The Money Supply Process
ECON 4673
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Answers

1. *Use T-accounts to show how balance sheets (assets and liabilities) of the Federal Reserve, the banks, and the public change after each of the following events. You should assume the reserves-to-deposits ratio is 10%.*

   a. *A person gets a $25,000 loan from a bank with the intention of buying an automobile.*

The Banks

Assets		Liabilities/Equity	
Loans	+ $25,000		
Total reserves	– $25,000		

The Public

Assets		Liabilities/Equity	
Currency outside banks	+ $25,000	Loans	+ $25,000

   This action does not impact the Federal Reserve's balance sheet.

   b. *A person deposits $400 into his/her checking account at a local bank.*

The Banks

Assets		Liabilities/Equity	
Total reserves	+ $400	Checking accounts	+ $400

The Public

Assets		Liabilities/Equity	
Checking accounts	+ $400		
Currency outside banks	– $400		

   This action does not impact the Federal Reserve's balance sheet.

   c. *The Fed provides an emergency loan to a bank for $1,000,000.*

The Banks

Assets		Liabilities/Equity	
Total reserves	+ $1,000,000	Borrowings (from the Fed)	+ $1,000,000

The Fed

Assets		Liabilities/Equity	
Loans to banks	+ $1,000,000	Total reserves	+ $1,000,000

This action does not impact the public's balance sheet.

d. *The Federal Reserve sells $250,000 in securities to Citibank.*

The Banks

Assets		Liabilities/Equity	
Securities	+ $250,000		
Total reserves	– $250,000		

The Fed

Assets		Liabilities/Equity	
Securities	– $250,000	Total Reserves	– $250,000

This action does not impact the public's balance sheet.

e. *First National Bank borrows $500,000 in overnight loans from Bank of America.*

The balance sheets of the Federal Reserve, the public, and banks as a whole are unaffected. The balance sheets of First National Bank and Bank of America, however, will change because of the loan.

2. *If a bank depositor withdraws $1,000 of from his checking account, what happens to total reserves, checkable deposits, currency outside of banks, and the monetary base?*

Total reserves and checking deposits will both decrease by $1,000 while currency outside of banks will increase by $1,000. Since currency outside of banks rises by the same amount that total reserves decline, the monetary base will be unchanged.

3. *Evaluate the following statement: "The Federal Reserve can perfectly control the size of the money supply."*

The Fed explicitly sets the required reserves ratio and can control the size of nonborrowed reserves fairly precisely through open market operations. On the other hand, banks determine how much reserves that they borrow from the Fed. Banks also select the amount of excess reserves they hold which impacts the excess reserves-to-deposits ratio. Furthermore, individuals decide how much currency they want to hold which affects the currency-to-deposits ratio. Thus, the Fed does not have complete control over the level of the money supply.

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4. *What effect might a financial panic have on the money multiplier and the money supply? Why? You may assume the monetary base is held constant.*

A financial panic would likely cause a decline in the money multiplier and the money supply, holding the monetary base constant. In a financial panic, banks usually want to make few loans (deleverage) so they can raise their leverage ratio. As a result, the excess reserves-to-deposits ratio would increase. In addition, depositors may get worried about the solvency of their banks and respond by withdrawing some of their checking deposits, which would raise

the currency-to-deposits ratio. Both the higher excess reserves-to-deposits ratio and higher currency-to-deposits ratio would reduce the money multiplier and the money supply.

5. *Suppose the Federal Reserve buys $1 million of bonds from First National Bank. If it is common practice for banks to hold 20% of any deposit is held as reserves, what is the total increase in money supply? You can assume the currency-to-deposits ratio is 0.*

$$\Delta M^S = [(1 + c)/(rr + c)] \times M^B$$
$$\Delta M^S = [(1 + 0)/(0.2 + 0)] \times \$1{,}000{,}000$$
$$\Delta M^S = [1/0.2] \times \$1{,}000{,}000$$
$$\Delta M^S = 5 \times \$1{,}000{,}000$$
$$\Delta M^S = \$5{,}000{,}000$$

6. *Suppose that currency outside of banks is $500 billion, the amount of checkable deposits is $1,000 billion, and the reserves-to-deposits ratio is 10%.*

   a. *Calculate the money supply, the amount of total reserves, the currency-to-deposits ratio, and the money multiplier.*

$$M^S = CU + ChD$$
$$M^S = \$500 \text{ billion} + \$1{,}000 \text{ billion}$$
$$M^S = \$1.5 \text{ Trillion};$$

$$TR = rr \times ChD$$
$$TR = 0.10 \times 1{,}000 \text{ billion}$$
$$TR = \$100 \text{ billion}$$

$$c = CU/ChD$$
$$c = 500 \text{ billion}/1{,}000 \text{ billion}$$
$$c = 0.50$$

$$m = (1 + c)/(rr + c)$$
$$m = 1.5/0.6$$
$$m = 2.5$$

   b. *Using the information in part (a), calculate the size of the monetary base.*

$$\$1{,}500 \text{ billion} = 2.5 \times M^B$$
$$M^B = \$1{,}500/2.5$$
$$M^B = \$600 \text{ billion}$$