in FY00 and FY01 respectively. Besides, both in terms of share in total investment and GDP, private investment experienced a steady rise in the period under review. The consistent expansion of private investment points to the existence of stimulating factors which may or may not include the recent slowdown of public borrowing from domestic sources other than Bangladesh Bank as indicated in Table-1.

Although a quick glance at both Table-1 and 2 gives a superficial indication of inverse relationship between public borrowing and private investment, i.e., crowding-out effect, it is not necessarily so. Moreover, plotting the data on government borrowing and private investment for extended period from FY90 to FY06 Figure-1 demonstrates no regular pattern in the said relationship. It thus becomes clear that merely tabular and graphical illustration do not provide any conclusive evidence regarding possible crowding-out of private investment by public borrowing in the Bangladesh economy. Therefore, an

[14] This may largely be attributed to the ever-widening loss of Bangladesh Petrolium Corporation (BPC) incurred in recent years as a result of incomplete pass-through of increased import price of oil on to the domestic tariff structure.

empirical study involving an explicit econometric method is warranted to gain a concrete idea about this particular issue.



Source: Prepared by the author on the basis data from various issues of Bangladesh Economic Review, Economic Trends and documents provided by National Savings Directorate (NSD).

4. Literature Review

Although there is a large body of literature on crowding-out effect, a paper directly relating public borrowing to the crowding-out effect could not be traced. More importantly, no individual country study on the public expenditure -private investment relationship is available for Bangladesh data. However, views expressed in the print media, seminars, symposiums, workshops and interviews frequently claim that to meet the widening public deficit, the government is disproportionately borrowing from the scheduled banks and general public which are also the sources of fund for private investment. Often it is also observed that public sector corporations too are doing the same. In the absence of a detailed study discussing the crowding-out effect in the Bangladesh case, this section will review some of the available studies covering crowding-out triggered by public expenditure through focusing on countries other than Bangladesh. Hopefully this will not reduce the efficacy of the study, because from the crowding-out perspective public expenditure and public borrowing are the two sides of the same coin as borrowing is mainly undertaken for financing expenditure. However, it would be wise to consider those countries which are more or less similar to Bangladesh in economic structure and stage of development.

Miguel (1994) in his study on Mexico found public investment causing a crowding-in rather than a crowding-out effect on private investment.[15] A similar result was found by Bazaumana (2004) in the case of Senegal. He drew on the Johansen co-integration techniques and bounds test approach to estimate long-run private investment function. Ahmed and Miller (1999) tried to explore the effects of disaggregated government expenditure on investment employing fixed- and random-effect methods in the context of some developed and developing countries. One of the results of their study was that government expenditure on transport and communication induced crowding-in effect in developing countries while expenditure on social security and welfare reduces private investment in both developed and developing countries. Cruz and Teixeira (1999) examined a temporal framework with Brazilian data for 1947-1990 and showed that although crowding-out effect occurred due to public investment in the short-run, a reversal appeared in the long-run effect of public investment. Mitra (2006) had the same conclusion as Cruz and Teixeira (1999), analyzing the evidence from India. Indian evidence was also examined by Serven (1996). He discussed the separate impacts of public capital for infrastructure and the same for non-infrastructure on private capital and found that public capital for non-infrastructure crowded-out private capital in both short- and long-run but other type of public capital crowded-out in the short-run and crowded-in in the long-run. Chhibber and Wijenbergen (1988) argued in their study with Turkish data that large budget deficit financed by borrowing domestically slowed down private investment causing real rate of interest to increase.

The above discussion suggests that there is no conclusive empirical finding on whether additional public expenditure leads to crowding-out or not. Some results go in favour of crowding-in while others support the crowding-out effect. On balance, it is perceived that the impact of public expenditure on private investment varies from case to case depending on the prevailing socio-economic setup. As public borrowing is assumed to be directed towards public expenditure in the current study this comment is fully applicable to the examination of the crowding-out effect of public borrowing as indicated earlier.

[15] Crowding-in is the antonym of crowding-out, meaning expansion of private investment instead of reduction prompted by either public expenditure or public borrowing.

