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IS THERE ANY CROWDING OUT OF PRIVATE EXPENDITURE BY FISCAL ACTIONS?

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IS THERE ANY CROWDING OUT OF PRIVATE EXPENDITURE BY FISCAL ACTIONS?

1. Introduction*

It is the contention of the simple Keynesian multiplier analysis that an increase in government expenditure or a decrease in the rate of taxation induces repeated rounds of spending. Similarly, a multiple reduction of total spending is said to result from fiscal changes opposite to those just mentioned. It is true to say, though, that this analysis pays little attention to the way deficits, or surpluses, are financed. Thus, an expansionary impact on the economy, for example, can be achieved by a rise in government spending matched by either an increase in tax receipts, or an increase in the money supply, or, indeed, by borrowing from the public through bond issuance.

This contention, however, has been severely challenged by a number of economists who argue that government spending financed by taxes or by borrowing from savings of the general public may reduce other spending to such an extent that there will be little, if any, net increase in total spending. In other words, increases in government expenditure, which are not accompanied by money creation, induce temporary increases in nominal income with no net effect over a longer period of time. This is frequently referred to as the crowding out of private expenditure by fiscal actions, known to Keynes as diversion (1929) or 'congestion' (1937). It is, thus, asserted that government spending financed by either taxation or borrowing from the public is mainly a resource transfer from the private sector to the government, with little net effect on total spending. It can have a strong stimulative influence on the economy, if, and only if, the increased government expenditure is financed by monetary expansion.

When increases in government spending crowd out an equivalent amount of private expenditure, so that the impact on total spending is zero, then we have the notion of *complete* crowding-out. On the other hand, crowding out is *partial* if the increased government expenditure is accompanied by a reduction in private expenditure smaller than the increase in government expenditure. In addition, *overcrowding out* occurs when the decrease in private expenditure is greater than the increase in government expenditure; finally, if the increase in total expenditure is the same or greater than the increase in government expenditure, then there is *no crowding out* (these definitions could be couched in both real or nominal terms, in which case we may have the distinction between *real* and *nominal* crowding out).

The current debate on crowding out focusses on the impact of the method of financing government spending and, in turn, has led to

increased analysis of the so-called Government Budget Constraint. (Christ, 1968, 1978; for a comprehensive review of the literature see Currie, 1978). This constraint specifies that the total flow of government expenditure must equal the total flow of financing from all sources. The total flow of financing includes taxes, net government borrowing from the public, and the net amount of new money issued. Budget deficits or surpluses alter the size of public debt, and the method of financing such deficits or disposing of such surpluses affects the composition of private wealth. Hence, any discussion of the effects of fiscal policy actions should distinguish the different monetary repercussions that result from such alternative modes of financing budget deficits or disposing of budget surpluses.[1] The inclusion of this constraint, which provides the necessary link between the fiscal sector and the rest of the economy in most recent models, has shed new light on the impact of aternative modes of financing budget deficits or disposing of budget surpluses. Neglect of this constraint results in introducing a bias in the policy effects, that is, in the magnitude of both the short-term and the long-term multipliers.[2]

The discussion so far has concentrated on the financing of government expenditure and the possible subsequent crowding out of private expenditure; this is termed in the literature as 'financial' crowding out. When, however, attention is directed to the size and share of public expenditure, then a different type of crowding out may occur. This refers to the contention that public expenditure could only expand at the expense of private expenditure, which must contract to provide the necessary room; this is the so-called 'resource' crowding out, and it is of the kind discussed by Bacon and Eltis (1976). For a critique of the validity of the conceptual framework of the Bacon and Eltis thesis see letto Gillies (1978) and Hadjimatheou and Skouras (1979). Clearly, in a situation of full-employment with real constraints (because of capital, raw-material or labour shortages) one could see how this may come about: resources would have to be diverted from the private sector to the public sector.[3] But, in less than full-employment situations, the extra resources required to meet the increased public demand could be mobilised from unemployed factors of production. The following comment by the Bank of England is quite interesting in this context; it has been argued that 'resource' crowding out is actually "neither interesting analytically nor relevant in the present conjuncture" (Treasury and Civil Service Committee, 1980, p.22) of excess capacity in the UK – see also Bacon and Eltis, (1979)! At full-employment, though, arguments can be constructed to show that expansion of the public sector need not be contractionary of the private sector. In the short-run fiscal policy may be expansionary – without creating inflation – by raising the level of capacity and labour utilization. In the longer-run an expanded public sector could enhance profitability and investment in the private sector, thus creating the climate for the economy to shift onto a higher growth path (Currie, 1981, p.13).

This paper attempts to review the theoretical foundations of the crowding out debate, and to summarise the major empirical results that have been published in the literature. The main conclusion is that although it makes a lot of difference how changes in government expenditure are financed, crowding out is never complete, at least in the 'short-run'.

