Case, Fair and Oster
Macroeconomics
Chapter 9 – Government and Fiscal Policy

Problem 2. Government of Altruia

Parallels "Lumpland" in the text.

Consumption function: $C = 150 + 0.8 (Y - T)$
Government expenditures: $G = 300$
Tax revenues: $T = 250$
Investment = 100

a. What is the budget surplus or deficit of Altruia?

b. What are the values of the government spending multiplier and the tax multiplier?

c. What are the equilibrium values of GDP, consumption, and savings?

d. What will they be if taxes are increased by 50?

Answers:

a. Budget deficit of $G - T = 300 - 250 = 50$

b. We must solve for Keynesian equilibrium:

$Y = C + I + G$
$Y = 150 + 0.8 Y - 0.8 T + I + G$
$Y - 0.8 Y = 150 - 0.8 T + I + G$
$0.2Y = 150 - 0.8 T + I + G$ and now multiply by 5
$Y = 750 - 4 T + 5 I + 5 G$

The tax multiplier is minus 4 (if taxes are raised by $ 1, GDP falls by $ 4);
The investment and government spending multipliers are both 5.

c. With the values given:

$Y = 750 - 4 * 250 + 500 + 1500$
$Y = 1750$

$C = 150 + 0.8 (1750 - 250) = 150 + 0.8 (1500) = 150 + 1200 = 1350$
$Sp = Y - T - C = 1750 - 250 - 1350 = 150$ (note that private savings is not just Y – T, but disposable income – taxes.

Private savings finances the government budget deficit and investment.

d. A tax increase of 50 will reduce GDP by $4 * 50 = 200$, so GDP = 1550.
Or calculate as $Y = 750 - 4 (300) + 5 (100) + 5 (300) = 1550$
Disposable income will be $1550 - 300 = 1250$,
Consumption will be $150 + 0.8 (1250) = 1150$
Private savings will be $Y - T - C = 1550 - 300 - 1150 = 100$, just enough to finance investment. Since G = T, there is no budget deficit to finance.

Problem 3. Agree or disagree.

A. If there is a budget surplus, the government not only does not have to borrow money, it will not renew some of the bonds which are coming due. Government debt will shrink. Also, government will be freeing up more funds for financial markets to work with, leading to lower interest rates and more investment by the private sector.

B.A tax cut will have the multiplier effect whatever the current state of the budget.

C.If MPS > 0.50, the tax multiplier is greater in absolute value than the government spending or investment multiplier.

Algebra: Let C = b * (Y – T),

$Y = b * (Y - T) + I + G$

$(1-b) Y = - bT + I + G$

The tax multiplier will be – b / (1- b) = MPC / MPS, and the government spending multiplier or investment multiplier will be 1 / (1-b) or 1 / MPS
As long as MPC is less than one, the tax multiplier will be less than the government spending multiplier.

If the MPS were 0.9, the MPC would be 0.1, and the tax multiplier would be 1/9 = 0.11, while the government spending multiplier would be 1 / 0.9 = 1.11.

Problem 4. Saving and Investment.
If private saving exceeds investment, and the government budget is balanced, the excess savings means that there is insufficient consumption expenditure, and inventories will build up, leading retailers to cut back on future orders and GDP to contract.

Problem 5. Economy of

Government purchases = 200
Taxes = 200
Planned investment = 100.

Compute disposable income = 1000 – 200 = 800
Since C = 0.75 (Y – T) , we have C = 600, and S = 800 – 600 = 200

Saving is greater than planned investment, and the result is that some of the planned inventory investment will not be purchased, leading retail firms to cut back on orders to firms and the Yuk economy to contract.

Note that C + I + G = 600 + 100 + 200 = 900, which is less than actual GDP of 1000. Some of the actual GDP is not purchased, so that unplanned inventory investment will take place.

Equilibrium in this economy will be:

$Y = .75 Y - .75 T + I + G$

$¼ Y = - ¾ (200) + 100 + 200 = 450$

Multiply by 4 to get:

$Y = - 600 + 400 + 800 = 600$

Cutting government purchases by 25 billion will reduce GDP by 100 billion.

