

IS CROWDING OUT OF FISCAL POLICY INEVITABLE?

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Introduction

The debate over crowding out has a long history, but it has assumed particular prominence over the past two decades in the context of the Monetarist/Keynesian debate. A number of empirical studies have attempted to determine the importance of crowding out, both for the short and long term, but the problems of modelling all the possible channels through which crowding out may work (or may be offset) mean that much further work is required.

In recent years the dangers of public borrowing crowding out private borrowing and of public spending crowding out private spending have again been emphasised in the literature and by policy makers. In the context of the controversy over crowding out, we would like to discuss in this article the following proposition: Crowding out of fiscal policy is only inevitable under conditions of *full employment*; in all other situations it can be ascribed, if it occurs, to inappropriate financing policies.

1. The Concept of Crowding Out

In discussions of fiscal policy the term "*crowding out*" has several meanings. If an increase in government demand, financed by either taxes or debt issuance to the public, fails to stimulate total economic activity, the private sector is said to have been "*crowded out*" (or displaced) by the action of the government.

Crowding out will be complete if the reduction in private expenditure is identical in magnitude to the increase in government expenditure so that the long run fiscal multiplier will be zero. On the other hand, crowding out will be partial if income rises by an amount less than the increase in government expenditure, and in this case the value of the multiplier will be between zero and one.

Absence of crowding out will be indicated by a fiscal multiplier of more than one. In contrast "*over*" or "*super crowding out*" will exist where the fall in private expenditure is greater than the rise in government expenditure, in which case the multiplier will be negative.

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The analysis of crowding out can be conducted in real or nominal terms. The crowding out hypothesis maintains that if prices are held constant, as in typical IS-LM fashion, an increase in real government demand financed real taxes or debt has no lasting effect on real income. Alternatively, crowding out implies that an increase in government spending given flexible prices and a constant money supply, has no lasting effect on nominal income.

Carlson and Spencer (1975) used Hick's IS-LM model in its standard form to present different cases in which crowding out may arise.

1) *The Classical Case*

In this case the demand for money is not sensitive to the rate of interest and hence the LM curve is vertical. Clearly government spending financed by increasing debt or taxes (constant money supply) can not change the velocity of circulation of money and fails to stimulate aggregate demand.

2) *The Keynesian Case*

Keynes suggested that a government expenditure program could, in the confused psychology which often prevails, have an adverse effect on confidence. This could cause either an offsetting reduction of investment (downward shift in the IS curve) or an increase in the liquidity preference (upward shift in the LM curve).

3) *Horizontal IS Curve*

If investment were perfectly elastic with respect to the interest rate, the IS curve would be horizontal and fiscal policy would not shift it, and the crowding out would be complete.

4) *Ultrarational Case*

The notion of ultrarationality is based on the assumption that households regard the corporate and government sectors as extensions of themselves. The principal direct implication of ultrarationality is that "crowding out" may take the form of direct substitution of government expenditure for private expenditure without adjustments in the interest rate, the price level, inflation or the exchange rate. In other words, every action undertaken by the government is neutralised by a corresponding action in the opposite direction by the private sector. David and Scadding (1975) call this as "ex-ante crowding out". According to Buiter (1977) this type of crowding out (direct crowding out in his terminology) is a multidimensional concept, the dimensions being characterized by the government activities that are crowding out (the denominator of the multiplier) and the private activities that are being crowded out (the numerator of the multiplier). In the textbook IS-LM model ex-ante or direct crowding out would be reflected in the inability of fiscal policy actions to shift the IS curve

2. Wealth Adjustment and the Government Budget Constraint

All cases outlined so far have not presented any conflicts with respect to nominal versus real crowding out issue, because aggregate demand typically does not shift. By the introduction of wealth into the demand for money function and consumption function and allowing price flexibility Robert Rasche (1973) showed that crowding out is possible even without the assumption that aggregate demand does not shift. In this case crowding out occurs in real terms but with a higher price level, crowding out is not likely to occur in nominal terms.

In the *Journal of Political Economy* (1972) debate, Friedman was accused by Tobin in assuming a vertical LM curve. But Friedman denied emphatically that the Monetarist propositions rested on the slope of the LM. Instead he stressed the continuing effects of deficit finance, and a fundamental distinction between stocks and flows. According to Friedman, the Keynesians only consider short run (or first round) effects of fiscal policy and neglect the perverse wealth effects that will lead to contractionary effects in the subsequent periods.

Friedman has also argued that government securities are close substitutes for private securities in portfolios. Increased sales of government bonds will lead to a significant reduction in the sale of private bonds and, therefore, in the quantity of finance available to private firms. In other words, private securities would be crowded out in portfolios and replaced by government securities.

