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Problem 1 (Money Creation)

Information on banking systems in six different countries has been arranged in the table below. The last three columns report the eventual change in the country's money supply resulting from open market sales or purchases by the country's central bank in the amounts indicated. Assume that all banks remain always fully loaned up (hold no excess reserves), and that cash in the hands of the public does not change.

Complete the table:

Country	RRR	Demand Deposit Multiplier	Open Market Sale of \$200	Open Market Purchase of \$100	Open Market Sale of \$400
1	0.1				-4000
2	0.2				
3		2.5			
4			-400		-800
5	0.8			125	
6		1.0	-200		

Circle the correct phrase and fill in the gaps:

If the central bank in Country 2 wants to increase the money supply by \$1000, it must **(increase/decrease)** reserves by the amount of dollars. One way to do this is through open market **(sales/purchases)**. Alternatively, the central bank could achieve the same increase in the money supply by an appropriate **(increase/decrease)** in the required reserve ratio, or an appropriate **(increase/decrease)** in the discount rate. However, if the central bank chooses to use open market operations to increase the money supply by \$1000, it will be required to **(buy/sell)** securities **(from/to)** the public in the amount of dollars.

Problem 2 (Money Market Equilibrium)

Circle the correct phrase and fill in the gaps:

If the central bank in Country 2 knows that the demand deposit multiplier is 10, and wants to increase the money supply by \$2000, it must **(increase/decrease)** reserves by the amount of dollars (if people hold no cash and banks loan out all excess reserves). As a result of this policy, in the money market there will initially be excess supply of **(bonds/money)** and also excess demand for **(bonds/money)**. Because excess demand for bonds will lead to an **(fall/increase)** in the price of bonds, the interest rate will go **(up/down)**, restoring the equilibrium in the **(bonds/money)** market.

Clearly, this demonstrates that money supply change and the choice of interest rate is the same thing from the standpoint of the Fed. When the Fed increases money supply, it has to accept the fact that the interest rate will go **(up/down)** as a result of that. By the same token, the Fed could well announce a lower interest rate target and keep **(increasing/decreasing)** the money supply to hit the desired interest rate target.

Conversely, if the central bank in Country 2 knows that the demand deposit multiplier is 10, and wants to decrease the money supply by \$2000, it must **(increase/decrease)** reserves by the

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amount of dollars (if people hold no cash and banks loan out all excess reserves). As a result of this policy, in the money market there will initially be excess supply of **(bonds/money)** and also excess demand for **(bonds/money)**. Because excess **(demand/supply)** for bonds will lead to an **(fall/increase)** in the price of bonds, the interest rate will go **(up/down)**, restoring the equilibrium in the **(bonds/money)** market.

Problem 3 (Introduction to Keynesian model)

Consider an economy that obeys the rules of the classical model with money, with one exception: *the labor market can be in a situation of disequilibrium, and does not have to clear.* In other words, firms can freely choose employment at the same prevailing nominal wage W . Goods market and loanable funds must be in equilibrium.

In addition:

- There is no government (G and T are both zero)
- Savings depend on disposable income $Y-T$, and are a fraction $s=0.1$ of disposable income $Y-T$, (where Y is output).
- Investment is a function of interest rate, and is given by the following equation $I = 50 - 100i$ (here we directly use nominal interest rate assuming that inflationary expectations are zero and real and nominal interest rate are equal!)

- a. Fix the interest rate at the level of $i = 10\%$. Using loanable funds market equilibrium, calculate real GDP, Y .

Your answer:

- b. Check if for the values from point **a** above the good market is in equilibrium. (Goods market equilibrium condition says $Y=C+I+G$)

Your answer:

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- c. Fix the interest rate at the level of 20%. Redo calculation that you did in point **a** and **b** above.

Your answer:

- d. In the long-run equilibrium (i.e. when labor market clears), output in this economy is $Y=400$. Given this information, in which case (a-b or c above) the economy is in the long-run equilibrium, and in which it is below this level?

Your answer:

- e. In which case (a-b or c above) you would expect unemployment in the labor market to be larger (HINT: think about employment L , and then figure out what it must imply about unemployment.)

