Crowding Out Effect of Public Borrowing: A Case of Pakistan

Khan, Rana Ejaz Ali and Gill, Abid Rashid

The Islamia University of Bahawalpur. Pakistan

January 2009

Crowding Out Effect of Public Borrowing: A Case of Pakistan

Rana Ejaz Ali Khan
Assistant Professor, Department of Economics,
The Islamia University of Bahawalpur. (Pakistan)
Ph: +92 062 92554546 ext:433
Cell: +92 0345 8724744
e-mail: ranaejazalikhan@iub.edu.pk
and
Abid Rashid Gill
Lecturer, Department of Economics,
The Islamia University of Bahawalpur. (Pakistan)
Ph: +92 062 92554546 ext:433
Cel: +92 0301 4126963 E-mail:
e-mail: abeepk@yahoo.com

The paper was presented in 8th National Research Conference on Management and Computer Sciences. 29th January 2009 at Szabist Islamabad, Pakistan

Crowding Out Effect of Public Borrowing: A Case of Pakistan

Abstract: To meet the public deficit, Government of Pakistan has been disproportionately borrowing from the scheduled banks and general public which are also the source of funding for private investment. Even the public sector corporations are doing the same. From the crowding out perspective borrowing and public expenditure are the same, as borrowing is mainly undertaken for financing expenditures. The issue of crowding out or crowding in effect of public borrowing on private investment needs considerable attention. The current study has investigated the crowding-out effect of public borrowing on private investment in the country. An investment function of three independent variables, i.e. public borrowing, GDP and lending rate has been estimated through unit root test, co-integration test and vector error correction model. The time series data of 34 years, i.e. fiscal year of 1971-72 to 2005-06, taken from Federal Bureau of Statistics and Finance Division, Government of Pakistan has been used. The results do not corroborate the crowding-out hypothesis in Pakistan explaining the market imperfections and substantial amount of excess liquidity. The results provide the evidence of crowding-in effect, which explains the direction of public expenditures towards private sector through contractors, politicians and bureaucrats, instead of public projects. The provision of subsidy, transfer payments, and substantial amount of micro-credit also explain the phenomenon of crowding-in. The evidence has important implications for fiscal management. To avoid unnecessary inflation and external indebtedness associated with deficit financing, government should rely on domestic sources. As long as excess liquidity prevails in financial system, the domestic resources, other than State Bank of Pakistan may be used to meet the deficit without hurting private investment.

JEL Classification: G28, H2, E22, E4, E51.
Key Words: Public Borrowing; Private Investment; Interest Rate; Subsidies; Transfer Payments;

1. Introduction

Due to narrow tax base the economy of Pakistan has been facing poor growth of revenue for a number of decades, which in turn forces the government to rely on continuous borrowing both from internal and external sources to finance the budgetary deficit. Along with it public sector corporations, owing to relatively weak financial position, also borrow from different sources. Due to recurrent borrowing, economy is burdened with public debt. For instance, in the fiscal years of 2004-05 to 2007-08 the borrowing from bank for financing fiscal deficit remained Rs.71, Rs.102, Rs.81 and Rs.464 billion respectively (FBS 2008 Pakistan Economic Survey). In first month of fiscal year 2008-09 the government's borrowing for budgetary support increased to Rs.58.24 billion depicting an increase of 40.95 percent compared to borrowing of last fiscal year.

Economists believe that expansionary fiscal policy may dilute the effects of tight monetary policy formulated for capping inflation. Furthermore, a loose fiscal policy may crowd-out private investment in the economy. Currently, in Pakistan, inflation is touching a record high affecting not only the macroeconomic indicators but also disturbing severely the social life of poor community. Although the loose fiscal policy may crowd-out private investment, but public spending may help in developing infrastructure for encouraging private investment. However, if surge in the government spending is not accompanied by increase in government revenue and proportionate change in real GDP, it may create public debt and inflation. Moreover, the higher public spending may put upward pressure on the interest rates and discourage private investment.

