EFFECT OF GOVERNMENT BORROWING ON PRIVATE INVESTMENT IN INDIA

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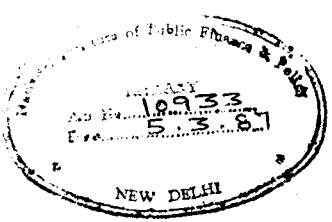

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1. Introduction

The difficulties of raising resources through taxation in an economy like India where the tax-income ratio has already reached very high levels, renders borrowing from the public an important instrument to finance growing expenditure needs.[1/] In India, government resorts to substantial domestic market borrowing to mobilise financial resources for planned economic development. In view of the limited scope for raising the tax rates further, domestic market borrowing has become an important means of resource mobilisation for the growing expenditure needs and, consequently, has grown substantially over the years. During the Sixth Plan (1980-85) the pattern of financing by the Central Government shows that almost 23 per cent of the resources were mobilised through domestic market borrowing whereas during the Fourth and Fifth Plan periods the corresponding percentage was much lower at 14 per cent and 19 per cent respectively (Government of India, 1985,p.7.)

The substantial reliance on market borrowing (hereafter referred to as debt financing) has its effects on private sector investment. Given the total volume of savings in the country, substantial drawal of household

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1/ In India, Government rely largely on indirect taxes and the Tax GDP ratio in the country has steadily increased from 6.5 per cent in 1950-51 to 16.9 per cent in 1984-85 (See Chelliah, 1986).

savings through market borrowing may reduce the available savings for private sector investment. On the other hand, public investments, by creating infrastructural facilities, may indeed create external economies beneficial to private sector growth. Besides, the higher demand arising from increasing investments in the public sector may indeed result in the complementarity of public and private investments.

2. The 'Crowding out' Hypothesis

Conceptually, given the limitations of external borrowing, any excess of government spending over and above its revenue can be financed either by (i) borrowing from the market (debt financing), (ii) borrowing from the central bank (money creation) or (iii) a combination of the two methods. In this context, Friedman argues that debt-financed government spending could lead to a reduction of real income in the economy. This happens because, debt financing entails a "reduction in the physical volume of assets created because of lowered private productive investment" (Friedman, 1972, p. 917). The view that debt financing necessarily entails a reduction in private sector investment is known as the 'crowding out hypothesis'.

In the theoretical formulations, over time, three different concepts of crowding out have emerged (Blinder and Solow, 1973, pp. 320-321). According to the first view, the genesis of which can be traced back to the writings of the Classical economists, in a full employment economy, the government can divert resources only by taking away resources available to the private sector.

Therefore, any method of financing government spending-taxation, debt financing and money creation - would lead to a crowding out effect. The effect, then, is not exclusively associated with debt financing.

The second concept of the crowding out phenomenon, also known as the 'transactions crowding out effect', is associated with the development of Keynesian economics. One of the basic tenets of the Keynesian macro-economic theory is that investment is inversely related to the rate of interest. The debt-financed government spending increases, in the first instance, the level of income in the economy. Since the transactions demand for money is directly related to the level of income, this increase in income leads to an increase in the demand for money. Given the money supply, restoration of equilibrium in the money market calls for an increase in the rate of interest, which, in turn, reduces the private sector investment activity in the economy.

The third concept of the crowding out effect takes into account the 'wealth effect' of government debt, both on private consumption as well as on demand for money. When the wealth effect of government bonds is included in the analysis, the transactions crowding out effect is merely the first-round effect of debt financing on private investment. For, now, the private sector perceives government bonds as private wealth which can produce a 'net wealth effect' on private consumption. The resultant increase in private consumption would give an impetus for private investment activity in the economy. The perceived increase in private wealth on account of government bonds would also increase the demand for money in the private sector.

Given the supply of money, this increase in the demand for money pushes up the interest rate which then further strengthens the initial rise in the interest rate associated with the transactions crowding out effect.