5. Methodology and Data Description

5.1. Approach: Four approaches, namely, the computable general equilibrium (CGE) model, IS-LM model, model of the impact on supply side, and estimation of the investment function have been used in addressing the crowding-out versus crowding-in issue (Cruz and Teixeira 1999). In view of the relative advantages and higher relevance of the investment function approach, it has been employed in the current study. Accordingly a private investment demand function in Bangladesh is estimated in the present study considering domestic public borrowing from sources other than Bangladesh Bank, weighted average interest rate on advances and GDP as explanatory variables. Theory suggests that while the coefficients of GDP and the interest rate are expected to assume respectively positive and negative signs, that of public borrowing may be either positive or negative depending upon the liquidity position in the economic system, the nature of the loan backed public expenditure, psychological impact on private investors and the like.

5.2. Nature of the variables: The variables used in this study can be defined as follows: *Private Investment* means investment made by private entrepreneurs, no matter whether they are domestic or from abroad. *Public Borrowing*, as explained earlier, refers to that part of total borrowing by public authorities, i.e., government itself and other public sector corporations which are sourced from domestic lenders except Bangladesh Bank. In other words, *public borrowing* figures show how much money is siphoned off from the funds available for potential private use.[16] *GDP* conveys its usual meaning that is, value of all goods and services produced domestically. *Interest Rate*, on the other hand, stands for weighted average of interest rates on advances charged by different banks. In order to escape the influences of inflation, data for all the variables except for the interest rate are taken in real terms. GDP and private investment data are in constant 1995/96 prices. Data for public borrowing is found in nominal terms and is transformed into real by the GDP deflator. For analytical convenience three variables namely real private investment, real domestic public borrowing and real GDP are taken in the log level. The labels LRPI,

[16] Due to the unavailability of consistent data for the whole period, the variable public borrowing in this study excludes NBDC and incorporates only borrowing from scheduled banks and general public (through NSD certificates). This exclusion, however, will not distort results that much because available observation suggests that figures for NBDC are rather inconsequential.

LRDPB, LRGDP and IR are used to denote respectively log of real private investment, log of real domestic public borrowing, log of real gross domestic product and the nominal interest rate.

5.3. Temporal framework: To keep the data set consistent, the present study uses yearly data rather than monthly or quarterly for a period of 31 years spanning from fiscal year 1976 to 2006. The unit of time is 'the year' because although data on public borrowing and the interest rate are available on a shorter period basis, GDP and private investment data are yet to be of shorter span than yearly. The starting point is 1976 instead of the year of independence (1972) because the data for the pre-1976 period are suspected to be noisy due to the post-war reconstruction from a very low level of economic activity. It may be noted that Bangladesh Bureau of Statistics (BBS), the country's only source of GDP and private investment data, made a methodological revision of GDP (and its components including investment) calculation and rebased it on 1995/96 prices extending back only to fiscal year 1980. We have further extended these data back to 1976 by using interpolation techniques.

5.4. Data collection: The nature of the present study does not necessarily require the use of primary sources for data series. Therefore, the data are collected from secondary sources. Various issues of *National Accounts Statistics* published by BBS provide GDP and private investment data, while public borrowing figures are derived by using data collected from various issues of *Economic Trends* published by Bangladesh Bank, various issues of *Bangladesh Economic Review* published by Ministry of Finance and documents supplied by National Saving Directorate to Bangladesh Bank. On the other hand, interest rate data are easily picked up from various issues of *Economic Trends*.

5.5. Method of estimation: Unit root test (test of stationarity) and Johansen co-integration test are used with a view to estimating the long-run impact of public borrowing on private investment. Next, the error correction method will be applied to find out the speed of adjustment the variables follow towards the long-run equilibrium path in response to any divergence occurred in the short-run. The whole process of estimation is run by the fourth version of the package Econometric Views, i.e., EViews 4.

6. Estimation and Possible Interpretation of Results

As a prerequisite for the co-integration test, stationary properties of the relevant variables have been verified by performing Augmented Dickey-Fuller (ADF) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests. Results of both the tests presented in Table 3 suggest that at the 5 percent level of significance LRGDP, IR and LRPI have been found to be non-stationary in level form and integrated of order one i.e. I(1). LRDPB shows mixed results in level form but found to be stationary in first difference form in both the tests.[17] Therefore we considered LRDPB as integrated of order one or I(1), which is also supported by the graphical representation (not shown here) of the data.