2. Theoretical Foundations of Crowding Out

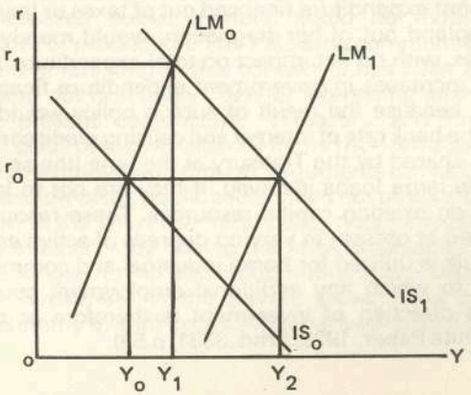
The crowding out debate is not new. Adam Smith, as early as 1776, argued that some types of labour were unproductive, and condemned the transfer of resources from the private sector to the government whether through taxation or borrowing. For Smith "saving is spending" because one man's saving becomes another man's investment; thus borrowing funds from the public to finance government spending was asserted to involve the "destruction of some capital which had before existed in the country; by the perversion of some portion of the annual produce which had before been destined for the maintenance of productive labour, towards that of unproductive labour" (Smith, 1937, p.878). Later classical economists, such as James Mill, and J. B. Say argued along similar lines: government spending was considered unnecessary as a stablization tool, because private investment was sufficient to utilise the funds provided by private saving.

The neo-classical economists argued that government expenditure financed by borrowing from the banks bid resources away from other sectors, thus increasing the purchasing power of the government, which would drive up the price level even under full employment conditions. The higher price level would serve as a deterrent to 'real' consumer or private investment spending which would otherwise have taken place. A good example of this view is found in the testimony of R. G. Hawtrey before the Macmillan Committee in 1930. Hawtrey argued that increases in government expenditure financed out of taxes or loans from savings, to bring England out of her stagnation, would merely replace private expenditures, with no net impact on total expenditure. He also rejected the idea of increases in government expenditure financed out of new bank credit because the result of such a policy would be inflationary forcing up the bank rate of interest and causing credit contraction.[4] These views were shared by the Treasury at the time (the so-called 'Treasury View'): "The large loans involved, if they are not to involve inflation, must draw on existing capital resources. These resources are on the whole utilized at present in varying degrees of active employment, and the great bulk is utilized for home industrial and commercial purposes. The extent to which any additional employment could be given by altering the direction of investment is therefore at the best strictly limited."(White Paper, 1929, Cmd. 3331, p.53).

The Bacon-Eltis (1976) thesis also belongs to the neoclassical tradition. They argue that in Britain the increased taxation, necessary to finance the expanding public sector, has been entirely borne by profits, with workers being able to shift any rise in taxation onto capital. Private investment and exports have been crowded out as a result. At the same time, the successful resistance of workers to bear part of the increase in taxation has led to rising inflation, which has also contributed to the crowding out of private expenditure in this country.

There is a Marxian counterpart to the neoclassical thesis on crowding out. Increases in public spending lead directly, through taxation, to an equivalent fall in surplus value, and to the extent that the extra employment in the public sector is not productive, then a *complete* crowding out of private accumulation occurs (Bullock and Yaffe, 1975); indeed, *overcrowding* out could easily occur, according to this analysis, if public spending also crowds out an amount of personal consumption expenditure.[5]

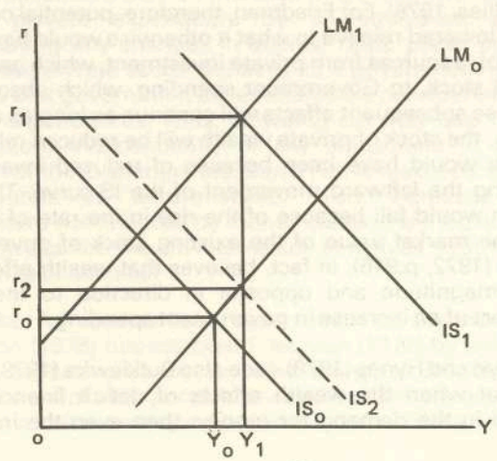
Perhaps the best argument for the existence of the crowding out effect can be found in Keynes own words: "If, for example, a Government employs 100,000 additional men on public works, and if the multiplier ..... is 4, it is not safe to assume that aggregate employment will increase by 400,000. For the new policy may have adverse reactions on investment in other directions ..... The method of financing the policy and the increased working cash, required by the increased employment and the associated rise of prices, may have the effect of increasing the rate of interest and so retarding investment in other directions, unless the monetary authority takes steps to the contrary; whilst, at the same time, the increased cost of capital goods will reduce their marginal efficiency to the private investor, and this will require an actual fall in the rate of interest to offset it" (Keynes, 1936, pp.119–120). It is very important to note that Keynes recognised that crowding out constituted one of the most fundamental elements of his monetary analysis. An increase in



government expenditure will create 'congestion'; in particular "The investment market can become congested through a shortage of cash. It can never become congested through a shortage of saving. This is the most fundamental of my conclusions within the field." (Keynes, 1937, p.669).

We may summarise these statements within the so-called IS–LM framework (Figure 1). The increase in government spending, is, of course, represented by a shift in the IS–curve to IS_1 (from IS_o) and, with LM being LM_o, a sharp rise in the rate of interest ensues (from r_o to r1) and little or no change in income (Y_o to Y_1). This kind of crowding out has been referred to in the literature as the 'Hicksian' crowding out (Meyer, 1980) or 'transactions' crowding out (Friedman, 1978); it must be recognised, though, that this crowding out could very well be ascribed to the restrictive monetary policy than to the expansionary fiscal policy (Buiter 1977a). For allowing the LM–curve to shift to the right (to LM_1 from LM_o), through monetary expansion, a significant rise in income occurs (to Y_2 from Y_o), thus allowing the full expansionary effects of fiscal policy to materialise.