Problem 6. Best way to stimulate the economy? Spending versus tax cuts.

It is true that the government spending multiplier will always be bigger than the tax multiplier. It is also true that a $ 1 tax cut will have just as big an immediate impact on the budget deficit as a $ 1 increase in government spending. But questions of timing may lead one to favor tax cuts (tax cuts can go into effect with the next paycheck deduction, planning for new road construction will take time), and political divisions are likely to mean that one party will favor tax cuts and one additional spending – the Bush response to the recession in 2008 was to offer tax cuts, Obama's response in 2009 was a package of immediately acting tax cuts with longer term increases in spending.

For a brief discussion of timing and multiplier effects of tax cuts and spending impacts, see the report of the Council of Economic Advisers, "Estimates of Job Creation from the American Recovery and Reinvestment Act of 2009", May 2009, http://www.whitehouse.gov/sites/default/files/microsites/Estimate-of-Job-Creation.pdf Estimates were based on Christina Romer's methodology, with quite high estimates for the spending needed to create one job-year of employment:

Direct federal spending: $ 92,136
Tax cuts: $ 145,351

The estimated multipliers for direct spending were 1.6 and for tax cuts 1.0 – note that these are much lower than would be found in the textbook.

Also see Douglas Elmendorf (head of the Congressional Budget Office), "Implementation Lags of Fiscal Policy", a Power Point presentation to the International Monetary Fund, June 2, 2009. http://www.cbo.gov/ftpdocs/102xx/doc10255/06-02-IMF.pdf

Type of spending	**Amount**	**2009**	**2010**	**2011**
Discretionary (highways, etc)	$ 308	11 %	47 %	72 %
Entitlements (unemployment)	$ 267	32	73	91
Tax credits	$ 212	31	116	119

(The last two numbers are over 100 % because the CBO believes more will be refunding than the original projections in the bill).

A more extended presentation by Elmendorf is in his testimony to Congress, "Policies for Increasing Economic Growth and Employment in the Short Term", Feb. 23, 2010. http://www.cbo.gov/ftpdocs/112xx/doc11255/02-23-Employment_Testimony.pdf Page 11 gives a nice overview of cumulative policy multipliers and their timing: unemployment compensation and most tax cuts act in 2010, infrastucture and aid to states in 2011. The magnitude of the multipliers is smaller than in the CEA document of May 2009 – unemployment compensation at 1.90, payroll tax cuts for employers at 1.20, and tax multipliers are estimated at 0.99.

A good brief overview (with links to lengthier debates) is given by Bruce Bartlett (a Reagan adviser, but one who was very disillusioned with Bush) in Forbes, "Does Stimulus Stimulate? The Role of Government in Economic Recovery" (Jan. 23, 2009) http://www.forbes.com/2009/01/22/stimulus-keynes-taxes-oped-cx_bb_0123bartlett.html

Problem 7. Republic of Nurd

Y = $ 200
C = $ 160 S = $ 40 C = 0.8 Yd
Ip = $ 30 G = T = $0 to start.

a. In equilibrium? No, since S > Ip. Consumption will be too little to prevent inventory accumulation and contraction.

The equilibrium level of income will be found by the usual procedure:

Y = C + I + G
Y = .8 Yd + I = 0.8 Y + 30 (note that in this case Yd = Y – T = Y since taxes are zero)
0.2Y = 2/10 Y = 30 (multiplier = 10/2 = 5)
Y* = 150.

Note that although savings is only $ 10 more than investment, the economy will contract by $ 50 to get rid of the excess savings.

b. Fiscal policy. Given that the full employment level of GDP is $ 200, what fiscal policy could the government follow? Since Keynesian equilibrium GDP is $ 50 below full employment (problem a), and the multiplier is $ 5, an increase in government spending of $ 10 would return Nurd to full employment.

c. Fiscal policy, part 2. If full employment GDP had been $ 250, it would have taken a $ 20 increase in government spending to raise GDP from $ 150 to $ 200. Again, this assumes the multiplier is 5 (see problem 6 for some comments on the realism of this).

d. Return to the initial data and set Ip = S = $ 40.

