

**Economics 102**  
**Spring 2012**  
**Homework #5**  
**Due 5/09/12 (Wed)**

**Note this is the last homework set for Econ 102, Spring 2012. You are almost there! ☺**

**Directions:** The homework will be collected in a box **before** the lecture. Please place your name, TA name and section number on top of the homework (legibly). Make sure you write your name as it appears on your ID so that you can receive the correct grade. Please remember the section number for the section **you are registered**, because you will need that number when you submit exams and homework. Late homework will not be accepted so make plans ahead of time. **Please show your work.** Good luck!

1. Write down your understanding and interpretation for each of the following equations, then make sure that you familiarize yourself with these formulas:

$$GDP = C + S_P + (T - TR)$$

$$GDP = C + I + G, \text{ in a closed economy}$$

$$GDP = C + I + G + (X - M), \text{ in an open economy}$$

$$KI = M - X$$

$$S_G = (T - TR) - G$$

$$NS = S_P + S_G = GDP - C - G, \text{ in a closed economy}$$

$$I = S_P + S_G + (M - X), \text{ in an open economy}$$

$$I = NS + KI$$

$$\text{Leakages} = \text{Injections in Equilibrium (i.e. } S_P + (T - TR) + M = I + G + X)$$

2. Consider the closed economy of country A where  $KI = 0$ . In year 2009, government expenditures ( $G$ ) are \$300 billion, the total tax collected ( $T$ ) is \$900 billion and tax being transferred ( $TR$ ) is \$200 billion. The loanable funds market is currently in equilibrium and total demand (including  $S_G$ ) is  $D_{LF}: r = 0.04 - 0.000025Q$ , where  $r$  is the real interest rate. Furthermore, private savings,  $S_P$ , equals \$800 billion at equilibrium.

- a. What is the government budget balance? Does the government have a budget surplus, a budget deficit, or a balanced budget?
- b. Calculate the equilibrium interest rate.
- c. Calculate the National Savings (NS) of country A in 2009.
- d. What is the level of private investment in equilibrium? Write an equation for the investment demand curve.

Suppose the president of country A opens this economy to trade with the rest of the world in 2010. Furthermore, suppose that the investment demand is the same as in 2009. Now, instead of being provided the equilibrium level of  $S_P$ , we are provided with the  $S_P$  curve:  $r = 0.025 + 0.000025Q$ , where  $r$  is still the real interest rate. We are also told that capital inflow equals \$200 billion in 2010. For this part of the problem assume that the government has a balanced budget in 2010. Answer the following questions:

- e. Compute the new equilibrium quantity of LF demanded or supplied and the equilibrium real interest rate in 2010.
  - f. Is this country borrowing from or lending to foreign countries?
  - g. What is private savings in equilibrium? What is NS in equilibrium?
3. Consider the standard textbook consumption function, that is, it has a y-intercept of autonomous consumption and is linear in disposable income. Assume that the slope of this consumption function equals 0.7, and that autonomous consumption equals \$20 billion.
    - a. Write down the consumption function for this economy.
    - b. What is the relationship between the slope of the consumption function and the MPC, marginal propensity to consume? What is the marginal propensity to save (MPS) in this example?
    - c. Suppose there is an increase in real income of \$500 billion in this economy, holding all else equal. What is the change in consumption given this change in real income?
    - d. Suppose there is an increase in tax payments,  $T$ , of \$300 billion in this economy, holding all else equal. What is the change in consumption given this change in tax payments?
    - e. Now, suppose that real income increases by \$500 billion while tax payments increase by \$300 billion. What is the change in consumption given these two changes?

4. Country B is a closed economy with no government and a fixed aggregate price level. There are only two sources of aggregate demand: consumer spending and investment spending. In country B, aggregate disposable income DI equals GDP.
  - a. Write down the condition for equilibrium and explain how if aggregate spending is not equal to aggregate output, the economy would move back to equilibrium.
  - b. Suppose you are told that the aggregate consumption function is  $C = 500 + 0.5DI$  and planned investment,  $I_{\text{Planned}}$  is 100. What is the MPC? What is the slope and y-intercept of the planned AE curve?
  - c. Find the income-expenditure equilibrium.
  - d. Calculate the value of the multiplier for this economy. What will be the change in the income-expenditure equilibrium level of real GDP if autonomous consumption decreases by 50?
  
5. The model of aggregate supply (AS) and aggregate demand (AD) can help us understand economic fluctuations and the use of macroeconomic policy to reduce these fluctuations.

AD: the inverse relationship between the aggregate price level (P) and the total quantity of aggregate output demanded by HHs, business, government, and the foreign sectors.