As far as the wealth-effect-induced crowding out is concerned, what is important is the relative strength of the wealth effect operating in the private consumption function and the money demand function. If the wealth effect of debt financing operating through the money demand function is stronger than that of the wealth effect operating in the private consumption function, there would be a crowding out of private investment. Conversely, there would take place a crowding in or an increase in private investment if the relative intensity of the wealth effect of debt finance is stronger on consumption function than on the money demand function. Thus the net result may be either crowding out or crowding in. As stated by Benjamin Friedman (1978, p. 609) "...bond financing of government deficit may either increase or decrease private investment spending. The incorrect but nevertheless currently widespread view that a decrease in investment is the only possible result is due to the failure to consider adequately the publics' portfolio behaviour." These alternative possibilities have, however, given rise to differing viewpoints on the subject. The monetarists hold that debt-financed spending would necessarily crowd out private sector investment while the fiscalists emphasise the crowding in possibility. Basically, the advocates of complete crowding out assume a money demand function which is relatively interest-inelastic so that equilibrium adjustment in the money market requires a considerable increase in interest rate which would

completely crowd out the interest-elastic private investment. On the contrary, the exponents of crowding in assume a money demand function which is perfectly interest-elastic so that the interest changes needed to restore equilibrium in the money market is too small to have any noticeable effect on private invesment (Blinder and Solow, 1973, p. 321).

The very theoretical formulation of the wealth-effect-induced crowding out or crowding in of the debt-financed government spending has been questioned by Barro (1974) in his study of private sector behaviour in response to the issuance of government bonds. His model of private sector behaviour takes that the utility of the present generation depends on the utility of the inheritors. The future tax liabilities implicit in current debt financing is completely perceived by the private sector. Therefore, debt financing seldom induces any net wealth effect either in the private consumption function or in the money demand function; government bonds are absorbed without any real effects in the economy.

3. Empirical Studies

While the theoretical position on the effect of debt financing on private investment activity is clouded in controversy, not very many studies exist to throw empirical light on the issue. Arestis (1972) has touched on the issue by estimating income multipliers associated with different modes of financing government budget deficit for the United Kingdom. He finds that, "Both the financing of increased government expenditure through issuing bonds and through increasing the money supply do not 'crowd-out'

an equivalent amount of private expenditure" (Arestis, 1979, pp. 45-46).

The question of the effect of debt-financed government spending on private investment has been directly addressed in Cebula's study (1978) for the USA and Canada. He estimated a private investment function for the years 1949 to 1976 wherein, the annual changes in the public debt was considered as an explanatory variable. The crowding out hypothesis was interpreted on the basis of the estimated coefficient of the public debt variable. In his estimated equations for both the USA and Canada, the coefficient of the debt variable was negative and statistically significant. On the basis of this result he concluded that: "Apparently, the larger the size of the deficit the greater the degree of crowding-out of private investment" (Cebula, 1978, p. 427).

Ostrosky pointed out a specific statistical problem in the invesment function fitted by Cebula (Ostrosky, 1979). Actually the private investment function estimated by Cebula included a lagged dependent variable as an explanatory variable. In this case, the D-W test is always biased in favour of the null-hypothesis of no autocorrelation. Therefore Ostrosky pointed out the possibility of the autocorrelation in the model being undetected. He estimated a modified version of Cebula's private investment function after dropping the lagged dependent variable and by making use of quarterly data for the period from 1950 to 1975.

His results too corroborated the partial crowding out hypothesis; even though the extent of it as indicated by the coefficient of public debt is reduced in respect of both the USA and Canada.

4. Crowding out in the Indian Context

It is of extreme importance to examine the concept of crowding out relevant to the nature of debt financing in the country. Only then it is possible to outline realistically the mechanism through which such crowding out, or even, for that matter, crowding in, may occur. In what follows, we observe the important characteristics of government borrowing in the country.

The two typical aspects of the government securities market in India are the following. First, direct participation of the private sector in the government securities market is completely absent in the country. The government borrows from a captive market, comprising government-controlled constituents that are statutorily required to invest in government securities. The major constituents are the Reserve Bank of India, commercial banks, the Life Insurance Corporation of India and the various provident funds. Other constituents include the Industrial Finance and State Financial Corporations, Industrial Development Bank of India, Unit Trust of India, Agricultural Refinance and Development Corporation of India, Industrial Credit and Investment Corporation of India, local authorities, various trusts and port trusts. As a matter of fact, the various captive market constituents mobilise savings from the private sector and part of such savings is drawn by government through market borrowing. The second

feature of the government securities market is that their interest rate is decided arbitrarily by the government and the rate is kept at a low level. The underlying rationale is the inevitable expenditures incurred by government on various social and economic overheads which are essential for the development of the country. The rate of return on these investments is far less or even non-existent, compared to the social rate of return on such investments. In view of this, it is considered the social responsibility of the various financial institutions which mobilise private savings in the country to provide the government funds at a cheaper rate.

