

Economics 325
Intermediate Macroeconomic Analysis
Practice Problem Set 6
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 Spring 2009

1. **Deriving a Money Demand Function.** Denote by $\phi(c_t, i_t)$ the real money demand function. Here you will generate particular functional forms for $\phi(\cdot)$ using the MIU model we have studied.

In an MIU model, recall that the consumption-money optimality condition can be expressed as

$$\frac{u_{m_t}}{u_{c_t}} = \frac{i_t}{1+i_t},$$

where u_{m_t} denotes marginal utility with respect to **real** money balances and u_{c_t} denotes marginal utility with respect to consumption. In each of the following, you are given a utility function and its associated marginal utility functions. For each case, construct the consumption-money optimality condition and use it to generate the function $\phi(\cdot)$. In each case, your money demand function should end up being an increasing function of c_t and a decreasing function of i_t . (**Note:** Be careful to make the distinction between real money holdings and nominal money holdings. The marginal utility function u_{m_t} is marginal utility with respect to **real** money holdings.)

a. $u\left(c_t, \frac{M_t}{P_t}\right) = \ln c_t + \ln\left(\frac{M_t}{P_t}\right).$

b. $u\left(c_t, \frac{M_t}{P_t}\right) = 2\sqrt{c_t} + 2\sqrt{\frac{M_t}{P_t}}.$

c. $u\left(c_t, \frac{M_t}{P_t}\right) = c_t^\sigma \cdot \left(\frac{M_t}{P_t}\right)^{1-\sigma}.$

2. **The Keynesian-RBC-New Keynesian Evolution.** Here you will briefly analyze aspects of the evolution in macroeconomic theory over the past 25 years.
 - a. Describe **briefly** what the Lucas critique is and how/why it led to the demise of (old) Keynesian models.
 - b. Briefly define and describe the neutrality vs. nonneutrality debate surrounding monetary policy today. Which type of shock does this debate concern?

3. **A Quantitative Look at Monetary Policy.** On June 25, 2003, the Federal Reserve's main policy-setting committee, the Federal Open Market Committee (FOMC), announced it was immediately lowering its target for the Federal Funds interest rate from 1.25% to 1.00%. To implement this policy, it thus needed to conduct an open-market operation on June 25, 2003. Assume the following:
 - The Fed could purchase or sell as many bonds as it wanted to at the equilibrium price of bonds which prevailed on June 24, 2003 (i.e., the day before it announced its policy);
 - On June 24, there were 1,000 bonds on the open market, **each of which promised to pay a face value of \$1.00 (one dollar) on June 24 (or June 25 if you like...), 2004;**
 - The money supply curve is vertical;
 - Before the Fed action, the domestic money supply was \$499.50, and the Fed has complete control over the domestic money supply;
 - The money demand function and the bond demand function are given, respectively, by

$$M^D = 993 - 39,480i$$

$$B^D = 4,185 - 3,227P_b,$$

where, as in class, i denotes the nominal interest rate and P_b denotes the price of each bond (which, recall, pays \$1 in one year's time). A reminder that a nominal interest rate of, for example, 1.25% , means that $i = 0.0125$.

Recall from introductory macroeconomics the notion of the **money multiplier**. For our purposes here, the presence of a money multiplier means that the total change in the money supply of an economy is equal to the money multiplier times the initial injection of money into the economy. Suppose that the money multiplier is 10 – that is, if the Fed injects \$1 into the economy, the money supply actually increases by \$10. Accurate to at least three decimal places, compute each of the following:

- The price of a bond before the Fed action;
- Total domestic money supply following the Fed action;
- The amount of dollars given (or taken) by the Federal Reserve to (or from) the banking system;
- Total bond supply on the open market following the Fed action;
- The price of a bond following the Fed action