Before the JPE (1972) debate. Writers like Ott and Ott (1965), Christ (1968)* and Silber (1970) for the closed economy** incorporate wealth effects and the government budget constraint in the standard IS-LM model to analyze the effects of fiscal policy. Wealth effects were introduced in private sector expenditure and in the demand for money function.

The government budget constraint is a financial restraint telling that a government deficit must be "covered" by issues of government debt, either demand debt (money) or deferred obligations (bonds). The implications of the government budget constraint (GBC) are:

i) that the constraint must always hold regardless of time period and regardless of the prevailing conditions of the economy, for example whether it is in disequilibrium or equilibrium. (Of course equilibrium requires that outside wealth is not changing).

* The Christ's government budget restraint says that the government can only spend funds that it has raised from taxation, the printing of money or the floating of bonds. The form of the GBC first used in the literature was: $G-T(Y) = \Delta M^e + \Delta B/r$.

** I will assume a closed economy in this article.

ii) any of the instrument variables: government expenditure (G), taxes(T), money supply (M^s) and bonds (B) can be altered if and only if at least one of the other three is changed as well.

iii) the GBC introduces into an otherwise static model the dynamic response of asset-stock levels to the net injection (or withdrawal) of a flow of demand for goods resulting from an unbalanced budget: Therefore long run equilibrium in a macro economic model requires stock equilibrium and flow equilibrium. Assuming a closed economy, fixed prices, that output is demand determined (IS-LM model); ignoring debt service cost in the GBC and ignoring the effect of variations in the interest rate on the valuation of wealth we can present some diagrammatical results (Artis 1979).

Figure 1 shows an IS-LM system in the top quadrant, and government expenditure and taxation schedules in the lower quadrant. Starting from an initial position of budget balance, with government spending \bar{G}_1 , income Y_1 and interest rate at r_1 , suppose the level of government spending to be increased to \bar{G}_2 .

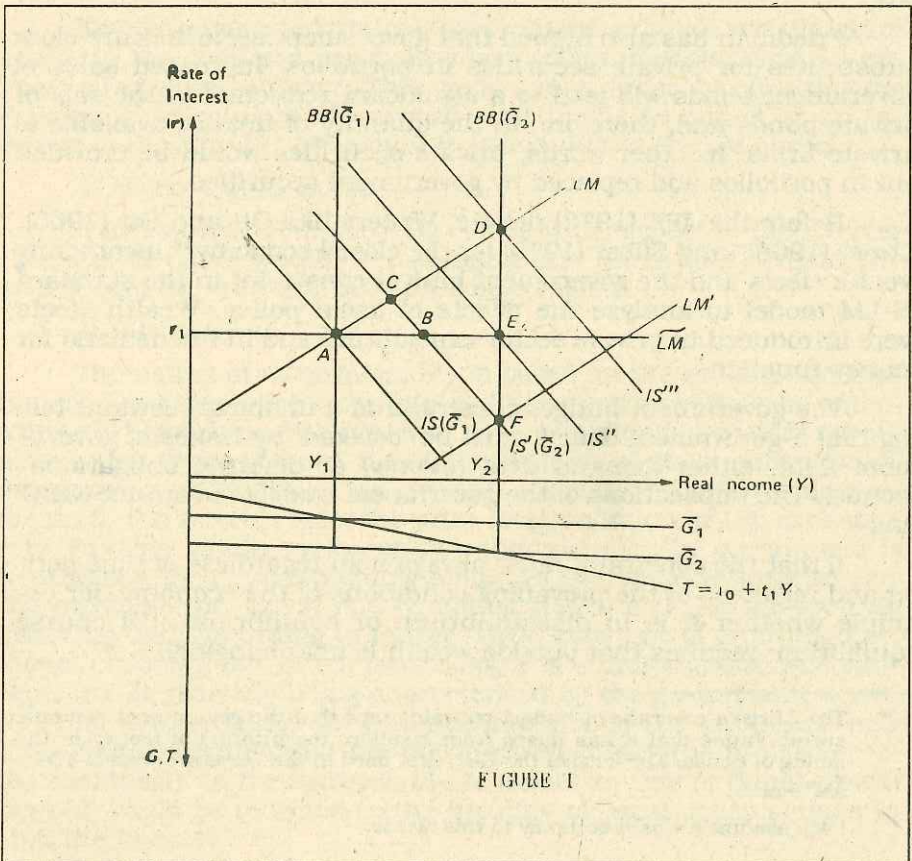


FIGURE 1

The "ordinary" income-expenditure multiplier would give the expansion of income by AB would arise with an accomodating monetary policy (pegging the intreset rate).

