

Homework 4

Chapter 10

3 of Problems and Applications

Chapter 11

3 and 7 of Problems and Applications

Also, please answer the following question:

10. About 4 million visitors will go to Shanghai Expo this year. This will stimulate the consumption in China this year. Please use IS-LM model to analyze the impact of this event to interest rate, income, consumption, and investment in China.

The homework should be put in your TA's mailbox before 2pm of next Monday.

KEY CONCEPTS

IS-LM model

IS curve

LM curve

Keynesian cross

Government-purchases multiplier

Tax multiplier

Theory of liquidity preference

QUESTIONS FOR REVIEW

1. Use the Keynesian cross to explain why fiscal policy has a multiplied effect on national income.
2. Use the theory of liquidity preference to explain why an increase in the money supply lowers the interest rate. What does this explanation assume about the price level?
3. Why does the IS curve slope downward?
4. Why does the LM curve slope upward?

PROBLEMS AND APPLICATIONS

1. Use the Keynesian cross to predict the impact on equilibrium GDP of
 - a. An increase in government purchases.
 - b. An increase in taxes.
 - c. Equal-sized increases in both government purchases and taxes.
2. In the Keynesian cross, assume that the consumption function is given by

$$C = 200 + 0.75(Y - T).$$
 Planned investment is 100; government purchases and taxes are both 100.
 - a. Graph planned expenditure as a function of income.
 - b. What is the equilibrium level of income?
 - c. If government purchases increase to 125, what is the new equilibrium income?
 - d. What level of government purchases is needed to achieve an income of 1,600?
3. Although our development of the Keynesian cross in this chapter assumes that taxes are a fixed amount, in many countries (including the United States) taxes depend on income. Let's represent the tax system by writing tax revenue as

$$T = \bar{T} + tY,$$
 where \bar{T} and t are parameters of the tax code. The parameter t is the marginal tax rate: if income rises by \$1, taxes rise by $t \times \$1$.
 - a. How does this tax system change the way consumption responds to changes in GDP?
 - b. In the Keynesian cross, how does this tax system alter the government-purchases multiplier?
 - c. In the IS-LM model, how does this tax system alter the slope of the IS curve?
4. Consider the impact of an increase in thriftiness in the Keynesian cross. Suppose the consumption function is

$$C = \bar{C} + c(Y - T),$$
 where \bar{C} is a parameter called *autonomous consumption* and c is the marginal propensity to consume.
 - a. What happens to equilibrium income when the society becomes more thrifty, as represented by a decline in \bar{C} ?
 - b. What happens to equilibrium saving?
 - c. Why do you suppose this result is called the *paradox of thrift*?
 - d. Does this paradox arise in the classical model of Chapter 3? Why or why not?

4. Expansionary fiscal policy—an increase in government purchases or a decrease in taxes—shifts the *IS* curve to the right. This shift in the *IS* curve increases the interest rate and income. The increase in income represents a rightward shift in the aggregate demand curve. Similarly, contractionary fiscal policy shifts the *IS* curve to the left, lowers the interest rate and income, and shifts the aggregate demand curve to the left.
5. Expansionary monetary policy shifts the *LM* curve downward. This shift in the *LM* curve lowers the interest rate and raises income. The increase in income represents a rightward shift of the aggregate demand curve. Similarly, contractionary monetary policy shifts the *LM* curve upward, raises the interest rate, lowers income, and shifts the aggregate demand curve to the left.

KEY CONCEPTS

Monetary transmission mechanism

Pigou effect

Debt-deflation theory

QUESTIONS FOR REVIEW

1. Explain why the aggregate demand curve slopes downward.
2. What is the impact of an increase in taxes on the interest rate, income, consumption, and investment?
3. What is the impact of a decrease in the money supply on the interest rate, income, consumption, and investment?
4. Describe the possible effects of falling prices on equilibrium income.

