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GOVERNMENT DEFICITS, DISTORTIONARY TAXES AND THE CURRENT ACCOUNT

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1. Introduction

The emergence of apparently unsurmountable budgetary problems throughout the OECD in the late seventies has brought the discussion on government deficits and the real rate of interest to the foreground of policy debates. Not surprisingly the discussion has largely centered on the U.S. since U.S. deficits have recently increased substantially and the U.S. is probably one of the few countries large enough to move the world interest rate.

A crucial element in that discussion should be the link between fiscal deficits and the current account of the balance of payments, since it is by creating an incipient ("ex ante") world current account deficit that an increase in government deficits would lead to an increase in the world rate of interest.(1)

Barro, in a by now classic paper, set the benchmarck for this discussion by demonstrating that in a world with perfect capital markets, infinitely lived consumers (or, equivalently, operative bequest motives) and non-distortionary taxes, pure fiscal policy would not affect private expenditure. Pure fiscal policy means a change in the financing mix for given government expenditure.

This result has important implications: with given government expenditure, unchanged private expenditure implies that the Current Account will not change after say a switch from tax to bond financing. In a Barro world such an increase in the government deficit leaves the CA and therefore the world rate of interest unaffected.

In this paper we introduce distortionary commodity taxes into the set up.

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(1) We will from here on omit the adjective real.

Commodity taxes are the main source of tax revenues [1] in most OECD countries since GATT negotiations have led to an increasing reliance on non-tariff barriers rather than trade taxes and corporate tax revenues have been on decline in line with reduced profitability.

We show, in a model where full information and intertemporal optimization underlie private behaviour and capital markets are perfect, that a cut in commodity taxes [2] will lead to increased private expenditure and an increase in the Current Account deficit. In a full two country world that would result in upward pressure on the world interest rate. Since that next step is obvious we do not present the two country extension necessary to demonstrate that result.

The channel via which this takes place is rather subtle: shifting commodity taxes towards the future is shown to affect the Consumption Rate of Interest (the terms at which future goods can be exchanged for current goods) in such a way that pure substitution effects reduce private savings.

2. Commodity taxes, Public Sector Deficits and Private Expenditure

2.1 In this section I will first present the simplest model possible that is still sufficiently structured to demonstrate the issues at hand. Consider then a small country without non-traded goods and with exogenous terms of trade, so that we can aggregate all goods into one single commodity. There are two time periods, today and tomorrow, labeled 1 and 2 respectively. Output in both periods (X_1 and X_2) is exogenous. Capital markets are perfect and fully integrated with the world capital market, so the rate of

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(1) With income taxes of course.

(2) Tax shift might be a better word since lower taxes now imply higher taxes tomorrow via the Government budget constraint.

interest is fixed at r. It will be notationally convenient to use instead the discount factor $\delta = 1/(1+r)$.

The only distortionary effect of commodity taxes (at a rate t_1 and t_2 for each period) is their impact on the intertemporal allocation of consumption.[1]

Private expenditure behaviour can be represented by an expenditure function:

$$E = E(1+t_1, \delta(1+t_2), U) \qquad (1)$$

with U equal to private welfare. The first two partial derivatives of E (referred to as E_1 and E_2) equal real expenditure in period one and two respectively, via standard properties of expenditure functions (see for example Ch. 2 in Dixit and Norman (1980)).

The private sector intertemporal budget constraint implies:

$$X_1 + \delta X_2 = E \qquad (2)$$

where $E = (1+t_1)E_1 + \delta(1+t_2)E_2$ (by homogeneity properties of the expenditure function) is the discounted value of current and future expenditure measured at tax inclusive prices.

The government also faces an intertemporal budget constraint:

$$\begin{aligned} G_1 + \delta G_2 &= T_1 + \delta T_2 \\ &= t_1 E_1 + \delta t_2 E_2 \end{aligned} \qquad (3)$$

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(1) It is easily demonstrated that all results carry over to a world with more goods per period where commodity taxes also distort within-period relative prices. A proof of this claim is available on request.

In what follows we will concentrate on pure fiscal policy, so variations in G_1 and G_2 will not be considered. Clearly $T_i = t_i E_i$.

Finally simple accounting tells us that the first period current account[1] equals:

$$CA_1 = X_1 - T_1 - E_1 + T_1 - G_1$$

private net savings; government net savings

$$= X_1 - E_1 - G_1 \qquad (4)$$

Note that $E_1 + T_1 = E_1(1+t_1)$.

Differentiation of (2) gives us the welfare effects of commodity tax changes:

$$E_u \, dU = - E_1 \, dt_1 - E_2 \, \delta dt_2 \qquad (2a)$$

Of course the government budget constraint puts a constraint on the tax parameters t_1 and t_2. Differentiation of the government budget constraint plus inserting the results in (2a) gives:

$$E_u \, dU = E_1 \left(1 - \frac{1 + \epsilon_1 t_1/(1+t_1)}{1 + \epsilon_2 t_2/(1+t_2)}\right) dt_1 \qquad (5)$$

where $\epsilon_1 = E_{11}(1+t_1)/E_1$ and similarly for ϵ_2. ϵ_i are price elasticities o aggregate per period expenditure. Manipulation of (5) yields an expression for the optimal tax structure over time:

$$\frac{(1+t_2)}{(1+t_1)} \frac{t_1}{t_2} = \frac{\epsilon_2}{\epsilon_1} \qquad (6)$$

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(1) Since there is no initial debt and therefore no interest payments in period one, the trade balance equals the CA in that period.

