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Article

A note on the Kaleckian government spending multiplier and self-financing fiscal policy

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Abstract:
This paper formulates a simple short-term Kaleckian model where the impact on output of an active fiscal policy can be assessed and the Kaleckian government spending multiplier introduced. The model also allows us to verify the limits through which an expansion of public spending can be self-financing. As in DeLong and Summers (2012) and Leão (2013), an unbalanced fiscal expansion raises aggregate demand and output through the short-term fiscal multiplier, and higher current output brings with it higher tax collections. Thus, under certain conditions, this mechanism allows for the recapture of some of the costs of the fiscal expansion. Due to the Kaleckian features of the model economy, a change in the functional distribution of income will generate an alteration in the conclusions reached regarding the evolution of the incremental debt-to-GDP ratio and self-financing. This is an important aspect of the distributional effects in Kaleckian models that has received very little or no attention from the theoretical literature.

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Fiscal policy cannot be described outside a macroeconomic framework.
Lance Taylor, 1988

The multiplier is a central concept in Keynesian and post-Keynesian economics. It is largely what justifies activist full-employment fiscal policy; that is, the effect that positive fiscal shocks have on domestic output. Post-Keynesian economists, in particular, are aware that it is indeed possible to derive the mechanics of the Keynesian multiplier within the Kaleckian macroeconomic framework, although with some important nuances and extensions. For instance, within a private two-class economy and in the context of imperfect competition, the multiplier effect of a change in any autonomous component of aggregate demand arises because this initial increase in demand generates profits, which then may induce further investment and consumption. Besides, deeply rooted in the notion of imperfect competition, the Kaleckian framework shows that market power

and the functional distribution of income are not peripheral issues but central determinants of the multiplier, output, and employment.

Though Kalecki did not explicitly formulate the multiplier, he certainly grasped the idea as early as the 1930s (Reynolds, 1987; Assous, 2011). Moreover, Kalecki handled the fundamental mechanisms equivalent to the fiscal multiplier concept in the 1937 article published in *The Economic Journal* and titled "A Theory of Commodity, Income, and Capital Taxation", even if he did not always use the exact "multiplier" terminology.[1] Subsequent literature based on his seminal works has been able to show that the Kaleckian determination of output via the fiscal multiplier has richer implications than the simple Keynesian income-expenditure model and vindicates the value and potential of active fiscal policy.[2]

But fiscal multipliers are only one of the many aspects that need to be considered in setting fiscal policy. By focusing on gross domestic product (GDP), the analysis of the fiscal multiplier is silent on other important variables, such as the evolution of the national debt. Increasing public debt paths may eventually lead to sharp adjustments if not to crises — i.e., to the generalized failure of governments to meet their obligations. Hence, preventing debt stock dynamics from deteriorating is a most desirable quality.

Our aim in this note is twofold. On the one hand, we explicitly consider the effects of an increase of government spending on output in an open economy where the government budget is unbalanced. We do this in the context of a post-Keynesian/Kaleckian short-run macroeconomic model characterized by imperfect competition and a two-class economy, where both property owners and workers save different fractions of their after-tax income and pay differentiated taxes. The model is also Kaleckian in the specific sense that output is below potential, the distribution of functional income affects the level of effective demand, and the before-tax distribution of income is given and determined by a markup (on unit costs). As expected, the government spending multiplier in this model is positive but, in contrast to the so-called bastard Keynesian models, the damping effect on interest-sensitive components of aggregate demand is absent. It turns out that, in an economy where the monetary authority assumes control of interest rates and where excess capacity prevails, interest rates may remain constant as fiscal policy changes, because the central bank and the fiscal authority would cooperate to support aggregate demand.

On the other hand, and against this backdrop, the note also seeks to move beyond the debate about the short-term impact that fiscal expansion (or fiscal consolidation) has on output and analyses the conditions under which a fiscal stimulus is self-financing. Conventionally, the fiscal problem of an excessive debt burden in the future is discussed within the analytical framework first proposed by Domar (1944), where fiscal solvency is guaranteed after stabilizing the deficit-to-GDP or debt-to-GDP ratio. Such an analysis, in fact, is summarized by a fundamental recursive

[1] What we may clearly see is that Kalecki's determination of profits for a closed economy depends on a multiplier. This multiplier effect of autonomous components of aggregate demand depends inversely on the profit share in national income.

