Working Paper No. 315

Crowding In or Crowding Out?
A Classical-Harrodian Perspective

by
Jamee K. Moudud
The Jerome Levy Economics Institute of Bard College,
2000

I would like to thank Anwar Shaikh for his support at every stage of this project. Without holding them responsible in any way, I would also like to thank John Sarich, Marc-André Pigeon, Ajit Zacharias, Dimitri Papadimitriou, and Randy Wray for their many helpful comments and suggestions. Thanks also to RaeAnn Moore for her excellent typing.

INTRODUCTION

In the postwar period fiscal policy in many countries has gone through two broad phases, roughly reflecting its evolution in the United States. During the long expansion of the 1960s fiscal policy in the U.S. took a deliberately Keynesian approach to macroeconomic management. In the early 1960s President Kennedy's Council of Economic Advisers argued that the economy was being slowed by a large structural budget surplus; the surplus, caused by excessively high tax revenues, was slowing aggregate demand before the economy reached full employment, as conventionally defined. The tax cut proposed in 1962 and enacted in 1964 led to a lowering of the budget surplus throughout the 1960s. President Johnson's War on Poverty program and the war in Vietnam provided further boosts to government spending and contributed to further lowering of the surplus.

The large and growing budget deficits of the 1970s along with stagflation called into question the Keynesian demand management policies of the previous decade. The abandonment of these policies coincided with the implementation of "supply-side" policies during the Reagan years. Ironically, the combination of large tax cuts, reduced domestic spending, and massive defense spending produced huge budget deficits during the relatively long expansion of the 1980s. Thus, unwittingly, Reagan's policies resembled the Keynesian policies of an earlier generation.

The passage of the Omnibus Budget Reconciliation Act of 1993 and later the Balanced Budget Act of 1997 marked the entrance of fiscal policy into the second phase. These acts represent an important policy shift toward greater fiscal restraint, a shift that led to the first budget surplus since 1969 in fiscal year 1998. In both the United States and overseas the pursuit of balanced budgets or fixed deficit targets is seen as one of the principal ways of increasing long-run growth. Such restrictive fiscal policies are a common element in policy discussions in Washington, the European Union, and the International Monetary Fund's structural adjustment policies. In contrast to the Keynesian policies of the 1960s and the policies of the 1970s and 1980s with their Keynesian-like effects, fiscal austerity has become the conventional wisdom of the 1990s.

That conventional wisdom is based on the neoclassical theory of output and employment, which has two variants. The general equilibrium version assumes the economy to be continuously at the full employment level of output. An increase in government deficit spending lowers the national saving rate and therefore the growth rate of investment and output. In this way, increased government consumption in the present is financed through decreased future consumption. Another way of making this argument is to say that deficits financed by borrowing lead to a rise in interest rates; the higher interest rates crowd out private investment, thereby lowering output growth.

In contrast to the general equilibrium model, the ISLM model relaxes the full employment assumption in the short run (Blinder and Solow, 1973). This allows fiscal policy to have a positive impact on output in the short run. The model shows that an increase in government expenditure, or a decrease in the taxation rate, creates a multiplier effect of spending that stimulates output and employment. By the same token there is a multiple reduction of spending with the opposite fiscal policies. At or beyond full employment, the "pumping" effect of the government deficit becomes inflationary.

Rational expectations models following Barro (1974) emphasize the *policy ineffectiveness* of budget deficits since rational private agents adjust their private savings rate, s,

to compensate for the higher budget deficit so as to be able to pay for higher future taxation. This ensures that the social savings rate $s^* = s + (t - g)$ remains fixed over time.

In general, in the non-mainstream Keynesian literature the system has sufficient flexibility to respond positively to fiscal injections. This is in contrast to neoclassical models in which the economy is rigidly pinned at the full employment level. The models of Tobin (Tobin, 1980; Tobin and Buiter, 1980), Godley (Godley, 1999), and Taylor (1985, 1991) allow for a variety

of mechanisms to derive both crowding in and crowding out effects from fiscal policy. As is standard in the macroeconomic literature, all three authors begin with the short-run equality of investment and savings, I = S, which defines a level of output so that growth is a long-run phenomenon determined by exogenous factors such as fiscal policy. All three authors allow for substantial excess capacity and unemployment. In the case of Tobin, however, the long run is characterized by full employment at the natural growth rate whereas Taylor (1985) explicitly argues that his stagnationist model faces *persistent* excess capacity. It is within this context that these authors use portfolio choice theory, inflation dynamics and the Tobin effect (Tobin, 1980; Tobin and Buiter, 1980; Taylor, 1985, 1991), the effects of fiscal policy on income distribution, effective demand, inflation, and the profit rate (Taylor, 1985, 1988), and the notion of the fiscal stance and wealth effects (Godley, 1999) to analyze the impact of government spending. As with Blinder and Solow (1973), these authors do not distinguish between level and shares of government spending.[(1)] Tobin and Taylor in particular use these various mechanisms to derive both crowding in and crowding out from government expenditures. These ambiguous theoretical results are consistent with the international studies carried out by World Institute for Development Economics Research on the impact of budget deficits. As Taylor (1988) summarizes, these country studies show that deficits can have both positive and negative effects on output and employment. Thus the reality is more complex than the simple neoclassical model outlined above.

The analysis developed in this paper provides an alternative theoretical perspective, one that is consistent with empirical reality and demonstrates that the impact of budget deficits is far more complex than is predicted by the neoclassical theory. This new theoretical context is a classical-Harrodian model of cyclical growth developed in Moudud (1999a), which is an extension of Shaikh (1989, 1990, 1991, 1992a). The model derives its name from the fact that certain of its crucial features have their theoretical antecedents in the works of classical economists such as François Quesnay, Karl Marx and David Ricardo and in Roy Harrod's seminal work on growth cycles (Harrod, 1973).[(2)]

The classical-Harrodian model has five main features. First, unlike traditional macroeconomic models in which growth is strictly a long-run phenomenon, the classical-Harrodian model starts with the assumption that growth is a persistent feature of the economy, in the short run and in the long run. As explained later, because of this dynamic context one has to distinguish between the levels of all variables from their shares relative to, say, output.[(3)]

Second, growth occurs not as a result of exogenous changes in technology or government spending but as a result of investment decisions, rooted in profitability and carried out in a world characterized by Keynesian uncertainty. Third, bank credit is endogenous and is injected into the economy whenever planned investment exceeds available saving. Fourth, full employment is not assumed, even over the long run when the economy fluctuates around normal capacity. Fifth, the classical-Harrodian framework is embedded in a social accounting matrix (SAM) with fully integrated stocks and flows. As pioneered by Godley (1999), and in contrast to the ISLM framework, there are no "black holes" in the model so that the sources and uses of all flows are explicitly taken into account.

In the classical-Harrodian model, as long as there is underutilized capacity, an increase

in the budget deficit will raise the growth rate. On the other hand, the long-run growth path of output is regulated by the normal rate of profit, which, as in Marx and Sraffa, is determined by income distribution and technology. Thus, given the social savings rate, any factor that has a positive effect on the normal rate of profit will raise the growth rate. For example, a rise in the profit margin would raise the long-run growth rate. On the other hand, given the normal profit rate, an increase in the social savings rate would also increase the growth rate. As will be demonstrated, this reliance on the social savings rate does not depend on the loanable funds doctrine but rather on the total amount of cash flow, or *investable surplus* , available to firms so that they can expand their capital stock.

The goal of this paper is to disentangle these results. In contrast to neoclassical and standard Keynesian analyses, its purpose is to show that the effects of fiscal expansion in a dynamic context are complex since both crowding out and crowding in are possible. The investigation will be carried out by partitioning the analysis between the *fast adjustment process* or short run and the *slow adjustment process* or long run. In the former, aggregate demand and supply may not be equal and instead seek to equilibrate, while capacity utilization is different from normal. In the long run capacity utilization is at the normal level although there is structural unemployment, as Goodwin (1967) demonstrated in his model. These two adjustment processes along with the different effects of circulating and fixed capital ensure that the growth path stable

Section 2 provides a mapping between static and dynamic model specifications and shows that there is a difference between an increase in the level of government spending G from an increase in the government spending-to-output ratio, g. Section 3 discusses the effect of fiscal expansion over the course of the fast adjustment process. Section 4 studies the effects of fiscal expansion during the slow adjustment process when it is growing along the warranted path. This section discusses the different policies that can either lower or raise the warranted path when the budget deficit increases. Finally, by drawing on Harrod's *Economic Dynamics* (1973), section 5 discusses the implications of the trade-offs that follow from expansionary fiscal policies.