The traditional (textbook) multiplier implies a movement from A to C. The expansionary effect of government expenditure is offset by an increase in the interest rate which reduces the interest sensitive private expenditure, given the money supply.* This kind of crowding out is recognized by both the Keynesians and Monetarists (See Blinder and Slow 1973).

The lines $BB(\bar{G}_1)$ and $BB(\bar{G}_2)$ indicate the level of income consistent with a balanced budget before and after the increase in government spending.

The movement from A to E shows the income expansion if the marginal propensity to absorb of the private sector is "unity" (New Cambridge). The movement to point F corresponds to the money financed regime of Christ (no wealth effects are considered).

The point D indicates the position that would be reached if the wealth effects in the LM schedule are just neutralised by sufficient money financing whilst positive wealth effects drive the IS schedule to IS''

3. "Crowding Out" and the Effectiveness of Fiscal Policy

Against the typical monetarist position that fiscal policy is ineffective in the long run, Blinder and Solow (1973, 1974, 1976) wrote three important papers. They introduced wealth effects and the GBC into the IS-LM system. They incorporated income linked tax revenues and considered two different versions of the model: one in which there is no capital accumulation and another in which there is capital accumulation.

With a simple specification of the GBC the long run impact of fiscal policy is:

$$G - T(Y) = \dot{B} + \dot{M} \quad (1)$$

where the dots indicate changes with respect to time or rate of growth. In the long run steady state solution $\dot{B} = \dot{M} = 0$ so

$$G - T(Y) = 0 \quad \text{or} \quad G = T(Y)$$

therefore $dY/dG = 1/T'_y$ (1.1)

This long run multiplier was also found by Christ (money finance case), so this result holds regardless of how the deficit is financed.

* This type of crowding out is labelled by Benjamin Friedman as "financial crowding out" because he considers the response of the demand for money for transaction purposes as consequence of G and fixed money supply (B.Friedman 1978, p.596).

Blinder and Solow argue that once account is taken of the need to service bond debt, the bond financed fiscal multiplier will exceed $(1/T_y)$. Therefore, rewriting the GBC to account for the net (after tax) coupon payments on the bonds issued as a result of the rise in government spending then we have:

$$G + B - T(Y + B) = \dot{B} / r + \dot{M}$$

in the steady state solution $\dot{B} = \dot{M} = 0$ so,

$$\frac{dY}{dG} = \frac{1 + (1-T') (dB/dG)}{T'} \quad (1.2)$$

since with money finance $dB/dG = 0$ clearly this bond finance multiplier is greater than the money finance multiplier in the long run.

This paradoxical result obtained by Blinder and Solow is due to their recognition of the deficit expanding effects of the service cost of bond finance, and the incorporation of these costs in the GBC. It is because this implies a larger requirement of finance and hence a larger increase in income to balance the budget under bond finance than under money finance.

Blinder and Solow put forward three possibilities:

i) $F_B < 0$ where F_B is the IS-LM multiplier effects of bonds (B) on real output (Y). In this case the negative wealth effects in the money market outweighs the positive wealth effects in the goods market. But the system would be *unstable*.

ii) $0 < F_B < \frac{1 - T'}{T'}$ where T' is the marginal propensity to tax.

The impact would be expansionary enough to balance the budget. Hence the system is *unstable*.

iii) $F_B > \frac{1 - T'}{T'}$ this is a *necessary condition for local stability* and bond financed government spending would have a net expansionary effect on GNP.

In the case of capital accumulation, they show that the previous stability condition is a sufficient and not a necessary condition provided only that the depressing effect on investment of a larger capital stock outweighs the expansionary impact via the wealth effects on consumption. The conditions are $I_K + C_W < 0$ and $F_B > (1 - T')/T'$. This, they argue, strengthens the case for regarding instability only as a mere possibility. Since $dY/dB > 0$ is no longer a necessary condition for convergence, it is logically possible for the economy to be stable and fiscal policy ineffective. But this however is regarded as a degradation rather than as a vindication of monetarism.

Tobin and Buiter (1976) considered the effects of fiscal policy in a somewhat different IS-LM model than that specified by Blinder and Solow. They pointed out that the correctly modified investment function employed by Blinder and Solow (1974) creates complications for the *stability* of the system. The conditions $F_B > (1 - T)/T$ and $I_K + C_W < 0$ are no longer sufficient conditions for the local stability.

Tobin and Buiter also used two different versions of the model. In model I they used G' , government purchases of goods and services plus debt interest net of taxes on such interests, as instruments of fiscal policy. In model II they used G defined as government purchases as Blinder and Solow. Model I proved to be favorably to the presumption of an expansionary effect of fiscal policy and the long run multiplier was the reciprocal of the tax rate.