[2] Early contributions by Harcourt (1965), Harris (1974), Asimakopulos (1975), Langer (1985), Reynolds (1987) and Mott (1989) contained key features that closely align with the Kaleckian approach that emphasizes the short-run connection between national income, imperfect competition, and the functional income distribution (which is distinct from the traditional Keynesian multiplier). As the post-Keynesian research project has shifted towards growth and distribution models and the need to find stable long-run solutions, the inclusion of the fiscal dimension and the treatment of government expenditures as a noncapacity-creating autonomous category has gained traction. In most of these works the derivation of a fiscal multiplier is present, although the focus is on the mechanism that ensures that the actual rate of capacity utilization converges to a stable, exogenously determined normal rate in the long run. Some recent examples of this approach to the so-called supermultiplier can be found in Allain (2015), Hein (2018) and Ko (2019).

equation based on the hypothesis that all the variables considered are independent of one another. This means, for instance, that whatever are the government decisions about spending, the economy's output dynamics are not affected. From this perspective, in the usual situation of a primary deficit that is financed by borrowing from the public, if output growth (which is a given) is less than the nominal rate of interest, fiscal austerity is the route that the public sector must follow to reduce its debt-to-GDP or deficit-to-GDP ratios back to sustainable paths.

In contrast, we will argue that a temporary boost to government purchases raises aggregate demand and output through the short-term fiscal multiplier, and higher current output brings with it higher tax collections and thus an immediate partial recapture of some of the costs of the fiscal expansion. So long as the initial government stimulus ultimately has the taxing capacity to stabilize or even reduce the incremental debt-to-GDP ratio, a short-term fiscal expansion will be consistent with sustainability so understood.

Two parameters are key to determining the path of the incremental public debt-to-GDP ratio: The Kaleckian government spending multiplier, that is, the impact of a fiscal stimulus on the GDP, and the sensitivity of taxes to changes in the level of economic activity. As we show in this note, both parameters are sensitive to changes in the distribution of income as represented by the degree of market power in the goods market. Therefore, through the fiscal expenditure multiplier and the sensitivity of tax revenue to the multiplier's impact on national income, it is possible to link the evolution of the debt-to-GDP ratio with the functional distribution of income. This connection between the incremental debt-to-GDP ratio and the distribution of income has largely escaped serious economic analysis. This note takes some steps towards filling this lacuna using a simple Kaleckian macroeconomic model.

The remainder of the paper is organized as follows: section 1 outlines the Kaleckian open economy model and derives the effects of an unbalanced-budget multiplier expansion. The Kaleckian multiplier undoubtedly increases the impact of a fiscal spending stimulus on national output, but what makes it particularly attractive in our case is its dependence on changes in income distribution. Section 2 outlines a scenario where fiscal stimulus would not be not only positive for the economy but also self-financing, and would provide us with an arithmetic model for estimating the limits of this situation. Section 3 pulls together the analysis of the earlier sections to examine the relationship between the incremental debt-to-GDP ratio and income distribution. Section 4 concludes.

1. The Kaleckian government spending multiplier

The economy is described in terms of a Keynes-Kalecki income-expenditure model. The Keynesian dimension is demand-determined equilibrium. The Kaleckian dimension assumes imperfect competition as the predominant structure in the market for goods, firms operating below full capacity output, and the fact that aggregate demand depends on the functional distribution of income.

A key element of our model is the division of the economy into two distinct classes: workers and capitalists. The second obtain their income from the real economy as profits, P, and from the return on government-supplied bonds as interest income, iD. At the same time, the wage bill in the economy, W, comes from a negotiated nominal wage, w, multiplied by the number of workers employed, L. Thus, from the income side of the economy, the private sector may be described by an account of factor income, which consists of labor income, W, and money profits, P.

$$pY = P + W \tag{1}$$

where Y is the level of real income and p the price level. Following Hein (2018), the total income received by the private domestic sector is composed of income from production (equation 1), and financial income, (iD):

$$Total\ Income = pY + iD = P + W + iD \tag{2}$$

The following expression shows how national income in money terms is disposed of:

$$pY + iD = pC + S + T \tag{3}$$

The right side in equation (3) shows that total income is allocated by income earners among nominal consumer expenditure, pC, total saving, S, and total taxes, T. Equation (3) can be rearranged and also be seen as the private's consumer budget equation:

$$pC + S = pY + iD - T \tag{3a}$$

stating that private consumption and saving are financed out of disposable income, i.e., out of factor income, pY, and interest income, iD, minus taxes, T.