MAPPING BETWEEN STATIC AND DYNAMIC MODEL SPECIFICATIONS

The point of departure of the classical-Harrodian model is a continuous rate of growth of output. This growth perspective can be found in the works of Harrod (Kregel, 1980), the Physiocrats, Marx, and von Neumann (Chakravarty, 1989). Thus any investigation of fiscal policy has to differentiate between temporary and permanent changes in government spending (G)

relative to the growth path of output. As shown in Moudud (1999a), this growth path does not depend on a persistent increase in government spending in a closed economy since it is driven by the rate of profit, the quintessentially classical feature of model (Duménil and Lévy, 1993). In fact, a fall in the rate of profit (Kleinknecht, Mandel, and Wallerstein, 1992) would lower the growth rate.

It follows therefore that in a dynamical system, there is a difference between a rise in the *level* of government spending G from a rise in the *share* of government spending g = G/Y.[(4)] A one-time increase in g is an acceleration of G relative to Y whereas a one-time increase in G produces a pulse in g which eventually dies out: each of these fiscal policies has a different effect on the system. Thus in a dynamical context, the nature of the fiscal policy needs to be specified.

Figure 1 maps the different types of fiscal policy in the static and dynamic cases. Each figure on the right is the dynamic equivalent of the static case on the left. Based on this figure we see that a *static pulse* (a jump in G followed by a fall to the initial level) is equivalent to a *dynamic spike*; a *static jump* is equivalent to a *dynamic pulse*; and, finally, a *static rise* is

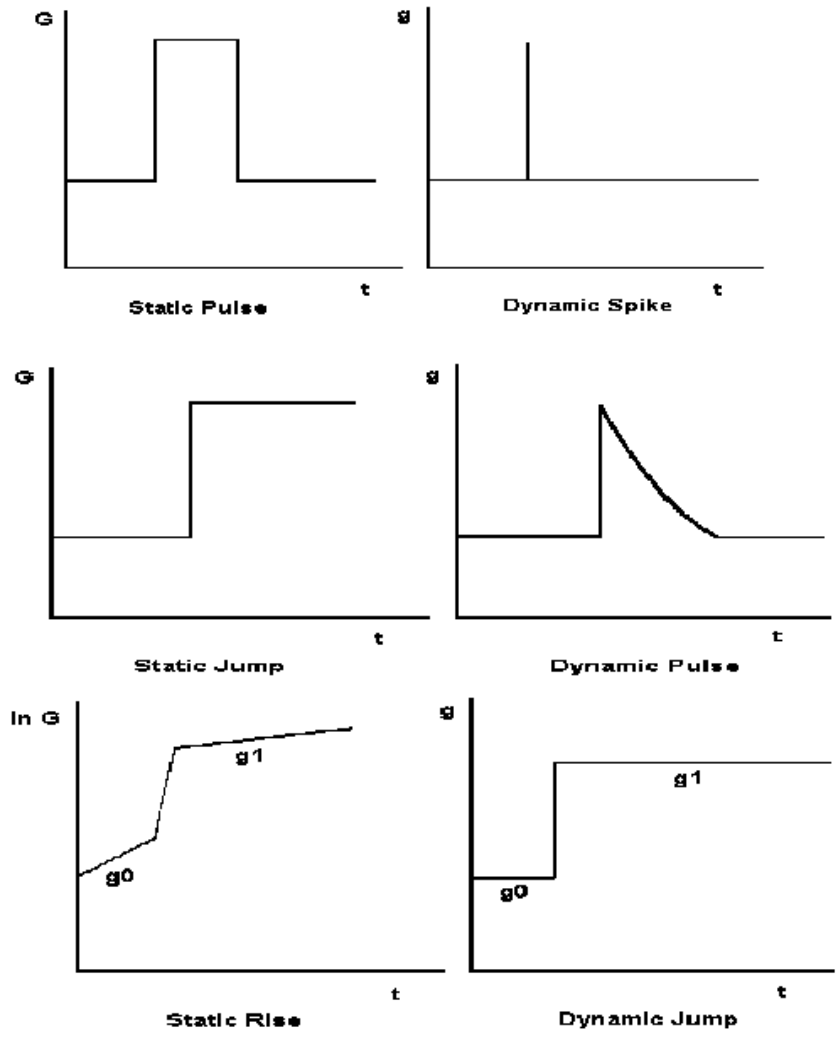

Figure 1. Mapping between Static and Dynamic Model Specifications

equivalent to a *dynamic jump*. Generally, the fiscal policy literature (for example, Blinder and Solow, 1973) is based on the static pulse scenario. The policy implications of these different fiscal policy regimes are also likely to be different as the subsequent simulations will show.

It therefore follows that in a mapping of the dynamical model with the existing literature (whose point of departure is a short-run level of output) it is important to ensure that the comparison is an appropriate one. For example, in order to assess the impact of an increase in government spending the effect of a rise in g in the Classical-Harrodian model needs to be compared with a gradually growing G in a static model.

THE EFFECTS OF GOVERNMENT SPENDING IN THE FAST ADJUSTMENT PROCESS

Figures 2 and 3 show the effect of an increase in g on the business cycle.[(5)] Given the taxation rate, these figures show the impact of an increase in the budget deficit. As derived in Moudud (1999a), the key short-run variable is *excess demand*, e, in the markets for goods and services. Excess demand is a measure of the degree of demand pressure faced by firms and is fueled

by the injection of money, m_s, over and above what the private sector desires to hold, m_d:

$$e \equiv (a - s) + (g - t) = m_s - m_d = (m_G + d_B) - m_d \qquad (1)$$

where a = total investment = circulating investment a_c + fixed investment a_f + finished goods inventory investment a_v, s = private savings rate, (g - t) = budget deficit, m_G = an endogenous component introduced by monetary authorities to circulate goods and services + an exogenous component which is created to finance the budget deficit, d_B = bank credit to businesses and m_d = money demand (all variables are expressed as shares of output). Following Shaikh (1989, 1991, 1992) investment in circulating capital (raw materials and labor) leads to an increase in actual output Y:

$$\frac{Y'}{Y} = ma_c = \frac{m}{(1+mv)}[e - a_f + s - (g - t)] \qquad (2)$$

where v = desired inventory/sales ratio and the prime denotes the time derivative, and m= input/output coefficient. On the other hand, investment in fixed capital adds to the capacity to produce output (or potential output) while investment in finished goods adds to the capacity to sell output. Investment in circulating capital is determined by firms' available cash flow. Excess demand stimulates sales and increases the cash flow while the accumulation of finance charges on debt owed to banks reduces it. In reduced form, this function is given by [(6)]

$$a_c' = h_1 e - h_2[(1 + i)d_B + (1 + i)D_B'/Y] \qquad (3)$$

where i=interest rate, $D_B = d_b Y$ = level of business debt and h_1 and h_2 are positive reaction coefficients.

An increase in demand, brought about by an increase in the budget deficit, will lead to an increase in investment in circulating capital which is financed by the injection bank credit. There is thus an accumulation of finance charges which exercises a retarding effect. See Figure 2:

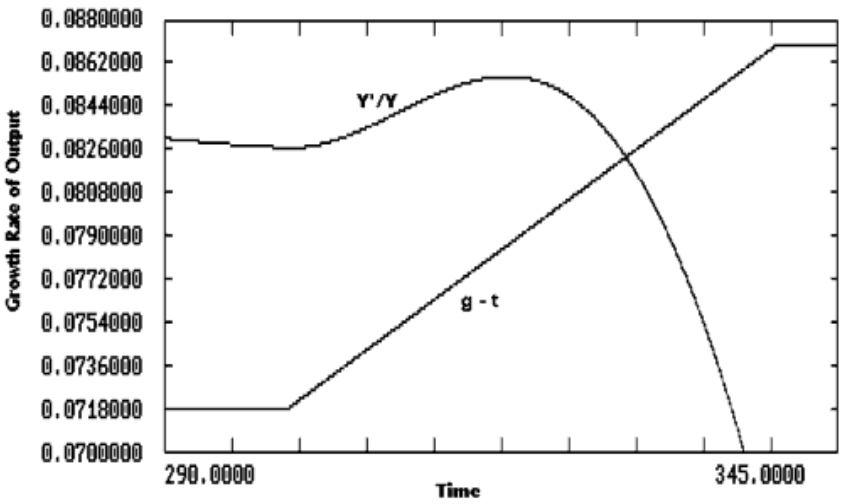

Figure 3. The Crowding In of Output in the Short Run

Figure 3 shows that the stimulus provided by the higher deficit leads to an increase in the short-run growth rate of output.