Keynes recognised a second way, based on business psychology, through which government spending could crowd out private spending: "With the confused psychology which often prevails, the Government programme may, through its effect on 'confidence' increase liquidity-preference or diminish the marginal efficiency of capital, which again, may retard other investment unless measures are taken to offset it" (Keynes, 1936, p.120). In other words, the increase in government spending, shown by the shift of IS to IS_1 in Figure 2, may have adverse effect on liquidity preference, the LM–curve which shifts to the left (to



LM_1), and income increases only slightly, from Y_O to Y_1. If the marginal efficiency of capital is adversely influenced, then the IS shifts from IS_1 back to IS_2 and with the LM being unchanged at LM_O the result is again a small increase in income as before, i.e. from Y_O to Y_1. We may note that when both, the IS and the LM, shift due to a simultaneous increase in liquidity preference and lower marginal efficiency of capital, income may in fact turn out to decrease not increase.

More recently the discussion on the existence of crowding out has concentrated on the slope of the LM-curve. In order for crowding out to occur, he proponents of it must be assuming that the demand for money is nearly perfectly interest-inelastic, that is to say, the LM-curve must be essentially vertical. Critics have argued that the majority of empirical studies produce estimates that do not support a zero interest elasticity of money demand. Friedman (1972)[6] has argued, though, that the slope of the LM curve is largely irelevant to the crowding out debate; in particular, Friedman has pointed out the necessity of distinguishing between initial and subsequent effects of fiscal actions. According to Friedman an 'expansionary' fiscal action might first be reflected in a rise in output, but the financing of the deficit would set in motion contractionary forces which would eventually offset the initial stimulative effect.[7] We illustrate this point by referring to Figure 2. In the short-run the IS curve tends to shift to IS_1, following an increase in government expenditure, but in the long-run the IS curve would revert back to its original position (IS_O); the reason is that there is a "reduction in the physical volume of assets created because of lowered private productive investments" (Friedman, 1972, p.917). In other words, Friedman is implicitly assuming that increases in government expenditure are at the expense of private investment expenditure; and that government expenditure does not create capacity but merely 'absorbs' resources. (For a critique of this view, see letto Gillies, 1978). For Friedman, therefore, potential output in the future will be lowered relative to what it otherwise would have been with the transfer of resources from private investment, which generates the future capital stock, to Government spending, which absorbs the capital stock. These subsequent effects will continue as long as a deficit exists; eventually, the stock of private wealth will be reduced relative to what it otherwise would have been because of reduced investment, thereby reinforcing the leftward movement of the IS-curve. The total volume of wealth would fall because of the rise in the rate of interest which reduces the market value of the existing stock of government bonds. Friedman (1972, p.916), in fact, believes that wealth effects are about equal in magnitude and opposite in direction to the initial expansionary effect of an increase in government spending.[8]

More recently Floyd and Hynes (1978) – see also Butkiewicz (1979) – have demonstrated that when the wealth effects of deficit financing are properly included in the demand for money, then even the initial, or

'first-round', positive effects of deficit financing are associated with first-round crowding out (irrespective of whether the deficit is financed by borrowing or printing money); however, "whether or not crowding out is complete, incomplete, or more than complete, depends on the magnitudes of the relevant parameters; the issue cannot be settled on theoretical grounds, regardless of the degree of homogeneity of the various wealth effects on the demand for money." (Floyd and Hynes, 1978, p.104).[9]

An additional possible source of crowding out could arise from price effects, when the price level is not assumed to be given; in situations like these changes in prices not only alter the real volume of wealth[10] – in which case the usual wealth effects become operative – but they may affect real expenditure through 'price-expectations' – see for example Arestis and Hadjimatheou (1982). This kind of crowding out may be contained, though, if price expectations cause the real rate of interest to fall; the extent of this type of impact would naturally depend on whether interest-sensitive expenditures are affected by real, rather than nominal interest rates (Currie, 1981, discusses this point in some more detail). Additionally, changes in prices may crowd out investment expenditure via their impact on profitability (Redhead, 1978). To the extent that prices lag behind costs inflationary pressures following increases in government expenditure could so affect profits that investment expenditure may be significantly curtailed. One should also mention the possibility of crowding out arising from the so-called 'ultrarationality hypothesis'. According to the latter (see, for example, David and Scalding, 1974) government expenditure is a close substitute for private expenditure. This hypothesis rests on the assumption, which has yet to be empirically supported, that the combined savings ratio of the private and public sectors is more stable than that of either of the two alone. It, therefore, follows that an increase in government expenditure would reduce private expenditure by an equivalent amount, without necessitating any changes in interest rates, prices or wealth. In other words, the private sector behaves as if government is an extension of itself, so that government expenditures are considered as substitutes for private expenditures. Thus, crowding out may take the form of direct substitution, independently of any adjustment in the interest rate, inflation or the exchange rate. Barro (1974) reaches the same conclusion on grounds of 'ultrarationality' also. Increases in government expenditure not financed by money creation will leave total expenditure unchanged since the private sector perceives debt finance as simply deferred tax liabilities.

A number of studies have been critical of the crowding out thesis. Davidson (1978) has attacked Friedman (1972) by pointing out that his results depend critically on "the marginal propensity to purchase securities out of each period's savings" (p.404); the argument here is that it is only when the marginal propensity to purchase securities is equal to

zero that the Friedman scenario holds true. In view of Keynes' belief that the marginal propensity to purchase securities is greater than zero, but less than one, the Keynesian argument will then be that crowding-out could only be partial.