From the expenditure side, the economy's accounts read:

$$Z = pC + pI + pG + p(X - IM) \tag{4}$$

where pC is already defined and pI, pG, and $p(X - IM)$ stand for business investment, government expenditure, and the balance of trade in nominal terms, respectively. In an open economy, domestic agents have manifold economic interactions with foreigners; e.g., goods are sold to, as well as purchased from, foreigners. The sales of goods and services to foreigners are exports, X, of the country, and purchases from foreigners constitute imports, IM.

The equilibrium condition in the goods market is that national expenditure, Z, equals national income, pY. Thus, using equations (3) and (4) we have:

$$pC + S + T - iD = pC + pI + pG + p(X - IM) \tag{5}$$

or

$$S + T - iD = pI + pG + p(X - IM) \tag{5a}$$

For the present purpose, investment demand, government expenditure, and exports are assumed to be exogenous, so that $I = \bar{I}$, $G = \bar{G}$ and $X = \bar{X}$. Furthermore, interest income (or interest payments on government debt), captured by the term iD, will remain constant as long as the central bank does not change the short-term interest rate while the economy is below full employment). This assumption certainly warrants explanation. As long as we are in a short-term Kaleckian economy with excess capacity, expansionary fiscal policy should not activate the demand-push mechanism on price dynamics but rather but rather should impact adjustments in output. For this reason, the monetary authority should not fear inflation in the short term. Moreover, interest rates would remain constant as fiscal policy changes, because the central bank and the fiscal authority would cooperate to support aggregate demand.

Let us consider, for instance, a situation where the trade flows are balanced, $p(X - IM) = 0$; correspondingly, if the private sector wants to invest more than it saves ($pI > S$), the public

sector must run a surplus ($T > G + iD$) and lend to the private sector. It does so by redeeming public debt.

Imports in real terms, M, are assumed to be proportional to national income, $Y + iD/p$. Hence:

$$IM = m\left(Y + \frac{iD}{p}\right),\ 0 < m < 1 \tag{6}$$

where m stands for the marginal propensity to import.

Now, to conduct a meaningful analysis, we must introduce the production and pricing side of the economy as well as the distribution of factor income. As we said, firms operate below full capacity, and output per unit of labor, $1/b$, is constant for all ranges of output up to full capacity. Thus:

$$Y = (1/b)\ L \rightarrow L = bY \tag{7}$$

Prices are set by a constant mark-up, τ, over unit variable costs:

$$p = (1 + \tau)wb, \qquad \tau > 0 \tag{8}$$

As we can see from equation (8), if production is fully integrated, aggregate unit costs are given by nominal wages, w, (taken as given in the short run), times b (which is labor per unit of output). We shall assume throughout that τ and p are exogenously given.

Now from equations (1) and (7), it is not difficult to see that gross profits (before taxes) will be given by:

$$P = (1 + \tau)wbY - wbY \tag{9}$$

or

$$P = \tau wbY \tag{9a}$$

Taxes in this simple model are assumed to be income taxes. In view of the social class distinction, it seems reasonable to discern between two groups of tax payers: workers, who receive wages, W, and nonworkers, who receive property income, $P + iD$.[3] The tax rate on wages, t_w, is a positive fraction of the tax rate on property income, t_p. Interest payments on the government debt, iD, are subject to the same profit tax rate and, since only property owners (capitalists) receive interest, total tax receipts are:

$$T = t_w W + t_p(P + iD), \qquad t_w < t_p \tag{10}$$

$$T = t_w wbY + t_p \tau wbY + t_p iD, \qquad t_w < t_p \tag{10a}$$

Tax revenues are known to be pro-cyclical in the above specification; they increase when the economy is booming and fall when a recession takes over.

[3] Transfers payments are ignored in our analysis.

The next magnitude that requires behavioral content is total private savings, S. We assume that the rate of savings out of profit income and interest income is the same, s_p, and is generally much higher than the rate of savings out of wage income, s_w.[4] Private savings, then, are simply:

$$S = s_w(wbY - t_w wbY) + s_p\big(P - t_p P\big) + s_p(iD - t_p iD), \qquad s_w < s_p \tag{11}$$

Rearranging and taking equation (9a) into consideration, we have:

$$S = s_w(1 - t_w)wbY + s_p\big(1 - t_p\big)\tau wbY + s_p(1 - t_p)iD \tag{11a}$$

Simple as it is, this aggregate savings function differs from the one that emerges in the conventional Keynesian tradition in one fundamental way: it depends explicitly on the distribution of income.

