The Case for Fiscal Policy

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ABSTRACT

This paper reconsiders the case for the use of fiscal policy based on a "functional finance" approach that advocates the use of fiscal policy to secure high levels of demand in the context of private aggregate demand, which would otherwise be too low. This "functional finance" view means that any budget deficit should be seen as a response to the perceived excess of private savings over investment at the desired level of economic activity. The paper outlines the "functional finance" approach and its relationship with fiscal policy. It then considers the three lines of argument that have been advanced against fiscal policy on the grounds of "crowding out." These lines are based on the response of interest rates, the supply-side equilibrium, and Ricardian equivalence. The paper advances the view that the arguments, which have been deployed against fiscal policy to the effect that it does not raise the level of economic activity, do not apply when a "functional finance" view of fiscal policy is adopted. A section on the intertermporal budget constraint considers whether this constraint rules out budget deficits, and concludes that in general it does not.

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1. INTRODUCTION[1]

The case for the use of fiscal policy and for governments to operate with an unbalanced budget (whether in surplus or deficit) arises from the simple Keynesian proposition that there is no automatic mechanism which ensures that aggregate demand is sufficient to underpin a high level of economic activity (Kalecki 1939, Keynes 1936). The notion that the budget should always be in balance (or even on average in balance) is rejected on the grounds that a balanced budget is generally not compatible with the achievement of high levels of aggregate demand. Further, although interest rates may have some impact on the level of aggregate demand, there are constraints on the extent to which interest rates can be varied (whether for reasons akin to a liquidity trap in operation which prevent the reduction of interest rates below a particular level or for foreign exchange considerations) and there are doubts relating to the potency of interest rates to influence aggregate demand (see Arestis and Sawyer 2002).

Many lines of argument have been developed to the effect that budget deficits and fiscal policy are ineffectual and/or have undesired (and undesirable) effects. This paper starts from a "functional finance" perspective (discussed in the next section)**,** which views the role of fiscal policy in terms of raising the level of aggregate demand, where it would otherwise be too low.[2] It puts forward the view that the arguments, which have been deployed against fiscal policy to the effect that it does not raise the level of economic activity, do not apply when a "functional finance" view of fiscal policy is adopted.

2. FISCAL POLICY AND "FUNCTIONAL FINANCE"

The starting point for this paper is the argument that the nature and role of fiscal policy should be approached from the perspective of what has been termed "functional finance" (Lerner, 1943). The general proposition is that the budget position should be used to secure a high level of economic activity in conditions where otherwise there would be a lower level of economic activity. Lerner (1943) put the case for Functional Finance (capitalized in the original), which "rejects completely the traditional doctrines of 'sound finance' and the

[1] Work on the importance of fiscal policy has been undertaken in the past here at The Levy Economics Institute. Of particular importance are the papers by Godley and McCarthy (1997) and Godley (1999, 2001). The role of fiscal policy has been studied in this work within a consistent stock/flow model, where it is very effective in terms of enabling imbalances in the private sector's balance sheets to be corrected (see, also, Minsky 1982, 1991).

[2] Leaving open as to what level of economic activity is regarded as optimum or desirable.

principle of trying to balance the budget over a solar year or any other arbitrary period" (p. 355). "Functional finance" supports the important proposition that total spending should be adjusted to eliminate both unemployment and inflation.

In a similar vein, Kalecki (1944a) argued that sustained full employment "must be based either on a long-run budget deficit policy or on the redistribution of income" (p. 135). Kalecki based his argument on the assumption that there would be a tendency for the level of aggregate demand to fall short of what was required for full employment. Then there was a need for either a budget deficit to mop up with the difference between full employment savings and investment or for full employment savings to be reduced through a redistribution of income (from rich to poor).

He also argued that "although it has been repeatedly stated in recent discussion that the budget deficit always finances itself ... that is to say, its rise always causes such an increase in incomes and changes in their distribution that there accrue just enough savings to finance it … the matter is still frequently misunderstood" (Kalecki 1944b). He then set out for a closed economy the equality:

(2.1) $G + I = T + S$

(where G is government expenditure, T tax revenue, I investment expenditure and S savings) and hence:

(2.2) $G - T = S - I$

which can be readily modified for the open economy as:

(2.3) $G + I + X = T + S + Q$

where X stands for exports and Q for imports.

From this perspective, the budget deficit is to be used to mop up "excess" private savings (over investment), and the counterpart budget surplus used when investment expenditure exceeds savings (at the desired level of economic activity). It follows**,** though**,** that a budget deficit is not required when there is a high level of private aggregate demand such that investment equals savings at a high level of economic activity (and a surplus would be required when investment exceeds savings at the desired level of economic activity). This can be expressed by saying that the government budget position should be set so that:

(2.4) $G - T = S(Yf) - I(Yf) + Q(Yf) - X(WY)$

where Y_f is the intended level of income (which may be thought of as equivalent to full employment or to some supply side constraint), WY is world income (which is taken as given for the purposes of G–T equation). A tendency for savings to run ahead of investment leads to the view that a budget deficit is required (in the absence of any tendency for balance

of trade surplus). But it is a short-fall of investment over savings that creates the requirement for a budget deficit: in the absence of any such short fall (in ex ante terms) there is no need for a budget deficit. The analysis of budget deficits should then be undertaken in a context**,** which at least allows for the emergence of an excess of (ex ante) savings over (ex ante) investment. In the absence of any such excess, the "functional finance" view would not see any cause for a budget deficit.[3]

The case for fiscal policy rests on the proposition that the equality between *ex ante* savings and *ex ante* investment at full employment income cannot be assured (or indeed at any target level of income).[4] If there were some automatic tendency, as expressed in Say's Law, for that equality to be assured, then any case for fiscal policy in the form of unbalanced budgets would disappear. Further, if the relevant rate of interest can be manipulated through monetary policy is such a way as to ensure this equality, then again there would be little room for fiscal policy. The basic Keynesian (Kaleckian) argument is that there is no assurance that this equality will be satisfied, and hence a need for fiscal policy and for an unbalanced budget.