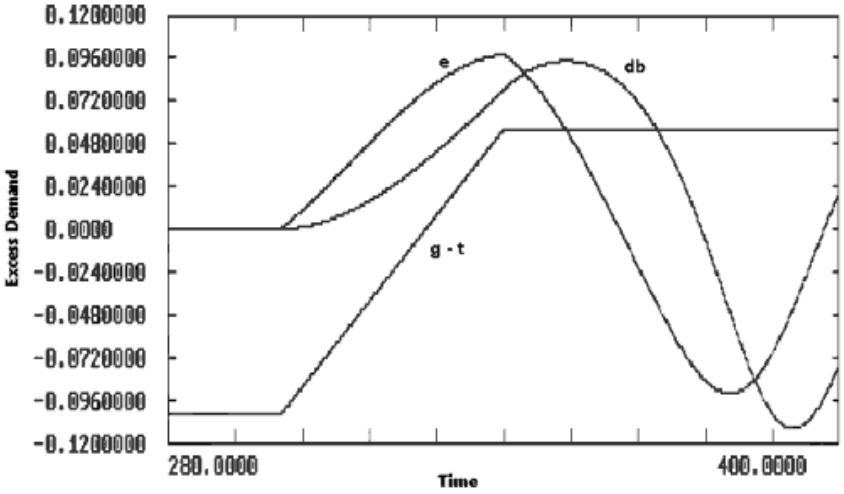

Figure 2. The Effect of a Rise in the Budget Deficit on Excess Demand and Business Debt

THE LONG-RUN EFFECTS OF GOVERNMENT SPENDING

Over the long run, capacity utilization fluctuates around normal and the slow adjustment process is described by (Shaikh, 1989; Moudud, 1999a):

$$\frac{a_f'}{a_f} = \kappa(u - 1) \qquad \kappa > 0 \qquad (4)$$

$$u'/u = \lambda(s^* - a_f r_n u) \qquad (5)$$

where

u = rate of capacity utilization

u_n = normal rate of capacity utilization = 1 by construction

r_n = normal rate of profit

λ = m/(1 + mq), m = constant profit margin on sales

q = constant inventory/output ratio

s^* = s - (g - t) = social savings rate.

We next turn to the long-run effect of an increase in the budget deficit. Figure 4 below shows that a rise in the budget deficit share leads to an eventual crowding out of output and employment. This is shown by curve A, while curve B corresponds to a constant budget deficit.

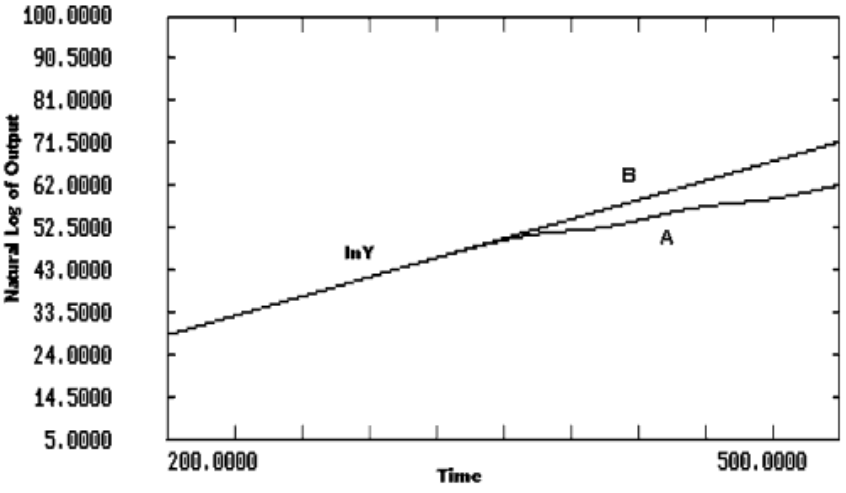

Figure 4. The Crowding Out of Output over the Long Run

This crowding out result neither assumes the loanable funds doctrine nor full employment. It is, however, a quintessentially classical effect (Eltis, 1993; Shaikh and Tonak,1994) in the sense that all nonproductive activities that do not create surplus value but instead use it for various purposes are forms of social consumption and will lower the fraction of surplus value that is available for investment.(7)

Why does the increase in social consumption not have an effective demand effect, as in Keynesian economics? The answer is because the classical effect holds in the long run when capacity utilization is at the normal level.

The crowding-out effect can be demonstrated in the following way from an extension of a Harrod-type system. If W = wages, C_c = capitalists consumption, C_w = working class consumption, T = taxes, and G = government spending then, assuming that $W = C_w$,

$$W + P + T = (C_c + C_w) + I + G \qquad (6)$$

$$P = C_c + I + (G - T) \qquad (7)$$

where I is fixed capital investment. If Y = output then

$$\frac{P}{Y} = \frac{C_c + I}{Y} + \frac{(G-T)}{Y} = \left(\frac{C_c}{Y}\right)\left(\frac{P}{Y}\right) + \frac{I}{Y} + \frac{(G-T)}{Y} \qquad (8)$$

$$s_c \frac{P}{Y} = \frac{I}{Y} + \frac{(G-T)}{Y} \qquad (9)$$

where the capitalist savings propensity $s_c = 1 - C_c/P$ is taken to be constant. In other words, the share of profits in output is given by

$$\frac{P}{Y} = \frac{[I/Y + (G-T)/Y]}{s_c} \qquad (10)$$

Dividing through by the capital-output ratio K/Y

$$\frac{P/Y}{K/Y} = \frac{I/Y + (G-T)/Y}{s_c K/Y} \qquad (11)$$

Now if Y* = potential output at normal capacity and capacity utilization $u = Y/Y^*$ then

$$\frac{K}{Y} = \frac{K}{Y^*}\frac{Y^*}{Y} = \frac{K}{Y^* u} \qquad (12)$$

If $v = K/Y^*$ is the normal capacity capital-output ratio and is taken to be constant, then combining equations 9 and 10 we get

the following expression for the rate of profit r:

$$r = \frac{P}{K} = \left(\frac{u}{s_c v}\right)\left[\left(\frac{I}{Y}\right) + \frac{(G-T)}{Y}\right] \qquad (13)$$

Equation 13 is important to the discussion of the relationship between the classical and post-Keynesian traditions. Both traditions would agree that in the short run, capacity utilization can take on any value, as determined by demand. Then a rise in the budget deficit share (G - T)/Y will raise the rate of profit both directly and indirectly via increased capacity utilization and investment.

The distinction between the two traditions arises in the long run. In the classical tradition capacity utilization gravitates around normal ($u\ u_n$) and the corresponding normal rate of profit ($r = r_n$) is given by technology and income distribution (Sraffa, 1960). Thus

$$\bar{r}_n = \frac{P}{K} = \left(\frac{\bar{u}_n}{s_c v}\right)\left[\left(\frac{I}{Y}\right) + \frac{(G-T)}{Y}\right] \qquad (14)$$

where the bars indicate that r_n and u_n are given exogenously in the long run, since historical/institutional factors determine normal capacity utilization.[(8)] Then a rise in the budget deficit share can only be accompanied by a fall in the investment share unless real wages and/or technology change. Thus the crowding out result is due to a particular type of supply-side constraint that normal capacity utilization imposes. One could argue that models in the Keynes/Kalecki tradition do not allow for such a result because their view of the long run is different - if, indeed, there is a "long run" in this tradition. Typically, models in this tradition assume persistent excess capacity, because of imperfect market structures (Taylor, 1985).

The importance of the social savings rate at normal capacity utilization is also central to Harrod and Domar's growth perspectives.[(9)] Thus Domar argues that "[T]he fall in the rate of growth is accompanied, or rather caused, by a declining propensity to save. The public prefers to consume a greater share of its income today; therefore, a smaller percentage is invested, and income cannot grow as fast as it otherwise would", (Domar, 1944, p. 821). Therefore, "[S]ince government absorbs a part of savings, it is of course desirable that its expenditures be productive," (ibid., p. 820).

Models such as those of Harrod-Domar, the von Neumann growth model, and indeed Marx's schemes of reproduction, are basically single-asset models. Thus any increase in savings *automatically* leads to an increase in capital accumulation. This, however, leads to the danger that these models might be interpreted as consistent with Say's law and neoclassical economics.