Returning to the equilibrium condition in the goods market as given by equation (5a) and substituting equations (10a), (11a), (8), and (6) into it, we have:

$$\big[s_w(1 - t_w) + s_p\tau\big(1 - t_p\big) + t_w + \tau t_p + (1 + \tau)m\big]\frac{1}{(1 + \tau)}Y$$

$$= (\bar{I} + \bar{G} + \bar{X}) + \big[1 - t_p - s_p(1 - t_p)\big]\frac{iD}{(1 + \tau)wb} \tag{12}$$

When solved for Y, this equation gives:

$$Y^* = \frac{(1 + \tau)(\bar{I} + \bar{G} + \bar{X}) + \big[1 - t_p - s_p\big(1 - t_p\big)\big]\frac{iD}{wb}}{s_w(1 - t_w) + s_p\tau\big(1 - t_p\big) + t_w + \tau t_p + (1 + \tau)m} \tag{13}$$

A meaningful and positive solution for equilibrium national income, Y^*, requires that $s_p(1 - t_p) + t_p < 1$ in equation (13).

Starting from an initial period (which is arbitrarily designated as period 0), the government's debt position in the period t is equal to D_0 plus the sum of the variations in government indebtedness between the years 0 and t. That is, $D_t = D_0 + \Delta D_1 + \Delta D_2 + \cdots + \Delta D_t$. Assuming $D_0 = 0$ and a balanced budget situation during the following periods, then $D_t = 0$. In this case, equation (13) reduces to:

$$Y^* = \frac{(1 + \tau)(\bar{I} + \bar{G} + \bar{X})}{s_w(1 - t_w) + s_p\tau\big(1 - t_p\big) + t_w + \tau t_p + (1 + \tau)m} \tag{14}$$

If we now turn our attention to the case in which $D_t = 0$ and the government applies the same tax rates (a flat tax) on wage and property income ($t_w = t_p = t$), then equilibrium national will be given by:

[4] This is mainly because ownership of corporate stock and debt purchases tend to be highly concentrated in the upper income brackets. Indeed, a seminal study by Onaran and Galanis (2014) estimating demand regimes for G20 countries finds values for s_p and s_w of 0.60 and 0.15, respectively.

$$Y^* = \frac{(1+\tau)(\bar{I} + \bar{G} + \bar{X})}{\tau(s_p + t) + s_w + t + (1+\tau)m} \tag{15}$$

Notice also that, in a closed economy with no government expenditure and no taxes, equation (13) reduces to:

$$Y^* = \frac{(1+\tau)\bar{I}}{\tau s_p + s_w} \tag{16}$$

where $(1+\tau)/(\tau s_p + s_w)$ is the familiar Kaleckian investment multiplier (see Harris, 1974; Langer, 1985; Reynolds, 1987; Mott and Slattery, 1994).

Consider the implication of a shock in the level of government spending, $\bar{G}$, in equation (13). In an unbalanced budget situation, by differentiating we get:[5]

$$\frac{dY^*}{d\bar{G}} = \frac{(1+\tau)}{s_w(1-t_w) + s_p\tau(1-t_p) + t_w + \tau t_p + (1+\tau)m} > 0$$

where

$$\alpha = \frac{(1+\tau)}{s_w(1-t_w) + s_p\tau(1-t_p) + t_w + \tau t_p + (1+\tau)m} \tag{17}$$

The term α represents the Kaleckian fiscal multiplier coefficient.[6] The size of the fiscal multiplier will depend on the magnitude of the propensities to save, of the tax rates, of the marginal propensity to import, and of the size of the mark-up.[7]

An issue of interest is the relationship between the value of the multiplier and market power. Noting that this relationship derives from the sign of the multiplier, we differentiate equation (17) with respect to τ, which yields:

$$\frac{d\alpha}{d\tau} = \frac{dY^*/d\bar{G}}{d\tau} = \frac{(s_w - s_p) + (t_w - t_p) + (s_p t_p - s_w t_w)}{[s_w(1-t_w) + s_p\tau(1-t_p) + t_w + \tau t_p]^2} \tag{18}$$

Notice that in equation (18), $(s_w - s_p) + (t_w - t_p) < 0$ and $(s_p t_p - s_w t_w) > 0$, but, since $|s_w - s_p + t_w - t_p| > |s_p t_p - s_w t_w|$, the impact of a change in the mark-up over the government spending multiplier turns out to be negative. That is, an increase in the mark-up that helps profit-

[5] Within a Kaleckian framework and in the context of a balanced-budget government sector whose spending is assumed to be financed entirely via lump-sum taxation, Vera (2006) presents a balanced budget multiplier.