The general presumption of Keynesians and others has been that there is likely to be a deficiency of *ex ante* investment relative to ex ante savings, rather than the reverse. This does not rule out that there will be occasions (as in the late 1990s in the UK and the U.S. with conditions of low unemployment) when investment runs ahead of savings. In the former case, a budget deficit is required to mop up the excess savings, while in the latter case a budget surplus results. However, the presumption that budget deficits are the more frequent outcome under the use of "functional finance" does raise the problem of cumulative budget deficits and rising government debt. Lerner (1943) and others acknowledge this possibility but saw that "No matter how much interest has to be paid on the debt, taxation must not be applied unless it is necessary to keep spending down to prevent inflation. The interest can be paid by borrowing still more" (p. 356). Lerner (1943) summarized the answers to arguments against deficit spending by saying that the national debt does not have to keep on increasing, and that even if it does the interest does not have to be paid from current taxes. Further, interest payments on bonds are an internal transfer. This question of the sustainability of budget deficits is further considered below.

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[3] One caveat to that statement is the following. A growing economy generally requires an increase in the stock of money, and within that an increase in the monetary base (M0) for which there is an increasing demand as income rises. The provision of M0 comes from a budget deficit.

[4] This discussion is cast in terms of a closed economy: adjustments to account for an open economy can be readily made without undermining the basic approach pursued here.

Fiscal policy is often viewed in terms of the determination of government expenditure and taxation as undertaken without specific regard to the state of private aggregate demand. The "crowding out" argument after all assumes that there is something to be crowded out. That approach to fiscal policy suggests either that fiscal policy has no effect on the level of economic activity (since there is crowding out) or that there is a positive link between government expenditure (budget deficit) and the level of economic activity. The investigation of fiscal policy through the means of simulation of macroeconometric models is concerned (usually) with the question of what happens if government expenditure is increased, other things being equal. The results of such simulations**,** generally, suggest that an increase in government expenditure does have a positive effect on the level of economic activity (Arestis and Sawyer 2003). Indeed in the context in which these simulations are undertaken, it is somewhat surprising that positive results are obtained since such macroeconometric models generally build in a variety of ways by which there would be crowding out—the most notable one being that imposition of some form of supply-side equilibrium.

The approach to fiscal policy just described is not one that underlies the approach of this paper. Indeed we would argue that this approach has been implicit in most recent discussion of fiscal policy and "crowding out," but does not correspond to the way in which fiscal policy should be viewed. The effects of fiscal policy (especially when that takes the form of a budget deficit) from a "functional finance" perspective start from the position that budget deficits are applied when there would otherwise be a deficiency of aggregate demand (below that required for the target level of economic activity), and conversely budget surpluses applied when there would otherwise be an excess of aggregate demand. This is not to say that fiscal policy has been always (or even usually) applied in this manner. But it is to argue that fiscal policy and its effects should be evaluated against this background. The evaluation of fiscal policy should not start from the presumption that there would otherwise be adequate effective demand in that all would agree that in the context of adequate private effective demand there is no requirement for budget deficits. There have been three distinct sets of arguments to the effect that fiscal policy will be ineffective, under the general heading of "crowding out," and these are now considered in turn.

3. CROWDING OUT MARK 1: INTEREST RATES

The first form of crowding, discussed in the context of the IS-LM analysis, was a partial "crowding-out" due to a rise in interest rates following a fiscal expansion which shifted the IS curve outwards. This was based on the assumption that the money supply was exogenous and fixed by government (or Central Bank), and that the interest rate equated the demand for and supply of money. In that context, though, it was recognized that a sufficient increase in the stock of money alongside an increase in government expenditure could prevent the rise in the interest rate, and allow the full effect on the level of economic activity of the increase in government expenditure to come through.

This argument relies on the view that monetary policy (in the form of an increase in the stock of money) does not accommodate fiscal policy, and that investment and other forms of private expenditure are sensitive to the rate of interest. It is also the case that this argument assumes that the stock of money is exogenously determined (outside of the private sector). It is clear that in industrialized economies most of what is counted as money takes the form of credit money (bank deposits). In that context, the stock of money is eventually determined by the demand for money and the level of interest rates is not set by the interaction of the supply and demand for money. Further, monetary policy no longer (if it ever did) takes the form of making changes in the stock of money (or even of targeting the rate of change of the stock of money) but rather takes the form of the setting of some key interest rate (e.g., Federal Funds rate, "repo" rate).

In the context of endogenous credit money with the key interest rate set by the Central Bank, "crowding out" through the operation of monetary policy would arise from the deliberate actions of the Central Bank. That is to say, if the Central Bank (presumably operating on an "independent" basis) responds to a fiscal expansion by raising interest rates (say on the grounds that fiscal expansion created inflationary pressures), then there would be some form of crowding out (in so far as an increase in interest rates reduces private expenditure). Its extent would depend on the size of the interest rate rise, its feed through to other interest rates, the interest rate responsiveness of expenditure, and the phase of the business cycle. The key point here is that any "crowding out" depends on the responses of the monetary authorities: it does not occur through the response of the markets. In the short run, at least, with the key interest rate set by the Central Bank any "crowding out" comes from the discretionary actions of the Central Bank. The effect of a budget deficit on the general level of interest rates then depends on the reactions of the Central Bank to the budget

deficit (or more generally to changes which are stimulated by the budget deficit). A "conservative" Central Bank which viewed a budget deficit as being to some degree inflationary (whether through a direct effect on inflation or through stimulating aggregate demand which was perceived as inflationary) would respond to a budget deficit by raising interest rates. In contrast a "Keynesian" Central Bank whose policy decisions were coordinated with the fiscal policy decisions would respond by making no change to the key interest rate. It is then possible that a budget deficit will be accompanied by increased interest rates, but that would be a discretionary policy decision of the Central Bank and not the operation of some "iron law."[5]

Others would argue that the (long-term) rate of interest is settled in the market for loanable funds, and further that the budget deficit, being the government's demand for loanable funds, will increase demand for loanable funds and thereby the rate of interest. But the "functional finance" approach views the budget deficit as filling the gap between ex ante savings and investment (at the desired level of economic activity). In the absence of the budget deficit, savings and investment would adjust, notably through changes in the level of economic activity. The budget deficit is required since (by assumption) the rate of interest cannot adjust sufficiently to bring ex ante savings and investment into line at an acceptable level of economic activity. The general expectation of the "functional finance" approach is that budget deficits have no effect on interest rates (when the budget deficit is designed to "mop up" excessive savings), and ironically this is the same conclusion, which is reached by the Ricardian equivalence literature.

