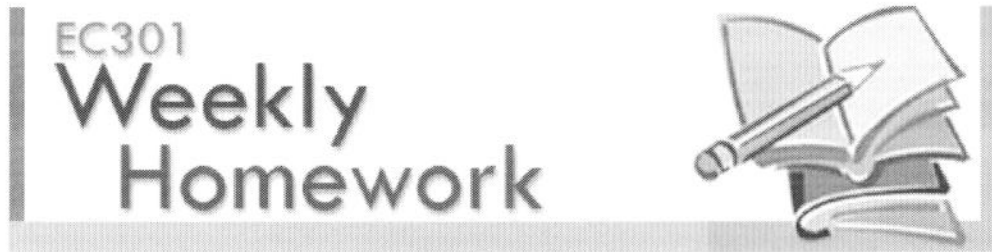


## Unit 6: Week 6 - Week 6 Homework



### Week 6 Homework Assignment

You are to work alone to analyze and prepare answers/solutions for the following questions. The text should be your primary source of information throughout this course.

Consolidate your responses into one file and submit it to your instructor **not later than Sunday Midnight central time**. Name your file with your name and the week number, i.e. JonesWeek6. Your file should be in either Microsoft word (\*.doc) or rich text (\*.rtf) format.

Submit your assignment by attaching it into the Dropbox, by clicking on the Dropbox tab at the top of the course frame and choosing the current week assignment. **Do not paste your answers into the Dropbox!** Your Homework is worth 20 points. Good luck!

#### Homework Assignment

Ending each chapter and appendix in the text are the chapter summary, review questions and problems. You are to review the chapter summary and then prepare answers to the following problems:

Chapter 14. Problem 1  
Chapter 17. Problem 3

## Concepts

policy activism  
policy rule  
policy instruments  
target variables  
discretionary policy

rigid rule  
constant growth rate rule (CGRR)  
feedback rule  
monetarism  
dynamic multipliers

multiplier uncertainty  
time inconsistency  
policy credibility  
Taylor Rule  
nominal anchor

## Questions

1. In the Appendix to Chapter 4, the equations of the *IS* and *LM* curves are given as follows:

$$IS: Y = k(A'_p - br)$$

$$LM: Y = [(M^s/P) + fr]/h$$

Here,  $k = 1/[s(1 - t) + t + nx]$ .

Let  $A'_p = C'_a - T_a + I'_p + G + NX_a$ , where  $C'_a$  is that part of consumption spending that is independent of both  $Y$  and  $r$ ,  $I'_p$  is similarly defined, and the other terms are as defined in the Appendix to Chapter 3.

- List the exogenous variables (and parameters) in this model. (See Chapter 3 to review the definition of this term.)
  - List the endogenous variables in this model. (See Chapter 3 to review the definition of this term.)
  - List the target variables in this model.
  - List the variables that make up the policy instruments in this model.
  - What is the relationship, if any, between endogenous variables and target variables in this model?
  - What is the relationship, if any, between exogenous variables and policy instruments in this model?
- Note:* In answering this question, use only the variables in the *IS* and *LM* equations and the variables defining  $k$  and  $A'_p$ . For example, don't include a variable such as structural employment policy as a policy instrument or the unemployment rate as a target variable; they are not variables in the preceding model, even though they are listed in Figure 14-1 as a policy instrument and target variable, respectively.
- In the *IS-LM* model of the preceding question, what are the monetary policy variables? What are the fiscal policy variables?
  - In the model of question 1, how many policy instruments are there? How many target variables? Is this consistent with the text's statement that you need as many policy instruments as target variables to achieve the desired values of the target variables?
  - What do advocates of policy rules think are the main objections to countercyclical activism?
  - Distinguish between a rigid rule and a feedback rule. Give an example of each.
  - One way of describing the rules-versus-activism debate is to compare the beliefs of each side regarding the self-correcting powers of the economy and the

efficacy of stabilization policy. What does each side believe about these issues?