In Model II three different cases were discussed (Figure II). Here GT represents the long run budget balance equation which can be

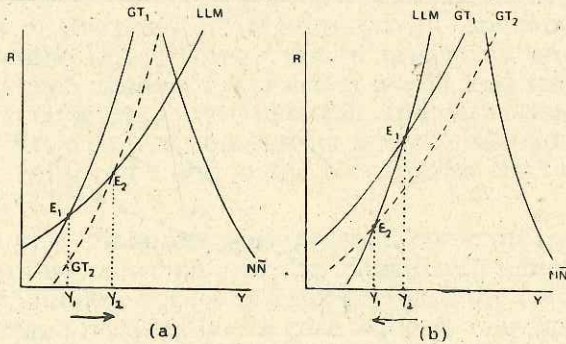
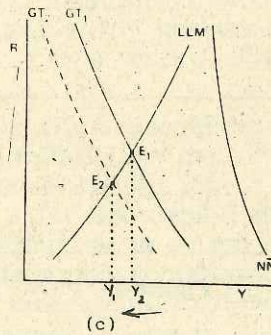


FIGURE 11



positively or negatively shaped. To the right of GT the budget deficit is negative and to the left is positive (in the general case).

An expansionary fiscal policy G (with the money supply constant) shifts the GT curve from GT_1 to GT_2 as is shown in all three cases above. When the long run LM curve (denoted LLM) is steeper and/or when the GT has negative slope the net effect is contractionary but the system is unstable (see cases b and c above). Only when the LLM is not too steep and GT has a positive slope, the system is likely to be stable and the net effect of fiscal policy is expansionary,

however even in this case the system may be unstable. The curve NN shows the full employment ceiling to real net national output. So all three cases above applied for a situation of underemployment (horizontal supply curve of labor).

It must be clear that Tobin and Buiter consider explicitly changes in the capital stock. In fact this allows them to express the balanced budget curve as function of the interest rate*.

Tobin and Buiter also considered a situation of full employment with flexible prices. The result can be illustrated in Figure III.

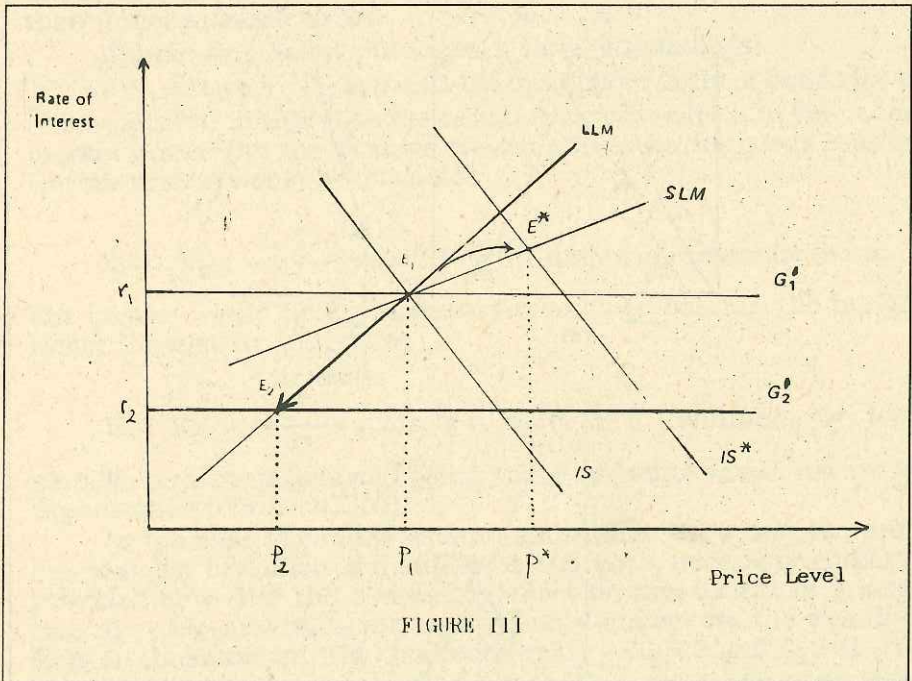


FIGURE III

Figure III

* This can be done because, given the level of employment (N), the level of income is just a function of the size of the capital stock, and the size of capital stock is just a function of the interest rate.

At the long run, steady state, full employment equilibrium E_1 , the government decides to increase total government expenditure (including interest payments) from G_1 to G_2 . The impact effect is to raise aggregate flow demand: the IS changes to IS^* and the multiplier moves us to E^* where IS^* intersects the short run LM (SLM). But this is a temporary equilibrium -with higher interest rate and prices- because the budget is not balanced therefore real income must ultimately increase as a result of an increase in G . At full employment, the only way for output to increase is a growth in the size of the capital stock. However this requires an eventual decline in the rate of return to capital and interest rate. Equilibrium therefore is achieved at E_2 which implies that the price level has fallen in the long run as well.