4. CROWDING OUT MARK 2: SUPPLY-SIDE EQUILIBRIUM

The second form of "crowding out" arose from a combination of the notion of a supply-side equilibrium (such as the natural rate of unemployment or the non-accelerating inflation rate of unemployment, the NAIRU), and that the level of aggregate demand would adjust to be consistent with that supply-side equilibrium. In the context of an exogenous money supply, this came through the assertion of a "real balance" effect, with changes in the price level generating changes in the real value of the stock of money, thereby generating changes in the level of aggregate demand.[6] In the context of endogenous money, it would come through the

[5] In the reverse direction, the reported agreement between Clinton and Greenspan whereby the latter would reduce interest rate if the former reduced budget deficit is an example of the policy nature of links between budget deficit and interest rates. This is a clear example of monetary and fiscal policies coordination.

[6] This could be a long adjustment process, but it is the "automatic" one invoked in the context of the NAIRU.

adjustment of interest rate by the Central Bank. This could occur if the Central Bank adopted some form of "Taylor's rule" under which the setting of the key interest rate depends on the "equilibrium" rate of interest, deviation of inflation from target and deviation of output from trend level (Taylor 1993). Monetary policy can guide aggregate demand to match supply provided that interest rates are effective in influencing the level of demand and provided that the Central Bank's calculation of the "equilibrium rate" of interest is accurate. As has been argued above, fiscal policy has an effect on the level of aggregate demand, and "crowding out" only occurs if it assumed that the supply-side equilibrium must be attained (in order to ensure a constant rate of inflation) *and* that the level of aggregate demand would anyway be equivalent to the supply-side equilibrium. In the absence of some powerful automatic market forces or a potent monetary policy, which can ensure that the level of aggregate demand moves quickly to be consistent with the supply-side equilibrium, then fiscal policy has a clear role to play.

The supply-side equilibrium can itself be influenced by the path of aggregate demand. The size and distribution of the capital stock is a determinant of the productive capacity of the economy, and a larger capital stock would be associated with the supply-side equilibrium involving a higher level of output and employment. The level of aggregate demand (including the change in economic activity and profitability) has an impact on investment expenditure, and thereby on the size of the capital stock. The supply-side equilibrium may form an inflation barrier at any point in time, but it is not to be seen as something immutable and unaffected by the level of aggregate demand.

If the representation of the economy (economic model) is such that there are self-contained subsets of equations from which equilibrium solutions can be derived, then it is possible to speak of equilibrium positions relating to each of the sub set of equations. In particular if there is a sub-set of equations which can be viewed as relating to the supply-side of the economy, then it is possible to speak of a supply-side equilibrium: and similarly for a demand-side equilibrium. The "natural rate of unemployment" and the NAIRU appear to fall into the category of supply-side equilibrium positions. In this context, the supply-side equilibrium seems to place a constraint on the level of output or employment (more generally the level of economic activity). In the present context, the supply-side equilibrium would appear to limit any role for fiscal policy (acting on the demand side of the economy) in that economic activity cannot be raised above the supply-side equilibrium for any length of time. However, this notion of supply-side equilibrium and the dichotomy (separation) between the supply-side and demand-side of the economy (which sometimes corresponds to

the separation between the real side and the monetary side of the economy as in the classical dichotomy) raises three issues.

First, what, if any, are the mechanisms on the supply-side of the economy, which take the economy to the supply-side equilibrium position? Second, are there mechanisms, which bring a compatibility between the supply-side and the demand-side of the economy? Third, are there interactions between the supply-side and the demand-side of the economy which are generally overlooked? We now look at these issues in turn.

On the first issue, it could be said little attention has been given to this. However, when the supply side is viewed as akin to a competitive (labor) market (with the "natural rate of unemployment" as the supply-side equilibrium), then an adjustment mechanism appears to be changes in real wages. In the expectations-augmented Phillips' curve, changes in real wages (expressed in terms of changes in nominal wages minus expected inflation) are linked with unemployment as a (negative) proxy for excess demand for labor. Real wages continue to adjust until the "natural rate of unemployment" is attained. This approach implicitly assumes that the cause of unemployment (and indeed over employment) arises from real wages differing from the equilibrium level. No attention is given to the level of aggregate demand, and implicitly it is assumed that the level of aggregate demand underpins the level of employment as set by the level of real wages. In the more general NAIRU approach, based on imperfect competition and wage bargaining (e.g., Layard, Nickell, and Jackman 1991), there is no obvious supply-side adjustment mechanism. Wages and prices change in response to the level of demand, but there is no mechanism at work, which guides the level of real wages to its equilibrium level.[7] The adjustment in this NAIRU approach comes from the demand side alone.

With regard to the second issue, one proposed mechanism has been the operation of the real balance effect. The general price level is assumed to respond to the excess of the demand position over the supply-side equilibrium (e.g., current demand determined level of unemployment relative to the "natural rate of unemployment"), and the change in the general price level leads to a change in the real value of the money stock which then impacts on the level of aggregate demand. The level of aggregate demand is (eventually) brought into line with the supply-side equilibrium. But it is well known (at least since Kalecki 1944c) that the real balance effect relies on "external" money with net worth to the private sector and to the stock of money remaining unchanged in the face of price changes. In a world of largely bank credit money, the amount of "external" money is relatively small: for example in the UK the

ratio of M0 to GDP is less than 4 percent; a price fall of 10 percent would increase real value of M0 by the equivalent of 0.4 percent. With a wealth effect on consumption of the order of 0.02 to 0.05 (OECD 2000, p. 192), aggregate demand would change by the order of 0.01 percent (for a decline of 10 percent in the price level). But with endogenous money the stock of money is determined by the demand for money. As prices fall, the demand for M0 would fall and hence the stock of M0 would also fall. In sum, the empirical relevance of the real balance effect can be readily dismissed.

