F I R S T  M I D T E R M

[30] 1. The opportunity cost of holding money

a. What is meant by “the opportunity cost of holding money”? (Please be brief.)

Suppose an individual spends $800 continuously through each month on every-day consumption goods. He does 4 short-term cash management (STCM) transactions each month: going to the bank once a week either to deposit money into or withdraw money out of his savings account. His savings-account deposits earn 1/2% per month (so 6% per year).

b. In a saw-tooth diagram, illustrate his transaction balances through each month and his average money demanded for transactions.

c. What does his opportunity cost of holding money equal? How much interest does he earn each month from STCM? (Give numerical answers, briefly explaining your calculations as you go along.) Is the income he earns from STCM a lot of money?

d. Big-ticket transactions Now suppose that at the end of month t the individual is going to buy a new house, and he must pay the seller $40,000 as a down-payment. Calculate his opportunity cost of keeping the $40,000 in his checking account throughout month t. Is it a lot of money?

e. Suppose instead that the individual withdraws the $40,000 down-payment from his savings account right at the end of month t. Illustrate this extra fast-money transaction, by appropriately modifying your saw-tooth diagram of part b.

f. Moving to the macro level, briefly give the intuition why V tends to go up when people do more fast-money transactions. Illustrate your answer using the demand-deposit and time-deposit “barrels.”

[20] 2. Classical monetary theory Suppose \( \frac{M^d}{P} = kY \), where \( k \) is a constant.

a. What is the definition of \( V \)? Starting from your definition, carefully prove that \( V \) will be a constant in this classical economy, assuming the money market remains in equilibrium.

b. As you know, the LM curve is defined as all combinations of \( Y \) and \( r \) that equilibrate the money market, i.e., that satisfy \( \frac{M^d}{P} = \frac{M^e}{P} \). Starting from this definition, carefully derive the equation of the LM curve for this classical economy and graph it.

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3. Suppose on an island economy the nominal monthly flows (in millions of dollars) are as follows:

\[ C^{\text{durables}} = 200m \quad \quad C^{\text{non-durables}} = 600m \]
\[ I = 400m \quad \quad G = T = NX = 0, \]

where \( NX \equiv \) net exports.

a. What does nominal income \( X \) and saving \( S \) equal each month?

b. Illustrate the monthly flows in a circular flow diagram (CFD). Be sure to include the consumer durables, wealth, and capital stock “barrels” in your diagram.

c. If the value of the shares traded on the Island's stock market falls by 20%, but consumption and other expenditures do not change, how would your CFD change?

d. Why is it more realistic to assume consumption expenditures would fall if the value of shares falls?

4. Continue to assume the monthly flows on the Island are as above. Now also assume there is only monetary exchange (no credit exchange), and no STCM except for fast-money transactions.

a. Illustrate money holdings through a typical month on the island using 2 saw tooth diagrams, one for all buyers and one for all sellers, assuming:

- \( M_{\text{asset}}^d = 0 \), and all transactions are slow-money transactions.

Also calculate \( M \) and \( V \).

b. Re-do part a. assuming:

- \( M_{\text{asset}}^d = 0 \), but \( I \) and \( C^{\text{durables}} \) are fast-money transactions.

Now assume the island economy goes into recession, with investment demand falling to \( I_{SR} = 300m \), consumption of durables falling to \( C_{SR}^{\text{durables}} = 100m \), and all other expenditures remaining unchanged.