Table 3: Unit Root Test Result

Tests	Trend assumption	Level/differenced	LRGDP	IR	LRDPB	LRPI
ADF	Constant	Level	2.55	-2.02	-3.12**	-2.67
		First difference	-8.46***	-4.08***	-8.70***	-4.04***
	Constant and trend	Level	0.29	-1.67	-3.92**	-2.74
		First difference	-10.85***	-3.82**	-8.53***	-4.28**
KPSS	Constant	Level	0.73**	0.17	0.44*	0.72**
		First difference	0.48**	0.27	-0.02	0.28
	Constant and trend	Level	0.20**	0.17**	0.12	0.09
		First difference	0.12	0.11	0.02	0.14

Note: 1., ** and *** indicate rejection of null hypothesis at 10, 5 and 1 percent level of significance.*

2. Lag length of ADF test has been determined by Akaike's Information Criteria (AIC).

3. Maximum bandwidth for KPSS has been determined by the Newey-West method.

This set of stationary properties allow us to exercise the Johansen co-integration test for estimating long-run relationship between the dependent variable LRPI and the independent variables LRGDP, IR and LRPI. Table 4 displays the result of Johansen co-integration test. Both the Trace and Max-eigen statistics reported in this table indicate that there are at least two co-integrating vectors between LRPI, LRGDP, LRDPB and IR at both 1 and 5 percent levels of significance. Thus it can be claimed that there is a long run equilibrium relationship between real private investment, real GDP, real domestic public borrowing sourced from other than BB and the interest rate variable.

[17] According to ADF test the null hypothesis of unit root is accepted for LRDPB at 1% level in both the cases. Again in the KPSS test LRDPB is found to be non stationary at the 10% level. Both ADF and KPSS test suggest that LRDPB is stationary in the first difference form at any level of significance.

Table 4: Johansen Co-integration Test Results						
Hypothesized no. of CE(s)	Trace statistic	5-percent critical value	1-percent critical value	Max-Eigen statistic	5-percent critical value	1-percent critical value
None **	120.00	47.20	54.50	68.40	27.10	32.20
At most 1 **	51.60	29.70	35.70	40.50	21.00	25.50
At most 2	11.10	15.40	20.00	11.10	14.10	18.60
At most 3	0.00	3.80	6.70	0.00	3.80	6.70

Johansen co-integration method provides a relationship which may be represented by the following equation:

$$LRPI = -11.822 + 1.346^{*} LRGDP + 0.311^{*} LRDPB - 0.063^{*} IR$$
$$\text{t-value} \quad [-14.07] \quad [-6.31] \quad [1.88]$$

According to the equation, in the long-run, GDP and public borrowing seem to have statistically significant impact on private investment, whereas the impact of interest rate on the same is found to be statistically not significant.

Adjustment coefficient on DLRPI equation is found to be correctly signed and significant. The coefficient is -0.30, implying that 30 percent of the deviation from long run equation is corrected within one year.

In line with the intention of this paper, the interpretation will solely centre on the coefficient of the variable 'domestic public borrowing from sources other than Bangladesh Bank (LRDPB)'.[18] Being positive with statistical significance, the coefficient leads to two points. Firstly, as a direct answer to the study's main query about the hypothesis that public borrowing leaves to a crowding-out impact on private investment, there appears a clear empirical rejection of such hypothesis. Secondly, the existence of crowding-in instead of crowding-out effect seems evident in the Bangladesh economy. Although the study is essentially concerned with the first point that is, verifying the existence of crowing out effect, this section will analyze both the issues considering the important implications of the crowding-in effect for the economy.

[18] Although the coefficient of GDP is consistent with the traditional investment theory, that of the interest rate is not. Many reasons may be pointed out for this apparent departure from an established belief. However, the interest rate insensitivity of private investment in Bangladesh is well supported by the findings of Ahmed and Islam (2006).

