Macro Problem Set 5

Q1

An economy's money market is described by the following equations, where M is the quantity of money in \$, r is the interest rate (expressed as a number), and Y is output in \$.

Money demand: $M = 750 + 0.1Y - 5{,}000r$
Money supply: $M = 1{,}200$

A. Do the coefficients of Y and r in the money demand equation have the expected signs?
B. Suppose that the output level is \$12,000. Verify that the equilibrium interest rate in the money market is 15 percent, i.e., 0.15.
C. Suppose the government reduces its purchases of goods and services, and consequently, the output level falls to \$9,000. Find the new equilibrium interest rate. Illustrate your solution by drawing a money market diagram.
D. Starting from the initial equilibrium in part B, suppose instead that the central bank conducts open market purchases. Consequently, the quantity of money supplied rises to 1,450. Find the new equilibrium interest rate. Illustrate your solution by drawing a money market diagram.

Q2

In this problem, we add the interest rate to the Keynesian model. An economy's goods market is described by the following equations, where r is the interest rate (expressed as a number), and all categories are \$.

Consumption: $C = 1{,}000 - 1{,}000r + 0.8(Y - T)$

Planned investment: $I^P = 1{,}300 - 3{,}000r$

Government purchases: $G = 1{,}000$

Net taxes: $T = 500$

Net exports: $NX = 100$

Firms' desired output: $Y = AE$

A. Construct the aggregate expenditure equation. Do the coefficients of Y and r have the expected signs?
B. Suppose the interest rate is 15 percent (i.e., 0.15). Verify that the equilibrium output level is \$12,000.
C. Suppose the government reduces its purchases of goods and services by \$600. If the interest rate remains unchanged at 15 percent, show that the equilibrium output level falls by \$3,000, reaching \$9,000.

Q3

In this question, which follows from Q1 and Q2, students investigate the interaction between the goods market and the money market, and how this affects the expenditure multiplier.

An economy's money market is described by the equations found in Q1, and its goods market is described by the equations found in Q2.

A. Suppose the government reduces its purchases of goods and services by \$600, and equilibrium output falls to \$9,000 as in Q2C. What then happens to the equilibrium interest rate?
B. If the equilibrium interest rate has changed as you found in Part A, what then happens to equilibrium output? Work it out by using the equations.
C. If the equilibrium output has changed as you found in Part B, what then happens to equilibrium interest rate?
D. The interaction between the two markets continues until both reach equilibrium. How would the ultimate change in equilibrium output compare to the \$3,000 decrease found when the interest rate is unchanged at 15%? What does this say about the size of the expenditure multiplier? Argue qualitatively, i.e., you are not required to work out the exact change in equilibrium output.

Q4

Suppose the economy's output is below potential, and the central bank acts to close the output gap. With the help of matching diagrams of the money market and the Keynesian Cross, describe how the central bank's actions affects equilibrium output and interest rate. In your diagrams, consider the interaction between the goods market and the money market, as you saw in the previous question.

Q5

Read the following two write-ups. The first is the Bank of England's FAQ on "Quantitative Easing", available for download on LumiNUS. You may also visit this public link for a slightly updated version that includes a very short video. The second is the European Central Bank's writeup "What is Forward Guidance?", available for download on LumiNUS, and also viewable via this public link .

A. Explain how quantitative easing and forward guidance are supposed to work in fighting a recession or slump.
B. Explain why the Bank of England and the European Central Bank have resorted to these unconventional monetary policies.

C. Why might an economist argue that in the environment where central banks are resorting to quantitative easing and forward guidance, fiscal policy is particularly effective?
D. Given that the 2022 inflation rates are expected to be above long-term inflation targets, how have the Bank of England and the European Central Bank adjusted their quantitative easing and forward guidance?