PROBLEMS AND APPLICATIONS

1. According to the *IS–LM* model, what happens in the short run to the interest rate, income, consumption, and investment under the following circumstances?
 - a. The central bank increases the money supply.
 - b. The government increases government purchases.
 - c. The government increases taxes.
 - d. The government increases government purchases and taxes by equal amounts.
2. Use the *IS–LM* model to predict the effects of each of the following shocks on income, the interest rate, consumption, and investment. In each case, explain what the Fed should do to keep income at its initial level.
 - a. After the invention of a new high-speed computer chip, many firms decide to upgrade their computer systems.
 - b. A wave of credit-card fraud increases the frequency with which people make transactions in cash.
 - c. A best-seller titled *Retire Rich* convinces the public to increase the percentage of their income devoted to saving.
3. Consider the economy of Hicksonia.
 - a. The consumption function is given by

$$C = 200 + 0.75(Y - T).$$

The investment function is

$$I = 200 - 25r$$

Government purchases and taxes are both 100. For this economy, graph the *IS* curve for r ranging from 0 to 8.

- b. The money demand function in Hicksonia is
- $$(M/P)^d = Y - 100r$$

The money supply M is 1,000 and the price level P is 2. For this economy, graph the *LM* curve for r ranging from 0 to 8.

- c. Find the equilibrium interest rate r and the equilibrium level of income Y .
- d. Suppose that government purchases are raised from 100 to 150. How much does the *IS* curve shift? What are the new equilibrium interest rate and level of income?
- e. Suppose instead that the money supply is raised from 1,000 to 1,200. How much does the *LM* curve shift? What are the new equilibrium interest rate and level of income?
- f. With the initial values for monetary and fiscal policy, suppose that the price level rises from 2 to 4. What happens? What are the new equilibrium interest rate and level of income?
- g. Derive and graph an equation for the aggregate demand curve. What happens to this aggregate demand curve if fiscal or monetary policy changes, as in parts (d) and (e)?
4. Explain why each of the following statements is true. Discuss the impact of monetary and fiscal policy in each of these special cases.
- If investment does not depend on the interest rate, the *IS* curve is vertical.
 - If money demand does not depend on the interest rate, the *LM* curve is vertical.
 - If money demand does not depend on income, the *LM* curve is horizontal.
 - If money demand is extremely sensitive to the interest rate, the *LM* curve is horizontal.
5. Suppose that the government wants to raise investment but keep output constant. In the *IS-LM* model, what mix of monetary and fiscal policy will achieve this goal? In the early 1980s, the U.S. government cut taxes and ran a budget

deficit while the Fed pursued a tight monetary policy. What effect should this policy mix have?

6. Use the *IS-LM* diagram to describe the short-run and long-run effects of the following changes on national income, the interest rate, the price level, consumption, investment, and real money balances.
- An increase in the money supply.
 - An increase in government purchases.
 - An increase in taxes.
7. The Fed is considering two alternative monetary policies:
- holding the money supply constant and letting the interest rate adjust, or
 - adjusting the money supply to hold the interest rate constant.

In the *IS-LM* model, which policy will better stabilize output under the following conditions?

- All shocks to the economy arise from exogenous changes in the demand for goods and services.
 - All shocks to the economy arise from exogenous changes in the demand for money.
8. Suppose that the demand for real money balances depends on disposable income. That is, the money demand function is
- $$M/P = L(r, Y - T).$$
- Using the *IS-LM* model, discuss whether this change in the money demand function alters the following:
- The analysis of changes in government purchases.
 - The analysis of changes in taxes.

9. This problem asks you to analyze the *IS-LM* model algebraically. Suppose consumption is a linear function of disposable income:

$$C(Y - T) = a + b(Y - T),$$

where $a > 0$ and $0 < b < 1$. Suppose also that investment is a linear function of the interest rate:

$$I(r) = c - dr,$$

where $c > 0$ and $d > 0$.

- Solve for Y as a function of r , the exogenous variables G and T , and the model's parameters a , b , c , and d .