Table 5: Liquidity Position (Outstanding) in the Banking System (in billion BDT)					
Period	Total liquid assets	Required liquid assets	Excess liquidity	Excess liquidity as % of total liquid asset	Excess liquidity as % of GDP
Average (1990-91 to 1994-95)	70.79	58.77	12.02	16.98	0.93
Average (1995-96 to 1999-00)	126.60	99.21	27.39	21.64	1.36
2000-01	188.75	144.13	44.62	23.64	1.76
2001-02	228.28	162.41	65.87	28.85	2.41
2002-03	266.56	186.85	79.71	29.90	2.65
2003-04	286.90	169.36	117.54	40.97	3.53
2004-05	305.71	196.29	109.42	35.79	2.95
Average (2000-01 to 2004-05)	255.24	171.80	83.43	32.69	2.72
2005-06	351.47	255.56	95.91	27.29	2.30

Source: Prepared by the author on the basis of Ahmed and Islam (2006).

Note: Yearly figures are as of end-June.

Table 6: Yarn and Cloth Production: Public versus Private Sector						
Fiscal year	Yarn production (million Kg.)			Cloth production (million meter)		
	Public sector	Private sector	Total	Public sector	Private sector	Total
1993-94	18.23	121.91	140.14	12.73	1035.27	1048.00
1994-95	18.13	135.24	153.37	4.65	1130.35	1135.00
1995-96	15.90	157.01	172.91	2.79	1262.43	1265.22
1996-97	7.39	186.76	194.15	0.78	1324.23	1325.01
1997-98	8.64	204.81	213.45	0.17	1394.83	1395.00
1998-99	10.02	186.76	228.84	-	1451.00	1451.00
1999-00	13.12	204.81	251.46	-	1630.00	1630.00
2000-01	15.81	186.76	271.57	-	1845.00	1845.00
2001-02	15.39	204.81	298.50	-	2050.00	2050.00
2002-03	9.35	330.65	340.00	-	2200.00	2200.00
2003-04	9.70	370.30	380.00	-	2750.00	2750.00
2004-05*	9.48	440.52	450.00	-	3100.00	3100.00

Source: Bangladesh Economic Review (2006). * provisional

A careful look into factors catalyzing the public borrowing-crowding-out nexus leads to the following arguments.

6.1. Excess liquidity in the banking system: As mentioned earlier, crowding-out effect of public borrowing arises due mainly to the fund scarcity in the system. The banking system of Bangladesh has long been characterized by substantial amount of excess

liquidity. Table 5 portrays excess liquidity scenario in the banking system over the last 16 years. Excess liquidity as a percentage of total liquid asset and GDP is seen to be significant every year. It is quite reasonable to view this steady overflow of liquidity as an endorsement of the fact that fund crisis channel of crowding-out effect does not work in Bangladesh. In other words, public borrowing from domestic sources other than Bangladesh Bank does not appear to exert any deterring impact on private investment by creating or exacerbating a fund crisis.

6.2. Private sector encounters only benign competition from the public sector: Pursuant to a private sector development policy, Bangladesh government took gradual steps to denationalize a large part of the economy since late 70s onward. This effort began to receive huge momentum during the 90s following the adoption of Structural Adjustment Program (SAP) under the auspices of the World Bank and the IMF in the 80s (Rahman and Tipu, ---).[19] The economy's movement towards a market based structure is still continuing. Due to such a market oriented approach to industrialization, no perceptible competition on the part of the public sector on the private investment is observed during the period under study. It is, indeed, not deniable that private goods are produced by several state owned enterprises (SOEs); and the SOEs often resort to borrowing for operating their businesses. For example, private sector is yet to invest in the production of sugar, paper, newsprint, fertilizer etc. Consequently, it is futile to say that public borrowing undertaken for public production of such goods gives rise to any crowding-out of private investment. Public production of other goods such as cosmetics, transport services, yarn, cloth etc., which are produced in the private sector as well, is also believed to exert only a minimal competition upon the private sector because public production of these goods is insignificant as compared to the national demand for these goods. Table 6 illustrates a token evidence of narrow competition offered by SOEs in the textile sector. Public sector production of yarn and cloth seems to have steadily declined to a negligible

[19] "*Structural adjustment* is a term used to describe the policy changes implemented by the International Monetary Fund (IMF) and the World Bank (the Bretton Woods Institutions) in developing countries. ……Through conditionalities, *Structural Adjustment Programs* generally implement free market programs and policy. These programs include internal changes (notably privatization and deregulation) as well as external ones, especially the reduction of trade barriers. The policy changes are insured by a variety of loan distribution programs, and progress monitoring by the lender during the life of the loan." (Wikipedia 2007).

status *vis-à-vis* private sector production, thus creating virtually no crowding-out effect associated with competition.