[6] An examination of α reveals that, in a closed economy context, if $s_p = s_w$ and $t = 0$, we have the basic Keynesian multiplier of one over the marginal propensity to save.

[7] Notice that we have assumed private investment as an exogenous variable, ignoring the possibility of an acceleration effect on it. When investment becomes sensitive to changes of income, it acts as an additional source of demand generation in the multiplier process. An increase in government spending then increases income, and this not only boosts consumption but also triggers an increase in investment. This positive feedback loop accelerates the overall demand increase, making the multiplier larger. Although this changes the orders of magnitude of the theoretical fiscal multiplier, it most likely does not change the direction of the process.

earners and hurts wage-earners will reduce effective demand and decrease the size of the fiscal multiplier.[8]

We now turn to the static public debt effects on national income:

$$\frac{dY^*}{dD} = \frac{-\left[s_p(1-t_p)+t_p-1\right]\frac{i}{wb}}{s_w(1-t_w)+s_p\tau\left(1-t_p\right)+t_w+\tau t_p}$$

If $\left[s_p(1-t_p)+t_p-1\right] < 0$, then, similar to Palley (2012), an instantaneous increase in the level of nominal public debt therefore increases income. The reason is that it increases interest payments on the debt of households, which increases consumption spending and aggregate demand.

2. Self-financing fiscal policy

A temporary boost to government purchases, $\Delta\bar{G}$, pushes aggregate demand through the short-term fiscal multiplier. Indeed, the increase in government spending is amplified by the economy's short-term policy relevant multiplier coefficient, α, reducing the output gap in the present period:

$$\Delta Y = \alpha\Delta\bar{G} \tag{19}$$

Call $B = D/p$ the stock of public debt measured in real terms. In constant price terms, the government budget constraint, which defines the budget deficit or surplus, is given then by:

$$\Delta B = \bar{G} + iB - T^R \tag{20}$$

where T^R stands for total tax receipts in real terms. We should note that, by not including a market for monetary assets, this precludes the possibility of monetizing a deficit. The combination of equations (10a) and (8) gives a full expression for tax receipts in real terms:

$$T^R = \frac{t_w}{(1+\tau)}Y + \frac{t_p}{(1+\tau)}\tau Y + t_p iB \tag{21}$$

or

$$T^R = \left[\frac{t_w+\tau t_p}{(1+\tau)}\right]Y + t_p iB \tag{21a}$$

In this framework, the effect of an increase in output on tax revenues is given by:

$$\Delta T^R = \beta\Delta Y \tag{22}$$

where

[8] This logic is valid as long as private investment is considered an exogenous variable in the system. In contrast, if we use a specification of the investment function, such as that proposed by Bhaduri and Marglin (1990), a change in the distribution of income between profits and wages has an ambiguous effect on aggregate demand, since a rise in the profit share reduces consumption demand but may increase investment demand.

$$\beta = \left[\frac{t_w + \tau t_p}{(1+\tau)}\right]$$

and

$$0 < \left[\frac{t_w + \tau t_p}{(1+\tau)}\right] < 1$$

In a context where no distinction is made in the tax rate paid by workers and property owners, the coefficient β reduces to the conventional marginal tax rate, t, and $\beta = t$. From the expression above, it is possible to depict the response of β to changes in market power. Thus, differentiating β with respect to τ yields:

$$\frac{d\beta}{d\tau} = \frac{(t_p - t_w)}{(1+\tau)^2} > 0 \tag{23}$$

This finding is not entirely surprising. If income distribution changes and becomes more favorable to capital (where higher tax rates are paid in a progressive system), then the income sensitivity of income tax yields, β, increases.

Let us see now under what conditions fiscal expansion is self-financing. Financing the expansion of government purchases requires increasing the national debt by an amount ΔB. Given α as before and assuming a baseline marginal tax revenue, β, the required increase in the national debt is then:[9]

$$\Delta B = (1 - \alpha\beta)\Delta\bar{G} \tag{24}$$

Equation (24) is similar to the one originally derived by De Long and Summers (2012) and later proposed by Leão (2013). A rapid examination of equation (24) reveals that $\alpha\beta$ should be less than 1. Notice that, in the absence of the fiscal multiplier or income taxes, the increase in government spending translates into an increase in public debt in a 1-to-1 ratio. However, in the case in equation (24) above, the increase in the public debt is less than the increase in government spending because higher current output brings with it higher tax collections and thus an immediate partial recapture of some of the costs of the fiscal expansion.

