

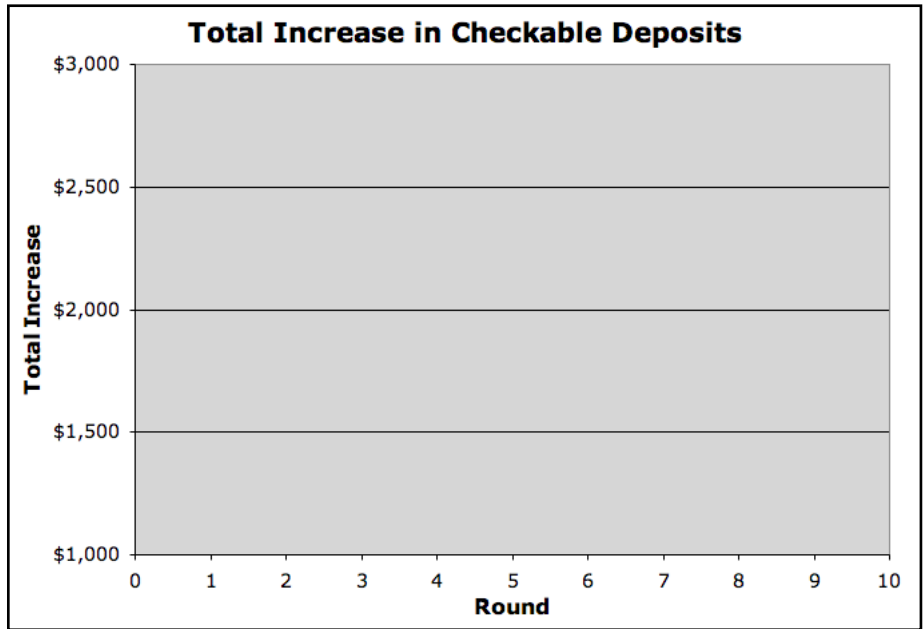
# The Money Multiplier

## Class Activity

### ANALYZING THE FORMULA

We have learned the money multiplier is equal to the reciprocal of the reserve ratio. But how do we know this is true? The following problem illustrates the answer. Suppose a bank has \$1,000 in excess reserves and a reserve ratio of 40%. Assume no money is held as currency in circulation and all excess reserves are loaned out. Calculate the increase to the money supply each round in the middle column. Then in the right-hand column, keep a running total of how much money has been created. Graph these data points using “Round” on the x-axis and “Total Increase” on the y-axis. Use this information to answer the questions.

Round	Increase per Round	Total Increase
0	\$1,000	\$1,000
1	\$600	\$1,600
2		
3		
4	\$129.60	
5		
6		\$2,430.02
7		
8		
9		
10		



- 1) What dollar amount does the graph seem to be approaching as the rounds get bigger?
- 2) What is the money multiplier when the reserve ratio is 40%? Use the following formula:  $m = 1 / rr$
- 3) What is the total increase in checkable deposits when excess reserves are \$1,000 and the reserve ratio is 40%? Use the following formula:  $\Delta CD = \Delta ER / rr$  (or use  $\Delta CD = \Delta ER \times m$ )

PRACTICE PROBLEMS

**Money Multiplier Formula**

- 4) Use these reserve ratio values to calculate the money multiplier. The formula is:  $m = 1 / rr$
- a)  $rr = 10\%$
  - b)  $rr = 20\%$
  - c)  $rr = 25\%$
  - d)  $rr = 5\%$

**Change in Checkable Deposits (using  $m$ )**

- 5) Use the following  $m$  values to calculate the change in checkable deposits. The formula is:  $\Delta CD = \Delta ER \times m$
- a)  $m = 4$  and  $\Delta ER = \$800$
  - b)  $m = 3.5$  and  $\Delta ER = -\$500$
  - c)  $m = 2.5$  and  $\Delta ER = \$2,000$

**Change in Checkable Deposits (using  $rr$ )**

- 6) Use the following  $rr$  values to calculate the change in checkable deposits. The formula is:  $\Delta CD = \Delta ER / rr$
- a)  $rr = 15\%$  and  $\Delta ER = \$600$
  - b)  $rr = 50\%$  and  $\Delta ER = -\$400$
  - c)  $rr = 5\%$  and  $\Delta ER = \$50$

**Money Supply and Monetary Base**

7) Suppose the U.S. economy has money in the forms listed on this table. Use this information to answer the following questions.

- a) What is the total amount of the M1 money supply? (These are the items available for spending.)
- b) What is the total amount of the monetary base? (These are the items controlled by the authorities.)
- c) What is the actual money multiplier in this scenario? (The formula is:  $m = \text{money supply} / \text{monetary base}$ )

Type of Money	Amount
Currency in Circulation	\$1,200 million
Bank Reserves at the Federal Reserve	\$500 million
Checkable Deposits	\$2,000 million
Currency in Bank Vaults	\$800 million
Traveler's Checks	\$50 million