Table 7: Trends in Debt-GDP Ratio for Some Selected Asian Countries (%)				
Year	Bangladesh	India	Pakistan	Sri Lanka
1993	54.23	53.71	79.43	96.80
1994	57.37	55.63	-	94.86
1995	55.68	53.18	-	94.65
1996	49.68	51.03	-	92.34
1997	48.67	49.38	-	85.82
1998	45.66	51.12	79.08	90.84
1999	46.68	51.22	-	95.06
2000	50.51	52.72	74.67	96.90
2001	50.43	55.92	-	103.20
2002	53.85	60.14	-	105.54
2003	52.47	63.30	59.88	105.83
2004	52.26	62.92	67.90	98.82
2005	50.88	64.22	54.30	98.50
2006	50.86	62.17	55.00	90.60

Source: Islam and Biswas (2006) and various issues of The World Factbook.

Note: i) Data for Bangladesh are as of end June. ii) The2006 figure for Bangladesh differs from that mentioned in the introductory section due to use of different sources.

6.3. Public borrowing is still at a sustainable level: Although borrowing from BB has risen in the recent past, the overall debt scenario of the Bangladesh public sector is still better than many of the neighbouring countries. As observed in the Table 7, while the outstanding debt-GDP ratio of Bangladesh remained stable around 50 percent over the past decade, that of Sri Lanka ranged from 85.82 to 105.83 followed by Pakistan and India ranging from 54.3 to 79.43 and 49.38 to 64.22 respectively. The debt-GDP ratio in Bangladesh has been found empirically sustainable by Islam and Biswas (2006).[20] Despite the prevalence of default behaviour on the part of SOEs, as a whole Bangladesh has earned good creditworthiness by virtue of the decent record of regularity in debt servicing.[21] Moreover, public borrowing from scheduled banks, NBDC and general public has been found to be neither alarmingly large nor prompted by any economic

[20] They concluded that "though there has been some volatility in debt dynamics during the whole sample period, explosive debt dynamics (EDD) coefficient during last three years indicate that debt dynamics was convergent. Considering all factors of recent debt-dynamics, it seems that debt-GDP ratio is sustainable."

[21] No coercive or repudiative attitude is evident in the public debt history of Bangladesh. Domestically, government debt instruments have been known for its timeliness in repayment. Internationally, Bangladesh has built a clean image among lender agencies and thus been frequently praised by them.

catastrophe having far reaching contagion effects.[22] Given these perspectives, there is hardly any reason why private investors would be concerned in their decision-making process with respect to public borrowing. The absence of such concern in the minds of private investors partly explains the nonappearance of the crowding-out effect in Bangladesh.

On the other hand, the observed crowding-in effect may be interpreted from the following angles:

6.4. Transfer and subsidy programs of the government: A good chunk of money from the government exchequer is spent each year as transfer payments for promoting private sector investment and agricultural sector and elevating the living standard of the relatively poorer segment of the society.[23] According to official statistics, roughly BDT 117 billion was spent as subsidy and other transfer payments in FY06.

Private investment in particular areas enjoys tax exemption for 5 to 7 years. The exempted period is 15 years for power generation companies. Some selected agro-based industries are allowed to receive interest rate subsidy under Equity and Entrepreneurship Fund (EEF) arrangement. The same facility is allowed for farmers under agricultural credit arrangement. Farmers are also getting subsidy in the form of reduced price of agricultural inputs. Most attractive facilities are rationed for export oriented industries. Cash incentives ranging from 5 to 30 percent are offered. Apart from cash incentives other facilities in the form of income tax exemption, tax holiday, duty-draw-back, duty free import and exemption of insurance premium are also given for those industries. On the consumption side, a significant amount of government fund flows routinely towards the hands of poor people as relief.