In the case of Pakistan, government borrowing State Bank of Pakistan (SBP) and commercial banks is increasing to alarming level. If government remains unable to attract external inflows in the presence of low remittances, and decrease in privatization proceeds, the borrowing volume could balloon to unbearable level that could affect the government's efforts to contain the inflationary pressure and bring down the poverty level in the country. The SBP has advised the government to reduce the dependence on bank borrowing especially on SBP in order to control inflation and support the monetary policy. According to the bank, the excessive borrowing is increasing inflationary pressure in economy by increased circulation of money in economy.

In the economic literature, besides the inflation effect of pubic borrowing, the issue of crowding-out or crowding-in effect on private investment by public investment has received considerable attention. For developing countries, a number of empirical studies (see Atukeren 2005; Rashid 2005; Erden and Holcombe 2006) have examined the long run stable association between public and private investment. The public sector has long been accused of indulging in excessive borrowing from domestic sources and thus stifling growth. For Pakistan, it deserves serious attention in the scenario of country's efforts to get higher economic growth rate. The current study is an attempt to empirically analyze the crowding-out effect of public borrowing on private investment to give some policy proposals to public sector authorities.

The study is arranged is as follows: in the second section, the existing empirical literature on crowding-out hypothesis, particularly relevant to Pakistan is reviewed. The third section summarizes theoretical framework. In the fourth section, multivariate time series techniques essential for estimating the model are discussed. The fifth section comprised of empirical results and discussion. Finally, in the sixth section conclusion and policy recommendations are outlined.

2. Literature Review

From the crowding-out perspective public expenditure and public borrowing are two sides of the same coin as borrowing by public sector is mainly undertaken for financing the expenditures. There is a large body of literature on crowding-out effect of public investment on private investment, for different economies, even for different sectors of an economy (see Looney 1995 for manufacturing sector in Pakistan; Saeed and Ali 2006 for sector wise effect in Pakistan; Rossiter 2002 for investment in equipment and structure in USA; Cumbers and Birch 2006 for biotechnology industry of Scotland), and even real and financial crowding-out (Chakraborty 2006 for India) however studies directly relating public borrowing to the crowding-out effect could not be traced out except Majumder (2007 for Bangladesh). There are mixed evidences of crowding-out and crowding-in effect of public investment in developing countries (Atukeren 2005). Empirical evidences have shown that for the developed and developing economies, the effect may be opposite (see Erden and Holcombe 2005). To see the studies for purpose of review, it would be better to take the countries which are more or less similar to Pakistan in economic structure and stage of development. The studies of dissimilar economies are also included to see the econometric technique. In the earlier studies, Erenburg (1993) has investigated the relationship between public capital and private investment decision for the short and long-run using the models for accelerator-cash flow, neoclassical and securities valuation cash flow. The results have shown that public capital stock and government investment spending yields a statistically significant direct relationship between private investment and public capital stock and an inverse relationship with government spending in the short and long-run.

Looney (1995) had explored the effect of public sector crowding-out on pattern of private capital formation for manufacturing sector in Pakistan. The study estimated that financial crowding-out of private investment had a distinct possibility in large manufacturing sector, but it is not a simple and straightforward process. The results suggested that in the large manufacturing sector, the private investment has not suffered from real crowding-out associated with the government's non-infrastructural investment program. Neither real nor financial crowding-out occurred in other areas of private investment. For Fiji, Jayaraman (1998) explained that although government investment in dominant public sector has crowding-out effect on private sector investment but no robust inference can be drawn as the level of significance is rather low. However, Looney and Fredericken (1997) estimated the relationship between public and private sector investment in Pakistan and confirmed the positive relationship between public and private sector investment.

Hyder (2001) for Pakistan tested the crowding-out hypothesis using vector error-correction framework on gross domestic product, public investment and private investment. The results confirmed the complementary relationship between public and private investment (see also Looney 1999 for Pakistan). By using co-integration VAR, Naqvi (2002) examined the relationship between the economic growth, public investment and private investment for Pakistan. The paper provided evidence that past government investment has had a positive impact on private investment. It further evidenced that growth in the economy generates both public and private investment.