Tobin (1978) argues that the David and Scalding (1974) ultrarationality hypothesis is not, in fact, supported by their empirical study of private saving behaviour. In the same paper and in a critique of Barro (1974), Tobin demonstrates that crowding out need not occur even at full employment. For the increased government expenditure at full employment and the inflationary pressures that ensue will make money a less attractive asset, and encourage economic units to save in other forms of assets including real capital. Thus, increased government expenditure enhances rather than reduces the economy's capital stock (contrary to Friedman's (1972) claim). Similarly, Mitchell (1981), employing a post-Keynesian framework, concludes that budget deficits do not produce destabilizing results for they provide the means through which the nominal growth in the economy can be accommodated.

The study by Friedman (1978) is interesting in that it accounts for crowding out phenomena within the context of a model that includes money, bonds and capital – see also Meyer (1980). Friedman demonstrates that crowding out crucially depends on "the ratio of the substitution coefficient between bonds and money to the substitution coefficient between bonds and capital" in relation to "the ratio of the respective wealth coefficients on the demand for money and capital" (Friedman, 1978, p.629). The importance of this study is that it relates to an issue which is completely ignored by the studies that emphasise the wealth effect in the demand for money, as in Floyd and Hynes (1976) for example. Since it is implicitly assumed in these studies that government bonds are closer substitutes for capital than money, it is taken for granted that the sign of the wealth effect in the demand for money is positive. This, however need not be the case; as Friedman (1978), Tobin (1971) and Tobin and Buiter (1976) argue the substitutability between bonds and money may be stronger than between bonds and capital. Clearly, if this were the case, then crowding out of the Flyd and Hynes (1978) type could not be sustained: the increase in wealth that would follow from bond-financed increases in government expenditure, would decrease the demand for money and with no higher interest rates it becomes very difficult to see how crowding out could ever occur. In fact, the available evidence on this substitutability condition would support, according to Friedman (1978, p.639), the non-existence of crowding out effects.

Blinder and Solow (1973, 1974, 1976a – see also Buiter (1977a) – have directed a rigorous theoretical attack on the crowding out thesis. They employ an IS-LM model extended to incorporate wealth effects in both the consumption and demand for money functions, as well as a Government Budget Constraint providing for government debt interest

payments. Their conclusion is that if government expenditure, financed by bond issuance, is more expansive than government spending financed by money creation their model is stable. Otherwise the model is unstable: in other words, if government expenditure, financed by bond issuance, is contractionary, as monetarists claim, or expansionary but less expansive than government expenditure financed by monetary creation, then the model is unstable. Fiscal Policy, therefore, is effective. The Blinder-Solow conclusion derives from the inclusion of interest payments in the Government Budget Constraint. For the model to be stable, the budget must balance in the long-run to ensure unchanging stocks of money and bonds. In order for the budget gap to close following the initial increase in government expenditure, income must rise by a larger amount in the case where the increased government expenditure is financed by bond issuance than by money creation. The inclusion of interest payments in the Government Budget Constraint would always ensure that higher tax receipts must be induced to offset the increased interest payments on the government debt and higher tax receipts could only come about through higher income; thus government expenditure is more expansionary in the bond financed case. The Blinder-Solow contribution, though, suffers from a number of problems: first, their analysis completely neglects price effects; secondly, their model's consistency depends critically upon the existence of a wealth effect in the consumption function; thirdly, they completely fail to account for the fact that wealth includes not only public debt but also the stock of capital; fourthly, there is the unsatisfactory implication that at the steady-state capital accumulation ceases, which, within the type of analysis employed by Blinder and Solow, must require reducing aggregate income to the extent that a zero savings rate is reached – for an elaboration on this and other problems[11] see Turnovsky (1977), pp.130–133. Fifthly, it has been demonstrated by Tobin and Buiter (1976) that if coupon payments are treated as government transfers – Blinder and Solow define government expenditure net of coupon payments – then the long-run government expenditure multiplier does not depend on the mode of financing; it is, in fact, equal to the inverse of the marginal tax rate as in Christ (1968). Currie (1978) argues that even in this case the possibility of instability remains (p.70) – Scarth (1976) uses empirical estimates to demonstrate this possibility – while Buiter (1977b) shows that when the effects of complicated lag structures are accounted for, the stability problem becomes a more complex issue.

The interest payments in the Blinder-Solow (1973/74) analysis refer to the service costs of added debt; if in addition, interest payments on existing debt is accounted for, then we have the type of "coupon effect" discussed by Artis (1978). This effect can arise when increases in government expenditure are financed through borrowing which leads to an increase in interest payments not only for the new debt but also because any refunding of existing debt will have to be done at higher interests rates; the implication here is that the additional interest cost

would have to be met by borrowing. Needless to say, of course, that the increased debt service payments in this case are expected to increase consumption and income more than in the Blinder-Solow case. Artis (1978), though, concedes "that there is something a litle bizarre about the dominance of this effect." (p.175) – see also Wilson (1979).

Another attack on the crowding out thesis is the study by Hendershott (1976) who argues that not only may crowding out not occur but, indeed, we may have the phenomenon of 'pulling in'. This can happen when investment depends on the level of income as well as on the rate of interest. Fiscal expansion may, in this case, increase investment although the fiscal operation raises the interest rate.