In what follows, it is shown that in a general multi-asset framework such as the one deployed by Moudud (1999a), the crucial determinant of investment is not total savings, but that part of it available for investment in the real sector. As shown there, the capital account of the business sector in the SAM implies that:

$$I_d^p = \{RE^p - [(\nabla M_d^p)_f + (\nabla BG_d^p)_f]\} + \{[S_h^p - [(\nabla M_d^p)_h + (\nabla BG_d^p)_h]\} + (\nabla L^p{}_d)_f$$

$$= \{RE^p - [(\nabla M_d^p)_f + (\nabla BG_d^p)_f]\} + (\nabla EQ_d^p)_h + (\nabla L^p{}_d)_f \qquad (15)$$

where ∇ next to a variable X is the desired addition to that variable = $X_t - X_{t-1}$, I_d^p = planned investment demand by firms, RE^p = retained earnings, ∇M_d^p = desired addition to money holdings, ∇BG_d^p = desired addition to government bond holdings, S_h^p = household savings, $(\nabla EQ_d^p)_h = S_h^p - [(\nabla M_d^p)_h + (\nabla BG_d^p)_h]$ = household demand for equity, $(\nabla L^p{}_d)_f$ = bank credit to firms, the superscript p stands for plans, the subscript d for demand, 'f'for firms, and 'h' for households. This equation relates business investment to its available finance, i.e. business and household savings less the money and bond holdings of these sectors plus bank credit. We will call the term $\{RE^p - [(\nabla M_d^p)_f + (\nabla BG_d^p)_f]\} + \{[S_h^p - [(\nabla M_d^p)_h + (\nabla BG_d^p)_h]\}$ the *investable surplus* , since it represents the actual amount of cash flow available to firms that can be used to expand their capital stock.

In the classical-Harrodian framework excess demand and business debt are zero when averaged across several business cycles. This corresponds to Harrod's warranted growth path when aggregate demand and supply are equal, capacity utilization is at the normal level, and growth is financed via business and household savings only. In terms of equation 1, the equality of aggregate demand and supply implies that $a = s - (g - t) = s^*$ = social savings rate. Since $(\nabla L^p{}_d)_f = 0$ along the warranted path and remembering that $a = I_d^p/Y$, it follows from equation 15 that

$$a = \{RE^p - [(\nabla M_d^p)_f + (\nabla BG_d^p)_f]\}/Y + \{[S_h^p - [(\nabla M_d^p)_h + (\nabla BG_d^p)_h]\}/Y = s - (g - t) \qquad (16)$$

Along the warranted path, the growth rate of output is given by

$$\frac{Y'}{Y} = ma_c = \frac{m}{(1+mv)}[s-(g-t)-a_f] \qquad (2a)$$

Jointly, equations 2a and 16 suggest that, if the rate of profit is given, a rise in the social savings rate increases investment and the growth rate because it entails an increase in the investable surplus available to the firm.(10) In other words, if planned investment rises in response to an increase in "animal spirits" (i.e. due to higher profit expectations), the investable surplus will have to increase to fuel the higher desired investment, i.e. there has to be a shift in the *composition* of private savings from money and bonds to investment in real capital stock and equity.

The intuition behind equation 16 is that an increase in the budget deficit leads to an injection of new money and bonds into the economy. After the system settles down with excess demand e = 0 and business debt $d_B = 0$, the private sector will end up holding additional money and bonds. Given the ratios RE^P/Y and $S^p{}_h/Y$, this implies a lowering of the private sector's investable surplus. Since $RE^P/Y + S^p{}_h/Y$ is given, it follows that a rise in the budget deficit reduces the investable surplus so that the investment rate falls.(11)

An important implication of equation 16 is that, if a collapse in profitability is accompanied by a greater flow of business and household savings into money and bond holdings that earn higher rates of return, no attempts to raise savings via tax cuts *by themselves* are likely to revive growth. Thus a cornerstone of mainstream policy is called into question by this multi-asset framework in which portfolio choice matters.

Given the importance of the social savings rate, does the paradox of thrift play a role in the classical-Harrodian perspective? A discussion of the effects of the paradox of thrift needs to distinguish between the short- and long-run effects of a rise in the savings rate.(12) Let $s^* = s + (t - g)$ be defined as the social savings rate in equation 5. Then a rise in s^* will have the effect of making $e < 0$ and $m_s < m_d$. From equation 3, a_c will fall, thereby ensuring that both the growth rate and level of output will also fall. With a_f fixed in the short run (remember it takes a longer time to respond and its variations correspond to the slow adjustment process) and desired inventory/sales ratio, the levels of fixed investment I_f and finished goods investment I_v will also drop. See Figure 5.

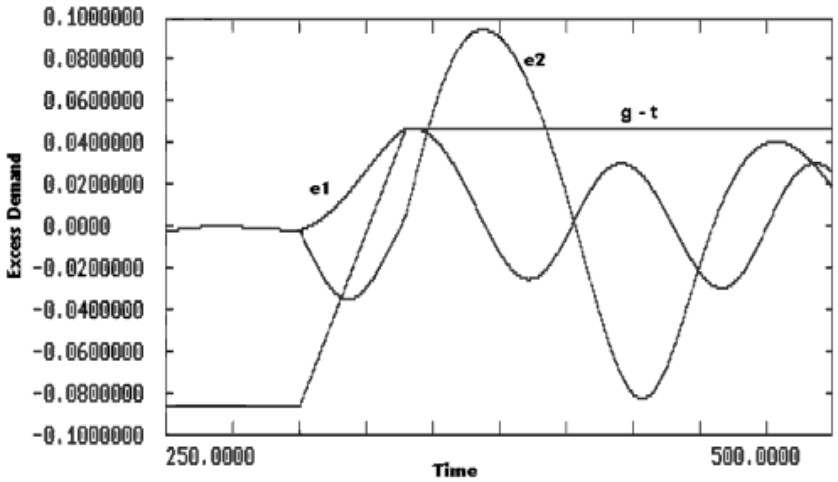

Figure 5. The Effect of a Higher Social Savings Rate on the Cycle: the Paradox of Thrift

Figure 5 plots the excess demand curves, e_1 and e_2, when the social savings rate falls and rises

respectively as a consequence of an increase in the budget deficit. In the case of e_1, the fall in the social savings rate raises excess demand and lowers long run growth (as in Figures 2 and 4, respectively). On the other hand, in the case of e_2 an increase in the social savings rate leads to a collapse of short-run demand as discussed above. Given the role of demand in the short run in the classical-Harrodian model, this Keynes/Kalecki type of result is not surprising. But note that unlike the latter literature, the mechanism in the former is different and moreover entails a dynamic disequilibrium (cyclical) adjustment process rather than a static equilibrium one. The dynamics arise from the endogeneity of investment demand in the classical model.

With a stable system the negative excess demand will eventually rise so as to ensure that e = 0 over time. This adjustment process will increase a_c and therefore the growth rate and level of output. Thus aggregate investment will begin to rise. In other words, as shown in Figure 5, even along the course of the cycle the paradox of thrift effect will begin to annul itself because of

the stable nature of the short-run growth path and the fact that circulating investment responds positively to excess demand and negatively to debt.

Over the long run, the rise in the social savings rate, brought about by an increase in the private savings rate that exceeds the increase in the budget deficit, will lead to the crowding in of output. See Figure 6.

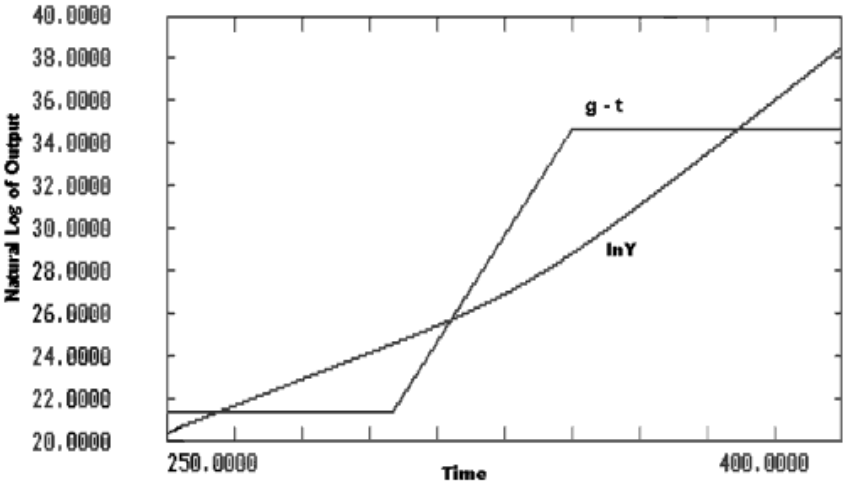

Figure 6. The Crowding In of Output over the Long Run

Over the medium- to long-run the normal rate of profit and the rate of savings out of profits assert themselves to determine the growth rate of output. Given the profit rate, a higher savings rate will raise the rate of accumulation. If, however, over time this leads to an increase in the normal capacity capital-output ratio and/or a rise in wages that exceeds productivity because of tight labor markets, the rate of profit will fall (Shaikh, 1987) and the rate of accumulation will slow down. Thus the higher savings rate would lead to an initial spurt in the growth rate but would eventually slow it down. In a sense, this is the long-run analogue of the paradox of thrift in the classical tradition. Needless to say, if the rate of profit falls then over time the mass of savings will also decay.

