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Hidden Economy and the Evasion Multipliers*

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Making the standard IS-LM curves interdependent via the introduction of taxes and evasion in the consumption and money demand functions, this paper evaluates the effects of changes in hidden economic activity on the income and interest rates of the regular economy. It finds, as a result, that the income-evasion multiplier could be positive (negative), after all, if the corresponding tax multiplier is normal and negative (perverse and positive). Some policy implications of the result are also pointed out.

I. Preliminary Remarks

Increasing concern is expessed by economic policymakers on the deleterious effects of growing 'hidden economy' and its income distribution (Tanzi 1980). Consequently, considerably attention has been focused on a host of negative aspects of the phenomenon to the total neglect of the fact that there exists a positive side also to it. Besdies acting as a safety valve for discontent and social tensions, the income generated in this economy will later show up as luxury expenditure to influence the consumption, investment and demand for money variables of the regular economy via disposable income.

The purpose of this paper is to demonstrate that in a simple IS-LM model of an economy the comparative static results show that the income multiplier of evasion, remains indeterminate in sign on a priori grounds. With a view to keeping our model simple and conventional, we shall employ an IS-LM framework with taxes and evasion also, entering the consumption and money demand functions thus making the IS and LM functions interdependent for changes in the two variables. The model is

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developed in two stages: (i) in the first stage taxes are treated as exogenous and in the second they are made to depend endogenously on both measured national income and evasion which is generally referred to represent concealed income.

An increase in evasion shifts the IS curve rightward and the LM curve leftward. If the LM curve were unchanged the rightward shift in the IS curve would have raised the level of equilibrium national income. Instead, the increase in evasion and the resulting increase in concealed expenditures, raise the demand for money at every level of national income by shifting the LM curve leftward so that at constant money supply it would raise the equilibrium rate of interest much higher than the rate if IS alone shifted up. The new equilibrium income would decline for sure. However, the extent of decline need not be so large as to result in a level lower than the initial equilibrium income in the absence of increase in evasion. Thus, unlike in the simple model of Peacock and Shaw (1982), the result depends on the relative magnitude of the interest elasticities of investment, money demand and money supply on the one side and the evasion elasticities of consumption and money demand on the other. The algebra of the model is worked out in the following section and some concluding remarks are made in the last section.

II. The Model

Assuming a closed economy, we have the following set of equations which describe the macroeconomic structure:

(1) $Y = C + I + G$

(2) $I = I(i)$

(3) $C = C(Y,T,E)$

(4) $L = L(Y,T,E,i)$

(5) $M = M(H,i)$

(6) $L = M$

Equation (1) defines the national income-expenditure identity, (2) is the investment function with interest rate 'i' as the only argument for simplicity sake, (3) is the consumption function with national income 'Y', taxes 'T', and evasion 'E' as arguments; since disposable income Yd is not only a function of taxes but also of evasion. As an identity $Y_d = Y - T + E$. Following Holmes and Smyth (1972), we postulate money demand as depending on interest rate and disposable income which logically makes national income, taxes and evasion also as the legitimate arguments of the 'L' function (4). Equation (5) represents the money supply function where H denotes high-powered money and (6) the equilibrium condition in the money market. Substituting (2) and (3) in (1) and (4) and (5) in (6) we obtain the IS and LM equations of the model as:

$$(7) \qquad Y = C(Y,T,E) + I(i) + G$$

$$(8) \qquad M(i,H) = L(Y,T,E,i)$$

To investigate the effects of evasion on national income, we totally differentiate (7) and (8) and arrange the result to obtain:

$$(9) \qquad \begin{bmatrix} 1-C_y & -I_i \\ -L_y & M_i-L_i \end{bmatrix} \begin{bmatrix} dy \\ di \end{bmatrix} \begin{bmatrix} C_T dT + C_E dE + dG \\ L_T dT + L_E dE - M_H dH \end{bmatrix}$$

where the subscripts denote partial derivatives, e.g., $C_E = \delta C / \delta E$, etc. Following conventional practice, we impose the following sign restrictions on the partial derivatives: $(1-C_y) > 0$, $L_y > 0$, $C_E > 0$, $L_E > 0$, $M_i > 0$, $M_H > 0$, $I_i < 0$, $L_i < 0$, $C_T < 0$ and $L_T < 0$. It needs mention here that the signs of C_E and L_E reflect the fact that: (1) evasion shows up in the form of luxury consumption and (2) evasion is fuelled by transactions in currency (Cagan, 1965, Gutman, 1977, Laurent, 1979, and Kovland, 1980) and also cheques presumably made out to cash (Feige, 1979). These sign restrictions ensure that the Jacobian (D) coefficient matrix of the system is positive e.g., $D = ((I-C_y)(M_i-L_i)-I_iL_y) > 0$.

Using Cramer's rule, the effects of evasion on national income and interest rates can be evaluated by inspecting the signs of the following multipliers:

$$(10) \qquad \frac{dy}{dE} = \frac{C_E(M_i-L_i) + L_iL_E}{D}$$

$$(11) \qquad \frac{di}{dE} = \frac{(1-C_y)L_E + C_EL_Y}{D}$$

It can be easily seen, first, that the sign of (11) is unambiguously positive, suggesting that an increase in evasion, in our model, leads to an increase in the interest rate. This result, obviously, seems to agree with economic intuition. But it is important to notice from (10) that although the sign of the denominator is known, the sign of the numerator is unknown and depends, empirically, upon the relative magnitudies of responsiveness of C, I, L and M functions to changes in evasion (E) and interest rate (i). A simple rearrangement of (10) yields that:

$$\text{(12)} \qquad \frac{dy}{dE} \gtrless 0 \text{ according to } \frac{L_i - M_i}{I_i} \gtrless \frac{L_E}{C_E}$$

From (12) it can be seen that the equilibrium income rises if and only if the indirect effect of the interest rate rise on the reduction in excess demand for money relative to a reduction in investment demand exceeds the direct effect of evasion on money demand increase relative to the increase in consumption expenditures. Otherwise, evasion could lead to a decline in equilibrium income.