This is of course an intertemporal variant of the Ramsey rule for the optimal commodity tax structure.

To avoid uninteresting complications due to a tax shift representing a move towards or further away from the Ramsey rule, we will assume that the tax shift towards the future analysed in subsection 2.2 starts from the Ramsey-rule. This has the attractive consequence that U will not be affected (at least not by marginal changes). Extensions to non-optimal starting points are trivial and left to the interested reader.

2.2 The effects of a tax cut today balanced by an equal present value tax cut tomorrow are now easily derived. First of all the government budget constraint makes t_2 a function of t_1 and U:

$$t_2 = t_2(t_1, U) \tag{7}$$

with

$$\frac{\delta \partial t_2}{\partial t_1} = - \frac{E_1(1+\epsilon_1 t_1/(1+t_1))}{E_2(1+\epsilon_2 t_2/(1+t_2))} < 0 \tag{7a}$$

i.e. a tax cut today implies a tax increase tomorrow, not a startling result of course.

We can now derive the effect of an increase in the government deficit caused by a shift of commodity taxes towards the future:

$$\frac{dCA_1}{dt} = \frac{\partial CA_1}{\partial t_1} + \frac{\partial CA}{\partial t_2}\frac{\partial t_2}{\partial t_1} + \frac{\partial CA_1}{\partial U}\frac{\partial U}{\partial t} \tag{8}$$

The third term (involving $\partial U/\partial t$) is zero because we start at the optimal (Ramsey) tax structure. Simple manipulation of (8) gives us:

$$\frac{dCA_1}{dt} = - E_{11} - \delta E_{12} \frac{\partial t_2}{\partial t_1} \qquad (8a)$$

From homogeneity of degree zero of the Hicksian demand functions E_i we know that $E_{11} = - \frac{\delta(1+t_2)}{1+t_1} E_{12}$. Also, $\frac{\delta(1+t_2)}{1+t_1}$ is the consumption discount factor δ_c, equal to what is known in the project analysis literature as $1/(1+CRI)$; CRI is the consumption rate of interest.[1] Clearly our tax cut affects the CRI (or the consumption discount factor δ_c):

$$\frac{\partial \delta_c}{\partial t} = - \frac{\delta_c}{(1+t_1)} \left(1 - \frac{(1+t_1)}{(1+t_2)} \frac{\partial t_2}{\partial t_1}\right) < 0 \qquad (9)$$

on an increase (decrease) in first period taxes decreases (increases) the consumption discount factor. The effect on the CRI is of course the opposite. In other words, shifting taxes towards the future ($dt < 0$) decreases the Consumption Rate of Interest, improving the terms at which current consumption can be bought at the expenses of future consumption.

Insertion of (9) into (8a) using the expression for E_{11} given above allows us to rewrite (8a) in a particularly informative way:

$$\frac{dCA_1}{dt} = - (1+t_1) E_{12} \frac{\partial \delta_c}{\partial t} > 0 \qquad (10)$$

So a tax shift towards the future ($dt < 0$) resulting in a government

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(1) CRI and δ_c are to be distinguished clearly from r and δ. Taxes or relative price changes over time can drive a wedge between the capital market rate of interest and the consumption rate of interest CRI.

deficit today will lead to a current account deficit today because of its effect on the Consumption Rate of Interest. Lower taxes today and higher taxes tomorrow shift the terms at which future consumption can be traded against current consumption in favour of current goods; this has a negative pure substitution effect on private savings, leading to a deterioration in the current account of the balance of payments. That would, in a fully-fledged two-country model, lead to an increase in the world interest rate. Also, introduction of a non-traded good or of a Mundell-Fleming "our goods-their goods" structure endogenizing the real exchange rate would lead to the obvious result of an increase in the first period real exchange rate, producing simultaneously a current account deficit and an appreciation in the real exchange rate as the consequence of a tax cut today.(1) It is interesting (although may be not more than that) to note that that is exactly what happened after the recent increases in government deficits in the US. Too many real world features are left out of this model however to draw strong conclusions.

3. Conclusion

In this paper we demonstrate that in a world with full information, perfect foresight, perfect capital markets and optimizing private agents an increase in the government deficit achieved by a cut in commodity taxes today balanced by an equal present value commodity tax increase tomorrow, will affect the intertemporal terms of trade and have a negative pure substitution effect on private savings. This in turn will lead to a

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(1) Since the increase in private expenditure today implies a decrease tomorrow, such a set up reproduces the familiar result that a tax cut leads to an appreciation today but a depreciation tomorrow when foreign and domestic assets are perfect substitutes (Sachs and Wyploz (1983)).

deterioration of the current account of the balance of payment. A full general equilibrium model of the same effect would therefore show an increase in the world rate of interest, lending support to frequently raised concerns about large government deficits putting upwards pressure on real interest rates, although the mechanism involved (the effect of the change in tax structure on the intertemporal terms of trade) is rather different from the channels usually stressed (portfolio crowding out etc.).

It should perhaps be stressed that our result does not rely on trivial effects on disposable income coupled with static Keynesian consumption functions: a tax-cut induced increase in disposable income today matched by an equal present value decline tomorrow will in our model with perfect capital markets and optimizing consumers, not affect private expenditure or the current account. Rather we stress the more subtle channel via tax effects on the intertemporal terms of trade (the consumption rate of interest).

References

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