It is worth mentioning that Tobin and Buiter offer no explicit mechanism by which E_2 is reached from the short-run equilibrium E^* . In fact they concede that the model is unstable.

It is clear that the results obtained by Tobin and Buiter for the full employment regime contradicts the common view that fiscal policy is ineffective.

Typically at the point of full employment, one would expect a complete crowding out. Higher demand pressures provoked by a bond-financed expansionary fiscal deficit would lead to a rise in the price level, reducing real money balances and activating a Pigou effect on expenditure so that equilibrium is eventually attained at the same level of real income and at the higher price level and interest rate (Artis, 1979).

When supply constraints are present, common sense leads to the conclusion that crowding out is inevitable and hence fiscal policy (and even monetary policy) can not increase the level of output. But even this result need not be the case when we take into account of price changes and allow for capital accumulation.

Buiter (1977) specified a model which endogenizes the price level and takes account of supply constraints. The specification adopted implies a "natural level of excess capacity" akin to the natural rate of employment (i.e. a vertical Phillips Curve in the long-run).

According to Buiter, the impact effect of a bond financed deficit will gradually generate inflationary expectations at higher levels of income and interest rate so that the rate of investment can either be positive or negative. If a variable capital stock is allowed for, there is a possibility of a long run rise in output since an increase in capital stock should shift the supply constraint. (This result might be reinforced if fiscal policy entails public investment).

Obviously, Buiter's result depends on the lags associated with the inflation expectation generating mechanism and the reaction of

the nominal interest rate to the financing scheme. If the net result is a fall in the real rate of interest, investment will increase and so will output. If the net result is an increase in the real rate of interest, investment and output will not change.

It may be argued that the incorporation of price changes into the models dealing with crowding out issue has not been too satisfactory. Indeed most of the models have assumed fixed prices and justify this procedure arguing that the results would not be substantially affected. This was the position of Blinder and Solow and has been corroborated by Currie (1978a, 1978b). Assuming an expectations augmented mechanism, a non-growing economy, balanced budget, zero net investment and a tax function fixed in real terms, Currie points out that with the nominal money stock held constant, bond financed (fiscal policy) final equilibrium requires zero inflation and a balanced government budget. Therefore, tax revenues must rise in real terms by the full increase in government expenditures.

Since in the final equilibrium the economy must be at the natural rate of unemployment, the increase in tax revenue can only occur if the natural rate declines or if labour productivity rises. In the latter case, final equilibrium will be attained at higher levels of income and tax revenue. If in the adjustment path private sector investment rises, an increase in the capital stock via capital deepening may result. This can only occur with lower real rates of interest but the stability of this long run seems highly problematic. (Capital shallowing can also arise.)

Money finance by contrast is likely to be stable, leading to an equilibrium where the rate of inflation is such that the inflation tax meets the shortfall of tax revenues below government expenditure. The possibility of instability is not ruled out in this case however.

According to Currie, it therefore appears that the conclusions concerning the effects of bond financed fiscal deficits are not dissimilar from these of the fixed price case. If bond finance is stable, then fiscal policy has a significant and permanent effect on the long run level of income, the long run multiplier being the inverse of the marginal tax rate. Again the possibility of instability is likely to occur.

One must bear in mind that a mathematical proof of such conclusions and hence his results might be misleading. This possibility becomes evident with the results obtained by Hayakawa (1977)*.

Hayakawa's study follows very close Bilinder and Solow's analysis but explicitly introduces a standard aggregate supply sched-

* Hayakawa's paper is important in my view not only for the way in which it introduces the supply side but for the recognition of wealth effects in the labor market. Labor Market Equilibrium is specified as: $PE_N(N, k) = h(N, P, W, X)$, $h_N < 0$, $h_P > 0$, $h_N > 0$. Real wealth is $W = M/P + B/rP + k$. X denotes all other factors affecting the supply price of labor function.

ule with wealth effects and allows for price movements (and distinguish between real and nominal crowding out).

Solving the model for real income and prices the system can be written as:

$$Y = Y(M, B, K) \quad Y_M \geq 0, Y_B \geq 0, Y_K \geq 0 \quad (2.1)$$

$$P = P(M, B, K) \quad P_M > 0, P_B \geq 0, P_K \geq 0 \quad (2.2)$$

$$r = r(M, B, K) \quad r_M \geq 0, r_B \geq 0, r_K \geq 0 \quad (2.3)$$

$$\dot{M} + \dot{B} / r = PG + B - T(PY + B) \quad (2.4)$$

(Government Budget Constraint)

$$K = I(r, Y, K) - sK \quad (2.5)$$

where Y = real GNP

M = stock of outside money

B = stock of government bonds (perpetuities paying \$1 annually)

s = rate of depreciation of capital

P = general price level

T = tax schedule (assumed linear)

r = market interest rate

I = real investment demand

N = labor

The partial derivatives are quite ambiguous because of the operation of wealth effects. Just to illustrate consider Y_M . $Y_M < 0$ is possible if wealth effects on leisure are strong enough to shift the aggregate supply schedule upward by more than the aggregate demand. But to the extent that this shifting of aggregate supply schedule tends to be limited, Y_M is most likely to be positive (Hayakawa 1979, pp 328-29).