Finally, the monetarist claim that failure to account properly for the role of wealth in the demand for money leads to erroneous conclusions as far as crowding out is concerned, has also been challenged. Modigliani and Ando (1976) argue that even if a wealth effect is included in the demand for money it could never produce significant crowding out; this is so because wealth could not rise unless savings increased which would require income to increase. Thus an increase in income should be accompanied by a rise in wealth; however, the gradual accumulation of wealth would affect the rate of interest, via the demand for money and, therefore, some crowding out of the interest rate sensitive type of private expenditures would ensue. Modigliani and Ando, though, went on to say that there is no reason for this process to be so fast as to cause complete crowding out. But they had a stronger argument to support the view of a very low wealth elasticity in the demand for money: "with well-functioning markets, and in the presence of a short-term asset involving no risk of principal, the demand for money must depend only on the short-term rate and the volume of transactions (as well as on transaction costs), but must be independent of either wealth or P." (Modigliani and Ando, 1976, p.28); they also reported that no significant wealth effects could be found in the demand for money of the empirical model they used for the purposes of their study – the MIT-PEN-SSRC (MPS) model for the U.S. economy. Goodhart (1975) seems to share the Modigliani-Ando view when he argues that "the wealth elasticity of demand for money, when narrowly defined, should be very low" (p.48). Currie (1981), however, has demonstrated that the wealth elasticity of demand for money is likely to be higher the wider the definition of the money supply adopted.

The analysis so far has been concerned with a closed economy. In the open economy case, where the existing literature is not as rich as for the closed economy, the above analysis would still be valid but, in addition, one would have to distinguish sharply between a regime of fixed exchange rates, and a regime of flexible exchange rates (Currie, 1981). When fixed exchange rates prevail a fiscal stimulus would inevitably result in a deficit in the balance of payments, with higher imports in

response to increased home demand. This, of course, would limit the size of the multiplier, but could hardly be considered as crowding out – this is essentially Thirlwall's (1978) 'balance of payments constraint'; see also Ward (1981). It was the case, nonetheless, especially in the U.K. during the post-war fixed exchange rate era, that in situations of severe balance of payments difficulties, the authorities would increase the Bank Rate along with a battery of credit squeeze measures such as hire purchase controls, requests to the banking sector to restrict lending, calls for special deposits, etc. Two kinds of crowding out could take place in this environment: first, there is the crowding out that could come about from higher interest rates, following the increase in Bank Rate. Second, the worsened balance of payments may be accompanied by higher prices of imports which may work through to higher costs and wages thus raising significantly the general price level; in this case the domestic inflationary pressures could conceivably crowd out some private expenditures as explained above. A further impact arising from the balance of payments deficit, is the subsequent decline in private sector wealth; in the absence of sterilization, this drain on wealth will take the form of a decline in the money stock. There is, though, an opposite impact on wealth arising from the capital account of the balance of payments. The higher interest rates resulting from the fiscal stimulus, may induce capital inflows which, again in the absence of sterilization, will mitigate the drain on wealth due to the deficit in the trade account of the balance of payments. Needless to say, the capital account effect would depend crucially on the degree of capital mobility.

In a regime of flexible exchange rates, the possibility of crowding out could arise in a more direct manner. A fiscal stimulus would, as above, worsen the balance of payments situation, which, now, would tend to depreciate the exchange rate, raising import prices, and the resulting inflationary pressures could crowd out some expenditure. This tendency of crowding out through inflation would be restrained, though, to some considerable extent by the improvement in competitiveness which, if it persists, could very well outweigh the tendency for crowding out, via increased exports – but see Thirlwall (1978). This process will also be influenced by any potential capital movements induced by the higher interest rates – themselves caused by the fiscal stimulus. Any inflow of capital would, of course, tend to mitigate the fall in the exchange rate. One should also account for any wealth effects arising from the balance of payments, as in the case of fixed exchange rates.

The analysis so far of both the fixed exchange rate and the flexible exchange rate regimes may be more appropriate in the case where expansionary fiscal policies are financed through taxation. When the financing is done through borrowing or money creation, the following comments are in order. In the money-financed case, fiscal expansion will be at least as powerful with floating exchange rates as with fixed ones. Since, though, long-run sock equilibrium in the flexible exchange rate

regime will require income to increase to a level sufficient to balance the budget, whereas in the fixed exchange rate long-run stock equilibrium could occur at a lower level of income (because the budget deficit could be matched by an equal balance of payments deficit), it follows that fiscal policy in the flexible exchange rate case could be more powerful, and the degree of crowding out smaller, than in the fixed exchange rate regime. Bond-finance, by contrast, is likely to be unstable. Stability in this case is only ensured when the wealth effects on expenditures are greater than the wealth effects on the demand for money; it therefore follows that stability may not be so likely to occur in the bond-financed case regardless of the foreign exchange rate regime prevailing – for more details on these conditions, and, indeed, for more details on the effects of fiscal policy and crowding out in the case of an open economy, see Currie (1981).

3. Empirical Evidence on Crowding Out

The origins of recent empirical work on the crowding out question can be traced primarily to the results published by Andersen and Jordan (1968) and supporting studies by Keran (1969, 1970). These results have indicated that crowding out occurs; that is, a change in government spending financed by either borrowing or taxes has only a negligible effect on gross national product over a period of about a year. It is in fact suggested that expansionary fiscal actions have an initial positive effect which is followed in later quarters by an approximately off-setting negative effect. Crowding out, therefore, occurs within a very short time period.