For a middle income country, Turkey Akkina and Celebi (2002) have analyzed the impact of government policy on private fixed investment spending and supported the accelerator principle and crowding-out hypothesis. The study concluded that public sector total fixed investment has a quantitatively large and negative effect on private fixed investment. For the USA, Rossiter (2002) concluded that public investment in equipment crowded-out private investment, while public investment in structures had a weak crowding-in effect.

The studies have shown different results possibly due to different economic structures an level of development of the countries, the different time period included in the analysis by researchers or econometric techniques. To some extent comparison of results remains impossible. For developing countries the study by Atukeren (2005) has dismantled the factors behind differences in the results of different studies by investigating crowding-out effect on private investment in 25 developing countries by using co-integration analysis and Granger-Causality test for the time period 1970 to 2000. The study identified that both crowding-in and crowding-out effects of public investment occurred in developing countries. By using probit model, the study explained that 10 out of 11 cases of crowding-out and 13 out of 14 cases of no crowding-out have common factors. Overall for all the countries, the economic freedom index did not explain the phenomenon of crowding-out, but size of government, monetary policy and international exchange or trade openness had explained crowding-out process.

Erden and Holcombe (2006) have also attempted the developing countries for the short and long-run estimation of public or private investment on economic activity. The study analyzed 19 developing countries using a panel data-set from 1980 to 1997. It derived a reduced form neoclassical model of private investment that allows the estimation of both short and long-run determinants of investment. The model also incorporates a measure of macroeconomic uncertainty which can affect private investment. The empirical results show that public

investment is complementary to private investment in the long-run as well as short-run. The impact of public investment remained double in long-run as compared to shot-run. The study also concluded that the interest rate has no statistically significant impact on the level of investment, but credit availability has positive effect on private sector investment.

Another study by Erden and Holcombe (2005) explained the differences of results of crowding-out effect in developing and developed countries by estimating the determinants of private investment with a focus on the role of public investment. The study constructed an empirical framework centered on the flexible accelerator model of private investment and applied it to developing and developed countries to see the differences in their investment behavior. This study concluded that public investment complements or crowds-in private investment in developing countries. The results also indicated that private investment is constrained by lesser availability of bank credit in developing economies. To enjoy the same level of prosperity, not only more investment is required but capital markets must be developed to allow the market allocation of private investment in developing economies. In developed economies, public investment crowds-out private investment in contrast to developing economies.

In the recent literature, a study by Spector (2005) is different from most papers concerning the crowding-out or Ricardian equivalence controversy. The study attempted to resolve the controversy by demonstrating that a typical reduced form equation might stem from more than one model. It further demonstrated that the information obtained from the estimation of a reduced form equation might yield different results depending on the underlying model that is being estimated. For example, in the crowding-in model, Ricardian equivalence and increases in interest rate can co-exist, while in the public contributions model, the case is different. Likewise, the absence of interest rate increases does not assure Ricardian equivalence. Unaffected interest rates imply Ricardian equivalence in the baseline model, but do not in the government constraint model. The study explained how conclusions about crowding-out and Ricardian equivalence depend on the magnitude and the direction of wealth effects, the composition of the government budget, and the impact of government deficit on the marginal efficiency of investment. Cumbers and Birch (2006) evidenced for Scotland that reduction in public expenditure did not lead to greater business investment. The study has taken the biotechnology industry to illustrate the relationship between the public and private sectors. However, it suggested that public spending is important in ensuring that economic wealth is broadly distributed. Chakraborty (2006) analyze the real and financial crowding-out in India using asymmetric vector autoregressive model. It is concluded that there is no evidence of direct crowding-out of private capital formation by public investment. The impact of non-homogeneity of public capital formation on private capital formation is also analyzed through public infrastructure and non-infrastructure investments revealing that the former has complementary relationship with private corporate investment but no evidence of real crowding-out.