With S = Ip, the economy is in equilibrium. The extra $ 10 in planned investment has exactly the same impact as the extra $ 10 in government spending in part b, and equilibrium GDP will be $ 200

e. Increase G from $ 0 to $ 30.

Solve algebraically as in (a), and you will find Y = $ 350, S = 0.2 * 350 = $ 70.
What happens to the savings? $ 40 goes to finance investment, and the other $ 30 is borrowed by the government to finance the deficit (note that this part did not say anything about the government raising taxes).

f. Increase T from $ 0 to $ 30.
With taxes, income and disposable income are no longer the same, and we must be more careful:

Y = 0.8 (Y – T) + I + G
Y = 0.8 Y – 0.8 T + I + G
0.2Y = - 0.8 T + I + G
Y = 5 (- 0.8 T) + 5 I + 5 G
Y = -4 T + 5 I + 5 G (note that the tax multiplier is minus MPC / MPS = -0.8 /0.2)
Y = -4 (30) + 5 (40) + 5 (30)
Y = -120 + 200 + 150 = 230

C = .8 (Y – T) = 0.8 (230 – 30) = 0.8 (200) = $ 160
S = .2 (Y – T) = 0.2 (230 – 30) = 0.2 (200) = $ 40 (just financing investment)
Note that you must be careful to remember to use Yd = Y – T in the consumption function.

As compared with part (d), the government has run a **balanced budget fiscal expansion** – increasing spending and taxes equally – and as the text notes, **the balanced budget multiplier is one.** (It may seem natural to think that the multiplier must be greater than one, but that is not always the case)

Problem 10. Multiplier calculations.

Remember that the government spending multiplier is (if there are no income taxes and we assume a closed economy) equal to 1 / (1 – MPC) = 1 / MPS. Note also that if there ARE income taxes and if the economy IS open, the formula becomes more complicated than is assumed in this problem. We will get to the income tax multiplier in the appendix to chapter 9, and to the open-economy multiplier in chapter 20, p. 381-94.

a. If MPS = 0.4, multiplier is 1 / 0.4 = 2.5

b. If MPC = 0.9, MPS = 0.1 and the multiplier is1 / 0.1 = 10

c. If MPS = 0.5, multiplier is = 2

d. If MPC = 0.75, MPS = 0.25, and the tax multiplier is MPC / MPS = 0.75 / 0.25 = 3
Note in this case that the government spending multiplier would be 1/ MPS = 4.

e. MPS = 0.1, so MPC = 0.9. The government multiplier is 10 (see part b) and the tax multiplier is MPC/MPS = 9

f. If the government spending multiplier is 6, MPS = 1/6 so MPC = 5/6 and the tax multiplier is MPC/MPS = 5.

g. If the tax multiplier is -2 we have:

$$2 = MPC / MPS = MPC / (1 - MPC)$$

so $2 (1 - MPC) = MPC$ after multiplying the equation by (1 - MPC)

$2 - 2\ MPC = MPC$ and we add 2 MPC to both sides to get

$2 = 3\ MPC$

or $MPC = 2/3$

If MPC = 2/3, MPS = 1/3, and the government multiplier will be 1 / MPS = 3

h. The balanced budget multiplier will be one – notice from the last three parts that the tax multiplier is always one less than the government spending multiplier, so that if we began from part (e) and increased both government spending and taxes by $ 100 billion, we would have:

$$\text{Change in GDP} = 10\ (\text{change in G}) - 9\ (\text{change in T}) = 10 * 100 - 9 * 100 = 100$$

and if we began from part (f) we would have:

$$\text{Change in GDP} = 6\ (\text{change in G}) - 5\ (\text{change in T}) = 6 * 100 - 5 * 100 = 100$$

and if we began from part (g):

$$\text{Change in GDP} = 6\ (\text{change in G}) - 5\ (\text{change in T}) = 3 * 100 - 2 * 100 = 100$$