- Under the constant growth rate rule (CGRR), the single target for the policymaker becomes the growth rate of the money supply. Does this statement suggest that those advocating the CGRR are not concerned with the level of real output and employment?
- Explain why stability of the demand for money is so important to those advocating a constant growth rate rule for the money supply. What happens to the argument in favor of this rule if money demand is unstable?
- Identify and describe the five main types of lags that affect the timeliness of monetary and fiscal policy.
- What problems do long and variable lags present to the policymaker? If lags are long and fixed (rather than long and variable), do any problems remain?
- Why does multiplier uncertainty create a dilemma for policymakers?
- How is the effectiveness lag of monetary policy measured in the data shown in Figure 14-2? Using those data, compare the effectiveness of monetary policy for the periods 1961–75, 1975–90, and 1991–2010. Discuss some of the reasons why the effectiveness of monetary policy changed over time.
- Explain how the rise in volatility in the late 1960s was different from the increases in volatility in the early 1980s and since 2007.
- Use the various types of lags to explain why a reduction in demand and supply shocks makes it easier for the Fed to conduct monetary policy.
- Explain why the behavior of inflation caused the Fed to react differently to a rise in the output gap in the late 1990s than it had in the late 1980s.
- Suppose policymakers announce their intentions to lower the inflation rate and adopt policy changes to slow nominal GDP growth. Describe, in terms of the *SP* model, the effects on the economy's output ratio, unemployment rate, and inflation rate under each of the following cases.
  - The public finds this announcement credible, and policymakers stick to their announced policies.
  - The public finds this announcement credible, but policymakers abandon their announced policies and leave the growth rate of nominal GDP unchanged.

- (c) The public does not find this announcement credible, but policymakers do stick to the announced policies.
- (d) The public does not find this announcement credible, and policymakers abandon their announced policies and do not lower the growth rate of nominal GDP.
17. Chapter 9 described three alternative policy responses by the Fed to a supply shock: neutral, accommodating, and extinguishing. In terms of how the Fed weighs inflation against output, that is, the parameters  $a$  and  $b$  of equation (14.1), explain how each of the Fed's policy responses to a supply shock would fit into a Taylor Rule.
18. Suppose the output ratio is 100 and the inflation rate is 5 percent. Given these conditions, why will policymakers be more likely to pursue a zero inflation target if they have a long time horizon and a low discount rate rather than a short time horizon and a high discount rate?
19. Use Figure 14-5 to explain why the "zero lower bound" meant that monetary policy could not provide as much stimulus to the economy in 2010 as implied by the Taylor Rule.
20. What is a nominal anchor for the economy and what is the advantage of using a nominal anchor in choosing a target variable to be fixed by a policy instrument? Explain why a nominal GDP growth rate rule and a Taylor Rule that places equal weight on inflation and output growth each has a nominal anchor. Finally, compare a Taylor Rule that places equal weight on inflation and output growth with one that places equal weight on inflation and the output ratio.
21. If effectiveness lags are long and variable, should policymakers use the current values or their best forecasts of target variables to determine policy? In evaluating the behavior of the Fed between 1994 and 2001, does it seem more likely that current or forecasted values of inflation and output determined their policies?
22. What are the arguments for and against using monetary policy to target a currency's exchange rate?
23. What are the arguments for and against the euro?

## Problems



Visit [www.MyEconLab.com](http://www.MyEconLab.com) to complete these or similar exercises.

1. You are given the following two  $IS$  curves that show how real GDP ( $Y_t$ ) in the current time period  $t$  depends on the current interest rate and interest rates in previous periods, where  $r_t$  is the interest rate in time period  $t$ . Furthermore each time period corresponds to a quarter or three months.

$$\begin{aligned} \text{I. } Y_t = & 8,800 - 25r_t - 25r_{t-1} \\ & - 25r_{t-2} - 25r_{t-3} - 20r_{t-4} - 20r_{t-5} \\ & - 20r_{t-6} - 15r_{t-7} - 15r_{t-8} - 10r_{t-9} \end{aligned}$$

$$\begin{aligned} \text{II. } Y_t = & 8,400 - 5r_t - 5r_{t-1} \\ & - 5r_{t-2} - 5r_{t-3} - 5r_{t-4} - 10r_{t-5} \\ & - 15r_{t-6} - 15r_{t-7} - 15r_{t-8} - 20r_{t-9} \end{aligned}$$

Suppose that the Fed can set the interest rate and that for the last 10 quarters, the interest rate has been 4 percent.

- (a) Verify that initially real GDP equals 8,000 for both  $IS$  curves.
- (b) Suppose that the Fed lowers the interest rate to 3 percent and keeps it there for the next 10 quarters. Calculate real GDP for the next 10 quarters for each  $IS$  curve.
- (c) For each  $IS$  curve, what is the total increase in real GDP?
- (d) For each  $IS$  curve, how many quarters does it take for the increase in real GDP to equal one-half of the total increase?
- (e) Using Figure 14-2, explain which one of the  $IS$  curves resembles the economy's response to a

change in the interest rate prior to 1991 and which one resembles its response since 1991. Explain how your answer is related to the interest-rate parameters in each  $IS$  equation.

- (f) Given your answers to parts b–d, explain how the changes in the monetary policy effectiveness lag and the interest-rate multiplier affects how much and how long monetary policymakers must change interest rates in response to any given demand shock.