Mitra (2006) has investigated the crowding-out effect in India, through the analysis of movements of government investment, private investment and gross domestic product (GDP) in a Structural Vector Auto Regression (SVAR) model. Empirical results suggested that government investment has been crowding-out private investment, though government investment had a positive impact on the economy in the long-run. For example, infrastructure such as roads and power has tremendously supported private sector development. The short-run impact of government investment is found less effective. Majumder (2007) investigated the crowding-out effect of public borrowing on private investment in Bangladesh. The

investment function has been estimated taking public borrowing, GDP and interest rate as independent variables. The long run relationship has been estimated by doing unit root test, co-integration test and an error correction model. The results did not corroborate the crowding-out hypothesis, rather provided the evidence of crowding-in effect. In terms of conventional wisdom, the results are somewhat paradoxical.

For Pakistan, Rashid' study (2005) is different from the previous studies in econometric techniques. The study used Impulse Response Function (IRF) Variance Decompositions (VDC) and Multivariate Co-integration Approach to examine the relationship between public and private investment. The endogenous variables were fixed public and private investment while exogenous variables were market rate of interest and change in output. VDC estimates were unexpectedly low and coefficients failed to give information about direction of the response of variables to certain shocks. IRF results indicated the positive response of private investment to changes in public investment. The result explained that in the long-run public investment crowds-in private investment.

Saeed and Ali's (2006) study is also unique in the sense that it estimated the impact of public investment on private investment in agriculture and manufacturing sector, and in overall economy. An unrestricted structural VAR model using the specification of production function was estimated. The study concluded that increase in public investment encourages private investment in agriculture sector, i.e. crowding-in and it discourage private investment in manufacturing sector, i.e. crowding-out. For overall economy there exists no significant impact of public investment on private investment.

From the literature, it may be perceived that the impact of public expenditure on private investment varies from country to country depending on the socio-economic and political setup. It also varies for different sectors and industries of the economies. In the case of Pakistan crowding-out effect of public borrowing is still unexplained and that is the core of our study.

3. Theoretical Foundation of Crowding-out Effect

The issue of crowding-out has remained a much debated topic in macroeconomics. We are concerned with theoretical foundation to analyze the crowding-out effect of public borrowing on private investment. In the classical view public borrowing authority accumulates resources for its own use leaving private sector with lesser part. The phenomenon is popularly termed as crowding-out of private investment (Majumder 2007). In the monetarist view, the expansion in the government expenditures after a relatively short transition period, displace or crowd-out an equivalent magnitude of private expenditures. The bulk of the impact is alleged to fall on investment by firms in plant and equipment. Firms compete against the government in the bond's markets for a limited quantity of funds. The increase in government expenditures in the absence of any change in the money supply raises output, income and the transaction demand for money. Given a constant money supply, the increase in the transaction demand for money and increase in supply of debt in the market push interest rate upward. The increase in interest rate chokes back business firms spendings on plant and equipment, housing construction, purchases of consumer durables, and perhaps even some state and local government expenditures. The net implication of the crowding-out hypothesis is that expansion in the federal government sector inevitably comes at the expense of the private sector of the economy, unless the money supply is expanded during the process (Thomas 2000).

The Keynesian view, on the other hand, assumes that if there is unemployment in the economy and interest rate sensitivity of investment is low, the expansionary fiscal policy will lead to little or no increase in the interest rate and increase output and income. In addition it assumes that government spending increases private investment due to positive effect of government spending on the expectations of the investors. Therefore, there is crowding-in rather than crowding-out. Keynesians agree with monetarists on the crowding-out hypothesis only when the economy is operating at the full-employment level. The neoclassical view assumes full employment and advocates competitive markets against government interventions. The neoclassical loanable funds theory explains that the balancing of savings and investment will be solved by the interest rate mechanism. The malfunctioning or slow operations of this mechanism are attributed to the short-term variations in employment and output. In case of an increase in government spending, interest rate has to increase to bring the capital market into equilibrium and crowd-out private investment.