The response to these empirical results has been substantial.

Corrigan (1970) has argued that the results reached by Andersen and Jordan are questionable in that the indicator of fiscal policy used by the authors, the 'Full Employment Surplus', which is an estimate of the overall National Income Account Budget at some arbitrarily defined full-employment level of economic activity, suffers from a serious defect. This defect refers to the upward trend in full employment growth in nominal incomes; thus, increases in full employment receipts would come about even in periods when tax policies and expenditure were unchanged. It is argued that a superior indicator of the direction and magnitude of short-run changes in discretionary fiscal policy is the so-called 'Initial Stimulus' which is supposed to be more independent of the level of economic activity than the equivalent variable utilised by Andersen and Jordan. The 'Initial Stimulus' is the algebraic sum of the initial effects of changes in government expenditure and the initial effects of changes in government tax policies on an accounting basis. It, therefore, seeks to identify and quantify those elements in the government budget that actually represent changes in discretionary

fiscal policy. In this way it is, therefore, more independent of the level of income than the 'Full Employment Surplus' indicator of fiscal policy.[12]

At an empirical level Corrigan provides results which indicate that the association between changes in gross national product and changes in fiscal policy as measured by the 'Initial Stimulus' is stronger than is the case with 'Full Employment Surplus'. In addition, when the 'Initial Stimulus' is used as the indicator of fiscal policy its impact on total spending is significant; the Andersen and Jordan study, therefore, appears to have overstated the case against fiscal policy, particularly with regard to the impact of tax changes on gross national product – see also DeLeeuw and Kalchbrenner (1969). Similar tests have been carried out by Artis and Nobay (1969) confirming this last result. In general, they found a strong fiscal multiplier, but a very weak monetary multiplier. More recently Friedman (1977) has provided evidence to show that, using updated series which include the 1969–1976 period, even the Andersen-Jordan reduced-form now 'believes in' fiscal policy. Carlson (1978), however, has defended the Andersen-Jordan thesis by arguing that the results of Friedman were defective in that they were characterised by a 'non-constant error variance'. This study showed that once this statistical problem was tackled, the Andersen-Jordan equation still did not 'believe in' fiscal policy (Carlson, 1978, p.19). This particular result has prompted Vrooman (1979) to suggest that "Carlson may be right, and that Friedman may have been wrong, but also that Carlson may have been wrong, and Friedman right" (p.111). His argument is that Carlson correctly observed the statistical problem in the Friedman study, but the method Carlson utilised to cure for the statistical weakness was not satisfactory; in fact, "Carlson was wrong in his method and his conclusion" (p.113). Vrooman, finally, concludes that Friedman was right in as much as there had been a significant increase in the impact of fiscal policy.

Davies (1969) argues that the surprisingly high association between money and gross national product is a reflection of common trends in gross national product and the monetary aggregates, particularly during the 1960's. He also adds that another weakness of the Andersen-Jordan study is the absence of a detailed transmission mechanism: what are the channels through which instruments of policy are supposed to influence ultimate targets? For according to Davies (1969): "We need to see precisely how money is supposed to produce the results it appears to produce in the Andersen-Jordan equation" (p.131).

Gramlich (1971) demonstrates that the reduced-form approach of Andersen and Jordan is not satisfactory at all in one very important respect. This can be shown by considering the impact coefficient of government expenditure on gross national product which in the Andersen and Jordan study is less than unity. Since the government spending component of gross national product automatically rises by

the amount of the expenditure, the impact coefficient of less than unity for government spending indicates that some endogenous component of total spending falls by a large amount as expenditures rise, and that the marginal propensity to consume must be very low. If, then, one could determine exactly what was falling and why, and if one knew what the implied consumption function looked like, one would have some guidance on the Andersen-Jordan findings, and presumably one would find them easier to accept. Reduced-forms, however, provide no internally consistent description of the various relationships involved, "Thus the reduced-form technique, while it may be indicative, does not seem to be very conclusive". (Gramlich, 1969, p.530). What is needed is for ".... the monetarists to spell out in detail precisely how they think the transmission process works. Moreover, this description must be translated into an econometric model with a reasonable degree of structural detail .... only after such a project is carried out, and carried out successfully, will most economists really be prepared to believe that money matters as much and as fast as it seems to in St. Louis." (Davies, 1969, p.131). Reduced-forms have also been attacked as being biased because of the presence of association between the policy variables included in the reduced-form and other exogenous variables (Modigliani, 1971; but see also Modigliani and Ando, 1976); additionally, reduced-forms would be biased if, over the period of estimation, the policy variables included in them were actively used for stabilization purposes (Goldfeld and Blinder, 1972). In this case the reduced-form coefficients will underestimate the true response to the variable used for stabilization purposes, and overestimate the response to other policy variables included in the reduced-form.

