Answer Sheet 4 - Econ 136 - Fall 2002

1. A fast-money world without asset balances
   a. Same as the answer to Question 2b in the last problem set.
   b. \( \frac{M^d}{P} = \frac{M^s}{P} \Rightarrow \frac{1}{5} C = \frac{M^s}{P} \) or, substituting in the consumption function, \( \frac{1}{5}(700 + 0.1Y) = \frac{M^s}{P} \Rightarrow 140 + 0.02Y = \frac{M^s}{P} \) \( \Rightarrow \) the equation of the LM with fast money and no asset balances is:

   \[
   LM: \quad Y = 50 \frac{M^s}{P} - 700
   \]

e. Plugging 1,000 into the consumption function shows \( C = 800 \) and hence \( I = 200 \). Plugging 200 into the investment function shows \( r = 10\% \). Plugging 800 into the money demand function shows \( \frac{M^d}{P} = 160 \), hence money-market equilibrium implies \( \frac{M^s}{P} = 160 \). Finally, \( V \equiv \frac{Y}{P} = \frac{1000}{160} = 6.25 \). Notice \( V \) is larger than the inverse of the Cambridge \( k \) since 5 is only the velocity of the slow-money transactions. See FIGURE below. I won’t bother drawing the circular flow diagram.

   Notice the full-employment real money supply is only 160 with fast money, while it was 200 without fast money. The reason should be familiar from the material before Midterm 1: you need less money to finance the same number of real transactions when there is fast money because some dollars do “double duty”: they finance a fast-money transaction (a spike) and then are available again to finance a slow-money transaction.

d. A credit crunch recession in a fast-money world Now real money demand must fall by 2 to 158. From the FM money demand function we see that \( C \) must fall by \( 5 \times 2 = 10 \) so that money demand falls by 2. That is, the SR value of consumption must be \( C_{SR} = 790 \). Plugging into the consumption function, we see that \( C \) will equal 790 only if \( Y = (790 - 700)/0.1 = 900 \); so \( Y_{SR} = 900 \). Since consumption plus investment equals total output, it follows that \( I_{SR} = 110 \). Hence, plugging into the investment function, we see that \( r \) must increase to \((290 - 110)/900 = 0.2\) that is \( r = 20\% \) during the credit crunch. Notice that the drop in the money supply from 160 to 158 is only 1.25%, yet real output falls by 10% from 1000 to 900. Why? Because fast money transactions (investment) have decreased much more than slow money transactions (consumption), leading to a substantial drop in velocity. Indeed, during the recession, \( v_{SR} = 900/158 \approx 5.7 \), as compared to 6.25 at full employment. See FIGURE below. I won’t bother drawing the CFD or the bird picture.

2. The term structure of interest rates during a credit crunch \( r_{LT} = 20\% \), as we found in the previous question. See FIGURE above. Now plugging into the formula relating the equilibrium values of the short and long rates, namely
\[
  r_{LT}^* = \frac{r_{LT}^e}{1 + r_{LT}^e} \times (1 + r_{ST}^e),
\]

we find: \(0.2 = \frac{1}{4} \times (1 + r_{ST}^e).\)

Solving for \(r_{ST}^e\) shows \(r_{ST}^e = 1.2 = 120\%\).

Thus the term structure is downward sloping. In the literature this is sometimes referred to as an “inversion” in the term structure, since an upward sloping term structure is more common. (I won’t bother drawing it; see the “Fast Money in IS-LM” handout if you can’t do it easily.) The reason for the huge difference between \(r_{LT}^*\) and \(r_{ST}^*\) is that lenders expect huge capital gains from lending long-term this year while interest rates are high, indeed, they expect capital gains of 100%!

3. **A liquidity trap recession with fast money** This question builds on Question 3 from the last problem set. Indeed, the picture of the liquidity trap recession is unchanged. See Figure below. The point of the question is to see what difference fast money makes to the amount of idle balances held at point B.

\[
  \frac{M^s}{P} - 159.18 = 160 - 159.18 = \boxed{0.82}.\]

Comparing this to the idle balances of 8.2 without fast money, we see that fast money decreases the amount of idle balances by a lot (indeed by 90%)!

The reason was explained in class and in the “Fast Money in IS-LM” handout. NOTE: As explained in this handout, you can also calculate the amount of idle balances with fast money by taking \(ck\Delta Y = .1(2)(41) = .82\), and you can calculate the amount of idle balances without fast money by taking \(k\Delta Y = .2(41) = 8.2\).

---

**A Liquidity Trap Recession on the Island**

![Liquidity Trap Recession Diagram](image)

Since \(Y_{SR} = 959\), \(C_{SR} = 700 + 0.1(959) = 795.9\), hence \((\frac{M^d}{P})_{tr} = \frac{1}{5}C = 159.18\), which implies idle balances =