The other adjustment mechanism postulated relates to the operation of interest rate policy by the Central Bank. The adoption of something akin to Taylor's rule would envisage the Central Bank discount rate being varied in response to the rate of inflation and to the output gap. The "equilibrium" rate of interest is then seen to be that which bring aggregate demand in line with available supply (and a constant rate of inflation). This is clearly not an automatic market mechanism**,** but rather arises from the discretionary operation of monetary policy (in the form of interest rates), as discussed above. In this context, the adjustment mechanism arises from an act of government (albeit in the form of the actions of the Central Bank) and fiscal policy could (and perhaps does) also act as an adjustment mechanism.

Turning now to the third issue, the relationship between the demand side and the supply side of the economy in the sense of changes on one side having a long lasting impact on the other side (rather than just an adjustment process) is often seen as non-existent. However, there are reasons for thinking that is not the case. The most cited example comes under the label of hysteresis effects in the labor market: periods of low demand and high levels of unemployment are viewed as having "scarring" effects on the work force and the effective supply of labor. Without dismissing such effects, in the context of the present paper a more significant effect may come through the effects of aggregate demand on investment, and of investment on productive capacity (and hence the supply side of the economy). Fiscal policy of the "functional finance" type boosts aggregate demand, and thereby has a stimulating impact on investment, which raises the future productive capacity of the economy. Further, some advocates of "functional finance" have viewed public sector investment as a form of expenditure**,** which can be varied according to the state of private demand,[8] and to the extent

[7] See Sawyer (1999) for further discussion.

[8] Keynes (1980) argued for public investment to be set such that Private Investment + Public Investment = Savings, and hence that the budget deficit appeared to finance public investment. Keynes (op. cit.) also advocated that "in peace-time budgets through the Chancellor making a forecast of capital expenditure under all heads, and comparing this with prospective savings, so as to show that the general prospective set-up is reasonably in accordance with the requirement of equilibrium. The capital budget will be a necessary ingredient in this exposition of the prospects of investment under all heads. If, as may be the case, something like two-

to which the budget deficit permits additional public investment there can also be a boost to future productive capacity.[9] The growth rate of the economy may thereby be favorable enhanced by fiscal policy.

5. CROWDING OUT MARK 3: RICARDIAN EQUIVALENCE

The "Ricardian equivalence" proposition is that the future prospects of taxation to pay for a bond-financed budget deficit reduces consumer expenditure (and increases savings) which may exactly offset the boost to expenditure arising from the budget deficit. The overall level of savings (public savings plus private savings) remains unchanged.

The Ricardian equivalence proposition has been derived in the context of full employment (or at least a level of income set on the supply side of the economy) and the implicit assumption that private sector aggregate demand will underpin that level of income. Thus, the Ricardian equivalence proposition is essentially irrelevant in the context of functional finance. The Ricardian equivalence proposition relates to the question of what happens if a budget deficit were introduced into a situation where ex ante investment and savings were equal at full employment (or equivalent). Functional finance is concerned with the policy recommendation of introducing a budget deficit into a situation where there is a difference between ex ante savings and ex ante investment (usually an excess of savings over investment) at full employment.

The "Ricardian equivalence" proposition clearly indicates that the level of aggregate demand is invariant to the budget deficit position. But it does not indicate what that level of private demand will be, though there is perhaps the presumption that some form of Say's Law will operate, and that aggregate demand will be sufficient to underpin full employment. However, there is no particular reason for this level of aggregate demand to correspond to any supply-side equilibrium. Specifically, in the event of a shift in the supply-side equilibrium, there is no assurance that there will be a corresponding shift in the level of private demand. Estimates of the supply-side equilibrium NAIRU vary over time and across country. But there would be little reason to think that private aggregate demand would be shifting to correspond to the shifting NAIRU.

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thirds or three-quarters of total investment will be under public or semi-public auspices, the amount of capital expenditure contemplated by the authorities will be the essential balancing factor. This is a very major change in the presentation of our affairs and one which I greatly hope we shall adopt. It has nothing whatever to do with deficit financing" (p. 352).

[9] This would depend on the nature of the investment, e.g. investment in roads or in defense equipment, and the productivity of that investment.

Now consider the approach of Barro (1974) which could be seen to revive interest in the Ricardian equivalence proposition under the heading of "are government bonds net wealth?" (we retain the same notation in what follows):

Generation 1 inherits a bequest of A_0^0 from generation 0, and acquires assets (save) of A_1^y while they are young; during their old age they consume c_1^0 and leave bequest of A_1^0. Their budget constraint in this retirement period is:

(5.1) $A_0^0 + A_1^y = c_1^0 + (1- r) A_1^0$

where r is the rate of interest. The assets bequested are assumed to be acquired at beginning of period and yield interest during the period.

Generation 2 receive labor income of w, and save A_2^y (on which they receive interest), and consume c_2^y and their budget constraint is:

(5.2) $c_2^y + (1 – r) A_2^y = w$

In this economy, there is net savings to provide for an increase in the capital stock which yields interest at rate r, hence it is required that:

(5.3) $A_1^0 + A_2^y - A_0^0 - A_1^y = DK$

where DK is the change in the capital stock set by the desire to invest.

This is equivalent to:

(5.4) $c_1^0 + c_2^y + DK = w + r(A_1^0 + A_2^y) = y$

where y stands for income.

But there is nothing, which ensures that this equality will hold when the variables are in notional (ex ante) form: ex post there would (of course) have to be equality.

Consider the case in notional (ex ante) terms where:

(5.5) $c_1^0 + c_2^y + DK < w + r(A_1^0 + A_2^y)$

i.e., intended expenditure falls short of income, and equivalently

(5.6) $A_0^0 + A_1^y + DK < A_2^y + A_1^0$

This would be a deflationary situation with (intended) expenditure falling short of (intended) income. Consider the case where income adjusts to bring equality between income and intended expenditure**.** We assume that consumption is a function of income (labor and capital income) and that return on capital varies proportionally with labor income (though utilization effects). Write w* as the labor income which would result at full employment, and r* as the rate of return at full employment, and the income and rate of return which results from a lower level of income as m.w* and m.r*; then

(5.7) $c_1^0 (m) + c_2^y (m) + DK = m.w^* + m.r^*.(A_1^0 + A_2^y)$

to give a solution for m (m < 1).