Because of these characteristics, the crowding out concept of debt financing discussed in economic literature is not of much relevance in the Indian context. Nevertheless, operationally, there are two channels through which debt financing is likely to affect private sector investment in the country. First, public borrowing reduces the savings available for private sector investment and this may have a deterrent effect on private investment in the country. Second, debt-financed government spending may complement private sector investment by augmenting the basic infrastructural facilities essential for private production, and also by generating demand for private sector products by heavy industries, which attract large amounts of government investment. (Patnaik and Rao, 1977)

5. Empirical Study in the Indian Context

In the present study we highlight empirically the effect of debt financing on private investment through the two channels described above, namely, the availability of

savings and the complementary character of debt-financed government spending. In this regard, mention needs to be made of the study by Sundararajan and Thakur (1980) who tested empirically the effect of government investment on private sector investment in the two economies of India and Korea. Their finding renders support to the phenomenon of public investment crowding out private investment in the economy. However, Rangarajan's (1982) investigation leads him to conclude that in the case of private investment the positive (stimulation) and negative (crowding out) effects almost cancel each other out, whereas in the case of private corporate investment the positive effect seems to dominate the negative. Thus, these empirical investigations have not yet settled the issue. Besides, they do not make any distinction between the different modes of financing government investment which may have distinct effects on private sector investment.

6. Methodology of the Study

The present empirical study closely follows the methodology adopted by Cebula (1978) and Ostrosky (1979). A simple private corporate investment function is formulated and the function is estimated by including government borrowing and availability of investible resources as additional arguments. Before proceeding further, it needs mention that there does not exist any single unique investment function which can be termed as the most appropriate for the country. This is self evident from a number of private corporate sector investment functions explored by several economists, each one of them emphasising only certain aspects of the private investment behaviour in the

country. (For instance, see Krishnamurthy, 1964; Pani, 1977, and Ahluwalia, 1977.) This aspect of the investment function is not peculiar to the Indian context. For instance, it has been remarked that, "Investment theory has received a great deal of attention in the last two decades. Nonetheless, it is fair to say that there is no clear consensus among economists as to a single 'best' theory of investment. Empirical generalisations regarding investment behaviour are similarly inconclusive. This is reflected in the fact that no econometric investment function performs very well; in particular, none allows us to predict the path of investment with much confidence" (Ackley, 1978, p. 612).

The present empirical investigation is based on a simple accelerator model of private corporate sector investment function. The model assumes that the real stock of capital adjusts to the desired stock through the process of investment and the desired stock of capital depends on the level of output. Therefore, logically, in this stock adjustment model, investment is a function of the actual stock of capital and the level of output. The investment function adopted presently, which takes explicit account of the additional arguments, government borrowing and the availability of resources for the private corporate sector, is the following.

$$PCI = f(K_{t-1}, Q, S, B),$$

Where PCI = Private corporate sector investment represented by the gross domestic capital formation in the private corporate sector.

K_{t-1} = Stock of capital at the beginning of the period t, arrived at by cumulating the variable PCI over the years.

Q = Level of private sector output, represented by the private sector Gross Domestic Product at factor cost.

S = Availability of investible resources, defined as the ratio of private sector saving to the gross saving in the economy (referred to as the private sector saving ratio).

and B = Government borrowing represented by the yearly changes in the stock of marketable rupee securities of the Central and State governments adjusted for the Reserve Bank of India holdings and intra-governmental holdings.

7. Estimated Equations

Within the framework of the above private corporate sector investment function, for the purpose of interpretation we have estimated four equations. They are presented in Table 1. Equation 1 is estimated by defining the variable representing the availability of investible resources as the private saving ratio. Nevertheless, the equation fails to explain the private corporate investment function in any meaningful way as the explanatory power of the equation is very low ($\bar{R}^2 = 0.34$) and none of the coefficients of the explanatory variables is significantly different from zero.

It was found that if in equation 1, the resource availability variable is replaced by the own saving of the private corporate sector represented by the ratio of

private corporate saving to the gross saving in the economy, the explanatory power of the equation improves drastically. Equation 2 in Table 1 presents the estimates of the private corporate investment function when the resource availability variable is replaced by the private corporate saving ratio. Equation 2 shows that it explains nearly 75 per cent of the variations in private corporate investment function, the significant explanatory variables being the private sector output and the own saving of the private corporate sector. However, in the equation the coefficients of the capital stock variable and government borrowing variable are not significantly different from zero.

