

## Macroeconomics Discussion Session #7

1. Given the following values:

$$mpc = .75 \quad Y_f = \$2600 \quad Y_e = \$2200$$

Identify three types of fiscal policies to bring the economy to full employment and cite the impact on the government budget deficit (or surplus) in each case.

First we must calculate the recessionary gap in this economy. To do that, we first calculate the value of the multiplier. The multiplier is  $1/(1-b) = 1/(1-.75) = 1/.25 = 4$ . Now we can calculate the gap at  $(Y_f - Y_e)/\text{multiplier} = (2600-2200)/4 = 400/4 = 100$ .

- 1) The first fiscal policy that may be used is to increase  $G$  by the size of the gap, holding taxes constant. Since the gap is 100, we increase  $G$  by 100. This autonomous spending will have a multiplier effect of 4, so  $100 \times 4 = 400$  in total increased aggregate output and income, moves the economy from the original equilibrium of  $Y_e = 2200$  to the full employment level of  $Y_f = 2600$ . Since we increased  $G$  by 100 and held taxes constant, the deficit will rise (or surplus fall) by 100.
- 2) The second fiscal policy that may be used to close the gap is to cut taxes  $T$ , holding government spending  $G$  constant. If we cut taxes, disposable income  $Y_d$  will rise by that amount, but consumption  $C$  will only rise by  $mpc \times$  that amount. So we need to cut taxes in such a way that consumption will go up by the size of the gap. So the question is:

$$\text{gap} = mpc \times ?$$

rearranging, we get:

$$? = \text{gap}/mpc$$

So, the general formula for finding out how much to cut taxes to get the same stimulus we would get by increasing  $G$  is to cut taxes by  $\text{gap}/mpc$ . In this case, that would mean  $100/.75 = 133.33$ . So we cut taxes by 133.33, then  $Y_d$  rises by 133.33 and  $C$  rises by  $.75 \times 133.33 = 100$ . This increased consumption spending will have a multiplier effect of 4, so  $100 \times 4 = 400$ , moving the economy from 2200  $\rightarrow$  2600, or from  $Y_e$  to  $Y_f$ . But in this case, the tax cut holding  $G$  constant will result in an increased deficit or decreased surplus of 133.33, rather than 100. So, it takes a larger deficit to get the same stimulus with a tax cut than it would with increased government spending.

- 3) The third fiscal policy that can be used to close the gap is to use the balanced budget multiplier. The balanced budget multiplier allows us to close the gap without an increased deficit or decreased surplus. Thus  $G$  is increased by  $Y_f - Y_e$ , but that spending increase is offset by an increase in taxes of the same amount. So we increase both  $G$  and  $T$  by  $Y_f - Y_e$ . In this case,  $Y_f - Y_e = 400$ , so  $G$  and  $T$  are increased by 400. (This is also due to the BBM always being equal to one.)

If we increase  $G$  by 400, it will have a multiplier effect of 4, so  $4 \times 400 = 1600 (+)$

We offset this with an increase in  $T$  by 400. This decreases  $Y_d$  by 400,  
 So  $C$  decreases by  $.75 \times 400 = 300$ . This spending decrease has a negative  
 Multiplier effect of 4, so  $4 \times 300 = 1200 = 1200 (-)$

$1600(+)$  and  $1200(-)$  means a total net effect of  $400(+)$ , and the economy moves from 2200  $\rightarrow$  2600, or from  $Y_e$  to  $Y_f$ .

Another way to calculate it would be to take the increase of  $G$  by 400 = 400(+)  
 The increase of  $T$  by 400 means a decrease of  $Y_d$  by 400 means a  
 Decrease of  $C$  by 300 = 300(-)

$400(+)$  and  $300(-)$  means an initial net effect of  $100(+)$ . Multiplier effect of 4 means  $4 \times 100 = 400$ , and the economy moves from  $Y_e$  to  $Y_f$  or from 2200  $\rightarrow$  2600.

Finally, we can show the BBM equals one by taking the formula:

$$1/(1-b) \times (1-b) (Y_f - Y_e)$$

$(1-b)$  is the same thing as  $(1-b)/1$ , so:

$$1/(1-b) \times (1-b)/1 (Y_f - Y_e)$$

so the  $(1-b)$ s cancel out and we are left with:

$$Y_f - Y_e = 400. \text{ So increase both } G \text{ and } T \text{ by } 400.$$

With the balanced budget multiplier, there is no change in the deficit or surplus. But note that government spending must be increased by four times the amount that would be necessary if government were willing to run a deficit, and taxes must be increased considerably. This shows how there are trade-offs in policymaking. What would we rather have, a greater increase in spending and more taxes with no deficit, or a smaller increase in spending with a deficit, or a tax cut and a larger deficit? But also remember that these are not purely economic issues. There is budgetary politics and there is fiscal politics. These do not always coincide with the economics. As economists, our focus is on the economics. We need to explain to the politicians and policymakers what their choices are and what the expected outcomes will be. Then they will decide.