Theoretically when government expands it's borrowing to finance increased expenditure, or cuts taxes (i.e. it is engaged in deficit spending) it crowds-out private sector investment by higher interest rate. As concerns the controversy in modern macroeconomics on the subject, it is due to disagreements about how financial markets would react to expanded government borrowing. If increased borrowing leads to higher interest rates by creating a greater demand for money and loanable funds and hence a higher price (ceteris paribus), the private sector, which is sensitive to interest rates will likely reduce investment due to lower rate of return. That is the investment is crowded-out. However, the fixed investment and other interest-sensitive expenditures have impacts by varying extents due to expansionary effect of government deficits. A fall in fixed investment by business can hurt long-term economic growth of the supply side, i.e. the growth of potential output. This crowding-out effect is moderated by the fact that government spending expands the market for private sector products through the multiplier and thus stimulates fixed investment (via the accelerator effect) or crowds-in. This accelerator effect becomes more important when business suffers from unused industrial capacity during serious recession or depression. Crowding-out can be avoided if the deficit is financed by simply printing money, but it carries concerns of accelerating inflation.

Crowding-out of another sort that is referred as international crowding-out may occur due to the prevalence of floating exchange rates, as demonstrated by the Mundell Fleming model. Government borrowing leads to higher interest rates, which attract inflows of money on the capital account from foreign financial markets. Under floating exchange rates, it leads to appreciation of the exchange rate and crowding-out of domestic exports. It counteracts the demand-promoting effects of government deficits but has no negative effect on long-term economic growth.

Crowding-out may have a serious situation in an economy when the economy is at potential output. In this situation the government's expansionary fiscal policy encourages increased prices leading to an increased demand for money. This in turn leads to higher interest rates (*ceteris paribus*) and crowds-out interest-sensitive spending. At potential output businesses need no more markets, so that there remains no room for an accelerator effect. More directly, if the economy is at full employment gross domestic product, any increase in government purchases shifts resources away from the private sector. The phenomenon is sometimes called real crowding-out. The negative effects of such type of crowding-out on long-term economic growth can be moderated if the government uses its deficit to finance productive investment in education, training, health and research.

4. Model Specifications and Data Description

The theoretical framework has enabled us to understand the relationship between private investment, and public borrowing, GDP and interest rate. It may be expressed in the function.

$$PI = f(PB, GDP, IR) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where
PI = Private investment
PB = Public borrowing
GDP = Gross domestic product
IR = Interest rate

The variables in the function may be defined as: private investment means investment made by private entrepreneurs, no matter whether they are local or from abroad. Public borrowing refers to part of total borrowing that is by public authorities from other than central bank. In other words public borrowing figures show how much money is siphoned off from the funds available for potential private use. GDP conveys its usual meanings 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 influence of inflation, data for all variables except interest rate are taken in real terms. For analytical convenience variables namely real private investment, real public borrowing, real GDP and nominal interest rate are taken in log level. The model has the form:

$$LRPI = f(LRPB, LRGDP, LIR) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

The labels LRPI, LRPB, LRGDP and LIR are used to denote respectively log of real private investment, log of real public borrowing, log of real GDP and log of nominal interest rate.

We have used the annual data rather than monthly or quarterly, for 34 years spanning 1971-72 to 2005-06. The data has been taken from Fifty Years of Pakistan by Federal Bureau of Statistics (FBS 1999) and Pakistan Economic Survey by FBS (various issues).