By "assumption" in this context, the intention to save will have adjusted so that:

(5.8) $A_0^0 + A_1^y + DK = A\hat{}_2^y + A\hat{}_1^0$

where a variable followed by ^ refers to the ex post value of that variable. In equation (5.8) the left hand side is treated as a given, and the right hand side has adjusted to the indicated level.

Now introduce functional finance such that the budget deficit can "mop up" excess private savings; this would mean that

(5.9) $c_1^0 + c_2^y + DK + B = w^* + r^*(A_1^0 + A_2^y)$

where B is the budget deficit and the other variables are at the level which corresponds to full employment. Income is higher [by $(1 - m^*)$], net private savings are equal to DK + B, and hence:

(5.10) $A_0^0 + A_1^y + DK + B = A_2^y + A_1^0$

with

(5.11) $A_2^y + A_1^0 - (A\hat{}_2^y + A\hat{}_1^0) = B$

In this model, generation 2 are able to save what they wish and do so in the form of assets and bonds. Their overall savings is higher than it would have been in the absence of functional finance.

What about next period's budget constraint for generation 2? In the absence of functional finance this is:

(5.12) $A\hat{}_2^y + A_1^0 = c_2^0 + (1 - r) A_2^0$

With functional finance it is:

(5.13) $A_2^y + A_1^0 = c_2^0 + (1 - r) A_2^0$

When fiscal policy is approached in "functional finance" terms, which is a budget deficit run by the government because there is a difference between savings and investment at the desired income level, then the Ricardian equivalence approach is scarcely relevant. In the absence of a budget deficit, the excess of savings over investment cannot occur (and the discrepancy is dealt with through a fall in income reducing savings until brought into line with income).

We have argued that the Ricardian equivalence theorem relies on the assumption of Say's Law. We now suggest that when fiscal policy acts as an automatic stabilizer, then the data may suggest support for the proposition that budget deficits "crowd out" private savings even though that is not the underlying mechanism. One aspect of the "functional finance" approach is a recognition that the expenditure/tax system can act as a (partial) automatic stabilizer, with government expenditure tending to rise and tax revenue tending to fall when

output slows, thereby limiting the extent of the slow down in output. This does not mean that these automatic stabilizers are sufficient since economic cycles still occur and employment is often far from being equivalent to full employment. The operation of the automatic stabilizer also indicates that the budget deficit can be an endogenous response to changes on the demand side of the economy.

Consider the case where there are demand shocks to the economy emanating from savings, investment and the foreign sector, which lead to fluctuations in the level of economic activity and the budget position. When fiscal policy is essentially passive (that is the automatic stabilizers operate but there is no active discretionary policy), then the budget deficit varies cyclically. However, this can give rise to the appearance of Ricardian equivalence, generated from the national income link between net private savings and the budget deficit (an equality in the simple context of a closed economy).

Next, consider a simple model in which savings are a simple function of post-tax income, i.e.,

(5.14) $S = a + s(1-t)Y$

and investment is autonomous, i.e.,

(5.15) $I = b$

Fluctuations in demand come from fluctuations in a and b, and these are simulated below as random variables. Tax revenue is a simple linear function of income, i.e.,

(5.16) $T = tY$

and government expenditure moves counter-cyclically, i.e.,

(5.17) $G = g – hY$

with g also subject to random fluctuations. All variables are written so as to be positive. The current account is CA and treated as a constant (with respect to income) but subject to random fluctuations. Then

(5.18) $G – T + CA = S – I$

from which:

(5.19) $g – hY – tY + CA = a + s(1-t)Y – I$

So that income is given by

(5.20) $[h + t + s(1-t)]Y = g + I + CA – a$

Fluctuations in the savings and investment behavior lead to fluctuations in the budget deficit, as well as in the level of income. The movement of income as calculated from equation 5.20 was generated through taking values of $s = 0.2$, $h = 0.1$ and $t = 0.4$, and applying random shocks to the values of g, I, a and CA. In Table 1 we indicate the range

within which the values of these variables lay: for example in the first experiment, *a* took values in the range 10 to 20 (15 +/– 5) on a randomly determined basis. For each value of these variables the values of income, savings and budget deficit were calculated. Each run was based on 100 observations: the regression of savings/income ratio on the budget deficit to GDP ratio was then estimated, and we also calculated the response of budget deficit to change in income. For each range of values of *g*, *I*, *a* and *CA*, 100 runs (each based on 100 observations) were undertaken. The average outcomes are reported in Table 1 for the results of the regression

(5.21) S/Y = m + n (BD/Y)

and the responsiveness of the budget deficit to variations in GDP.

Table 1: Results of simulation exercise

A	I	G	CA	N	Responsiveness
15 +/– 5	22.5+/– 7.5	32.5+/– 2.5	0 +/– 5	–0.745 (0.0524) –0.755 (0.0519)	0.398 0.408
25 +/– 5	22.5+/– 7.5	32.5+/– 2.5	0 +/– 5	–1.020 (0.0391) –0.9959 (0.402)	0.706 0.666
15 +/– 5	22.5+/– 7.5	30.0 +/– 5	0 +/– 5	–0.790 (0.0591) –0.778 (0.0591)	0.473 0.550

The results from this simple model serve to illustrate two features. First, variations in budget deficit with changes in output are of the same order of magnitude as those observed (references) in the range 0.4 to 0.7.[10] Second, the estimated coefficient on the budget deficit (relative to GDP) in a savings ratio equation is fairly close to unity (though in most cases differ significantly from unity), and hence gives the appearance of a Ricardian equivalence even though no wealth effects have been included. The relationship between savings and the budget deficit here reflects the national income accounts relationship between private savings minus investment and the budget deficit. Thus these experiments indicate that the operation of fiscal policy as an automatic stabilizer (which partly reflects a functional finance approach) could generate (through the relationship between budget deficit, current

[10] The European Commission has, for example, estimated that the sensitivity of the budget balance to output is around 0.5 percent for the EU, that is a 1 percent fall in GDP will increase the budget deficit by 0.5 percent (Buti et al. 1997, p. 7).

account and net private savings) results which mimic those associated with the Ricardian equivalence approach.

