Review Questions

1. Explain why in Mr. Keynes’s story of a liquidity trap recession, there would be a very large excess supply of money available for short-term lending if \( r_{ST} > 0 \). Conclude that \( r_{ST} = 0 \) is “natural” in Mr. Keynes’s story of a liquidity trap recession.

2. Assume lenders are risk neutral and have the same \( r^e_{LT} \). Explain why, in equilibrium, the expected rate of return from short-term and long-term lending must be equal. Using this fact, be able to derive the formula relating the short- and long-term interest rates: \( r_{LT}^* = \frac{r^e_{LT}}{1 + r^e_{LT}} \times (1 + r_{ST}^*) \). What does the formula imply for the term structure of interest rates when \( r_{LT}^* > r^e_{LT} \)? When \( r_{LT}^* < r^e_{LT} \)? When is it more likely that the term structure will be upward sloping, during a credit crunch recession or during a liquidity trap recession?

3. Derive the equation of the LM with fast money and no asset balances. Using the equation, explain mathematically why \( M_\downarrow \) leads to \( Y \downarrow \). Why does this imply that in a world with fast money, the recession after a monetary contraction will be larger than in a CQT world?

4. Assume there is no government or foreign trade, so \( Y = C + I \). Starting from the consumption function \( C = C_a + cY \) show mathematically that, when \( Y \downarrow \), consumption decreases less than investment, that is, \( \frac{C}{Y} \uparrow \) while \( \frac{I}{Y} \downarrow \). (If you have trouble, see the “Fast Money in IS-LM” handout.) Now explain intuitively why investment \( I \) goes down a lot more than consumption \( C \) when income goes down.

5. Intuitively, why does adding fast money to Mr. Keynes’s story decrease the amount of idle speculative balances held in a liquidity trap recession? Relatedly, why does adding fast money decrease the excess supply of money that would be available for short-term lending in a liquidity trap recession if \( r_{ST} > 0 \)?

6. With fast money, the excess supply of money that would be available for short-term lending in a liquidity trap recession if \( r_{ST} > 0 \) is small when the marginal propensity to consume, \( c \), is small. Why? Illustrate your answer using a saw-tooth diagram with fast money.

Exercises

1. A fast-money world without asset balances. Consider a simple economy in which there is only consumption and investment demand (so \( G = T = NX = 0 \)). In particular, like in Question 2 on the last problem set:

   Consumption function: \( C = 700 + .1Y \) \hspace{1cm} (1)
   Investment function: \( I(r) = 290 - 900r \) \hspace{1cm} (2)

   But unlike Question 2 on the last problem set, money is held only for slow-money transactions, so:

   \[ \text{FM money transaction demand: } \left( \frac{M^d}{P} \right)_{tr} = \frac{1}{5} C. \] \hspace{1cm} (3)

   For this question, assume people hold no asset balances; so their transaction demand for money coincides with their total demand for money.

   a. Using (1) and (2), find the equation of the economy’s IS curve.

   b. Using (1) and (3), find the equation of the economy’s LM curve. Show your work.

   c. Suppose \( Y^{FE} = 1,000 \) for this economy. If it is currently operating at full employment, what must consumption \( C \) and investment \( I \) equal? What must the interest rate \( r \) equal? What must the real money supply equal? What
2. The term structure of interest rates during a credit crunch recession Now suppose there are 3 financial assets, not just 2 on the above Island Economy: In addition to money, there are time deposits \( T \) paying interest \( r_{ST} \) and bonds (perpetuities) \( b \) paying interest \( r_{LT} \). [To accommodate this change, in the investment function (2) above, now assume “\( r \)” stands for the long rate, that is \( r \equiv r_{LT} \).] Also suppose everyone has the same inelastic interest rate expectations, with \( r^e_{LT} = 10\% \). Find the short-run equilibrium values of \( r_{ST} \) and \( r_{LT} \) after the fall in the money supply by 1.25% to \( \frac{M}{P} = 158 \). Illustrate the short-run value of \( r_{LT} \) in an IS-LM diagram that takes account of lenders’ inelastic interest rate expectations, hence that takes account of the fact that lenders will hold some asset balances if \( r_{LT} \) falls enough.

What happens to the term structure of interest rates during the recession? Please illustrate your answer.

3. A liquidity trap recession with fast money Continue to assume there are 3 financial assets on the above Island Economy and all lenders believe \( r^e_{LT} = 10\% \). But now, starting from the long-run full employment equilibrium, suppose there is a fall in investment opportunities on the Island rather than a fall in the money supply—so a real shock. In particular, due to an increase in investor uncertainty, the investment function temporarily shifts down to

\[
I_2(r) = 245 - 900r_{LT}.
\]

What will happen to \( r_{ST}, r_{LT}, Y \) and \( V \) in the short run? (Give numerical answers.) Illustrate your answer graphically using IS-LM.

Calculate the amount of idle speculative balances lenders are holding during the recession. Compare your answer with the amount of idle balances without fast money (see Question 3 on the last problem set). Explain the difference.

For fun, you might want to illustrate the liquidity trap recession using a “bird flying” picture. You also might want to illustrate it in a Circular Flow Diagram (CFD). NOTE: In drawing the CFD, it is helpful to put 2 dials above the “financial markets” box — a short-term and long-term interest rate dial,— since firms will look at the position of these dials to determine how much to borrow and hence how much to invest.