Introductory Macroeconomics

Pre-Tutorial #3
Week Starting 22rd March 2021

The Tutorial. This week's tutorial provides an introduction to short run macroeconomics and the Keynesian model.

Note that your tutor is under no obligation to go through the answers to the pre-tutorial work in detail. The focus in the tutorial will be on the tutorial work itself – the questions here are preparatory.

Reading Guide. You should look carefully over your lecture notes for Week 3. You may also find Chapters 6 and 7 of BOFAH useful.

Key Concepts. Okun's Law. Planned aggregate expenditure. The multiplier.

Problems.

1. Let u_t^* denote the *natural rate of unemployment*. Using Okun's Law, answer the following questions. Explain your reasoning. The data are hypothetical.

Year	Real GDP	Potential GDP	u_t^* (percent)	u_t (percent)
2010	7480	8000	(a)	6.0
2011	8100	(b)	5.0	5.0
2012	(c)	8200	4.5	4.0
2013	8415	8250	5.0	(d)

   (a) In 2010, would u_t^* be larger, smaller, or the same as u_t?

   (b) In 2011, would Potential GDP be larger, smaller or the same as Real GDP?

   (c) In 2012, would Real GDP be larger, smaller or the same as Potential GDP?

   (d) In 2013, would u_t be larger, smaller or the same as u_t^*?

2. Define planned aggregate expenditure (PAE) and list its components. Why does planned spending change when output changes?

3. Sketch a graph of the consumption function, labelling the axes of the graph. Discuss the economic meaning of (a) a movement from left to right along the graph of the consumption function, and (b) a parallel upward shift of the consumption function.

4. Sketch the 45-degree Keynesian cross diagram. Explain in words the economic significance of the lines graphed in the diagram. Given only this diagram, how could you determine exogenous expenditure, the marginal propensity to consume, and short run equilibrium?

5. Consider a simple economy without government spending or taxation. The economy is described by the following equations

$$C = 1800 + 0.6Y$$

$$\bar{I} = 900$$

   (a) Derive an equation linking Y to planned aggregate expenditure (PAE).

   (b) What is the level of exogenous expenditure in this economy?

   (c) What do we mean by the marginal propensity to consume? What is the marginal propensity to consume in this economy?

   (d) What is the equilibrium level of GDP?

   (e) What is the value of the multiplier in this economy?

Solutions to Pre-Tutorial Work.

1. Okun's Law says that if Real GDP is below Potential GDP then the unemployment rate u_t is above the natural rate of unemployment u_t^*. Based on this:

   (a) u_t^* must be smaller than u_t since actual output is below potential.

   (b) Potential GDP must equal Real GDP since $u_t = u_t^*$.

   (c) Real GDP must be above potential GDP since u_t is below u_t^*.

   (d) u_t must be below u_t^* since to move from potential to real GDP there is an increase in output which reduces unemployment.

2. PAE is the amount of spending planned to be undertaken by all sectors of the economy on domestically produced goods and services. In general, its components are all the GDP components: planned consumption spending plus planned investment plus planned government spending plus planned exports minus planned imports. Planned spending changes with output because, for example, planned consumption increases when consumers have higher disposable income (which rises with output).

3. The figure below shows the consumption function $C = \bar{C} + c(Y - T)$, plotting planned consumption C as a function of disposable income $Y - T$. The slope of this line is the *marginal propensity to consume*, c, a number between zero and one.

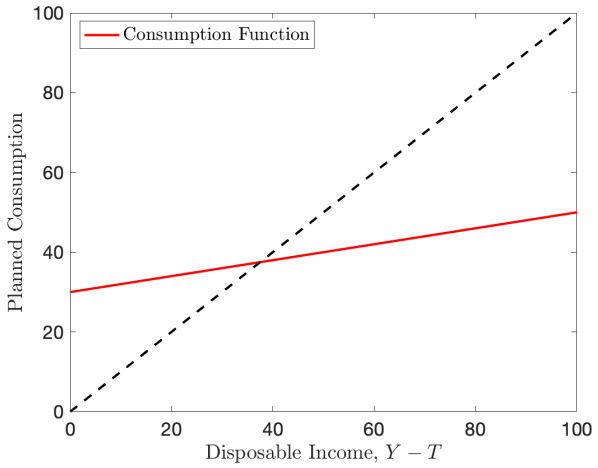

Figure 1: Consumption function $C = \bar{C} + c(Y - T)$.

A change in income Y induces a movement along the consumption function. A change in autonomous consumption $\bar{C}$ will shift the consumption function. An example of the latter effect might be a reduction in the rate of unemployment, leading to a boost in consumer confidence and hence more spending by households at each level of income.

4. The 45-degree line traces all possible points of equilibrium where $PAE = AE$. Since by GDP accounting aggregate expenditure is equal to aggregate output is equal to aggregate income, this is also all the points where $PAE = Y$. The PAE line shows levels of planned aggregate

expenditure at each level of Y. Exogenous expenditure is given by the vertical intercept of this line. The marginal propensity to consume is the slope of the PAE line. Short-run equilibrium output occurs where the PAE line crosses the 45-degree line. Figure 2 illustrates.

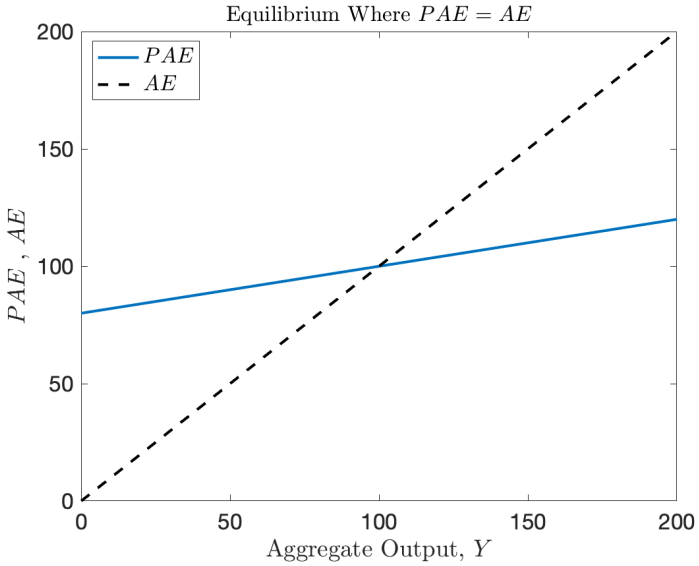

Figure 2: Keynesian equilibrium where $PAE = AE$.

5. (a) PAE is given by planned C plus planned I, namely

$$PAE = \bar{C} + cY + \bar{I} = 1800 + 0.6Y + 900 = 2700 + 0.6Y$$

(b) The level of exogenous (autonomous) expenditure is given by those parts of expenditure that are independent of the current Y. For this example that is

$$\bar{C} + \bar{I} = 1800 + 900 = 2700$$

(c) The marginal propensity to consume is the increase in planned consumption per unit increase in disposable income. In this example the marginal propensity to consume is $c = 0.6$.

(d) The equilibrium condition is $PAE = AE = Y$ which can be written

$$2700 + 0.6Y = Y$$

which we need to solve for Y. The solution is

$$Y = \frac{1}{(1 - 0.6)} 2700 = \frac{2700}{0.4} = 6750$$

(e) The multiplier is given by

$$\frac{1}{1 - c} = \frac{1}{(1 - 0.6)} = \frac{1}{0.4} = 2.5$$