The significance of transfer program is presented in the Table 8. A closer look at the table suggests that about one fourth of revenue expenditure is allocated for subsidy and other transfer payments (SOTP). It can, however, be inferred that private investment is induced

[22] See Table 1.

[23] Transfer payments are the payments (generally from government) made to people without anything being rendered in exchange by the recipients. Pension for aged people, allowance for widows, allowance for insolvent freedom fighters etc. are typical examples of transfer payments in Bangladesh.

directly by SOTP to the industrial sector (including agro-based industries) and indirectly by the same to poor people through the consumption channel (SOTP? consumption demand? investment demand? private investment?). Obviously, the fund government uses for SOTP purpose has important bearing on its borrowing decisions. It is, thus, logical to relate domestic public borrowing from sources other than Bangladesh Bank to the enhanced investment in the private sector resulting from SOTP.

Table 8: Government Expenditure on Subsidy and Other Transfer Payment Programs (SOTP)

Fiscal year	SOTP in billion BDT	SOTP as % of revenue expenditure	Fiscal year	SOTP in billion BDT	SOTP as % of revenue expenditure
1990-91	23.92	32.72	1998-99	48.50	28.93
1991-92	22.48	28.46	1999-00	48.46	26.27
1992-93	22.31	26.22	2000-01	55.78	27.00
1993-94	23.31	25.48	2001-02	59.15	26.07
1994-95	27.28	26.49	2002-03	70.84	27.99
1995-96	31.78	26.90	2003-04	81.86	28.83
1996-97	34.80	27.76	2004-05	104.37	31.32
1997-98	38.29	26.41	2005-06	117.05	31.35

Source: Prepared by the author on the basis of data from Bangladesh Economic Review 2006.

Table 9: ADP Expenditure on Sectors Directly Complementing Private Sector (in billion BDT)

	Sectors	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06*
(a)	Water resources	8.77	10.66	9.83	7.60	7.33	6.79	9.13	11.12
(b)	Electricity	14.97	19.95	19.72	17.00	23.52	29.03	31.88	31.20
(c)	Oil, gas and natural resources	5.84	6.58	4.00	4.31	6.85	8.59	8.45	10.00
(d)	Transport	22.45	26.90	32.99	28.00	29.12	30.34	30.31	30.40
(e)	Communication	3.44	4.79	4.58	8.59	6.21	3.74	10.50	7.36
(f)	Industry	0.98	2.56	5.41	2.66	1.95	4.61	5.11	4.46
(g)	Physical infrastructure, water supply and housing	6.70	10.83	12.12	9.31	9.60	9.74	13.60	12.96
(h)	**Total (a+--+g)**	***63.15***	***82.27***	***88.65***	***77.47***	***84.58***	***92.84***	***108.98***	***107.50***
(i)	**Total ADP**	***125.09***	***154.71***	***162.40***	***140.90***	***154.34***	***168.17***	***187.70***	***245.00***
(j)	**(h) as % of total ADP**	***50.48***	***53.18***	***54.59***	***54.98***	***54.80***	***55.21***	***58.06***	***43.88***

Source: Prepared by the author on the basis of data from Bangladesh Economic Review 2006.

** Figures for FY06 are provisional estimates.*

6.5. Development expenditure: In general, revenue budget shows a surplus balance. The overall budgetary balance becomes negative due to the Annual Development Program (ADP) component of the budget. The government has to borrow to finance that part of

ADP which is not covered by surplus revenue balance. Thus, public borrowing may be thought to be linked with development expenditures. It is important to note that by definition most outcome of ADP expenditure, by means of positive externalities, would be seen as complementary to the private economic activities. Some of the sectors under ADP such as water resources, electricity, oil and gas etc. make for direct and significant external economies. As projected in Table 9, around half of the ADP budget is engaged in producing those goods and services which are postulated to directly stimulate private investment. Thus considering the structure of development expenditure and associated government borrowing it may be summed up that the crowding-in is a natural consequence of public borrowing.