Let $b = B/Y$ denote the debt-to-GDP ratio. Here it is clear that an increase in government spending will reduce the debt-to-GDP ratio if, after the stimulus, public debt rises by less than GDP. In other words, if $\Delta\bar{G} \rightarrow \Delta Y > \Delta B$.

The incremental debt-to-GDP ratio associated with an increase in public spending is:

$$\frac{\Delta B}{\Delta Y} = \frac{(1 - \beta\alpha)\Delta\bar{G}}{\alpha\Delta\bar{G}} = \frac{(1 - \beta\alpha)}{\alpha} \tag{25}$$

[9] Derivation of equation (24) can be obtained directly, assuming initially a balanced budget, $\Delta B = \bar{G} + iB - T^R = 0$, that is subject to a fiscal expansion, $\Delta\bar{G}$. Assuming $\Delta t_p iD_{t-a} = 0$ and using $\Delta Y = \alpha\Delta\bar{G}$ and $\Delta T^R = \beta\Delta Y$, we have $\Delta T^R = \beta\alpha\Delta\bar{G}$. Since $\Delta B = \Delta\bar{G} - \beta\alpha\Delta\bar{G}$, it follows that $\Delta B = (1 - \alpha\beta)\Delta\bar{G}$.

This condition says that an increase in government spending will reduce the debt-to-GDP ratio and will be self-financing if $\alpha > (1 - \beta\alpha)$.[10] More formally:

$$if \alpha < (1 - \beta\alpha) \rightarrow \frac{\Delta B}{\Delta Y} > 1 \rightarrow b \uparrow$$

$$if \alpha > (1 - \beta\alpha) \rightarrow \frac{\Delta B}{\Delta Y} < 1 \rightarrow b \downarrow$$

For what values in the parameter space does the expression $\alpha > (1 - \beta\alpha)$ hold? In fact, there are a huge number of combinations of the government multiplier, α, and the tax parameter, β, that can be evaluated. If we take, for instance, β and α to be their "consensus values", we can see to what extent expression $\alpha > (1 - \beta\alpha)$ holds. Of course, the question is what could be the consensus values for these parameters? Regarding the size of the fiscal multiplier, though many empirical studies find different results, recent meta-analysis research methods that combine results from multiple studies approach some consensus value. Gechert and Rannenberg (2018), for instance, conduct a meta-regression analysis on a unique data set of 98 empirical studies with more than 1800 observations on multiplier effects and control for regime dependence. They find spending multipliers to increase output by about 0.6 to 0.8 units during a downturn. Hlaváček and Ismayilov (2022) increase the dataset to 132 studies and more than 3200 observations to conduct a meta-analysis on multiplier effects, and their results show that the fiscal multiplier moves in the range of 0.75-0.82. Ramey (2011) reviews aggregate empirical estimates from the United States as well as cross-locality estimates and concludes that the government spending multiplier is probably between 0.8 and 1.5

There are, however, a number of recent studies that use more sophisticated techniques that have shown that multipliers can exceed 1 under specific circumstances very similar to those described and assumed in this work. Christiano et al. (2011) found that the government spending multiplier can be substantially larger than 1 when the zero lower bound binds. Eggertsson (2010) and Woodford (2011) independently arrived at similar conclusions, highlighting that fiscal policy is most potent precisely when monetary policy is constrained. Batini et al. (2014), and Charles et al. (2015) found government spending multipliers higher than 1, in particular when the economy was in a severe downturn or if the use and/or the transmission of monetary policy were impaired. From a post-Keynesian perspective, Zezza (2024) presents simulations using a stock-flow consistent (SFC) model, which was calibrated to real quarterly data and shows (for the Italian economy) that the multiplier remains positive and above 1 for several years after the fiscal shock.