Most of the macroeconomic time series are non-stationary. If a series is non-stationary in a regression, then all the regression results suffer from spurious regression problem. To avoid this problem, it has now become a standard practice to begin the analysis with prior determination of unvaried properties of the time series. If the series follow the same order of integration, then there can be a meaningful long-run relationship among them which can be explored by identifying a combination of the non-stationary series that gives a stationary combination through co-integration techniques. Testing for co-integration involves two steps. In the first stage time series are tested for the presence of unit roots or non-statoinarity. In the second stage, co-integration test is performed to identify the existence of a long-run relationship. For our data, to test the stationary properties of the series the standard Augmented Dickey-Fuller (ADF) test has been applied. The general Augmented Dickey-Fuller equation is:

$$\Delta X_t = \alpha + \delta X_t\text{-}1 + \sum_{j=2}^{q} \delta_j \Delta X_{t-j} + \epsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Augmented Dickey Fuller (ADF) test is carried out to test for the stationarity of the variables. In implementing ADF unit root test, each variable is regressed on a constant. To test the

presence of co-integration among the variables, procedure developed by Johansen (1988, 1991), Johansen and Juselius (1990) is used. The purpose of co-integration test is to determine whether a group of non-stationary series is co-integrated or not. The method comprised of maximum likelihood procedure for the estimation and determination of the presence of co-integration. In our study Johansen co-integration test is used with a view to estimating the long-run impact of public borrowing on private investment. The vector error correction method is 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.

5. Results and Discussion

As a prerequisite for the co-integration test, stationary property of the relevant variables has been verified by performing Augmented Dickey-Fuller (ADF) test (see Hyder 2001). Results of ADF test are presented in table 1.

Table 1: Unit root Test Result

Test	Trend assumption	Level/difference	LRGDP	LIR	LRPB	LRPI
ADF	Constant	Level	-2.168	-2.029	-1.784	0.743
		Difference	-15.334	-3.108	-5.733	-5.987

The ADF results suggested that a 5 percent level of significance for LRGDP, LIR, LRPB and LRPI have been found to be non-stationary in level form and integrated of order one i.e. I(1). The 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 variable LRGDP, LRPB and LIR. In this regard first step is to choose a specific lag length. The SC criteria determined two lag length for the model.

The results of Johansen co-integration test are shown in table-2. Both the Trace and Eigen statistics indicate that there is one co-integration vector between LRPI, LRGDP, LRPB and LIR at 5 percent levels of significance. It may be claimed that there is a long-run relationship between real private investment, real GDP, real public borrowing and interest rate.

Table 2: Johansen Co-integration Test Results

Hypothesized No. of CE(s)	Trace Statistic	Eigen Value	0.05 Critical Value
None*	52.128	0.634	47.856
At most 1	19.928	0.313	29.797
At most 2	7.917	0.218	15.494
At most 3	0.026	0.000	3.841

Trace test indicates 1 co-integrating equation (s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

Johansen co-integration method provides a relationship between long-run real private investment and explanatory variables like real GDP, real public borrowing and interest rate. It is presented in equation 4. The GDP and public borrowing seem to have statistically significant impact on private investment in the long run, whereas the impact of interest rate on private investment is found to be statistically insignificant. The significant ECM term -0.142315 (t -1.354) implies the short-run adjustment to long equilibrium.

$$LRPI = 5.065 + 0.0989LRPB + 1.477LRGDP - 0.46LIR \quad \ldots\ldots\ldots\ldots\ldots\ldots (4)$$
$$\text{t-values} \qquad (-1.8472) \qquad (-28.8445) \qquad (2.5497)$$

In line with objectives of the study, the interpretation focuses on the coefficient of public borrowing, being positive with statistical significance. It explains two points, firstly, a direct answer to the main query that public borrowing makes crowding-out impact on private investment. It appears an empirical rejection of the hypothesis. Secondly, the existence of crowding-in effect seems evident in the economy. Although the study is essentially concerned with the first point that is, verifying the existence of crowding-out effect, but the latter one signifies the important implications of the crowding-out effect for the economy.

Crowding-out effect of public borrowing arises mainly due to scarcity of funds in the system. The banking system of Pakistan has long been characterized by substantial amount of excess liquidity. 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 the economy. In other words, public borrowing from domestic sources other than State Bank does not appear to exert any deterring impact on private investment by creating fund crisis.