6.6. Government microcredit program: Alongside the SOTP and development expenditure, Bangladesh government is reported to disburse a substantial amount of microcredit every year through its different ministries and other organizations. Available statistics suggests that about BDT 10 billion out of government fund was disbursed as microcredit in the last fiscal year (BB 2006). Such microcredit programs of the government, which have bearing on public borrowing, also contribute to the crowding-in effect as recipients of microcredit add to mainly private investment from their borrowed funds.

6.7. ADP-black money linkage: One explanation of crowding-in effect in Bangladesh may proceed as follows: If in a system of 'public expenditure', a sizeable fraction of funds are not spent on the provision of public projects but are instead pumped back into the private sector by the contractors, politicians, bureaucrats and others who conspire to fraud the public, black-money based underground economy has every likelihood to be fortified.[24] Excess billing for services provided by contractors is believed to be a major conduit for such leakages of funds. The diversion of allocated expenditure (financed say by public borrowing) to personal use mainly by the recipient of ADP contracts form the

[24] According to NBR source, the amount of black-money legalized in FY06 under the government declared whitening program was to the tune of BDT 46.03 billion. Although there is no credible estimate of black money, some financial analysts opine that the black money amounted to roughly BDT 700 billion in 2004, up by BDT 100 billion from the previous year, while others guesstimated it to be as high as 40 to 50 percent of the formal economy. However, some extreme estimates suggest that it is almost equivalent to the formal economy (The Daily Financial Express, 22 April 2007 issue).

basis of additional spending in the domestic economy into consumption or, of course, investment, especially in the construction sector. As argued frequently by knowledgeable persons and printing media, the above mentioned situation is inherent in Bangladesh economy.

Possible corruption via misappropriation of ADP funds is also argued to lead to greater private investment in selected area, and hence, again supportive of the crowding-in argument. However, just because public expenditure has positive externalities for the private economy, does not imply that these expenditures are at the optimal level or that the public expenditure programs are efficiently run.

7. Summary and Conclusion

The study has been conducted with a view to examining the presence of crowding-out effect of public borrowing on the private investment in the Bangladesh economy. To accomplish the task, a model for investment function has been specified and estimated considering public borrowing, GDP and interest rate as independent variables. A long-run relationship has been estimated and analyzed by performing unit root test, co-integration test and an error correction model. The main findings of the study confirm with statistical significance that there is no crowding-out effect in Bangladesh, rather, the crowding-in effect is evident. This result is indeed somewhat paradoxical in terms of conventional wisdom. The study has attempted to offer a rationale for this seemingly paradoxical finding from a macroeconomic point of view. In doing so, it has analyzed a couple of macroeconomic issues and ended up with the conclusion that the presence of crowding-in instead of crowding-out effect can be attributed to such factors as excess liquidity in the banking system, imperceptible government competition with the private sector, relatively sustainable public debt scenario, government expenditure for transfer payment program, significant development expenditure for producing those goods and services which has the potential to discharge positive externalities, government microcredit programs and ADP-black money linkages.

The results of the study have important implications for the fiscal management. Existence of excess liquidity and possibility of crowding-in effect together put the fiscal authority

in a position to foster private investment and hence economic growth through expanding borrowing backed public expenditure. However, the overall criteria that public expenditure authority ought to ensure is the transparency and efficiency in its programs. Moreover, government can avoid unnecessary inflation and external indebtedness by reducing reliance for funds on Bangladesh Bank and foreign sources as long as excess liquidity in the banking system prevails.

In view of the perceived limitations inherent in this study, the following aspects may be taken up by future researchers:

- Decomposing private investment by category and taking each of them as separate dependant variable;
- Segregating borrowing by government itself and borrowing by other public sector corporations, and considering them as separate explanatory variables;
- Splitting public borrowing by sources (not only banks, NBDC or general public but also Bangladesh Bank and external sources) and taking all of them as explanatory variables;
- Incorporating a dummy variable for capturing the issue of economic reform and structural variation between after and before 1990 periods; and
- Finally, if possible, carrying on the whole study on the basis of quarterly data to make the analytical framework parsimonious.

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