Thus, given the rate of profit, if it is desired to increase the warranted path, attempts should be made to boost the flow of investable surplus. Further research has to be done to investigate the factors that would make households and firms lower their money and bond holdings and channel their savings into equity and real investment.

On the other hand, the social savings rate can be raised either by contractionary fiscal policies or via appropriate taxation policies that boost the private savings, thereby providing room for the budget deficit to rise at a slower rate. For example, it is empirically true for most OECD countries that business retained earnings are the most important source of finance for investment (Corbett and Jenkinson, 1989; Ruggles and Ruggles, 1992). Further, the consensus view in the econometrics literature is that retained earnings constitute the most important of investment (see Blecker, 1997, for a summary of this literature). In other words, if s_f and s_h are business and household savings, respectively, and excess demand equals zero, the growth rate of output (equation 2) can be approximated by:

$$\frac{Y'}{Y} = \frac{m}{(1+mv)}[s_f + s_h - (g-t) - a_f] \approx \frac{m}{(1+mv)}[s_f - (g-t) - a_f] \qquad (17)$$

Taxation policy to stimulate business retained earnings can be studied by writing the above equation in terms of different kinds of taxes:

$$\frac{Y'}{Y} = \frac{m}{(1+mv)}[s_{f0}(1-t_f) - (g - (t_f + t_{Khh} + \overline{t_{Lhh}} + t_O) - a_f] \qquad (18)$$

where $s_f = s_{f0}(1 - t_f)$ = business savings rate net of tax payments, t_{Khh} = capitalist household taxes, t_{Lhh} = working class household taxes, and t_O = "other taxes" including transactions on securities (STETS, Tobin tax) and financial market transactions. The purpose of taxation policy is to lower t_f and raise t_{Khh} and the taxes on *certain* kinds of financial market transactions (such as capital gains, STETS, Tobin taxes etc.) so as to keep $t = t_f + t_{Khh} + t_{Lhh} + t_O$ constant. This would make $s_f = s_{f0}(1 - t_f)$ increase and thereby provide room for government spending, g, to rise at a slower pace. The resulting increase in the social savings rate would also increase the warranted growth rate.

There is an analytical basis for the taxation policy proposed here. Given the relative unimportance of capitalist household savings for business investment, the lower rate of corporate taxation, coupled with the higher marginal tax rates on capitalist households, effectively involves a transfer of surplus value from the circuit of revenue to the circuit of capital which is where

surplus value is generated. Moreover, the selective increase in taxes on certain types of financial market transactions (especially those of a speculative kind such as foreign exchange transactions) would involve a transfer of surplus value from non-productive activities in the circuit of finance capital to the circuit of industrial capital.(13) Both policies would have the effect of increasing the total amount of surplus value within the circuit of productive capital.(14) If the profit rate is given, there will consequently be an increase in investment.

Using a classical-Marxian framework, Shaikh and Tonak (1994) make an economic distinction between two sectors in the economy. The *primary sector* consists of production and trading activities that are involved in the domestic production and realization of the total product. The *secondary sector* consists of all those activities that are involved in the recirculation of the value and money streams generated in the primary sector. Included in the secondary sector are financial flows, ground rent, royalties etc. Thus the tax policy proposed here entails (a) a transfer of surplus value from the circuit of revenue (capitalist households) to the circuit of capital and (b) from the secondary to the primary sector. The latter policy would entail a transfer from one component of the circuit of financial capital (such as the stock market through STETS and Tobin taxes on foreign transactions) to the circuit of industrial capital.

Finally, as both Pechman (1987) and Feldstein (1970, 1974) argue, maintaining a high marginal tax rate on wealthy households relative to corporations is likely to induce the latter to reduce the dividend payout rate and therefore accumulate retained earnings. The reason is presumably to reduce the amount of surplus value that the state siphons off.

The above discussion has focused primarily on OECD countries. What about developing countries? Since the bulk of the wealthy, "leisured classes" in these countries engage principally in highly lucrative but economically nonprofitable activities (real estate speculation, black marketeering, etc.), tax rates on such households should be raised while they are lowered for the business sector where the surplus value is actually generated. Again, such a policy would have the beneficial effect of allowing the budget deficit, the social savings rate, and warranted growth rate to rise.

As Figure 1 shows, the nature of the fiscal policy matters in the dynamic context. A one-time increase in the budget deficit share $\gamma = (g - t)$ in a growth context implies a gradually increasing value of the budget deficit level (G - T). In terms of Figure 1 this corresponds to the equivalence between a *dynamic jump* and *static rise* . The analysis of fiscal policy in the classical-Harrodian model is strictly speaking not comparable with the literature earlier most of which studies the impact of one-time increases in (G - T) on a static level of output. To make an appropriate comparison with these models, we need to ask how they would respond if (G - T) rises gradually over time. The Keynesian models would eventually reach full employment, experience a rise in prices and a crowding out of output. These would also be the results in the full employment neoclassical model.

The question now becomes, what would be the effect of a one-time increase in (G - T) in the classical-Harrodian model? This would correspond to a *dynamic pulse* . For this purpose, assume the following function

$$(G - T) = \gamma_1 Y + \gamma_2 \qquad (19)$$

In other words,

$$(g - t) = \gamma_1 + \frac{\gamma_2}{Y} \qquad (20)$$

where $\gamma_2/Y \to 0$ in a growing system.

The results show that a one-time increase in (G - T) caused by a jump in γ_2 produces a stimulating effect on the short-rungrowth rate and level of output (Figure 7). The short-run stimulus involves a rise in (g - t) whose effect on the system was discussed above. Over the longer-run (g - t) reverts to its structural value given by γ_1.

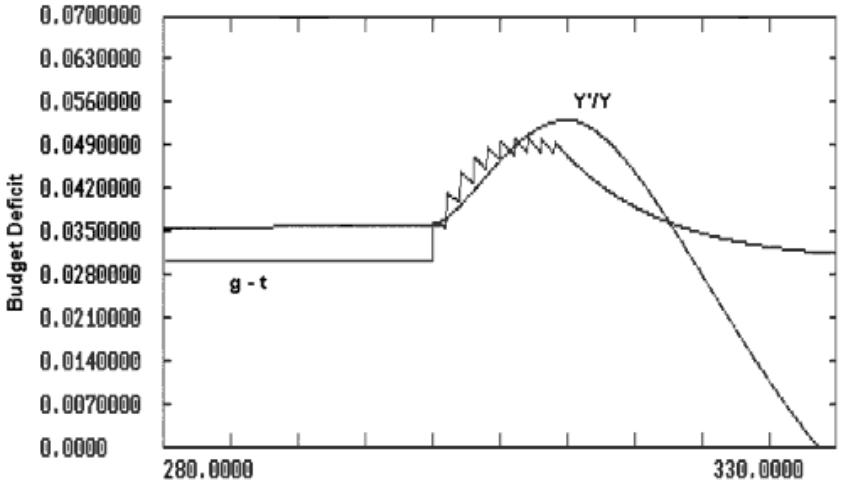

Figure 7. The Effect of an Increase in G in the Short Run

Figure 8 shows that the above fiscal policy has no effect on output in the longer run.

Figure 8 shows that the above fiscal policy has no effect on output in the longer run.

