THE SIMPLE ARITHMETIC OF FISCAL POLICY IN A DEPRESSED ECONOMY: A STRIPPED-DOWN FORMULATION

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With:

- a transitory expansion of government purchases ΔG;
- a real government borrowing rate r;
- a multiplier μ;
- a 'hysteresis' parameter η;
- a 'hysteresis shadow' decay parameter ϱ; and
- a drag on the economy from raising a dollar of extra taxes ξ:

At a real discount rate of r, the effect of transitory fiscal expansion on the infinite-horizon burden of financing the government is:

$$\Delta B = \Delta G\left((1-\tau\mu) - \frac{\tau\mu\eta}{r+\rho}\right)$$

For μ=1.5, τ=0.33, and for r for credit-worthy sovereigns of zero, expansionary fiscal policy is self-financing as long as:

$$\frac{\eta}{\rho} > 1$$

For a non-zero sovereign real interest rate r, the requirement for expansionary fiscal policy to be self-financing is:

$$\frac{\eta}{r+\rho} > 1$$

The effect of expansionary policy on the present value of output is:

$$\Delta W = \Delta G\left[\mu\left(1+\frac{\eta}{r+\rho}\right) - \xi\left((1-\tau\mu) - \frac{\tau\mu\eta}{r+\rho}\right)\right]$$

For μ=1.5, τ=0.33, and r=0, the present value of the difference in output is positive as long as:

$$\xi > 3\left(\frac{\rho+\eta}{\rho-\eta}\right)$$

Note that ξ=3 is the top of the Laffer Curve.

THE SIMPLE ARITHMETIC OF FISCAL POLICY IN A DEPRESSED ECONOMY: A SLIGHTLY LESS STRIPPED-DOWN FORMULATION

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I. A transitory expansion of government purchases ΔG has four effects on production: (a) a boost to current-year output determined by the multiplier μ equal to +μΔG; (b) a boost to next-year output, determined by the economy's degree of 'hysteresis' η equal to +ημΔG; (c) subsequent decay of the hysteresis shadow cast on potential output aggregate supply at a rate ϱ; and (d) the drag on the economy from the extra taxes needed to finance the initial government purchases. At a real discount rate of r, the present value of the first three effects is:

$$\Delta W = \mu \Delta G \left(1 + \frac{\eta}{r+\rho}\right)$$

II. A transitory expansion of government purchases ΔG has four effects on the government budget: (a) a boost to this-year government purchases equal to +ΔG : (b) a boost to this-year tax collections via the Keynesian boost to this-year output equal to –τμΔG; (c) a boost to next-year tax collections via "hysteresis" equal to –τημΔG; and (d) thereafter—as hysteresis effects are persistent but not permanent—continued increased tax collections from the hysteresis shadow decaying at a rate ϱ. At a real discount rate of r, the change in infinite-horizon burden of financing the government is:

$$\Delta B = \Delta G \left((1 - \tau\mu) - \frac{\tau\mu\eta}{r+\rho}\right)$$

III. For a multiplier μ=1.5, for a marginal tax share τ=0.33, and for a real interest rate r for credit-worthy sovereigns that is zero, an increase in government purchases reduces the present value of the burden of financing the government as long as:

$$\frac{\eta}{\rho} > 1$$

For a credit-worthy sovereign real interest rate of zero, a multiplier μ=1.5, and a marginal tax share τ=0.3, expansionary fiscal policy is self financing as long as the hysteresis parameter η is greater than the speed of decay of the hysteresis effect .ϱ That is not a high hurdle to surmount. For a non-zero sovereign real interest rate, the requirement for expansionary fiscal policy to be self-financing is:

$$\frac{\eta}{r+\rho} > 1$$

IV. Now return to (I) and add to (I) the implications of (III), with a deadweight loss to output from raising a dollar of tax revenue ξ:

$$\Delta W = \Delta G\left[\mu\left(1+\frac{\eta}{r+\rho}\right) - \xi\left((1-\tau\mu) - \frac{\tau\mu\eta}{r+\rho}\right)\right]$$

For a multiplier μ=1.5, a marginal tax share τ=0.33, a real interest rate r for credit-worthy sovereigns of zero, the present value of the total net effect on present and future output is thus positive as long as:

$$\xi > 3\left(\frac{\rho+\eta}{\rho-\eta}\right)$$

Note that ξ=3 is the top of the Laffer Curve: the requirement for expansionary fiscal policy to be a good deal are thus considerably weaker than the requirement for tax increases to actually raise revenue.