

The following formulas may be useful.

Inflation and Interest Rates

$$\text{GDP Deflator} = \frac{P_{1,t}Q_{1,t} + P_{2,t}Q_{2,t} + \dots + P_{n,t}Q_{n,t}}{P_{1,b}Q_{1,t} + P_{2,b}Q_{2,t} + \dots + P_{n,b}Q_{n,t}} \cdot 100,$$

$$\text{CPI} = \frac{P_{1,t}Q_{1,b} + P_{2,t}Q_{2,b} + \dots + P_{n,t}Q_{n,b}}{P_{1,b}Q_{1,b} + P_{2,b}Q_{2,b} + \dots + P_{n,b}Q_{n,b}} \cdot 100, \quad \pi = \frac{P_{t+1} - P_t}{P_t}, \quad R_t = r_t + \pi_t$$

Money Supply

$$M = (cr + 1)D, \quad H = (cr + rd)D, \quad cr = \frac{C}{D}, \quad rd = \frac{TR}{D},$$

$$M = Hk(R), \quad \Delta M = \Delta Hk(R), \quad k(R) = \frac{cr + 1}{cr + rrr + e(R)}$$

$$\frac{M}{P} = \frac{H}{P}k(R), \quad TR = NBR + BR = ER + RR, \quad rd = rrr + e(R)$$

$$M2 = C + D + S = (cr + 1 + sr)D, \quad M2 = H \cdot k_{M2}(R), \quad k_{M2}(R) = \frac{cr + 1 + sr}{cr + rd}.$$

Money Demand

$$\frac{M}{P} = \sqrt{\frac{\delta C}{2R}}, \quad n = \sqrt{\frac{RC}{2\delta}}, \quad MV = PC, \quad V = \sqrt{\frac{2RC}{\delta}}, \quad MD = a - b\pi_{t+1}^e$$

Short answer questions (1-2 sentences)

Question 1 (15 points)

Consider a decrease in Consumption. According to the BT model, explain what happens to:

- a. The number of withdraws.
- b. Money Demand.
- c. Velocity.

Question 2 (8 points)

Explain the essential differences (from the bank's perspective) between borrowing from the FED at the discount rate to fund a loan and securitizing the loan on the mortgage backed securities market.

Question 3 (10 points)

For each of the following, does money supply increase, decrease, or remain unchanged?

- a. The U.S. treasury issues tbills to pay for the stimulus package.
- b. Eco 403 students withdraw cash from their checking accounts to go out after their quiz.
- c. A bank borrows from the FED's term auction facility to increase excess reserves.
- d. A bank borrows at the FED funds rate to make a loan.
- e. Tim buys Freakonomics with a credit card.

Question 4 (8 points).

Give two differences between items in M1 and items in M2.

Longer Questions

Question 5 (25 points).

Graph the money market with the BT money demand. Show on the graph the effect of a decrease in the cost of withdraws. Explain what happens to:

- a. The equilibrium interest rate.
- b. The real money supply.

- c. The number of withdraws per period.
- d. Excess reserves.
- e. Consumption velocity.

Question 6 (18 points).

From the Wall Street Journal's write up of Bernanke's testimony on Tuesday: "[Bernanke said] most officials are looking for 2% inflation in the long run. Fed watchers have taken that longer-term forecast as a de facto inflation target." Later in the article: "Earlier this month, the Fed increased by fivefold the size of its TAF [term auction facility] facility to as much as \$1 trillion. 'The TAF is expecting to make loans soon,' Bernanke said."

Graph the money market using the Cagan model of money demand.

- a. Show on the graph an increase in TAF lending (hint: what is the FED lending?).
- b. Explain what happens to interest rates, inflation, and money demand.
- c. Make a conjecture as to what "most officials" are expecting to happen. Explain your reasoning.

Question 7 (16 points).

Suppose we have:

- bank lending rate equal to 6%.
- inflation rate of 1%.
- required reserve ratio of 0.1.
- Interest rate earned on savings deposits of 3.5%.

Assume there is no cost to the bank of maintaining checking accounts and no excess reserves.

- a. Calculate the average return the bank makes on loans funded through checking deposits.
- b. Calculate the return the bank makes on loans funded through savings deposits.
- c. Which type of deposits is more profitable for the bank?
- d. Suppose the FED is now paying 1% interest on reserves. Repeat (a)-(c).