6. THE INTERTERMPORAL BUDGET CONSTRAINT

The "functional finance" approach takes the view that budget deficits (or surpluses) occur as and when required to ensure high levels of economic activity. However, the "functional finance" view is that a budget deficit is not an occasional occurrence (e.g., arising from the operation of automatic stabilizers during a recession), but rather that a budget deficit may need to be a quasi-permanent feature arising from a tendency of private savings to run ahead of investment. Indeed, the experience of the industrialized economies in the post-war period has involved budget deficits in most years (see, for example, Dwyer and Haffer 1998, p. 43, in the case of the U.S.).[11]

The argument is put that long-term budget deficits are unsustainable: one year's budget deficit adds to the public debt and leading to future interest payments. The continuation of a primary budget deficit (that is deficit excluding interest payments) involves the build up of interest payments, and further borrowing to cover those interest payments and the continuing primary deficit. Although the budget deficit is growing (when interest payments are included) and the public debt is also growing, their relationship with GDP depends on the growth of the economy as well as the level of interest rates. Domar (1944) provided an early analysis of this and saw "the problem of the debt burden [as] essentially a problem of achieving a growing national income" (p. 822), though when his analysis used numerical values for key variables rates of interest of 2 percent and 3 percent were assumed. Kalecki (1944b) argued that an increasing national debt did not constitute a burden on society as a whole since it is largely an internal transfer, and further noted that in an expanding economy the debt to income ratio need not rise if the rate of growth is sufficiently high (as further discussed below). But in the event that there was a problem of a rising debt to income ratio (and hence of interest payments to income), Kalecki (1944b) advocated an annual capital tax. This would be levied on firms and individuals, which would cover interest payments on the national debt which would affect neither capitalists' consumption nor the profitability of investment" (p. 363).

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[11] Figures in OECD, *Economic Outlook* December 2002 reveal that there was no year in the 17 years since the mid-1980s for which data are given there when the OECD area as a whole has a budget surplus (and one year, 2000, when the deficit was zero).

It is well-known that a continuing primary budget deficit equivalent to a proportion *d* of GDP will lead to a debt to GDP ratio stabilizing at $b = d/(g - r)$ (where *g* is the growth rate and *r* interest rate, either both in real terms or both in nominal terms).[12] It is evident that the stabilization of the debt to income ratio (with a given primary deficit) requires that $g > r$. In a similar vein, a continuing budget deficit of *d"* (including interest payments) leads to a debt to GDP ratio stabilizing at *d"/g* where here *g* is in nominal terms. But this implies that $b + rd = gd$, i.e., $b = (g - r)d$ and hence if *g* is less than *r* the primary budget deficit is negative (i.e., primary budget is in surplus).

However, in the functional finance approach, the budget deficit which is relevant is the overall budget position rather than the primary deficit (or surplus). To the extent that a budget deficit is required to offset an excess of private savings over investment, then it is the overall budget deficit which is relevant (see below for some caveats). Bond interest payments are a transfer payment and add to the income of the recipient, and similar in many respects to other transfer payments. In terms of sustainability, then, of a fiscal deficit, the condition under "functional finance" is readily satisfied (with the requirement of growth being positive).

If a budget deficit (of a particular size relative to GDP) is run for a number of years, then it is clear that the interest payments component of the deficit will increase, and the appearance is given that interest payments are "crowding" out other forms of public expenditure and/or leading to higher levels of taxation. However, in the case in which it is the overall budget deficit which is relevant, then a constant deficit (relative to GDP) will lead to a debt to GDP ratio, which converges on the ratio deficit/nominal growth rate.[13]

This simple analysis of the budget deficit makes no allowance for any reaction in the willingness of the private sector to hold the public debt. If the public debt becomes an increasing part of the wealth portfolio, then the (marginal) attractiveness of holding public debt diminishes. This could have the effect of diminishing the appeal of savings, which has the beneficial effect of stimulating aggregate demand. Further, a higher rate of interest may

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[12] Let the outstanding public sector debt be D, and then the budget deficit is dD/dt and is equal to G + rD - T where r is the post-tax rate of interest on public debt, G is government expenditure (other than interest payments) and T is taxation (other than that based on receipt of interest from government). With Y as national income, we have :

$$d(D/Y)/dt = (1/Y)\, dD/dt - (D/Y)(1/Y).dY/dt = (G + rDT)/Y - (D/Y)\, g$$

where g is the growth of national income. The debt to income ratio rises (falls) if $(G - T)/Y > (<) (D/Y)(g - r)$.

[13] In that context, the Stability and Growth Pact requirements (for the operation of the European single currency) of a maximum budget deficit of 3 percent of GDP with a balance to small surplus in the budget over the business cycle and debt to GDP ratio of 60 percent are not compatible. An average 3 percent deficit, and 60 percent debt ratio would be compatible with a 5 percent nominal growth rate.

have to be paid on public debt. The analysis of Godley and Rowthorn (1994) incorporates aspects of that notion and includes a (pre-determined) wealth to income ratio for the private sector and a bond to wealth ratio which depends on the (exogenous) interest rate and the rate of inflation: hence there is a desired bond to income ratio. There is a sense in which the deficit of the public sector is then constrained by that bond to income ratio, and hence the non-monetized debt to income ratio. But this constraint may be of little relevance in the sense that the government is not seeking to run a deficit for the sake of it. It is more significant whether there is a constraint on the level of public expenditure and whether there are other constraints on the economy. On the former, we can note that in the Godley and Rowthorn (op. cit.) model, an expansion in the level of public expenditure sets off an expansion of output and hence of tax revenue (and other changes) such that there is not an explosion in the debt to GDP ratio (and this does not rely on the rate of growth being greater than the rate of interest). This would suggest that there may be reactions from the private sector (arising from a reluctance to hold ever increasing amounts of government debt) which make the conditions for the sustainability of a deficit position less constraining than it first appeared.

