PSET 2 Solutions

1. What happens to the economy if actual investment is greater than planned investment?

In general, planned investment is the amount of investment firms plan to undertake during a year. Actual investment is the amount of investment actually undertaken during a year. If actual investment is greater than planned investment, then inventories go up, since inventories are part of capital. This increase in inventories may lead firms to reduce output.

2. What is the marginal propensity to save? How is the multiplier affected by it?

The marginal propensity to save (MPS) is the proportion of each additional dollar of income that is saved by consumers. Note that this is the direct opposite of the marginal propensity to consume (MPC). Thus, the MPS + MPC = 1, and MPS = 1 – MPC.

In the simple model considered in class, Multiplier = 1/MPS. A higher MPS leads to a lower multiplier.

3. Explain carefully the difference between an endogenous variable, an exogenous variable, and a parameter or coefficient. Give an example of each as used in class. If parameters are chosen by the procedure of least squares, what does this mean? What if least absolute deviations was used instead?

A variable is called endogenous if it is explained within the model in which it appears. It is the variable that we, as economists, want to explain. Consumption and output are endogenous variables in the multiplier model of the goods market. An exogenous variable, on the other hand, is one that comes from outside the model and is not explained by the model. Transfer payments, investment and government spending have been treated as exogenous variables in the goods market model we have seen in class. Parameters or coefficients are non-economic variables that describe the relationship between economic variables in our model. Examples of parameters are the marginal propensity to consume b, which describes the relationship between income and consumption or the technology parameters that describe a production function. These coefficients cannot be measured directly but have to be estimated using econometric techniques like least squares.

Using least squares means that we choose the parameters that minimize the squared deviations between the fitted values provided by the model and the values observed in the data. If we use least absolute deviations instead of least squared deviations, then we choose the model parameters that optimize for the minimum absolute value (rather than squared value) of the difference between the fitted and observed values. One difference between least squared deviations and least absolute deviations is that the former, by relying on the squared terms, gives greater emphasis to large differentials between the fitted and observed data points in determining model parameters.

4. Why would a balanced budget amendment increase the size of the government spending multiplier?

This is a trick question. Under the balanced budget amendment, government spending becomes an endogenous variable. There is thus NO government spending multiplier.

5. Consider the model C = b(Y −T),T = tY −TR,Y = C+I+G, where C is consumption, I is planned investment (exogenous), G is government spending (exogenous), Y is output, T is net taxes, t is the tax rate (exogenous), and T R is the value of transfer payments (exogenous). b is the marginal propensity to consume. Assume that b = .75 and t = 1/3. How much does Y increase when G increases by 10? How much does Y increase when T R increases by 10? Explain carefully why these two multipliers are not the same—what is the intuition?

We have three equations.

C = b(Y −T) [1]
T = tY −TR [2]
Y = C+I+G [3]

Solving the system of simultaneous equations for Y, we get the following

$$Y = \frac{b}{1-b+bt}TR + \frac{I+G}{1-b+bt}$$

The Government Spending multiplier is $\frac{1}{1-b+bt} = \frac{1}{1-0.75+0.75*\frac{1}{3}} = 2$

*So when Government Spending increases by 10, Y increases by 2*10=20 units.*

The Transfer payment multiplier is $\frac{b}{1-b+bt} = \frac{0.75}{1-0.75+0.75*\frac{1}{3}} = 1.5$

*So when Transfer payments increase by 10, Y increases by 1.5*10 = 15 units.*

The transfer payment multiplier is less than the government spending multiplier. The change in transfer enters spending decisions through consumption and consumption is dependent on the marginal propensity to consume. Assuming MPC < 1, a dollar increase in transfer payments results in an increase in spending of less than one dollar. In contrast, G affects spending decisions directly without being tied to the MPC, thereby leading to a higher multiplier. Government spending is an injection into the economy that does not have to work through some indirect source before having an effect on the economy.

6. In the above question, how much will the government deficit increase if G is increased

by 10? How much will it increase if T R is increased by 10?

Recall that the Government Deficit= $G + TR - tY$

The change in the Government deficit = $\Delta G + \Delta TR - t\Delta Y$

When Government Spending increases by 10, the change in deficit = $+10 + 0 - \frac{1}{3}20 = 3.33.$

When Transfer Payments increase by 10, the change in deficit = $+0 + 10 - \frac{1}{3}15 = 5.$

7. What was the size of the federal government deficit (at an annual rate) in each of the quarters 2015:3–2016:2?

Quarter	Deficit (Billions of dollars, seasonally adjusted at annual rate)
2015:3	664.6
2015:4	-586.2
2016:1	714.6
2016:2	679.8