Without capital accumulation and pure bond financed fiscal policy the system's stability condition becomes:

$$Y_B^* > \frac{P_B (G - T' Y^*)}{T' P^*} + \frac{1 - T'}{T' P^*} \quad (2.6)$$

where the asterisk denotes equilibrium values.

If we assume $P_B = 0$ and $P^* = 1$ we get condition (16b) of Bilinder and Solow (1973):

$$Y_B^* > \frac{1 - T'}{T'}$$

Therefore (2.6) contrasts with the result of Blinder and Solow. The instantaneous bond multiplier must be greater than $(1-T')/T'$.

Hayakawa concludes that the necessary and sufficient condition for long run stability is that marginal tax receipts cover the change in the nominal cost of governmental expenditure in the case of money financing, and this change plus an additional after tax burden of interest payments on newly issued bonds in the case of bond financing. Without this requirement, the deficit can not be closed and the system will become unstable.

Nominal crowding out is completely inconsistent with stability under both financing methods but stability is perfectly compatible with real crowding out.

Where capital accumulation is considered, the stability condition is slightly more complicated. Nominal crowding out, although remote in possibility may not always be inconsistent with stability as when capital accumulation substantially increases the productive capacity of the economy. When nominal crowding out is consistent with stability, real income and the price level must respond positively and negatively (respectively) to a change in the stock of money or bonds.

Furthermore, Hayakawa has shown (in either real or nominal terms) that bond financing is not necessarily more expansionary than money financing in the long run, because the total impact of a change in government expenditure on the general price level is different between the two financing methods.

Hayakawa's paper may also have some difficulties, in fact the criticism of a kind of double counting of bonds, as stock first and then as flow in the financing of budget deficit, is applicable here as in Blinder and Solow (Sparks 1976 and Miller 1976). Also the role of price expectations is assumed away. Nevertheless, Hayakawa's results point out the danger of drawing conclusions about the crowding out issue without a formal (mathematical) proof.

It becomes apparent from the foregoing analysis that the question of instability remains open and in general difficult to establish a solution on theoretical grounds.

Currie has pointed out that the probability of instability with bond financed deficits may be overstated. In practice with progressive tax systems, a rise in the price level will lead to automatic changes in fiscal policy, raising the real tax take through fiscal drag even without a rise in real income. If the government does not alter tax regulations to maintain the real tax schedule in the face of inflation, this may stabilise the economy. (Although in this case the long run effects of fiscal policy may be contractionary.)

A further stabilising factor arises if government expenditure on goods and services is held constant in real terms. In this case if government bonds are denominated in nominal terms, inflation

can reduce the government deficit by generating a fall in the real burden of interest payments.

If we take into account that government expenditure may be directly or indirectly productive. (In fact it may raise the productive capacity through public investment and/or may raise the profitability of private sector investment if government expenditure is on infrastructure). This will reduce the possibility of instability*.

Up to now I have implicitly assumed that there are no difficulties in the definition of wealth, but Barro (1974) has argued that government bonds are not perceived as net private wealth by the private sector. He argues that such assets should not enter net wealth, since the coupon payments on government bonds have a net present value equal to the discounted associated future tax liability, which must bear on the private sector. If Barro's argument is correct, government bonds issuance do not enter into picture and the scope for fiscal policy is practically nil.

Nevertheless, Tobin and Buiter's result for the regime of full employment (see above) represents a particular situation in which fiscal policy is expansionary regardless of the government bonds being perceived as net private wealth.

Even more important, there are powerful reasons to believe that Barro's case is just an extreme theoretical possibility. In practice, bond holders are not "ultra-rational" as Barro suggests: a) they may suffer tax illusion, b) the relevant discount rates need not be equal, c) taxpayers and bond holders need not be the same and have different behavior, d) the government not necessarily have to finance these interest payments by taxation, it can issue new debt, e) furthermore it is possible to argue that Barro's economic units are not so rational after all. For if holding government bonds they are incurring in a future obligation in the form of taxes then why they do not decide to hold other assets in which future obligations do not arise.

Even if there were an agreement about, the definition of wealth (i.e. including money, government bonds and capital) still remains the question of substitutability.