2. Suppose that natural real GDP ( $Y^N$ ) equals \$12,000, the Federal Reserve's desired real federal funds rate ( $r^{FF*}$ ) equals 2.5 percent, and its desired inflation rate ( $p^*$ ) equals 2 percent. Initially, an asset bubble collapses, which results in a negative demand shock. It is then followed by an upsurge in government spending that results in a positive demand shock. You are given the following combinations of actual inflation and real GDP: (1.0, \$11,400); (1.5, \$11,700); (2.0, \$12,000); (2.8, \$12,480); (2.4, \$12,240).

- (a) For each level of real GDP, compute  $\hat{Y} = 100(\log(Y/Y^N))$ .
- (b) Explain what each of the following pairs of values for the parameters  $a$  and  $b$  in equation (14.1), the equation for the Taylor Rule, means in terms of how the Fed weighs inflation against output: (0.5, 0.5); (1/3, 2/3), if real GDP is less than natural real GDP, and (2/3, 1/3), if real GDP exceeds natural real GDP; (0.0, 1.0); (1.0, 0.0). In particular,

7. Explain why critics of the Friedman-Phelps and Lucas models argue that those models fail to provide a satisfactory explanation of business cycles.
8. How does an adverse supply shock affect the production function? What is the effect of an adverse supply shock on the demand for labor?
9. Explain why in a real business cycle (RBC) model, the price level and output move in opposite directions. Is that consistent with what happened in the Great Depression and the Global Economic Crisis of 2007–09? What other problems do the Great Depression and the Global Economic Crisis of 2007–09 present in terms of the RBC model providing a satisfactory explanation of business cycles?
10. What is meant by intertemporal substitution? How is the slope of the labor supply curve related to the ability of a real business cycle model to explain the real-world behavior of the real wage rate and employment over the course of the business cycle?
11. Discuss the positive contributions that the New Classical theory made to macroeconomics.
12. Compare the growth rates of input, output, and multifactor productivity in Japan and the United States since 1970.
13. What was the important assumption made with respect to wage rates in the original Keynesian model? How does the new Keynesian model differ in its approach to that assumption?
14. “Classical and new classical firms choose output, but new Keynesian firms choose price.” Explain.
15. Explain why it is believed that greater pressure is placed on employment and output in response to shifts in aggregate demand under a situation of long-term staggered labor contracts than would be the case under shorter-term, uniform-expiration-date contracts.
16. What is a macroeconomic externality? How do long-term agreements impose a macroeconomic externality on the economy? What other sources of macroeconomic externalities are identified in this chapter?
17. In what ways are the original Keynesian model and the new Keynesian model similar? In what ways do they differ?
18. What is meant by the terms *nominal* and *real rigidities*? If nominal rigidities could be completely removed from the U.S. economy, would that solve the problem of output and employment fluctuations during business cycles?
19. Is it possible for there to be a business cycle without fluctuations in employment and output? Which, if any, school(s) of thought suggested that this would be the normal case?
20. What are the similarities and differences between the new Keynesian model and the new classical and real business cycle models?
21. The new Keynesian model relies on the concept of coordination failure to explain why demand and supply shocks lead to undesirable output and employment fluctuations. What role does this suggest for government stabilization policy? Is this a point with which the new classical model agrees? Why?
22. Explain what is meant by each of the four terms in a Dynamic Stochastic General Equilibrium (DSGE) model. What features of the New Classical and New Keynesian models are included in a DSGE model?
23. Explain which portions of the material previously discussed in this text are reflected in the three equation DSGE model discussed at the end of this chapter. What kind of a shock to this simple model would explain the behavior of interest rates during the period 2002–04?
24. Discuss some of the possible features that the simple three equation DSGE model discussed at the end of this chapter is lacking in order to be able to fully explain the events leading up to and including the Global Economic Crisis of 2007–09 and possible policy responses to the crisis.

## Problems



Visit [www.MyEconLab.com](http://www.MyEconLab.com) to complete these or similar exercises.

1. You are given the following two forecasts of the price levels by persons A and B, as well as the actual price level for the next ten periods. Initially, the price level is 100.
 

| Period   | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Person A | 102 | 104 | 106 | 109 | 112 | 116 | 119 | 122 | 122 | 127 |
| Person B | 103 | 103 | 106 | 112 | 114 | 118 | 120 | 121 | 126 | 126 |
| Actual   | 102 | 104 | 107 | 110 | 114 | 117 | 120 | 123 | 125 | 128 |

  - (a) For each person, calculate the difference between the actual price level and that person's forecast of the price level.
  - (b) In terms of how rational expectations are described in this chapter and your answer to part a, which person's forecasts are most consistent with the concept of rational expectations?
2. Suppose that the equation for the aggregate demand is  $Y = \$9,000 + M^s/P$ , where  $M^s$  is the nominal money supply and  $P$  is the price level. Initially the nominal money supply equals \$3,000. In addition, suppose that the expectations of firms and workers are rational in the sense defined on p. 547.
  - (a) Calculate points on the aggregate demand curve when the price level equals 0.8, 1.0, 1.2, 1.25, and

1.5, given the initial value of the nominal money supply.