The methodology of single-equation estimates has been severely critised by Modigliani (1977) arguing that reduced-forms are a very poor representation of what actually takes place in an economic system, while Modigliani and Ando (1976) provide empirical evidence for this claim. This evidence is based on an exercise designed to test whether the Andersen-Jordan reduced-form could reproduce the output generated by a fairly complex 'black box' which purports to have characteristics similar to the US economy's – simulation exercises have shown that this is the case; the 'black box' chosen for this exercise is a multi-equation model of the US economy. Modigliani and Ando (1976) concluded that the reduced-form provided results which were by far very different from the true ones. They were thus able to suggest that the reduced-form was "both a severely biased and quite unreliable method of estimating the response of a complex economy to fiscal and monetary action" (p.42), and that the evidence produced by large macroeconometric models is expected to be much more reliable and dependable than that of reduced-forms. Inevitably, then, "there are no viable alternatives to the painstaking task of looking inside the black box. When this is done, one cannot fail to conclude that the effects of macro fiscal actions are certain to be long-lasting and likely to be substantial" (Modigliani and Ando,

1976, p.42).

Schwartz (1976) has attacked the study by Modigliani and Ando (1976) arguing that since the multi-equation model, used to represent the 'black box', suffers from some severe shortcomings[13] this particular study proved actually nothing – see also Darby (1976). This criticism, though, is completely irrelevant for Schwartz misses the whole point of the Modigliani and Ando paper when she criticises the specification of the model they use; the point here is that the study by Modigliani and Ando does not make any claims about the correct specification of their model (Gordon, 1976, p.59).

The studies that have been concerned with large models, however, reveal that corwding out can occur over time. The way that crowding out is studied in these empirical works is usually through simulation results which show the implied government expenditure and tax multipliers. The model simulations, then, have not always produced evidence which would support the standard Keynesian presumption of positive government spending multipliers; and as Fromm and Klein (1973) point out: "Conventional textbook expositions generally depict real expenditure multipliers approaching positive asymptotes. In fact, most of the models here show such multipliers reaching a peak in two or three years and then declining thereafter in fluctuating paths. At the end of five to ten years, some of the models show that continued sustained fiscal stimulus has ever-increasing perverse impacts" (p.393). These results should not be interpreted to suggest that 'government spending does not matter'. It would seem that it does matter over a certain period. Moreover, if government spending were to accelerate rapidly than be held to a once-for-all increase, the impact on gross national product would be considerable over the period of acceleration and also over some periods beyond. It would, therefore, appear that these estimates of the fiscal multiplier are not as damaging to the Keynesian position as they initially appear (Klein, 1973, pp.9–12). After all, it takes a considerable length of time in some of the models for the government spending multiplier to approach zero or turn negative, and policy makers historically have shown little concern for the long run. Nevertheless, before such a conclusion is finally reached a much more detailed analysis is required to establish whether demand management can still be effectively implemented even with crowding out occuring within a period of 2–3 years. This particular question has been dealt with in the paper by Arestis and Karakitsos (1980) where it is clearly shown that fiscal policy can be relied upon to achieve the ultimate targets for inflation and unemployment under different modes of finance. The framework used in this study is that of 'optimal control' within the National Institute of Economic and Social Research model of the UK economy.

The above studies refer, mainly to the US experience; in the case of the

UK similar results have been reported. Bisham (1975) derives a GDP multiplier of 0.98 after eleven quarters for the National Institute of Economic and Social Research model with respect to an increase in government expenditure; Ball, Burns and Miller (1975) for the London Business School model, report a real multiplier of 1.11 after twenty four quarters, while in the study by Evans and Riley (1975), where the Treasury model is employed, the multiplier is 1.33 after sixteen quarters. In the study of Laury, Lewis and Ormerod (1978), the multipliers are 0.68, 1.06 and 1.09 for the above models, respectively. What is interesting about these multipliers is that they "indicate rather less disagreement than one might have been led to expect from similar US studies", and with respect to the pattern of fiscal policy impact, "the British models are telling much the same story". (Laury, Lewis and Ormerod, 1978, p.64) – the same results are reached in the studies by Taylor (1979) and Lewis and Ormerod (1979), and National Institute of Economic and Social Research (1981). In the study by Fetherston and Godley (1981) the dynamic multiplier is 3.27 after five years for the Cambridge Economic Policy Group model, while in the study by Ball, Burns and Warburton (1979) the multiplier is 0.65 in the case of the London Business School model.[14] The latter study is interesting in as much as the increase in government expenditure is financed through money creation; as such it shows little, if any, crowding out. Nevertheless, by the end of the experiment (32 quarters) the increase in real government spending is roughly equal to the fall in real consumer spending; it is only because other components of aggregate expenditure are not crowded out that the overall impact on aggregate output is positive.

In a more recent study Arestis and Karakitsos (1982) employ the 'optimal control' technique, which they show to be superior to the standard simulation technique used by the other studies, to conclude that within the National Institute of Economic and Social Research model crowding out is never complete; and although the dynamic multipliers derived in this study do differ from the ones of the other studies of the UK economy mentioned above (due to the superior technique utilised in the Arestis-Karakitsos study), the pattern of results in terms of crowding out are, in fact, similar. All these studies employ the three models mentioned above; in the study by Arestis (1979) a small dynamic model is used which again provides similar results. Studies with small models but utilising US and Canadian data include the Cebula (1978) and the Zahn (1978) papers; they show that although the level of private investment spending is crowded out by government budget deficits (financed through borrowing), crowding out is not complete in as short a period as the studies by Andersen-Jordan and Keran suggest. A further result of the Cebula (1978) study is that the partial crowding out which is evident in his paper has an important inflationary impact on the economies of Canada and US. This result is important in that the inflationary potential of fiscal policies is derived from 'supply considerations' and not from the traditional 'demand considerations'. The Zahn (1978) study – using US

data – clearly indicates that the crowding out that occurs is never large enough to outweigh the expansionary influence of government spending except perhaps in the very long run. This last comment suggests a progression of the debate on crowding out from "Does it exist?" to "What is the time period required for it to set in?" The answer to the latter question must be that in the short-run, at least, no complete crowding out is evident (Meyer, 1980).