On the other hand the crowding-in effect may be explained in the economic scenario of Pakistan. Every year a good chunk of money from government exchequer is spent as transfer payments for promoting private sector investment, growth of agricultural sector and elevating the living standard of poor community. Private investment in particular areas is enjoying tax exemption. The farmers are availing concession 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. Apart from cash incentives the facilities in the form of income tax exemption, tax holiday, duty-draw-back, duty-free imports and exemption of insurance premium are also available to these industries. On the consumption side, a significant amount of government funds flows routinely towards poor people as relief. It can be inferred that private investment is induced directly by subsidy and transfer payment programs to the industrial sector and indirectly by the same to poor people through the consumption channel. The government funds for subsidy and other transfer payment programs has important bearing on its borrowing decisions. It becomes logical to relate domestic public borrowing from sources other than State Bank of Pakistan to enhance investment in the private sector resulting from subsidy and other transfer payment programs.

In general, revenue budget shows a surplus balance for Pakistan economy. The overall budgetary balance becomes negative due to Annual Development Program of the budget. The government has to borrow to finance that part of Annual Development Program which is not covered by surplus revenue balance. Thus, public borrowing is linked with development expenditures. It is important to note that most outcomes of Annual Development Program expenditures, by means of positive externalities, would be seen as complementary to the private economic activities. Thus considering the structure of development expenditure and associated government borrowing it may be summed up that the crowding-in is a consequence of public borrowing.

Along with subsidies, transfer payments programs and development expenditures, the government disburses a substantial amount of micro-credit every year through ministries and public sector organizations. Such micro-credit programs funded by government, also have bearing on public borrowing and contribute to the crowding-in effect as recipients of micro-credit add to private investment through their borrowed money.

Another explanation of crowding-in effect in the economy may be that in a system where a sizeable fraction of public expenditures are not spent on public projects but are pumped back into the private sector by the contractors, politicians, bureaucrats and those who conspire to fraud the public sector, the underground economy is fortified resultantly the private investment is crowded-in. Excess billing for services provided by contractors is a major conduit for leakages of funds. The diversion of allocated funds (financed by say public borrowing) to personal use mainly by the recipients of Annual Development Program contractors make additional spending in the economy, in the form of consumption or investment, especially in the construction industry.

The corruption through inappropriate use of Annual Development Program funds may also be argued to support crowding-in argument. Although public expenditures have positive externalities for private sector, but it implies that these expenditures are not optimally used and public expenditure programs are in efficiently run.

Crowding-out phenomenon is assumed a part of perfect markets, but in Pakistan markets are imperfect. There are no incentives for private investors to invest in the negligible sectors. It may be concluded that private investment complements are not available in the economy.

6. Conclusion and Recommendations

The study is conducted with a view to examine the presence of crowding-out effect of public borrowing on private investment in Pakistan. 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 error correction model. The main findings of the study confirmed with statistical significance that there is no crowding-out effects in Pakistan, 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 rational 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, relatively sustainable public debt scenario, government expenditures for transfer payment program, significant development expenditure for producing those goods and services which has the potential to discharge positive externalities, government micro-credit program and black money linkages.

The results of study have important implications for 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 are the transparency and efficiency in its programs. In perceived limitations inherent in this study, the following aspects may be taken up by further research:

- Decomposing private investment by category and taking each of them separate dependent variable;
- Segregating borrowing by government and public sector corporations, and considering them as separate explanatory variables;
- Finally, if possible, carrying on the whole study on the basis of quarterly data to make the analytical framework parsimonious.