- (b) Suppose that natural real GDP equals \$12,000 and that the short-run supply curve is given in the table below, where the price surprise equals  $P - P^e$  and  $P^e$  is the expected price level:

|                |        |        |        |        |        |
|----------------|--------|--------|--------|--------|--------|
| Price surprise | -0.2   | 0.0    | 0.2    | 0.25   | 0.5    |
| Real GDP       | 11,900 | 12,000 | 12,100 | 12,125 | 12,250 |

Given that the expected price level is initially 1.0, explain why the economy is in long-run equilibrium when the price level equals 1.0 and real GDP equals \$12,000.

- (c) Suppose that the real exchange rate declines and as a result, aggregate demand increases. Also assume that the decline in the real exchange rate will persist over time. As a result of this decline, the new equation for the aggregate demand is  $Y = \$9,600 + M^s/P$ . Given no change in the nominal money supply, calculate the points on the new aggregate demand curve when the price level equals 0.8, 1.0, 1.2, 1.25, and 1.5, given the initial value of the nominal money supply. Using the table given in part b, explain what the new equilibrium price level and level of real GDP are in the short run, given the price surprise induced by the decline in the real exchange rate.
- (d) Monetary policymakers respond to the decline in the real exchange rate in one of three ways: (i) they do nothing and leave the nominal money supply as is; (ii) they change the money supply so as to return the price level to its level as given in part b; or (iii) they change the money supply so as to maintain the price level as determined by your answer to part c. For each of these cases, assume that this is how monetary policymakers have behaved in the past and this is how firms and workers expect them to behave in response to the decline in the real exchange rate. Calculate what the long-run equilibrium price level is and what the expected price level is under each response by monetary policymakers. Calculate by how much monetary policymakers must change the nominal money supply for the expectations of firms and workers to be realized.
3. Suppose that instead of persisting as is assumed in problem 2, the decline in the real exchange rate is only temporary in that after the initial change in the price level that you found in part c of problem 2, aggregate demand returns to its original level.
- (a) Given that monetary policymakers, firms, and workers all recognize that the decline in the real exchange rate is only temporary and given the three policy responses described in part d of problem 2, again calculate what the long-run

equilibrium price level is and what the expected price level is under each response by monetary policymakers. Again calculate by how much monetary policymakers must change the nominal money supply for the expectations of firms and workers to be realized.

- (b) Compare your answers to part d of problem 2 with those of part a of this problem and explain why they are different.
- (c) Explain what data or other factors that monetary policymakers, firms, and workers might analyze in attempting to determine if the decline in the real exchange rate is temporary or will persist. Finally, suppose that monetary policymakers are better able than firms and workers to determine if a change in the real exchange rate is temporary or will persist and that firms and workers know this. Given your answer to part d of problem 2 and part a of this problem, explain how once monetary policymakers have determined whether the change in the real exchange rate is only temporary or will persist, they could signal their finding to firms and workers.
4. Suppose that the equation for the aggregate demand is  $Y = 7,000 + 2,400/P$ . In this real business cycle model, the equation for natural real GDP is  $Y^N = 9,000 + \text{technology shock}$ . The technology shocks for periods 1–6 are given below.

|                  |      |     |   |       |     |   |
|------------------|------|-----|---|-------|-----|---|
| Period           | 1    | 2   | 3 | 4     | 5   | 6 |
| Technology shock | -400 | -80 | 0 | 1,000 | 400 | 0 |

- (a) Calculate the points on the aggregate demand curve when the price level equals 0.75, 0.80, 1.00, 1.20, 1.25, and 1.50.
- (b) Compute the price level and real GDP in periods 1–6. Describe the cyclical behavior of real GDP and the price level in this real business cycle model.
5. Using Figures 17-2 and 17-3 as a guide, assume a price-setting monopolist firm with no fixed costs and constant marginal cost ( $MC_0$ ) of \$3.00 faces an original demand curve  $P = 10 - 0.1Y$ .
- (a) What is the equation of the firm's marginal revenue curve  $MR_0$ ? (Recall that for a linear demand curve,  $MR$  is twice as steep as demand.)
- (b) What quantity will the firm produce to maximize profits? What price will it set to ensure that it sells all that it produces? (Hint: Recall that profit is maximized when  $MC_0 = MR_0$ .)
- (c) At the profit-maximizing price, what is the firm's total revenue? Total cost? Profit?
- (d) What is the value of consumer surplus? (Hint: Recall that the area of a triangle equals one half the area of the rectangle formed by its two sides.)