A suspected drawback of equation 2 is the possible effect on the estimated coefficients of the intercorrelation among the independent variables. Therefore, the capital stock variable which has shown a relatively high correlation with the government borrowing variable (0.91) and private sector output variable (0.97) is dropped from the equation and the re-estimate is presented as equation 4. (For its own sake, the result of a similar exercise with respect to equation 1 is presented in equation 3.) As evident from equation 4, this exercise does not materially affect in any way either the statistical significance of the explanatory variables nor the explanatory power of the equation as compared to equation 2. Because of these reasons it may be assumed that equation 2 is not affected by any serious multicollinearity problem and we drew our inferences on the basis of this equation.

8. The Inferences

Two important inferences are drawn on the basis of the estimated equation 2 (Table 2). First, government borrowing in the country does not crowd out any private investment even though such government borrowing reduces the investible savings available in the economy. This is mainly because of the fact, as evidenced by the private corporate investment function estimated in the study, that the private corporate investment decisions are largely guided by the availability of own saving of the corporate sector rather than the availability of investible resources in the form of private saving in the economy. Second, the government spending financed by government borrowing does not have any significant stimulative effect on private corporate investment. This aspect is substantiated by the empirical finding that in the estimated corporate sector investment function, the coefficient of government borrowing is not significantly different from zero.

TABLE 1

Estimated Equations

Dependent variable: Private corporate sector investment. Independent Variables	Equation 1	Equation 2	Equation 3	Equation 4
(1)	(2)	(3)	(4)	(5)
Capital stock	0.0226 (0.5711)	0.0054 (0.2124)		
Government borrowing	-0.8620 (-1.4326)	-0.2530 (-0.6383)	-0.7057 (-1.3447)	-0.2132 (-0.6089)
Private sector saving ratio	-2626.0917 (-1.3127)		-2439.8444 (-1.2619)	
Private corporate sector saving ratio		13450.3045 (5.4533)		13495.1009 (5.5566)
Private sector GDP	0.0519 (1.2232)	0.0753 (2.6110)	0.0158 (2.9412)	0.0804 (5.1043)
Intercept	1146.7949 (0.9223)	-1887.3051 (-3.3545)	783.5183 (0.7496)	-1897.4627 (-5.0417)
R^2	0.3361	0.7449	0.3720	0.7516
F-Value	3.5735	16.1084	4.8577	21.9645
SE-Estimate	241.5757	156.7350	237.0622	152.3543
DW Statistic	1.7286	1.9276	1.7449	1.9765
Rho	0.1229	0.0209	0.1149	-0.0014

Notes:
1. Simple linear estimates are presented.
2. Annual data for the years 1961-62 to 1983-84 are used for estimation.
3. Estimates are corrected for first order autocorrelation.
4. Within parentheses are t-values.

Note on the Variables Used and Data Source

PCI: is the Gross Domestic Capital Formation of the private corporate sector deflated by the implicit price deflator of the Gross Domestic Capital Formation (base year 1970-71). Data source is Central Statistical Organisation, National Accounts Statistics (Various issues).

K_{t-1}: is the cumulated figures of PCI.

Q: is the private sector share of the Gross Domestic Product at factor cost deflated by the implicit price deflator of Gross Domestic Product at factor cost (base year 1970-71). Data source is Central Statistical Organisation, National Accounts Statistics (Various issues).

S: is the ratio of private sector gross savings to the total gross savings consisting of private sector and public sector savings. The ratio of the private corporate sector saving to the total gross savings is used as an alternative variable in the fitted equation.

B: is the annual change in the combined stock of Central and State governments' marketable rupee securities. For computing the variable, from the combined stock; the stock of Reserve Bank holdings, State governments' holding of Central government securities and the State governments' own holding

of State government securities are deducted. The annual change in the adjusted stock of Central and State government securities is deflated by the implicit price deflator of Gross Domestic Capital Formation (base year 1970-71). The data are collected from Reserve Bank of India, Reserve Bank of India Bulletin (relevant issues) and Reserve Bank of India, Report on Currency and Finance (relevant issues). The Reserve Bank of India conducts periodic surveys on the ownership pattern of Government rupee debt and publishes it in the Reserve Bank of India Bulletin (February 1960, March 1961, April 1962, September 1963, October 1964, January and December 1965, December 1966, March 1968, July 1969, May 1971, April 1982, January 1986). For the years in which the survey data are not available the Reserve Bank of India estimates the ownership pattern of securities based on the Reserve Bank of India records, annual reports of LIC, report of various provident funds, etc., and publishes it in Report on Currency and Finance.

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