References

Akkina, K. R. and M. A. Celebi (2002) The Determinants of Private Fixed Investment and the Relationship between Public and Private Capital Accumulation in Turkey. *The Pakistan Development Review* 41(3): 243-254

Atukeren, E. (2005) Interaction between Public and Private Investment: Evidences from Developing Countries, *KYKLOS, 58(3):307-330.*

Chakraborty, L. S. (2006) Fiscal Deficit, Capital Formation, and Crowding-Out: Evidence from India. National Institute of Public Finance and Policy, Working Paper: No.43

Cumbers, A. and Birch (2006) Public Sector Spending and Regional Economic Development: Crowding-Out or Adding Value? Centre for Public Policy for Regions, University of Glasgow.

Erden, L. and R. G. Holcombe (2005) The Effects of Public Investment on Private Investment in Developing Economies. *Public Finance R*eview 33(5): 575-602

Erden, L. and R. G. Holcombe (2006) The Linkage between Public and Private Investment: A Cointegration Analysis of a Panel of Developing Countries. *Eastern Economic Journal 32(3): 479-492*

Erenburg, S. J. (1993) The Relationship between Public and Private Investment. The Jerome Levy Economics Institute of Bard College and Eastern Michigan University, Working Paper: No. 85

FBS (1999) Fifty Years of Pakistan. Federal Bureau of Statistics (FBS), Finance Division, Islamabad.

FBS (various years) Pakistan Economic Survey. Federal Bureau of Statistics (BBS), Finance Division, Islamabad.

Hyder, K. (2001) Crowding-out Hypothesis in a Vector Error Correction Framework: A case study of Pakistan. *The Pakistan Development Review 40(4): 633-650*

Jayaraman, T. K. (1998) Private Investment in Fiji: 1977-1994, Did Government Investment Have any Crowding-out Effect. *South Pacific Study 18(2): 57-67*

Johansen, S. (1988) "Statistical Analysis of Cointegration Vectors", *Journal of Economic Dynamics and Control", 13:231-254.*

Johansen, S. (1991) Estimation and Hypothesis Testing of Cointegration Vector in Guassrion Vector Autoregression Models. *Econometrica, 59:1551-1580.*

Johansen, S. and K. Juselius (1990) Maximum Likelihood Estimation and Inference on Cointegration with Application to the Demand for Money. *Oxford Bulletin of Economics and Statistics, 52:169-210.*

Looney, R. E. (1995) Public Sector Deficits and Private Investment: A Test of the Crowding-out Hypothesis in Pakistan's Manufacturing Industry. *The Pakistan Development Review, 34(3): 277-292*

Looney, R. E. and P. C. Frederiken (1997) Government Investment and Follow-on Private Sector Investment in Pakistan, 1972-1995. *Journal of Economic Development 22(1): 91-100*

Loony, R. E. (1999) Government Investment in Manufacturing: Stimulus or Hindrance to Pakistan's Private Sector? *International Journal of Social Economics 26(4): 521-36*

Majumder, A. M. (2007) Does public Borrowing Crowd-Out Private Investment? The Bangladesh Evidence. Policy Analysis Unit, Working Paper Series: WP 0708

Mitra, P. (2006) Has Government Investment Crowded-Out Private Investment in India?, Available at http://www.aeaweb.org/annual_mtg_papers/2006/0108_1015_0102

Naqvi, N. H. (2002) Crowding-in or Crowding-out? Modelling the Relationship between Public and Private Fixed Capital Formation Using Co-integration Analysis: the Case of Pakistan 1964-2000. *The Pakistan Development Review 41(3): 255-276*

Rashid, A. (2005) Public/Private Investment Linkages: A Multivariate Cointegration Analysis. *The Pakistan Development Review 44(4): 805-817*

Rossiter, R. (2002) Structural Cointegration Analysis of Private and Public Investment. *International Journal of Business and Economics 1(1): 59-67*

Saeed, H. and A. Ali (2006) The Impact of Public Investment on Private Investment: A Disaggregated Analysis. *The Pakistan Development Review 45(4): 639-663*

Spector, L. C. (2005) Macroeconomic Models and the Determination of Crowding-Out. Department of Economics, Ball State University Working Paper: No. 200511

Thomas, Jr. (2000) Money Banking and Economic Activity. Wiley and Sons.