Finally, a word on 'resource' crowding out of the Bacon and Eltis (1976) type. It has been demonstrated, quite convincingly, by Hadjimatheou and Skouras (1979) that the available empirical evidence does not support the conclusions reached by Bacon and Eltis. They have in fact shown that the data used by Bacon and Eltis are misleading, and that proper and detailed examination of the statistical evidence provided by Bacon and Eltis does not substantiate their arguments. When Hadjimatheou and Skouras attempt to correct for these deficiencies their own evidence seems to contradict that of Bacon and Eltis. Furthermore, letto Gillies (1978) has argued that not enough evidence exists to support the Bacon and Eltis contention that industry has been squeezed out of resources by the expansion of the public sector. Also Thirlwall (1978) argues that the growth of the public sector has not been an autonomous development in the economy but a response to the economy's inability to grow at a rate compatible with full employment because of a serious balance of payments constraint.

4. Conclusions

Whether crowding out exists or not is, of course, a very important issue in contemporary economic analysis and policy. Indeed, the acceptance or rejection of crowding out phenomena constitutes a fundamental difference between monetarists and non-monetarists (Blinder and Solow, 1973; Stein, 1976; Tobin and Buiter, 1976).

The theoretical review and the summary of the empirical results on the existence of crowding out provided in this paper, clearly indicate that:

(i) in none of the non-reduced form studies does complete crowding out occur, at least in the short-run.

(ii) In the long-run we may have complete crowding out, but there is, of course, the inevitable problem of what constitutes the long run; and in any case 'in the long-run we are all dead'. Furthermore, there is the argument that when crowding out occurs, this can only be so because of an inappropriate mix of the policy instruments employed by the policy-makers (Currie, 1981).

(iii) not enough evidence exists to show that 'resource' crowding out

has occurred, at least in the UK.

We may, therefore, conclude this paper by saying that, theoretical considerations and the available empirical evidence clearly indicate that complete crowding out does not occur. Thus fiscal policy matters, indeed it matters a great deal, for even if crowding out was complete, or even over-complete, fiscal policy would still be important in the sense discussed by Buiter (1977a), Arestis and Karakitsos (1980), and Currie (1981).

FOOTNOTES

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1. See Arestis (1979), Cebula and Curran (1978), and Choudhry (1976) for typical examples.
2. See Choudhry (1976, p.408) who reaches the same conclusion after a 'synoptic' discussion of the literature. See also, Christ's (1968, 1978) contributions on this point, as well as the papers by Carlson and Spencer (1975), and Spencer and Yohe (1970).
3. Peston (1981) demonstrates that "at full employment a reduction in public sector employment *allows* an increase in private sector employment, but it does not guarantee it" (p.26).
4. For a more detailed discussion of this view see Klein (1968), pp.45–46.
5. Those Marxists who accept the 'Underconsumption Hypothesis' argue, however, that government intervention is necessary in order to create additional effective demand by absorbing part of the continually mounting volume of surplus which could not be absorbed through private channels (Baran and Sweezy, 1966).
6. See also the paper by Brunner and Meltzer (1972, 1976) – but see McGrath (1977) – as well as the ones by Silber (1970) and Rasche (1973).

7. Meyer (1975) provides a numerical example clearly showing the expansionary initial effects as well as the subsequent contractionary effects of a fiscal action in an IS–LM framework.
8. There is the question here of what constitutes wealth: for although there is little disagreement that high-powered money and capital stock ought to be included in the definition of wealth, the same cannot be said for government bonds and bank demand deposits. The controversy surrounding the treatment of these two items as wealth has been summarised by Currie (1981).
9. It has been pointed out to me by D. Currie that the argument of Floyd and Hynes (1978) is flawed in that it is likely to be actual, not 'permanent', wealth holdings that are relevant for considerations of portfolio balance.
10. It should be clear by now that changes in wealth may come about through three avenues: from changes in the quantity of outstanding assets included in wealth; from changes in interest rates which cause the value of the existing stock of fixed-interest bonds and equities to alter; and from changes in the aggregate price level which induces the real value of wealth to change. For an elaboration on all these changes, see Currie (1981).
11. For a further critical analysis of the Blinder-Solow reasoning, see Infante and Stein (1976) to which Blinder and Solow (1976b) responded, defending their 1973/74 contributions.
12. For more details on the notion of the indicator 'Full Employment Surplus' see *Council of Economic Advisers* (1974) and Artis (1978); and on the meaning of the 'Initial Stimulus' indicator see *Federal Reserve Bank of New York* (1965).
13. The shortcomings Schwartz refers to are points which non-monetarists – like Modigliani and Ando – would reject in any case on purely theoretical grounds. For example, one such shortcoming Schwartz suggests is the inclusion of real money balances in the consumption function; presumably Modigliani and Ando would not accept this proposition as being theoretically valid.
14. It must be stressed that the dynamic multipliers of these large-scale models may change as the specification of the structural relationships of these models are up-dated.

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