Knowing the sensitivity of tax revenues to changes in income is much more difficult. The study of the response of tax revenues to changes in national income is a topic that has practically

[10] We should point out that the results will not change in scenarios in which the economy is led to a higher path for long-run potential output. Rather, they are confirmed, but the possible long-term effects of active fiscal policy are somewhat more complex. If we estimate, for instance, the possible presence of hysteresis in economies confronted with recessionary processes, in addition to the short-run output boost we may have a situation in which the fiscal stimulus helps mitigate the recession's depth and duration. This reduces the negative hysteresis effect — less skill decay, less investment shortfall — and leads to a higher path for long-run potential output than if no action were taken. This higher potential output, in turn, may translate directly into higher long-run tax revenue for the government, as the economy's permanent tax base is larger. In sum, if the positive long-run tax revenue generated by reducing the hysteresis "shadow" is large enough to cover the present value of the debt service costs incurred from the initial stimulus, then the policy is self-financing. The argument of DeLong and Summers (2012) for self-financing precisely goes beyond just the immediate budgetary impact and contends that a fiscal stimulus can be self-financing if it prevents long-term damage to potential output (hysteresis).

disappeared from fiscal studies. Early calculations by Musgrave (1959), using a somewhat simple model, estimates the degree of built-in flexibility attributable to the personal income tax in the U.S. to be about 0.33. Smith (1963) later estimates a coefficient of 0.2 (for the U.S.). Hutton and Lambert (1980) estimate effective marginal rates for different periods in the U.K. that oscillate between 0.28 and 0.31. This gives us a plausible value of 0.27 (the mean), which is not too far from the value of 0.33 taken by De Long and Summers (2012).

Table 1 shows some estimates of the response of the incremental debt-to-GDP ratio ($\Delta B/\Delta Y$) to a range of values of the fiscal multiplier and the sensitivity of tax revenues to changes in income. We have reasonably assumed a value of the fiscal spending multiplier within a range between 0.5 and 0.85. In addition, we have safely assumed that the sensitivity of tax collection to changes in income ranges between 0.20 and 0.35. The conclusion that emerges is that, for a range of values of the tax collection sensitivity between 0.2 and 0.35, multipliers can generally be higher than 0.85 for an increase in government expenditure to reduce the debt-to-GDP ratio.

Table 1 – *Responses of the incremental debt-to-GDP ratio to a range of values of the fiscal multiplier and the sensitivity of tax revenues to changes in income*

	Fiscal multipliers							
Tax sensitivity	$\alpha = 0.5$	$\alpha = 0.55$	$\alpha = 0.60$	$\alpha = 0.65$	$\alpha = 0.70$	$\alpha = 0.75$	$\alpha = 0.80$	$\alpha = 0.85$
$\beta = 0.20$	1.8	1.62	1.47	1.34	1.23	1.13	1.05	0.98
$\beta = 0.25$	1.75	1.57	1.42	1.29	1.18	1.08	1	0.93
$\beta = 0.30$	1.7	1.52	1.37	1.24	1.13	1.03	0.95	0.88
$\beta = 0.35$	1.65	1.47	1.32	1.19	1.08	0.98	0.9	0.83

Indeed, for given values of the sensitivity of tax collection to changes in income, condition (24) can be used to calculate the minimum values of the multiplier, α_{min}, that make an increase in government spending reduce the debt ratio. All we have to do is impose a value equal to unity in equation (24) and rearrange. That is:

$$1 = \frac{(1 - \beta\alpha_{min})}{\alpha_{min}}$$

$$\alpha_{min} = \frac{1}{(1 + \beta)}$$

To illustrate this conclusion, suppose that the tax structure in the economy allows a sensitivity to changes in national income equal to 0.35. That would lead to a minimum (or required) government spending multiplier of 0.74. Hence, as long as the multiplier is higher than 0.74, the incremental debt-to-GDP ratio, *b*, associated with an increase in public spending ratio would decline after an increase in government spending.

3. Income distribution and self-financing fiscal policy

Due to the Kaleckian features of the model economy, any redistribution of income between workers and those who receive property income (with different propensities to consume and save) will lead to a change in the fiscal multiplier as well as in the income sensitivity of income tax yields. Therefore, a change in the functional distribution of income will generate an alteration in the conclusions reached regarding the evolution of the incremental debt-to-GDP ratio, $\Delta B/\Delta Y$. This is an important aspect of the distributional effects in Kaleckian models that has received very little or no attention from the theoretical literature.