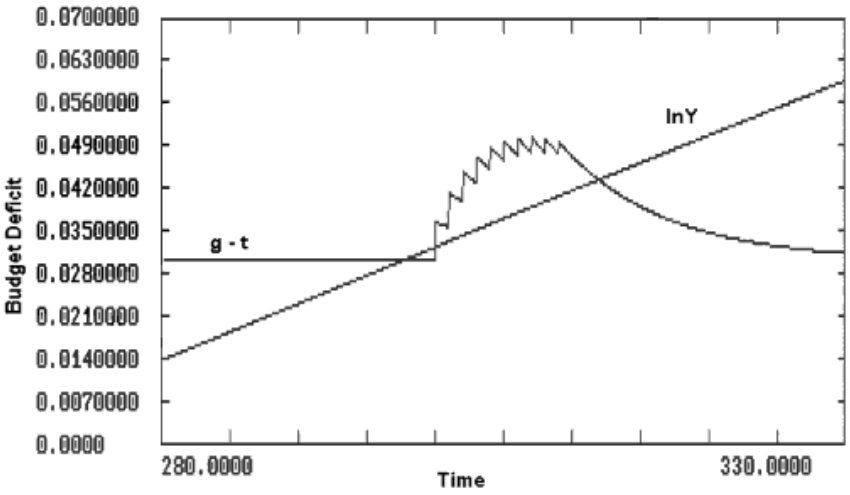

Figure 8. The Effect of an Increase in G over the Long Run

That is, there is no crowding out because (g - t) eventually reverts to its original value. Figures 7 and 8 illustrate a vital difference between the classical and neoclassical models. In the latter, given full employment output, there is crowding out in shares because of the crowding out in levels. The two situations are entirely equivalent because of the static nature of the neoclassical model. The dynamic classical model shows that the standard policy of a one-time increase in G-T produces a short-run positive effect on output with no long run crowding out effect.

To summarize the discussion on fiscal policy in the classical-Harrodian model, a rise in the deficit share (g - t) has somewhat different effects from a rise in the deficit level (G - T). Both can produce crowding in of investment and output as in immediate short-run effect. However, (g - t) eventually crowds out output in terms of its level and its growth rate. On the other hand, a one-time increase in (G - T) has no longer-run effect on the system since the dynamic pulse dies out.

One way to interpret these results is as follows. Since the dynamic jump case in the classical-Harrodian model is equivalent to the static rise in standard models (see Figure 1 in which a one-time increase in g corresponds to a gradually increasing G = gY), this particular policy sooner or later leads to negative effects in both groups of models. In other words in the Keynes/Kalecki tradition, given a gradually growing government spending G the system eventually reaches full capacity and full employment so that "[neo]classical theory comes into its own from this point onwards,"(Keynes, 1936, p. 378). Thus a persistent rise in G in this tradition leads to inflation and crowding out. In fact as Arestis (1985) points out, Keynes had recognized the importance of crowding out when, in discussing government spending, he stated that

> 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 (Keynes, 1936, p. 119-20).

On the other hand, in the classical-Harrodian model the system eventually reaches normal capacity with structural

unemployment and crowding out (with a fixed savings rate). Rather than full employment the long-run normal capacity utilization requirement delimits the extent to which demand stimulation can have a positive effect on output. This result is in fact analogous to the Sraffian and classical inverse relationship between a higher wage share (leading to higher consumption demand) and the uniform rate of profit. This inverse relationship implicitly assumes that the system is at the normal capacity level. If capacity utilization were not at the normal level then the increased effective demand from the higher wages might raise capacity utilization more than the increased wage-costs would lower the normal rate of profit so that actual rate of profit $r = r_n u$ would actually rise.

The above discussions should make it clear that the impact of budget deficits in a growth context is more complex than it is in a static model. While authors in the Keynes/Kalecki tradition discuss budget deficits both in terms of levels and shares (Tobin, 1980; Taylor, 1985; Arestis, 1985; Nell, 1988) their static framework of analysis makes it impossible to investigate the impact of deficits on the growth rate of output as in the above discussion. Tobin (1980) does incorporate growth into his macro-model, but the impact of budget deficits on the long-run growth path cannot be investigated since the latter is determined exogenously by population growth and technology.

IS CROWDING OUT ALWAYS UNDESIRABLE? SOME POLICY IMPLICATIONS

While a considerable amount of time has been devoted to analyzing how the warranted growth path can be raised, it should not be inferred that crowding out is necessarily a desirable state of affairs. To understand the complexity of the issue involved, we turn to Harrod's analysis of policy conflicts in chapter 7 of *Economic Dynamics* . It should be recalled that Harrod's policy analysis revolves around the mutual relationships between the actual (g_Y), warranted (g_Y^w), and natural (g_Y^n) growth rates. The warranted growth rate produces the dynamic equilibrium path with normal capacity utilization along which all producers are satisfied with their production decisions, i.e., excess demand equals zero. The value of g_Y^w is jointly determined by the desired social savings rate and the desired capital-output ratio. The actual growth rate is determined by the actual savings rate and capital-output ratio. Thus the warranted growth rate is an *ex ante* concept since it is a reflection of the savings and productions plans that are made with regard to demand expectations. On the other hand, the actual growth rate is an *ex post* concept reflecting what actually did take place (Harrod, 1973). Finally, Harrod deals with the natural growth rate, which is the economy's maximum growth rate and is determined jointly by productivity and population growth. While not recognized by Harrod, the natural growth, which involves the equality of the growth rates of labor demand and supply, may be consistent with unemployment in which the level of the labor supply exceeds that of labor demand.

Harrod argues that the "central paradox" (ibid., p.102) of expansionary policies is that they have opposite effects on the actual and warranted growth rates. Thus an increase in the shape of budget deficit will raise the actual growth rate while lowering the warranted one. Whether or not these results are good with respect to unemployment depends on the relationship between these growth rates and the natural growth rate.

Harrod's analysis rests on two different scenarios. The first one is when $g_Y^w > g_Y^n$. He calls this the *oversaving scenario* since the social savings rate is excessive with respect to that amount necessary to maintain the economy on its maximum growth path. Expansionary fiscal policy is beneficial in this situation since it *lowers* the warranted path towards the natural growth path while providing a stimulus to the actual growth rate. The only problem is if $g_Y > g_Y^w$ since expansionary policies would increase this particular gap and thereby provoke inflationary pressures. Nonetheless, the key policy is to lower the social savings rate.

On the other hand, when $g_Y^w < g_Y^n$ the social savings rate is insufficient since it maintains the warranted growth rate below the natural growth rate. This is the *undersaving scenario* and expansionary fiscal policy worsens long-run unemployment by lowering the warranted growth further while providing a boost to the actual growth rate. The key policy is to raise the social savings rate so as to move g_Y^w closer to g_Y^n .

Harrod's analysis of the relationship between these three growth rates is of tremendous importance since it provides a more full description of the different effects of expansionary budget deficits. They do raise three issues, however. First, Harrod's analysis could not deal with the issue of knife-edge instability. This problem, however, is solved in the classical-Harrodian perspective via debt dynamics and the interaction between fixed and circulating capital (Shaikh, 1989, 1991). Second, unlike both the Keynesian and the neoclassical perspective, it does not need to assume full employment in order to produce the crowding out effect; one could, in fact, argue that this result shows Harrod's classical roots. On the other hand, in contrast to neoclassical analysis, Harrod's analysis shows that long-run crowding out can be beneficial under certain circumstances. Third, as the discussion in section 4 shows, a number of taxation or monetary policies can be used to raise the warranted growth in the undersaving scenario if expansionary fiscal policy is necessary. Furthermore, unlike neoclassical policy, the central role of investable surplus eliminates the importance of fiscal austerity under these circumstances.

CONCLUSION

Table 1 summarizes the study of fiscal policy in the neoclassical, Keynes/Kalecki, and classical-Harrodian perspectives.

	Neoclassical	Keynes/Kalecki	Classical-Harrodian
Rise in g (increase in G relative to Y).	Crowding out.	Short-run crowding in of output level. Long-run crowding out at full capacity/full employment.	Short-run crowding in of output growth. In the long run, if s is *fixed* then crowding out at normal capacity with structural unemployment. If s *rises* fast enough, so that s^* increases, crowding in will occur (increase in investable surplus).
One-time rise in G.	Crowding out.	Short-run crowding in of output level. No long-run crowding out unless full capacity/full employment barrier reached.	Short-run crowding in of output growth. No long-run crowding out since g remains unchanged.

Table 1. Summary of the Impact of Fiscal Policy in the Three Theoretical Traditions

Perhaps the central message of this paper is that there in no unique "one size fits all" fiscal policy that is suitable for all countries at all times. In this respect, the classical-Harrodian model follows those of Taylor (1985, 1991), Tobin (1980), and Tobin and Buiter (1980) which also use a variety of mechanisms to derive crowding in and crowding out. However, the mechanisms involved in the classical-Harrodian model are very different from those of these authors, as is the context in which fiscal policy is analyzed. These vital differences aside, the complexities in the broad heterodox tradition should be contrasted with neoclassical analyses in which budget deficits are at best neutral (Barro, 1974, 1991) or harmful in both short- and long-runs (McCafferty, 1990).