Your answer:

Problem 4 (Derive the equation for AD curve and plot it)

The economy of *Lukasia* is described by the following equations:

Money demand $M^d = P + 2Y - 100i$

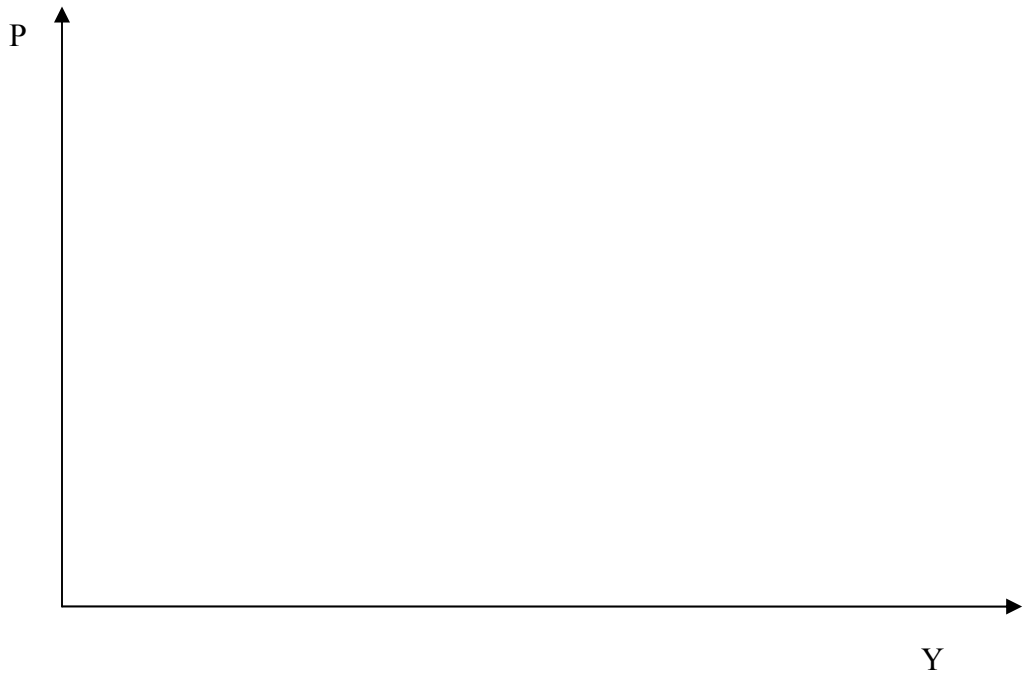
Money supply $M^s = 50$

Saving rate $s = .2$

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Demand for Investment $I=100-100i$
(There is no government in *Lukasia*, i.e. $G=T=0$)
a. Derive the equation and plot the AD curve.

Your answer:



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- b. Suppose money supply increases to 20. Derive and plot the new AD curve on the same graph.
- c. Suppose investment function changes to $I=120-100i$. Derive and plot the new AD curve on the same graph.

Problem 5 (Classical Model with Money)

Assume that output in long-run equilibrium of the classical model is 100 and the real interest rate pinned down by the loanable funds market is 10%.

- a. Assuming that people expect a 10% inflation in this period, calculate the nominal interest rate

Your answer:

- b. Given that money supply is 100, and money demand equation is given by $M^d = 2P - 100i + Y$ (i is nominal interest rate), compute the equilibrium price level P .

Your answer:

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Problem 6

For each of the following statements, circle T if the statement is true or F if the statement is false.

- T F When there is an excess supply of money in the economy, there is also an excess supply of bonds
- T F A rise in the interest rate causes the money demand curve to shift leftward
- T F All else equal, if the price level goes up, then the money demand curve shifts to the right and interest rate falls
- T F The currency circulating in the United States is an example of fiat money, because bills and coins have no intrinsic value, and serve as means of payment by government declaration.
- T F If banks increase their holdings of excess reserves as the money supply expands, the demand deposit multiplier will be larger than $1/RRR$.
- T F An important function of the Fed is to supervise and regulate commercial banks.
- T F The liquidity of an asset is the ease at which it can be converted to cash.
- T F Open market operation is the most popular instrument to conduct monetary policy right now in the US.
- T F Less liquid assets will in general pay higher return than more liquid assets, as they can not be that easily used to make payments and thus need to compensate for it in order for people to hold them.

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Problem 7 (TEST)

Circle the letter in front of the single best answer.

1. Which of the following assets is the most liquid?
 - a. Checking account funds
 - b. Government bonds
 - c. Money market funds
 - d. Real estate
 - e. Rare stamps

2. If the required reserve ratio is 0.10, and a bank has \$10 million in customer demand deposits, then its required reserves are
 - a. \$100,000
 - b. \$90,000
 - c. 1 million
 - d. 9 million
 - e. 10 million

3. When a bank makes a loan, the bank's balance sheet will immediately show
 - a. an increase in both assets and liabilities
 - b. a decrease in both assets and liabilities
 - c. an increase in assets and a decrease in liabilities
 - d. an increase and a decrease in assets
 - e. an increase and a decrease in liabilities

4. Which of the following would tend to increase the US money supply?
 - a. An increase in the discount rate
 - b. A decrease in the required reserve ratio
 - c. A sale of government bonds by the FOMC
 - d. All of the above
 - e. None of the above

5. Which of the following items would not be listed on a bank's balance sheet?
 - a. The bank's net worth
 - b. Property and building that the bank owns
 - c. Loans the bank has made to others
 - d. Government bonds in the bank's possession
 - e. The bank's income during the year