AS: the relationship between the aggregate price level and the total quantity of final goods and services, or aggregate output, producers are willing to supply.

SRAS: the positive relationship between the aggregate price level and the level of aggregate output or real GDP. (Short-run AS curve is upward sloping)

LRAS: vertical! The aggregate price level has no effect on the quantity of aggregate output supplied; the level of aggregate output equals potential GDP.

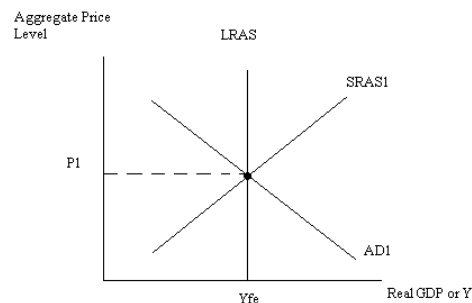
- a. True or False
  - 1) A movement up or down the AD curve is due to changes in the prices of all final goods and services, whereas a movement up or down the demand curve for any individual good is due to a change in the price of that good while all other prices are held constant.
  - 2) A decrease in the aggregate price level increases the purchasing power and therefore leads to a decrease in the quantity of aggregate output demanded.
  - 3) An increase in the aggregate price level will result in less investment and therefore an increase in the quantity of aggregate output demanded.
  - 4) In the long run, nominal wages and prices are completely flexible and therefore in the long run, the aggregate price level has no effect on the quantity of aggregate output supplied.

- 5) In the short-run, nominal wages are sticky due to the existence of both formal and informal agreements. This means that wages decrease slowly in the presence of low unemployment, and increase slowly in the presence of high unemployment.
- 6) When the level of aggregate production is less than the potential output level, this implies that unemployment is high. Jobs are scarce and workers are abundant, which causes nominal wages to fall over time. The SRAS will shift to the left, moving the short run level of aggregate production closer to the potential output level.
- 7) In the short-run equilibrium in the AD/AS Model, the aggregate output may be less than, equal to, or greater than potential output.
- 8) When the economy operates with a recessionary gap, the economy is self-correcting; when the economy operates with an inflationary gap, the economy is not self-correcting.

b. Identify the direction of the following shifts and movements.

- 1) What happens to the AD curve when consumers and firms become more optimistic?
- 2) What happens to the AD curve when the value of household assets increases?
- 3) What happens to the AD curve when firms initially have a low level of physical capital?
- 4) What happens to the SRAS curve when commodity prices or nominal wages increase?
- 5) What happens to the SRAS curve when productivity decreases?
- 6) What happens to the SRAS curve when the aggregate price level increases?
- 7) What happens to the LRAS curve when the level of potential output for an economy increases over time?
- 8) What happens to the AD curve, the SRAS curve, and the LRAS curve if the central bank increases the money supply?

6. Use the AD/AS model for this question. Consider an economy that is initially in long-run equilibrium as drawn in the following graph, where LRAS is the long-run AS curve,  $AD_1$  is the aggregate demand curve,  $SRAS_1$  is the short-run AS curve,  $Y_{fe}$  is the potential output under full employment, and  $P_1$  is the equilibrium aggregate price level.



- a. Illustrate using graphs what happened when the economy's central bank reduces the money supply. Identify on the graph the new short run aggregate price level and the new short run level of real GDP.
- b. Describe in words what happens in the graph you drew in part (a). Explain the effect of the shift of the AD curve on the aggregate price level. In your answer be sure to comment on the level of output and its relationship to the full employment level of output; also comment on the current rate of unemployment and its relationship to the natural rate of unemployment. What happened to the aggregate price level relative to its initial level?
- c. Illustrate using a graph how the economy you depicted in (a) will adjust in the long run. On the graph identify the long run price level and the long run level of aggregate output. Explain your results. In your answer make sure you comment on what is happening to wages and prices during this long run adjustment.
- d. Illustrate using a graph what happens in the short run when the government increases its level of spending, holding everything else constant.
- e. Provide a verbal explanation of the changes you made in your graph in (d). In your answer be sure to comment on the relationship between the short run level of output and the full employment level of output, the relationship between the current rate of unemployment and the natural rate of unemployment, and the relationship between the short run aggregate price level and the initial aggregate price level.
- f. Use a graph to illustrate the long run adjustment to the scenario you depicted in (d). Explain what will happen over time.
- g. For each of the following scenarios, describe the effect on the AD curve, the SRAS curve, and the LRAS curve.
  - i) The price of oil falls.
  - ii) Labor unions successfully negotiate an increase in nominal wages for their workers.
  - iii) The supply of unsold houses in the economy increases by 20%.