Practice Questions 5 - Econ 136 - Fall 2002

Review Questions

1. Briefly explain what is meant by “cash flow problems” and why they arise during recessions. Also explain why such problems may be contagious: if a firm you gave trade credit to has a cash flow problem, you may get one too. In a worst-case scenario, explain why this may give rise to chain bankruptcies like we witnessed in the recent liquidity crisis in Korea: one firm going bankrupt after another, like dominoes falling.

2. Precautionary balances provide a cushion again cash flow problems. Explain and illustrate using a saw-tooth diagram.

3. Even with fast money, in a liquidity trap recession \( r_{ST} = 0 \) because otherwise there would be at least a small excess supply of money available for short-term lending. Explain how precautionary balances, by “mopping up” this excess supply of money, can lead to a Keynes-type recession with \( r_{ST} > 0 \).

4. What do \( \phi \), \( \hat{\rho} \), and \( \ell \) stand for in the formula \( P_{\text{risky}} = (1 - \phi) \hat{\rho} - \phi \ell \)? Explain the idea behind the formula using 2 barrel diagrams, one for the event “no default happens” and the other for the event “a default happens.”

5. Starting from the above formula, explain how to derive the formula for the risk premium, \( RP = \frac{\phi}{1 - \phi}(r + \ell) \). [Use the assumption of risk neutrality and the idea of arbitrage between lending markets.] What happens to the risk premium if \( \phi \uparrow \)? What about if \( \ell \uparrow \)? What is the relation between the size of \( \ell \) and the amount of collateral a firm puts up?

6. Use the idea of cash flow problems and the above formula for RP to briefly explain why the risk premium goes up if a recession is long lasting. Give 2 reasons.

7. Explain why the IS shifts down when \( RP \uparrow \). Explain why the riskless rate was very low but the risky rate was very high during the Great Depression. Illustrate your answer using an IS–LM diagram.

8. Some economists have argued that credit was not really very tight during the Great Depression. As evidence, they point to the fact that the rate of interest on Treasury bills (short term government bonds) was very low during the Depression. (So the government had to pay very little for borrowing.) What’s wrong with their argument?

9. You know that wages and prices fell about 25% between 1929 and 1933. Explain why deflation worsened firms’ cash flow problems and hence made the Depression much more severe.

Exercises

1. What difference do precautionary balances make?

   Return to the Island economy we analyzed in the last problem set. Initially on the real wing:

   \[
   \text{Consumption function: } C = 700 + .1Y \tag{1}
   \]

   \[
   \text{Investment function: } I_1(r_{LT}) = 290 - 900r_{LT} \tag{2}
   \]

   So initially the IS curve is given by:

   \[
   \text{IS}_1: \quad Y = 1100 - 1000r_{LT}.
   \]

   Initially the economy is operating at full employment, where \( Y^{FE} = 1000 \). In the initial long-run equilibrium

   \[
   r_{LT} = r_{ST} = r^e_{LT} = 10\%.
   \]

   Notice all lenders have the same inelastic interest rate expectations. In particular, since \( r^e_{LT} = 10\% \), \( r^0_{\text{min}} \approx 9.1\% \equiv .091. \)
On the money wing, initially \( \frac{M^t}{P} = 160 \), enough to finance \( Y^{FE} \) real transactions. We continue to assume:

**FM money transaction demand:** \( (\frac{M^t}{P})_{tr} = \frac{1}{5} C. \) (3)

But unlike the last problem set, we now assume firms also hold some precautionary balances during recessions, as a cushion against cash flow problems. In particular, when \( Y \) falls below \( Y^{FE} \):

\[
(\frac{M^t}{P})_{prec} = 0.01 \times (Y^{FE} - Y) + L(r_{LT}),
\]

where

\[
L(r_{LT}) = \begin{cases} 
0 & \text{if } r_{LT} \geq 0.93 \\
\frac{0.0001}{r_{LT} - 0.91} - 0.42 & \text{if } 0.91 < r_{LT} < 0.93 \\
\infty & \text{if } r_{LT} \leq 0.91.
\end{cases}
\]

(See the EXAMPLE in the cash flow handout for a graph of the liquidity preference function. The equation looks ugly, but the graph has a pretty shape!)

a. Starting from the money-market equilibrium condition, find the equation of the economy’s initial LM curve, showing your work. Graph the LM (with \( r_{LT} \) on the vertical axis) along with the initial IS. Label the initial equilibrium point A. Calculate the aggregate real transaction balances and real precautionary balances held at point A. What do \( r_{LT} \) and \( r_{ST} \) initially equal?

b. A Keynes-type recession with fast-money and precautionary balances

Now suppose there is a fall in investment opportunities on the Island to \( I_2(r_{LT}) = 245 - 900r_{LT} \), leading to a lower IS given by:

\[
IS_2 \quad Y = 1050 - 1000r_{LT}.
\]

What will happen to \( r_{ST} \), \( r_{LT} \), \( Y \) and \( V \) in the short run? (Given numerical answers.) Illustrate your answer graphically using IS-LM. HINT: \( r_{LT} \) will fall to 9.2%.

Calculate the transaction balances, precautionary balances, and idle speculative balances that individuals are holding during the recession. Compare your answer with the amount of idle speculative balances you found being held in Question 3 on the last problem set; explain the difference that precautionary balances make.

c. A credit crunch recession in a fast-money world with precautionary balances

Now suppose instead that \( IS = IS_1 \) but the money supply falls by 1.25% to \( \frac{M}{P} = 158 \). Find the equation of the new LM. Graph \( IS_1 \) along with the new LM, and calculate the short run (SR) values of \( C, I, Y, r_{LT}, r_{ST} \), and \( V \). Compare your answers with the answers to Question 1d on the last problem set, and explain any differences that precautionary balances make. Calculate the transaction balances, precautionary balances, and idle speculative balances that individuals are holding during the recession.

2. Default risk and the risk premium

Suppose in Question 1b above, the risk premium lenders insist on increases from \( RP_1 = 0 \) to \( RP_2 = 8.45\% \) after the investment function shifts down—because lenders become more worried about the possibility of default. What will happen to the IS curve after \( RP_1^+ \)? What difference will this make to your answers to Question 1b? Illustrate your answer using IS-LM, being sure to show the equilibrium values for both the riskless long rate \( r_{LT} \) and the risky long rate \( r_{LT}^\prime \) after \( RP_1^+ \). HINT: \( r_{LT} \) will fall to 9.15%. 