The contrasting approach is one based on the notion that the government faces an inter-temporal budget constraint of the general form: the present value of current government debt and future budget positions should sum to zero. There has then to be some future primary surpluses on the budget to offset the initial existing government debt. It can alternatively be put that the present value of current and future budget deficits including interest payments sums to zero, and in a sense future budget positions average zero. This arises when it is not possible to service debt forever by rolling it over, and "Ponzi finance" is ruled out when the current value of outstanding government debt is equal to the discounted future current and budget surpluses (Buiter 2001, p.3). Further, "Ponzi finance is ruled out if the present discounted value of the terminal public debt goes to zero, that is, if the long-run growth rate of the public debt is less than the long-run interest rate" (Buiter 2001, fn. 3, p. 3). With a constant interest rate of r this becomes:

$$(6.1)\quad \lim_{s\to\infty} e^{-r(s-t)}.B(s) = 0$$

where B is the volume of outstanding government bonds. If the growth rate of the bonds outstanding is h with an initial level of $B(0)$, this gives:

$$(6.2)\quad \lim_{s\to\infty} e^{-r(s-t)}.B(0)e^{hs} = B(0)e^{rt}e^{(h-r)s} = 0$$

and this requires $h < r$. A constant bond to GDP ratio would then imply that g (= h) < r (g the growth of GDP), whereas a declining bond to GDP ratio would result from $g > h$.

These two approaches obviously stand in some contrast. The first indicates that a government can run a perpetual budget deficit of any size, and that is sustainable and the debt to GDP ratio will eventually stabilize (at a finite value), provided that $r < g$. The second indicates that a government must, in effect, clears its debts: a government which starts with outstanding debt (as all do) must then run a primary budget surplus in future to in effect pay off that debt, and is premised on $r > g$. In the "functional finance" case, as indicated above, the case of $r > g$ would lead to a stable debt to income ratio but while there would be an overall budget deficit, there would be a primary surplus (when the debt ratio had stabilized).

A first response to this contrast is to turn to the empirical evidence on the relationship between interest rate and growth, recalling that here the relevant interest rate is the post-tax rate of interest on government debt.[14] In Table 2 we report some comparisons for four major countries between post-tax rate of interest and the rate of growth. The rate of growth reported is the average annual growth rate achieved over the period considered (rather than being an estimate of some underlying trend). The original source for the data provides estimates of pre-tax rate of interest, and a 25 percent tax rate has been assumed in order to calculate the post-tax rate of interest.

[14] The conditions discussed immediately above relate to the actual rate of interest which is paid, and does not in any way relate to what would be the appropriate rate of discount to be applied to government decisions.

Table 2: Comparison of growth rates and interest rates

	Nominal long term rate	Post tax rate of interest	Rate of inflation	Post tax real rate of interest	Pre tax real rate of interest	Rate of Growth
1951-1997						
UK	8.45	6.34	6.22	0.12	2.21	2.31
USA	7.12	5.34	3.99	1.35	3.16	2.83
France	7.46	5.60	5.57	0.03	1.80	3.36
Germany	7.22	5.42	3.01	2.41	4.15	3.87
1969-1979						
UK	11.53	8.65	11.1	-2.45	0.85	2.42
USA	7.86	5.90	6.5	-0.61	1.65	3.66
France	8.33	6.25	8.21	-1.96	0.49	3.50
Germany	8.18	6.14	4.56	1.58	3.72	2.93
1980-1997						
UK	9.65	7.24	5.68	1.56	3.67	2.62
USA	9.84	7.38	4.4	2.98	5.21	3.44
France	10.07	7.55	4.88	2.67	4.87	1.95
Germany	7.43	5.57	2.86	2.71	4.48	2.38

Source: Based on Chadha and Dimsdale (1999), and growth rate calculations based on figures from OECD (2002), OECD *Historical Statistics*, various issues

It is apparent that there is a tendency for the (post tax) rate of interest to fall below the rate of growth, though not universally and less in the past two decades than formerly. Further, the difference between the rate of interest and the rate of growth is often small. Our own calculations using figures from OECD (2002) for long-term interest rates (on 10 year government bonds) and nominal GDP growth, with again an assumed 25 percent tax rate, indicates that for the 20 OECD countries for which data were complete, over the period 1985 to 2001, the growth rate and post tax interest rate were close on average, but (averaged across countries) the growth rate exceeded the post tax rate of interest rate most years with the period 1990 to 1993 being the main exceptions.[15]

The use of the interest rate on bonds may overstate the average cost of borrowing by government in that a government funds part of its budget deficit by the issue of the monetary base (cash and notes held by the public and reserves of the commercial banks with the Central Bank, which the literature labels as M0). As the demand by the public to hold M0

[15] In 1990, the average difference of $r - g$ was calculated at 0.46 percent, rising to 2.17 and 2.68 in 1991 and 1992 respectively, then falling back to 1.71 percent in 1993. In those years there were some particularly large gaps, for example, Finland with a decline in nominal GDP of 4.5 percent and pre tax interest rate of 11.9 percent. The average for the whole period across all countries was –0.16 percent (i.e., on average g exceeded r, and excluding the four years of the early 1990s the average was –0.75 percent.

rises with nominal income growth this is satisfied by the government. Base money bears a zero rate of interest, and to that extent part of the budget deficit is funded at zero cost. Although this is not a substantial part of the budget deficit, nevertheless it has the effect of reducing somewhat the average cost of funding the budget deficit. An M0/GDP ratio of around 5 percent (which is not untypical) and nominal growth of 5 percent per annum would lead to an increase of M0 equivalent to 0.25 percent of GDP.

