Answer Sheet 5 - Econ 136 - Fall 2002

1. What difference do precautionary balances make?

   a. Following the method in the cash flow handout, we find the equation of the LM is:

   \[
   Y = \frac{M^s}{P} - 150 - L(r_{LT}) \times 0.01.
   \]

   In particular, since \( \frac{M^s}{P} = 160 \) initially:

   \[
   \text{LM}_1: \quad Y = 1000 - 100L(r_{LT}).
   \]

   At A: \( \left( \frac{M^d}{P} \right)_{tr} = \frac{1}{5} C^{FE} = \frac{1}{5} \times 800 = 160 \), while \( \left( \frac{M^d}{P} \right)_{prec} = 0 \) because the economy is at full employment. Also initially \( r_{LT} = r_{ST} = r^*_LT = 10\% \).

   ![Figure 1: A Keynes-type recession with fast money, precautionary balances, and \( r_{ST}^* > 0 \)]

   b. At B: \( r_{LT} \) falls to \( r^*_LT = 9.2\% \), hence \( r_{ST} \) falls to \( r^*_ST = 1.2\% \). \( Y \) falls to 958, hence \( V \) falls to \( 958/160 \approx 6.0 \). There are 2 reasons why \( V \): the economy loses mainly fast money transactions at \( B \) and firms hold some idle precautionary balances at \( B \).

   At \( B \): \((M^d/P)_{tr} = \frac{1}{5} \times C^{SR} = \frac{1}{5} \times 795.8 = 159.16\) and \((M^d/P)_{prec} = 0.05(Y^{FE} - Y^{SR}) + L(r_{LT}) = 0.42 + 0.42 = 0.84\). Notice that, relative to \( A \), at point \( B \) \( (M^d/P)_{tr} \) a little but \( (M^d/P)_{prec} \) a little—to “mop up” the potential excess supply of money due to \( C \); this permits a recession with \( r_{ST} > 0 \). Compared to Mr. Keynes’s story of recessions, there are no speculative balances held at \( B \) because \( r_{ST} > 0 \). Our alternative story for the money wing—involving fast money and precautionary balances—allows for a recession after a real shock with \( r_{ST} > 0 \).

   NOTE: I call the recession in Figure 1 a “Keynes-type recession” because we have maintained Mr. Keynes’s key insight about inelastic interest rate expectations preventing \( r_{LT} \) from falling enough to prevent a recession after a real shock. We have only changed his story about the money wing, de-emphasizing speculative balances to allow for a recession after a real shock with \( r_{ST} > 0 \).

   c. Since \( \frac{M^s}{P} \) drops to 158, the new equation for the LM is:

   \[
   \text{LM}_2: \quad Y = 800 - 100L(r_{LT}).
   \]

   Furthermore, since \( r_{LT} > 9.3\% \) in the credit crunch recession, \( L(r_{LT}) = 0 \), so \( Y \) drops to \( Y^{SR} = 800 \). In the recession, \( C = 780 \); hence \( I = 20 \), which implies \( r_{LT} = 30\% \), and so \( r_{ST} = 2.3 = 230\% \) — a terrible credit crunch. During the crunch, \( V \) decreases to \( 800/158 \approx 5.1 \). It falls for 2 reasons: because the
Figure 2: A CREDIT-CRUNCH RECESSION WITH FAST MONEY AND PRECAUTIONARY BALANCES

economy has lost mainly fast money transactions at $B'$ and firms are holding some idle precautionary balances at $B'$. The credit crunch is a lot worse than without precautionary balances because $V$ has fallen a lot more, reflected in the fact that both the short-term and long-term interest rates are a lot higher than without precautionary balances.

At $B'$: \( (M^d)^{spec} = 0 \) because \( r_{ST} > 0 \),
\[
(M^d)_{tr} = \frac{1}{3} \times C^{SR} = \frac{1}{3} \times 780 = 156,
\]
and \( (M^d)_{prec} = .05(Y^{FE} - Y^{SR}) + L(r_{LT}) = 2 + 0 = 2 \).

2. Now the recession gets even worse. Although the riskless rate is lower (9.15% rather than 9.2%), the risky rate is higher: $9.15\% + RP_2 = 17.6\%$—and investment demand depends on the interest rate that firms have to pay, not on the interest rate lenders receive. See point D in Figure 3.

In particular, when \( \dot{r}_{LT} = 17.6\% \), investment demand falls to only \( \frac{I^{SR}}{L} = 86.6 \). From the equation of the LM, we see that \( Y^{SR} = 874 \) when \( r_{LT} = 9.15\% \), hence \( C^{SR} = 787.4 \).

When \( r_{LT} = 9.15\% \), \( \frac{r_{ST}}{r_{LT}} = .65\% \) — very low because \( r_{LT} \)

Figure 3: THE RECESSION GETS WORSE

is very close to \( r_{min}^0 \). [NOTE: To calculate \( r_{ST} \) use the fact that \( r_{LT} = \frac{\dot{r}_{LT}}{L} \times (1 + r_{ST}) \).] With such a low opportunity cost of holding money and cash flow problems severe, firms are holding enough precautionary balances to offset the decrease in households' holding of transaction balances due to the further fall in $C$. 