Equation (25) does not specify the fiscal multiplier, α, and the tax revenue reaction parameter, β, in terms of the functional distribution of income. If we go a step further and substitute α and β into equation (25), after simplification it yields:

$$\frac{\Delta B}{\Delta Y} = \frac{s_w(1-t_w) + s_p\tau\left(1-t_p\right) + (1+\tau)m}{(1+\tau)} \tag{26}$$

When we turn to the effect of our distributional variable, τ, on the incremental debt-to-GDP ratio, we get the following result:

$$\frac{d\,{\Delta B}/{\Delta Y}}{d\tau} = \frac{s_p\left(1-t_p\right) - s_w(1-t_w)}{(1+\tau)^2} \tag{27}$$

The interpretation of expression (27) may not be straightforward, but it is nonetheless important.[11] We do know that the necessary condition for finding a stable and economically meaningful equilibrium in the standard short-run post-Keynesian macro model is $s_p > s_w$. Now, the condition for the expression to be positive is $s_p\left(1-t_p\right) > s_w(1-t_w)$. Given that $s_p > s_w$, for the inequality to hold, the positive difference between $s_p$and s_w must be greater than the difference in the amount subtracted from each, $s_p t_p - s_w t_w$. In other words:

$$if\ (s_p - s_w) > (s_p t_p - s_w t_w) \rightarrow \frac{d\,{\Delta B}/{\Delta Y}}{d\tau} > 0 \tag{28}$$

In the extreme Ricardian case, when $s_w = 0$, the above condition is immediately fulfilled. The same will happen when the government applies the same tax rates on wage and property income ($t_w = t_p = t$). Thus, expression (28) holds true under a variety of circumstances. Essentially, expression (28) it is telling us that, if income distribution becomes more favorable to the business sector, the impact of a higher level of public spending on the debt stock becomes greater than the impact that the same fiscal action has on income. Since we have argued that under certain conditions a government action through fiscal spending can be self-financing, what we find now is that a higher market power, other things being equal, is likely to make the conditions for this to happen more restrictive.

[11] The difference between the impact that a change in the markup may have on the fiscal multiplier, α, and on the sensitivity of tax collection to changes in income, β, is particularly important because both effects go in opposite directions.

In the face of a decline in the labor share, the problems identified by Kaleckian models are not limited to highlighting the risks of contraction in output and employment. What we now see clearly is that active fiscal policy also risks losing its potential to be self-financing.

4. Conclusions

The present note has re-examined the foundations of the unbalanced government spending multiplier process, making use of an explicit Kaleckian model for an open economy. We confirm that the Kaleckian multiplier is a powerful catalyst for fiscal stimulus provided that the stimulus does not lead to a change in prices in the short-run, and provided that monetary policy helps reduce the amount of slack in the economy by maintaining the interest rate at its lower bound.

If there is one thing that sets the Kaleckian multiplier apart from other analytical derivations, it is its sensitivity to changes in the functional distribution of income. This is not uncommon for, within the Kaleckian framework, the multiplier effect of autonomous changes of government spending depends inversely on the profit share in national income.

The novel feature about the approach taken here regarding the value of discretionary fiscal policy is the public debt sustainability constraint, which requires the incremental public debt-to-GDP ratio to be less than 1 to avoid an ever-increasing debt-to-GDP ratio. What we show is that the conventional view about public debt dynamics is not useful if output dynamics and the collection of taxes are dependent on adjustments in the government budget.

We outline a scenario where fiscal stimulus would be not only positive for the economy but also self-financing. We also provide the reader with a simple arithmetic model for estimating the limits of this situation. Our analysis strongly suggests the need for caution regarding the pace of fiscal consolidation. The note shows, for instance, that, for a tax sensitivity to changes in output equal to 0.30, fiscal multipliers must be sufficiently above 0.8 to lead to a self-defeating scenario of fiscal consolidation measures. In other words, for a given response of tax collection to changes in output, there is a minimum value of the multiplier to make fiscal policy self-financing.

Consideration of the Kaleckian fiscal multiplier as well as the sensitivity of an increase in output on tax revenues has given us some further insight into the way in which changes in the distribution of income affect the evolution of the incremental debt-to-GDP ratio, and into the possibilities of self-financing fiscal policy. Indeed, a change in the functional distribution of income will generate an alteration in the conclusions reached regarding the evolution of the incremental debt-to-GDP ratio. This is an important aspect of the distributional effects in Kaleckian models that has received very little or no attention from the theoretical literature. We find that higher market power (and a fall in the labor share of national income), other things being equal, is likely to make the conditions for self-financing fiscal policy more restrictive.

Finally, it is important to stress at least one caveat for future research. Our discussion about self-financing active fiscal policy and self-defeating consolidation focuses on the short-term dynamics. As the economy expands and approaches potential output, a longer time horizon may require the analysis of price dynamics and of the underlying interest rate dynamics.

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