Traditionally, as in all the foregone analysis, the crowding out literature assumes that government bonds are closer substitutes for capital than for money. But the opposite may be the case so that bonds act as substitutes for money in private sector portfolios. This is more likely the wider definition of money adopted and the shorter the maturity of the government bonds in question**.

* B. Friedman has called this "crowding in" and argued that there are accelerator-based effects at work.

** This possibility was noted by Tobin and Buiter (1976) and Currie (1978b).

B. Friedman (1978) argues that if one considers adequately the public's portfolio behavior then the net result of bond-financed fiscal policy may be either crowding out or crowding in. Following Tobin and Brainard (1963), B.Friedman specifies a system of linear asset demands (money, capital, bonds) subject to the balance sheet constraints (i.e. the sum of the wealth coefficients is equal to one; the sum (across assets) of the other (relevant) coefficients must be zero)*.

He is also more specific about the "interest rate" since there are two asset yields and argue that the appropriate one to represent the IS/LM diagram is r_K (the yield on capital). He also assumes that the matrix of relative asset substitutabilities is symmetric and work out a relative index of *substitutability*, σ which is strictly positive: $\sigma = m_2/b_3 = b_1/k_2$ given $m_2, b_3 < 0$. So if bonds are close substitutes for money (m_2 is large and b_3 small) σ is large. If bonds are close substitutes for capital σ is small.

According to B.Friedman the portfolio effect of bond financed deficits hinges on the relative substitutability condition:

$$\frac{dr_K}{dG} \geq 0 \text{ as } \sigma \geq \sigma^* \text{ where } \sigma^* \text{ is the critical value given by}$$

$$\sigma^* = \frac{m_5}{k_5} = \frac{m_5}{1 - m_5 - b_5}$$

As we can see in Figure IV, if $\sigma = \sigma^*$ the two components of the portfolio effect exactly offset one another so that the conditional LM does not shift, and the rightward shift of the IS_0 to IS_1 together with the traditional transactions crowding out is the entire story of bond financed deficits.

* The system of linear asset demands:

$$\begin{array}{|c|} \hline M^D \\ \hline B^D \\ \hline K^D \\ \hline \end{array} = \begin{array}{|c|} \hline m_0 \\ \hline b_0 \\ \hline k_0 \\ \hline \end{array} + \begin{array}{|c|c|c|} \hline m_1 & m_2 & m_3 \\ \hline b_1 & b_2 & b_3 \\ \hline k_1 & k_2 & k_3 \\ \hline \end{array} \begin{array}{|c|} \hline r_M \\ \hline r_B \\ \hline r_K \\ \hline \end{array} + \begin{array}{|c|} \hline m_4 \\ \hline b_4 \\ \hline k_4 \\ \hline \end{array} Y + \begin{array}{|c|} \hline m_5 \\ \hline b_5 \\ \hline k_5 \\ \hline \end{array} W$$

where M^D, B^D, K^D = the amount of each asset demanded

m_i, b_i, k_i = fixed coefficients

r_M = the known yield on money

r_B, r_K = the respective expected yields on bonds and capital.