The role of profitability and the social savings rate/investable surplus, as well as the absence of the full employment condition, should alert us to the fundamental differences between the classical-Harrodian and neoclassical perspective. *If* it is desired that both the warranted path and the budget deficit be raised, then clearly appropriate policies are needed to increase the flow of investable surplus into the business sector. For example, expansionary monetary policies would lower the attractiveness of bank deposits because they would lower interest rates. Such policies would also make credit cheaper and increase the cyclical stimulus from the higher deficit. Given the stock market rate of return(15), such a general fall in interest rates would tend to lower the rates of return on bank deposits and increase the flow of business and household savings into the business sector. In other words, rather than target inflation or monetary aggregates, the purpose of monetary policy should be to stimulate growth and employment (Papadimitriou and Wray, 1994).

However, it is important to remember that the undersaving scenario confronts the policymakers with trade-offs. Fiscal expansion raises short-run demand but, by lowering the social savings rate, lowers the warranted path. On the other hand, a fiscal expansion accompanied by a rising social savings rate depresses short-run demand (via the paradox of thrift), although it raises the warranted path. Thus fiscal policy in the undersaving scenario should alert us to the fact that there may be no such thing as a "fine-tuning" or perfect policy, a point that Harrod stresses in his analysis. (16)

On the other hand, in the oversaving scenario there does not appear to be such a trade-off since expansionary fiscal policy both stimulates short-run demand and, by lowering the warranted growth path, brings the economy in line with its maximum growth rate.

The simulation exercises performed in this paper were carried out by holding the rate of profit constant. However, attempts to raise the social savings rate are likely to be futile in a long wave decline with the collapse of profitability (van Duijn, 1983; Sterman, 1985, 1986; 1992; Shaikh, 1992; Duménil and Lévy, 1993; Freeman, 1996). Further, as households and businesses seek safe and liquid havens for their savings, it is unlikely that fiscal austerity and tight monetary policies will slow down the reduction of the investable surplus. Quite the contrary, austerity policies are likely to exacerbate the problem by deepening the growth cycle recession, accelerate the flight of savings from the business sector, and increase social misery. If a long wave recovery necessarily involves the cutting of business costs by downsizing and cut backs, it is difficult to see why the social safety net needs to be eroded to bring about the recovery. After all, cutting the budget deficit *by itself* will not raise the long-run rate of profit. This implies that in dealing with the warranted growth rate, the recovery of the normal rate of profit needs to be addressed squarely since, after all, it is the rate of profit that generates the savings needed to finance investment.

These issues are of particular significance for the current world crisis with its growing unemployment and the IMF's draconian austerity policies.

REFERENCES

Arestis, P., and Malcolm Sawyer. 1998. "The Macroeconomics of Industrial Strategy." Working Paper no. 238. Annandale-on-Hudson, N.Y.: The Jerome Levy Economics Institute.

Arestis, P. 1985. "Is there Crowding out of Private Expenditure by Fiscal Actions?" In Arestis, P., and T. Skouras, eds., *Post Keynesian Economic Theory* . Armonk, N.Y.: M.E. Sharpe.

Asimakopulos, A. 1983. "Kalecki and Keynes on Finance, Investment, Saving." *Cambridge Journal of Economics* 37 (September/December).

------. 1986. "Harrod and Domar on Dynamic Economics." *Banca Nazionale del Lavorro Quarterly Review* 0, 158 (September): 275-290.

Barro, Robert J. 1974. "Are Government Bonds Net Wealth?" *Journal of Political Economy* 82 (November/December): 1095-1117.

------. 1990. "Government Spending in a Simple Model of Endogenous Growth." *Journal of Political Economy* 98, S103-S125.

------. 1991. "The Ricardian Model of Budget Deficits." In Rock, J.M., ed. *Debt and the Twin Deficits Debate* . Mountain View, Calif.: Mayfield Pub. Co.

Blanchard, O. J., and S. Fischer. 1989. *Lectures on Macroeconomics* . Cambridge, Mass.: MIT Press.

Bernstein, Peter L., and Robert L. Heilbroner. 1991. "The Relationship Between the Budget Deficits and the Savings/Investment Imbalance in the U.S.: Facts, Fancies, and Prescriptions." In Rock, J.M., ed. *Debt and the Twin Deficits Debate* . Mountain View,

Calif.: Mayfield Pub. Co.

Blecker, Robert. 1990. "Are Americans on a Consumption Binge? The Evidence Reconsidered." Washington, D.C.: Economic Policy Institute.

Blinder, Alan S., and Robert M. Solow. 1973. "Does Fiscal Policy Matter?" *Journal of Public Economics* 24 (November): 319-337.

Buiter, Willem H. 1977. "Crowding out and the Effectiveness of Fiscal Policy." *Journal of Public Economics* , June.

Chakravarty, S. 1989. John von Neumann's Model of an Expanding Economy: An Essay in Interpretation." In Dore, M.H.I., S. Chakravarty, and R. M. Goodwin, eds. *John von Neumann and Modern Economics* . Oxford: Clarendon Press.

Currie, D.A. 1978. "Macroeconomic Policy and Government Financing." In Artis, M.J., and A.R. Nobay, eds. *Contemporary Economic Analysis Vol. 1.* London: Croom Helm.

Domar, E. 1944. "The Burden of 'National Debt' and the National Income." *American Economic Review,* December, 798-827.

Duménil, G., and D. Lévy. 1993. *The Economics of the Profit Rate* . Aldershot: Edward Elgar.

Eltis, W. 1993. *Classical Economics, Public Expenditure, and Growth* . Aldershot: Edward Elgar Press.

Fazzari, Steven M. 1993. *The Investment-Finance Link* . Public Policy Brief No. 9. Annandale-on-Hudson, N.Y.: The Jerome Levy Economics Institute.

Fazzari, Steven M., R. Glenn Hubbard, and Bruce C. Petersen. 1988. "Investment Financing Decisions and Tax Policy." *American Economic Review* 78, 200-205.

Feldstein, Martin 1983. *Capital Taxation* . Cambridge, Mass.: Harvard University Press.

------. 1992. "The Budget and Trade Deficits Aren't Really Twins." National Bureau of Economic Research Working Paper #3966.

Feldstein, Martin S., and P. Bachetta 1989. "National Saving and International Investment." National Bureau of Economic

Research Working Paper #3164.

Freeman, Christopher, ed. 1996. *Long Wave Theory* . Cheltenham, U.K. and Lyme, N.H.: Edward Elgar.

Godley, W. 1999. "Money and Credit in a Keynesian Model of Income Determination." *Cambridge Journal of Economics* 23, 393-411.

Godley, W., and A. Shaikh, 1998. "An Important Inconsistency at the Heart of the Standard Macroeconomic Model." Working Paper No. 236, Annandale-on-Hudson, N.Y.: The Jerome Levy Economics Institute.

Goodwin, R.M. 1967. "A Growth Cycle." In Feinstein, C.H., ed. *Socialism, Capitalism, and Economic Growth (Essays Presented to Maurice Dobb)* . Cambridge: Cambridge University Press.

Hacche, Graham 1979. *The Theory of Economic Growth* . New York: St. Martin's Press.

Harrod, Roy. 1973. *Economic Dynamics* . London: MacMillan Press Ltd.

Keynes, J.M. 1936. *The General Theory of Employment, Interest, and Money* . New York: Harcourt, Brace & World.

Kleinknecht, Alfred, Ernest Mandel, and Immanuel Wallerstein, eds. 1992. *New Findings in Long-Wave Research* . New York: St. Martin's Press.

Kregel, J.A. 1980. "Economic Dynamics and the Theory of Steady Growth: An Historical Essay on Harrod's 'Knife-Edge'." *History of Political Economy* 12, 1: 97-123.

Kurz, Heinz D., and Neri Salvadori. 1995. *Theory of Production: A Long-Period Analysis* . Cambridge and New York: Cambridge University Press.

Lucas, R.E. 1988. "On the Mechanics of Economic Development." *Journal of Monetary Economics* 22, 3-42.

McCafferty, Stephen. 1990. *Macroeconomic Theory* . New York: Harper Collins.

McCallum, John. 1993. "Government Spending and National Saving." In Baldassarri, Mundell,

and McCallum, eds., *Debt, Deficit and Economic Performance* . New York: St. Martin's Press.

Minsky, Hyman 1986. *Stabilizing an Unstable Economy* . New Haven, Conn.: Yale University Press.

Moore, B.J. 1988. *Horizontalists and Verticalists: The Macroeconomics of Credit Money* . Cambridge, U.K.: Cambridge University Press.

Moudud, Jamee K. 1998a. "Finance and the Macroeconomic Process in a Classical Growth and Cycles Model." Working Paper. no. 253, Annandale-on-Hudson, N.Y.: The Jerome Levy Economics Institute.