The policy implication of this result is indeed interesting. It is true that plugging evasion is an involved and difficult task. Persistence of norms gaps and a host of economic factors including financial repression especially in the form of low administered interest rates help aid and abet evasion. Low interest rates signal low opportunity cost of holding money and lower returns on financial assets relative to yields on speculative and unproductive investment in physical assets. Evaded income partly goes into luxury and wasteful consumption and partly gets invested in the unproductive assets. In these circumstances, introduction of financial liberalization would help check evasion especially through 'marketization' of interest rates. Equilibrium interest rates rise and interest elasticity of money demand tends to increase. As a result, for a given interest sensitivity of investment demand there is greater likelihood of the left-and-side ratio of (12) to exceed the right-hand-side ratio thereby making the income-evasion multiplier positive and evasion confer income benefits on the economy. Thus, financial liberalization and monetary policy have a significant role to play inplugging evasion.

In the above model, however, 'E' can be renamed as government subsidy, transfer expenditures etc. and the result holds quantitatively though qualitative differences exist. Therefore, with a view to improving upon this result, in what follows below in the extended version of the model, we introduce tax endogeneity for a more insightful result. The endogenized tax function reads as:

$$(13) \qquad T = T(Y, E)$$

with $T_Y > 0$ and $T_E < 0$. Although it has become a fashion in recent years, to apparently suggest that the 'hidden economy' is essentially the result of 'fiscal pathology' and an attempt to escape taxes, we are inclined to argue against this reverse causality as a universal truth because there is little direct evidence to it (Cagan, 1965, and Geerams and Wilmots, 1985).

To investigate, now, the effects of evasion via the endogeneity of taxes, we totally differentiate (7), (8) and (13) with respect to E and rearrange to obtain

$$(14) \qquad \begin{bmatrix} 1-C_Y-C_T T_Y & -I_i \\ -L_Y-L_T T_Y & M_i-L_i \end{bmatrix} \begin{bmatrix} dy \\ di \end{bmatrix} = \begin{bmatrix} (C_E + C_T T_E)dE \\ (L_E + L_T T_E)dE \end{bmatrix}$$

The sign of the Jacobian matrix of (14) is a priori indeterminate unlike in (9) because the sign of $(L_Y + L_T T_Y)$ in the determinant $D = ((1-C_Y-C_T T_Y)\ (M_i-L_i)-I_i\ (L_Y + L_T T_Y))$ is indeterminate. The indeterminary can be resolved in two ways: (i) to assume that the LM curve still slopes upwards as normal and (ii) to allow for the perverse downward sloping LM curve. In the first case $L_Y + L_T T_Y$ becomes positive and so is $D > 0$. The signs of the multipliers (15) and (16), therefore, depend upon the signs of their respective numerators. Given that

$$(15) \qquad \frac{dy}{dE} = \frac{(C_E + C_T T_E)\ (M_i-L_i) + I_i\ (L_E + L_T T_E)}{D}$$

$$(16) \qquad \frac{di}{dE} = \frac{(1-C_Y-C_T T_Y)\ (L_E + L_T T_E) + (L_Y + L_T T_Y)\ (C_E + C_T T_E)}{D}$$

the LM curve slopes upwards, the interest-evasion multiplier in (16) takes a positive value once again. But the sign of the income-evasion multiplier of (15) depends on the following inequality that

$$(17) \qquad \frac{dy}{dE} \gtrless 0 \text{ as } \frac{L_i-M_i}{I_i} \gtrless \frac{L_E + L_T T_E}{C_E + C_T T_E}$$

Note that (17) turns out to be an extension of the result in (12). Furthermore, it is easy to see that a more insightful result is transparent from (17) in that according to the rules of ratio and proportion applied to (12) and (17) yield and very interesting result that

$$(18) \qquad \frac{dy}{dE} \gtrless 0 \text{ as } \frac{L_i - M_i}{I_i} \gtrless \frac{L_T}{C_T}$$

This is exactly the same inequality that described a crucial result in Holmes and Smyth (1972). Our income-evasion multiplier will become positive (negative) under the same conditions when their tax multiplier is normal and negative (parverse and positive).

In the second case when both the IS and LM curves negatively slope stability of the system is ensured if the slope of the IS curve is greater than that of the LM curve in the absolute sense. Algebraically it requires that the Jacobian $D = ((1-C_Y-C_TT_Y)\ (M_i-L_i)-I_i(L_Y+L_TT_Y)) > 0$. Given this, the sign of the interest-evasion multiplier (16) becomes positive and for the sign of the income-evasion multiplier (15) is determined by the same inequalities of (17) and (18). It is true that this result hinges on the popular definition of disposable income $Y_d = Y-T+E$ and in this form, replacement of evasion by a subsidy or tax reduction does not seem to alter the result quantitatively. However, qualitatively it is different in that intuitively it is more appealing to accept evasion rather than a subsidy as an argument of the tax function (in less developed countries).

III. Concluding Remarks

The most important result of our model is that the regular income effect of changes in evasion is a priori indeterminate. For the income-evasion multiplier to be positive, under normal IS and LM, not only should the indirect effect of interest rate rise on the reduction in excess demand for money relative to that of investment demand exceed the direct effect of evasion on money demand increase relative to that of consumption demand but also, in turn, exceed the ratio of tax induced change in money demand to a similar change in consumption. This latter condition is discovered to be the same condition that makes the tax multiplier of Holmes and Smyth (1972) become normal (negative).

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