Subject to: $m_5 + b_5 + k_5 = 1, m_i + b_i + k_i = 0, i = 0, \dots, 4$

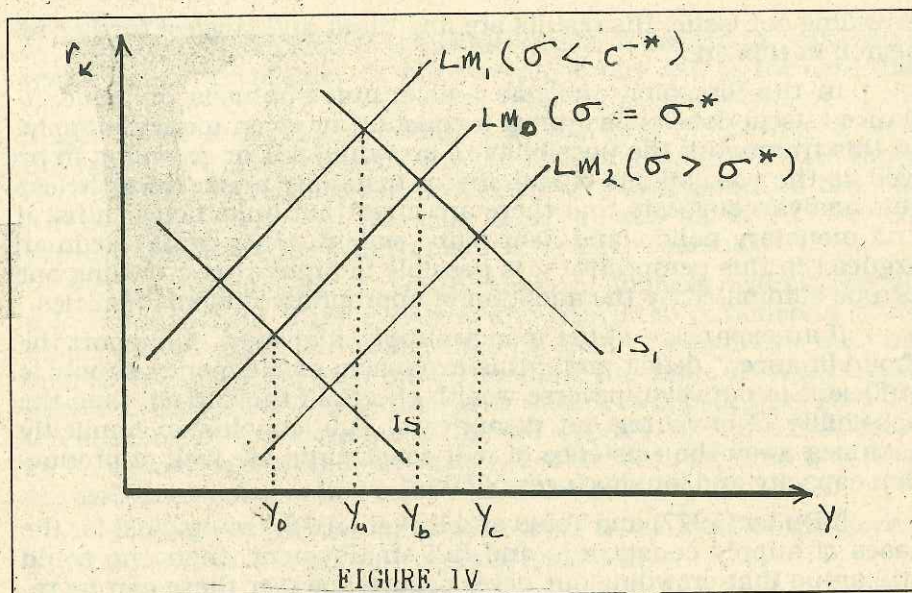


FIGURE IV

If $\sigma < \sigma^*$ (bonds more substitutable for capital than for money) the LM shifts leftward and portfolio crowding out is added to the transactions crowding out. The change in Y_0 (here to Y_a) may be contractionary, expansionary or neutral. If $\sigma > \sigma^*$ the conditional LM curve shifts rightward and portfolio crowding in reinforces the income effect of fiscal policy (Y_0 is moved to Y_c).

B.Friedman points out that if bonds and capital are perfect substitutes portfolio crowding in can not occur and the only possibilities are portfolio crowding out or an unshifting conditional LM curve. Blinder and Solow (as many others) represent a special case in B.Friedman's framework, since they assume $\sigma = 0$ and arbitrarily preclude portfolio crowding in. Even more, he argues, that it is misleading to call that case "bond financed" as a general description of bond financing of government deficits.

Friedman then proceeds to analyse the portfolio substitutabilities and the role of debt management policy with some empirical evidence. He concludes that the nominal returns on government debt instruments, together with their relatively "short" average maturity suggest strongly that they are not perfect substitutes for real capital and do not appear to be perfect substitutes for money either, however the range of different maturities actually or potentially available strongly suggests that all government debt instruments are not even perfect substitutes for one another.

In my view B.Friedman's paper is pointing out quite correctly the important role that public's portfolio behaviors play in the

crowding out issue. His results are important and suggest further research in this area*.

In the foregoing analysis I have put emphasis on bond financed fiscal deficits assuming a constant or given money supply. In this framework the possibility of crowding out or crowding in as well as the possibilities of stability or instability arise. Nevertheless this analysis suggests that there are important links between fiscal and monetary policy (and debt management policy as B.Friedman argues.) In this perspective it is possible to argue that crowding out can be eliminated by the adoption of appropriate financial policies.

If an expansion of the money supply is allowed to support the "bond financed" deficit and if this expansion of the money supply is sufficient to outweigh perverse wealth effects (if they arise), then the possibility of crowding out disappears. This conclusion implicitly assumes away the existence of real constraints i.e. lack of production capacity and/or shortages of labor.

If Buiter (1977) and Tobin and Buiter (1976) results hold for the cases of supply constraints and full employment, then one could still argue that crowding out never occurs however these can be regarded as an extreme (Keynesian) results and not as the general case. Furthermore in both studies the stability of the model is not guaranteed.

Conclusions

I have considered the possibility of crowding out in the context of a closed economy. In my view it is still safe to argue that the fundamental reason for the occurrence of crowding out is the existence of real constraints. Under full employment crowding out is inevitable (expect perhaps under very stringent and unrealistic conditions).

In all other situations crowding out is evitable if the adequate financial policies (methods of finance) are adopted. This suggests important links among fiscal, monetary and debt management policies. This in turn suggests that the degree of freedom of these policies is not unlimited and that they must be in harmony in any program of stabilisation. If however policy makers establish a rigid commitment for any of these policies i.e. a fix rule of x per cent growth of money supply is adopted (as monetary policy) then the possibility of crowding out is not eliminated.

Finally, I would like to comment on the time horizon considered in the literature. It is not so clear *how long* is the long run effects of fiscal policy.

One must bear in mind that although it may result interesting and illuminating a long run analysis, in practice stabilisation poli-

* One must bear in mind that Friedman does not consider neither price change nor the stability condition of this model. In fact there are other various criticisms that can be mentioned. (See comments to this paper Brookings Paper or Economic Activity 1978, No: 3, pp.642-654.)

cy is likely to be devoted to the achievement of certain targets with a very short period of time. In other words, it may well be the case that the policy maker is interested not only in the achievement of the target by minimizing the variance of any possible deviation from the target, but also by minimizing the time span in which such target is obtained. In this case the possibility of crowding out in the long run becomes irrelevant. This case is more likely when we take into account that there are politicians behind any economic decision.

It can also be argued that the long run analysis neglects the fact that the structure of the economy and hence the parameters of the model (i.e. elasticities, propensities to invest, to consume etc.) are subject to change through time. Therefore, the long run analysis implies the *ceteris paribus* assumption that, if dropped, may lead different results. The relevance of this will depend upon the time span, by how much is changed the structure of the economy and how flexible and changeable is that structure of the economy.

Whether or not crowding out occurs is, as most of the Keynesian/Monetarist debate, an empirical question.

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