------. 1998b. "Government Spending and Growth Cycles: Fiscal Policy in a Dynamic Context." Working Paper no. 260, Annandale-on-Hudson, N.Y.: The Jerome Levy Economics Institute.

------. 1999a. "Finance in a Classical and Harrodian Cyclical Growth Model." Working Paper no. 290. Annandale-on-Hudson, N.Y.: The Jerome Levy Economics Institute.

------. 1999b. "Government Spending and Growth Cycles." Public Policy Brief, No. 52, Annandale-on-Hudson, N.Y.: The Jerome Levy Economics Institute.

Nell, E. J. 1988. *Prosperity and Public Spending* . Boston, Mass.: Unwin Hyman.

Nguyen, Duc-Tho, and Stephen J. Turnovsky. 1983. "The Dynamics of Fiscal and Monetary Policies Under Bond Financing." *Journal of Monetary Economics* 11, 45-71.

Palley, Thomas I.1996. *Post Keynesian Economics* . New York: St. Martin's Press.

Pechman, Joseph 1986. *The Rich, The Poor, and the Taxes They Pay* . Boulder, Colo.: Westview Press.

------. 1987. *Federal Tax Policy* . Washington, D.C.: The Brookings Institution.

Peterson, Wallace C. 1991. *Transfer Spending, Taxes, and the American Welfare State* . Norwell, Mass.: Kluwer Academic Press.

Pigeon, Marc-André, and L. Randall Wray. 1998. *Did the Clinton Tide Raise All Boats?* Public Policy Brief, No. 45 Annandale-on-Hudson, N.Y.: The Jerome Levy Economics Institute.

Pollin, Robert J. 1991."Two Theories of Money Supply Endogeneity: Some Empirical Evidence." *Journal of Post Keynesian Economics* 13 (Spring): 366-396.

Rock, J.M ., ed. 1991. *Debt and the Twin Deficits Debate* . Mountain View, Calif.: Mayfield Publishing Co.

Rogers, Colin. 1989. *Money, Interest and Capital* . Cambridge: Cambridge University Press.

Romer, P.M. 1986. "Increasing Returns and Long-Run Growth." *Journal of Political Economy* 94, 1002-1037.

Shaikh, A. 1989. "Accumulation, Finance, and Effective Demand in Marx, Keynes, and Kalecki." In Semmler, W., ed. *Financial Dynamics and Business Cycles: New Perspectives* . Armonk, N.Y.: M.E. Sharpe.

------. 1990. "Fiscal Policy in a Dynamic Context." Mimeo. New School for Social Research.

------. 1991. "Wandering Around the Warranted Path: Dynamic Nonlinear Solutions to the Harrodian Knife-Edge." In Nell, E.J., and W. Semmler, eds. *Nicholas Kaldor and Mainstream Economics* . New York: St. Martin's Press.

------. 1992. "A Dynamic Approach to the Theory of Effective Demand." In Papadimitriou, D., ed. *Profits, Deficits and Instability* . London: Macmillan.

------. 1995. "The Stock Market and the Corporate Sector: A Profit-Based Approach." Working Paper no. 146, Annandale-on-Hudson, N.Y.: The Jerome Levy Economics Institute.

------. 1996a. "Federal Deficit and National Debt." Mimeo. New School for Social Research.

------. 1996b. "Fiscal Policy, Economic Theory and Dynamical Analysis." Mimeo. New School for Social Research.

Shaikh, A., and A. E. Tonak. 1994. *Measuring the Wealth of Nations: The Political Economy of National Income Accounts* . Cambridge: Cambridge University Press.

Sterman, John D 1992. "Long Wave Decline and the Politics of Depression." Mimeo. Massachusetts Institute of Technology. November 10.

------. 1985.."A Behavioral Model of the Economic Long Wave." *Journal of Economic Behavior and Organization* 6, 17-53.

------. 1986."The Economic Long Wave: Theory and Evidence." *System Dynamics Review* 2, no. 2 (Summer): 87-124.

Taylor, Lance. 1985."A Stagnationist Model of Economic Growth."*Cambridge Journal of Economics* 9, 383-403.

Taylor, Lance. 1988. *Varieties of Stabilization Experience* . Oxford: Oxford University Press.

------. 1991. *Income, Distribution, Inflation, and Growth* . Cambridge, Mass.: MIT Press.

Tobin, James. 1990. *Asset Accumulation and Economic Activity* . Chicago: University of Chicago Press.

Tobin, James, and Willem Buiter. 1980. "Fiscal and Monetary Policies, Capital Formation, and Economic Activity." In von Furstenburg, George, ed. *The Government and Capital Formation* . Cambridge, Mass.: Ballinger Publishing Company.

van Duijn, J. J. 1983. *The Long Wave in Economic Life* . London: Allen and Unwin.

Winston, G. C. 1974. "The Theory of Capacity Utilization and Idleness." *Journal of Economic Literature* 12, no. 4: 1301-1320.

Wray, Randall 1990. *Money and Credit in Capitalist Economies: The Endogenous Money Approach* . Aldershot: Edward Elgar.

Notes

1. Taylor (1985, 1991) does write all variables in terms of shares but does not investigate the different implications of changes in levels and changes in shares of government spending.

2. These roots and the theoretical underpinnings of the classical-Harrodian model are discussed in Moudud (1998a, 1998b, 1999a, 1999b) and Shaikh (1989, 1991, 1992).

3. Unless otherwise stated, the budget deficit refers to the budget deficit-to-output ratio.

4. All lowercase letters refer to variables as shares of output, while uppercase ones refer to levels.

5. The next section discusses the effects of a rise in G. As shown in Figure 9, a rise in G also produces a short-run stimulus.

6. See Moudud (1999a) for the derivation of this relationship. As discussed in this paper, the fast adjustment process is a 4 x 4 system of nonlinear differential equations while the slow adjustment process is a 2 x 2 system. The paper lists the parameter values and studies the stability properties. Note that the model ignores any possibly inflationary effects of a positive excess demand.

7. On other hand, the inclusion of government production activities would reduce this crowding out effect.

8. The normal rate of capacity utilization is the economically feasible capacity and is defined as that level which is determined by the normal intensity and length of the working day, the number of shifts, the determinants of overtime etc. Normal capacity, utilization includes some reserve capacity and can be considered to be a firms optimal usage of its capital stock so as to maximize profits. It should be distinguished from engineering capacity, which is the technical upper limit to normal capacity (Shaikh, 1991; Winston, 1974).

9. Domar's model is somewhat different from that of Harrod in that it emphasizes the full employment growth rate of the system. The long-run growth path of output or investment are positive functions of the savings rate and another parameter that relates the rate of increase of productive capacity to investment (Hacche, 1979; Asimakopoulos, 1986).

10. Note that $a = a_c + a_f + a_v$. From equation 4, a_f takes on the normal capacity value a_{fn} when $u = 1$. As shown in Moudud (1999a), if v is a fixed desired inventory/output ratio then $a_v = mva_c$. Thus, an increase in the social savings rate when output is at normal capacity raises both a_c and a_v.

11. One could equally well posit a warranted growth path with some non-zero debt-output ratio, so that the growth path is jointly determined by the investable surplus and bank credit. In this situation, provided this debt-output ratio were a variable and responded one-for-one to demand stimuli, there would be no crowding out at all if the budget deficit rises. However, with a less than perfectly accommodating banking sector, whether or not there is crowding out would depend on the relative variations of the investable surplus and the debt-output ratio. If both rise there will be crowding in; if they move in opposite directions the net effect will be ambiguous and there could be crowding out. An investigation of these additional issues is beyond the scope of this paper.

12. I am grateful to Anwar Shaikh for discussions on this issue.

13. The banking sector should be exempt from such higher taxes given the crucial role of bank credit in the process of accumulation. Alternatively, since the retained earnings term in the social savings rate corresponds to the undistributed profits of nonbanking firms, higher taxes on the banking sector could be imposed. So as not to adversely affect this sector's profitability, this policy should be accompanied by lowering the discount rate and by expansionary monetary policies which would have the effect of decreasing the costs that banks incur to attract borrowed and nonborrowed reserves.

14. As Pechman (1986, 1987) argued, if a broad definition of household income is taken (so that incomes from *all* sources are included), then more categories of the incomes of wealthy households would fall into the tax net. Such measures, as well as the closing of what are called tax expenditures (Peterson, 1991), would provide the government with a greater degree of flexibility in recouping the lost revenues from lower rates of corporate taxation.

15. Which is itself determined by corporate profitability, as shown by Shaikh (1995).

16. Harrod (1973) mentions another trade-off between high employment growth and demand-pull inflation. However the present paper does not deal with inflation.