

I. How Commercial Banks Create Money

A. Fractional Reserve Banking

B. Definitions

1. Required Reserves (RR)
2. Required Reserves Ratio (RRR)
3. Excess Reserves (ER)

C. Assumptions

1. No Cash Drain
2. No Excess Reserves

D. An example

E. A General Relationship

Ia) Fractional Reserves - commercial banks hold reserves which are some fraction of the banks' demand deposit liabilities.
checking accounts

B. Definitions

1. (legally) Required Reserves (RR) - these reserves that the Fed (central bank) legally requires commercial banks to hold.

Required Reserves = Vault Cash + Reserve Money Deposited with the District Federal Reserve Bank.

2. Required Reserves Ratio (RRR)

= fraction of demand deposit (checking account) liabilities that commercial banks are legally required to hold.

$$RRR = \frac{\text{Required Reserves (RR)} (\$)}{\text{Demand Deposit Liabilities}} = \frac{RR}{DD}$$

for calculating purposes:

$$RR = \underbrace{DD}_{\text{from their banks}} \cdot \underbrace{RRR}_{\text{from the Fed}}$$

3. Excess Reserves (ER) = Any reserves commercial banks hold in excess of the legally required reserves.

$$ER = \text{Total Reserves} \leftarrow \text{minus} \rightarrow \text{Required Reserves (RR)}$$

ER are the only funds commercial banks can legally lend. (to earn interest income)

C. Assumptions

1. No Cash Drain - Public holds just the amount of currency (cash) that it wants; if additional money becomes available, it will be held as a demand deposit

i.e. in a checking account

2. ~~Commercial banks~~ Commercial banks hold zero excess reserves
i.e. these banks loan all excess reserves to earn interest on loans.

3. Assume Required Reserve Ratio = 20%

D. An example

Suppose \$100 (currency) is deposited in a commercial bank.

Round 1

Reserves in the commercial bank increase by \$100, and the bank's Demand Deposit Liabilities increase by \$100,

Balance Sheet:

First Generation Bank	
Assets	Liabilities
Reserves + \$100	Demand Deposit + \$100

but only \$20 must legally be held in reserves, so Total Reserves + \$100 \leftarrow minus \rightarrow required reserves + \$20 = Excess reserves + \$80

Round 2

\$60 Loan is made by the First Generation Bank

Assets	Liabilities
Reserves + \$100	Demand Deposit + \$100
Loan + \$80	+\$80

Money? YES
if people will accept the checks

When the initial Borrower writes an \$80 check which is deposited in Second Generation Bank which demands payment from the First Generation Bank in the form of currency.

Second Generation Bank

Assets	Liabilities
Reserves + \$80	Demand Deposits + \$80
Loan + \$64	+ \$64

only \$16 in RR

$$ER = TR_{Reserves} - RR \\ = +80 - 16 = \$64$$

Change in M^b

	+ \$100	initial deposit
Round 1	+ \$80	Loan
Round 2	+ \$64	Loan

E. General Relationship

Maximum Potential Change in the money Supply

\$500

Change in total reserves in the Commercial banking system

= \$100

x $\frac{1}{RRR}$

x $\frac{1}{20\%}$

the Fed "controls" by selling and buying bonds

Assuming: 1. no cash drain
2. All excess reserves are loaned