It can be noted that in the literature on Taylor's rule, it has been asserted that the equilibrium real rate of interest (Central Bank discount rate) is approximately equal to the real rate of growth.[16] The rate of interest relevant for the present discussion is the post-tax rate of interest on (long term) bonds. The interest rate on bonds can generally be expected to be above the discount rate, but after allowing for taxation the post tax rate on bonds could well be below the rate of growth. This may suggest that the relevant r and g may be close.
The payment of interest on bonds (and the replacement of other forms of public expenditure in the context of a given budget deficit) changes the composition of transfer payments and of disposable income, in so far as these interest payments accrue to the rich rather than the poor. They can be expected to raise the propensity to save and hence raise the excess of savings over investment and the required budget deficit.

The size of the budget required by "functional finance" is equal (for the closed economy) to savings minus investment (at full employment). Both savings and investment depend on the composition of income (wages vs. profits for example) and on the structure of taxation and of transfer payments. As Laramie and Mair have shown (e.g., Laramie and Mair 2000), manipulation of the tax structure can be undertaken such that the tax system has a less deflationary role, and hence full employment (or any desired level of income) achieved with a lower budget deficit (than otherwise). This result can alternatively be seen as saying that the excess of savings over investment can be lowered through the adoption of an appropriate tax structure.

The second consideration also concerns the relationship between savings and investment (again considering a closed economy or modifying savings to include capital inflow from overseas). The counterpart to an intertemporal government budget constraint is an intertemporal private sector budget constraint, of the form that the present value of difference between private savings and investment summed over the future would also be zero (noting that the same discount rate would have to be used for both constraints). The

[16] Taylor (1993), for example, postulates a 2 percent "equilibrium" real rate of interest which he says "is close to the assumed steady-state growth rate of 2.2 percent."

fulfilment of the intertemporal private sector budget constraint requires the equality (over time) between savings and investment. It is possible that savings and investment would be equal at a rate of interest linked with the rate of discount used and compatible with a high level of economic activity. But unless some equivalent of Say's Law is invoked there is little reason to think that such a happy outcome will transpire. In other circumstances, the adjustment between savings and investment occurs through variations in the level of economic activity. Hence, the intertemporal government budget constraint imposes on the private sector a requirement of (over time) savings equals investment, and that may require relatively low levels of economic activity.

One solution to the path of budget deficits in the face of intertemporal budget constraint is to balance budget in each accounting period. Another is to balance budget over business cycle. Why is the first regarded (generally) as inferior to the latter? It is presumably because it is recognized that fiscal policy has some automatic stabilizer properties in the face of demand shocks, which arise from fluctuations in savings and investment functions. If the rate of interest could be used to ensure the equality between savings and investment, there would be no requirement for a budget deficit. The deficit is a recognition that the interest rate is not available and/or impotent. The automatic stabilizer dampens fluctuations in private aggregate demand.

The intertemporal budget constraint is consistent with a number of different fiscal policy regimes: for example, balance budget each year, or balance budget over the course of each business cycle. Although this does not appear to be discussed, the implicit assumption appears to be that the course of the economy (and specifically the growth rate and the rate of interest) is independent of the fiscal policy rule, which is adopted (provided that the rule conforms to the intertemporal budget constraint).

Consider the case where the cause of movements from year to year in the budget position emanates from movements in the balance between savings and investment. In the absence of counter-veiling movements in the budget position, the movements in the propensity to save and to invest would generate variations in the level of economic activity, and further variations in the actual volume of savings and of investment. The time path followed by the level of economic activity may have hysteresis effects from a range of causes. One of these would be when variability of key economic variables affects economic decisions on savings and investment. Another would come from asymmetries: economic activity above average would have different size effects as compared with economic activity below average. When there is some supply-side barrier to the level of economic activity,

then upswings in aggregate demand may not be able to lead to increases in economic activity whereas downswings in aggregate demand lead to decreases in economic activity.

When there are variations and differences in intended savings and investment over time (and in the absence of such variations and differences there would be no need for fiscal policy), then fiscal policy (of the "functional finance" sort) can be seen to lead to higher levels of economic activity, of savings and of investment. When investment expenditure is sensitive to the level of economic activity, then fiscal policy leads to a higher level of investment, and thereby a larger capital stock. A number of views of the growth process (e.g., endogenous growth, demand-led growth), envisage that higher rates of capital formation are associated with faster growth of productivity. Thus, it may be argued that fiscal policy (of the "right sort") raises the growth rate of the economy. The intertemporal budget constraint as usually portrayed, takes the growth rate of the economy as given, and unaffected by savings and investment. However, when consideration is given to the variations in savings and investment, and the role, which fiscal policy can play in setting the level of economic activity, then the growth rate cannot be taken as predetermined. Thus, even if there is some intertemporal budget constraint, there is still a role for fiscal policy.

The sustainability of a primary budget deficit (of given size relative to GDP) requires that the rate of growth exceeds the post-tax rate of interest. We have suggested that it is often the case that that condition holds empirically. Tight monetary policy (in the form of relative high interest rates) both directly (through impact on interest rate on bonds) and indirectly (through impact on investment and growth) harms the prospect of sustainability being achieved. It points in the direction of ensuring appropriate monetary policy rather than being too concerned over the precise size of the budget deficit. We have also argued that it is the size of the overall budget deficit which is relevant in the context of functional finance rather than the size of the primary budget deficit since it is the impact of the deficit on aggregate demand and the ability of the deficit to mop up excess savings which is relevant. For the overall budget deficit the issue of sustainability does not arise (provided that the growth rate of GDP is positive).

7. CONCLUDING REMARKS

The levels of taxation and public expenditure and the balance between them vary for many reasons. Writing this at a time when the public expenditure consequences of U.S. administration's proposals for tax cuts for the rich, it is not possible to forget that the fiscal

stance may change for reasons far removed from the application of the ideas of "functional finance." The case we have set out in this paper is that fiscal policy *should* be operated to secure the desired level of economic activity (and that it is a potent instrument for doing so). This "functional finance" view means that any budget deficit should be seen as a response to the perceived excess of private savings over investment at the desired level of economic activity. We have argued that the "crowding out" arguments, which have been advanced, do not take into account this view of "functional finance." The assessment of fiscal policy should relate to the circumstances in which it is intended to be employed, and then we find that the "crowding out" arguments do not apply.

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