

Money

1. Why do we have money? There are three basic functions that money serves

a) Medium of exchange

- allows for the specialization of workers. They receive money wages to buy goods needed rather than produce their own goods.
- avoids the problem of the double coincidence of wants. In a society with barter you must find someone who has what you desire and wants what you have produced.

b) Accounting Unit: allows valuation and pricing in a common unit

c) store of value: in barter, need to store goods which could perish or lose value. e.g. light blue leisure suit with polyester floral print shirt. With money one can store value over time.

Advantages of money

highly liquid as compared to stocks and bonds.

Disadvantages of money

Loses value during inflationary periods or episodes.

Different Types of Money

a) Commodity Money has value as a commodity such as rice, cattle, seashells, copper, stones, cigarettes as used in the POW camps of WWII.

problems

- when valuable resources are used as money, those resources cannot be used for consumption. Copper used to make pennies cannot be used to make electrical wire.
- There exists an incentive to debase the currency. Rulers would reduce the amount of the precious metal in a coin. People would tend to circulate the altered coins and save the coins which still had the greater amount of the precious metal. This is known as Gresham's law: bad money drives out good.
- The supply of money is determined by supply of the commodity. The money supply could fluctuate substantially. The discovery of new gold would mean that the supply of money would increase and the price level would rise.

b) Fiat Money (has nothing to do with an Italian sports car) very little value as a commodity money because the public accepts it as money (not necessarily because the government declares it as money) People accept it because they believe that everyone else will accept it. This is very different from a "fully backed" currency that is a currency that is backed by some commodity like gold or silver. For example in the early part of this century the US still had silver dollar notes. If one wanted one could take the note to the treasury and demand the silver which was held since the inception of the note as a form of its backing.

advantages of fiat money

- uses relatively little of society's resources
- no incentive to debase this type of currency
- supply not tied to commodity. Therefore it potentially has less susceptibility to lead to fluctuation in the money supply. It can grow with the economy.

problem

- government controls money supply and it may cause inflation by printing too much money

Bank Money: checks backed by a bank account.

in the US we have Fiat and Bank Money

### Money Supply Definitions

Most liquid M1 = currency held by the public (not including the banks) 25%  
+ demand deposits (non-interest checking accounts) >74%  
+ other checkable deposits (interest bearing checking)  
+traveller's checks 1%

Less liquid M2 = M1  
+ savings deposits  
+ money market mutual fund share, deposits  
+ small time deposits (<\$100,000)  
+ other

Least liquid M3 = M2  
+ large time deposits (>\$100,000)

We usually refer to M1 as the money supply.

Credit cards are not money-they are short-term loans which must be paid off using money.

### Banking System

Private institutions: banks, S and L's, credit unions, etc. (will refer to these as banks)

Central Bank (Federal Reserve): Board + Regional Banks

- oversees banking system
- independent of congressional and the executive branches.

Bank Balance Sheet	
Assets	Liabilities
vault cash	deposits
reserves at the Federal Reserve	borrowing
loans	
securities and other	net worth
total assets	total liabilities
	=

Bank Balance Sheet		
Assets		Liabilities
vault cash		deposits
reserves at the Federal Reserve		borrowing
loans		net worth
securities and other		total liabilities
total assets	=	

Bank assets consist of IOU's: loans to persons and firms, government bonds, deposits with other banks, liabilities consist of deposits customers have made - demand deposits, savings deposits, and time deposits

bank reserves: vault cash plus reserves at the Fed (which earn no interest)

banks do not have enough reserves to cover all deposits (hence that is why our system is referred to as a "fractional reserve system"). Usually banks only hold enough to meet required reserves.

banks use excess reserves to make loans which earn interest.

When a bank's net worth is  $>0$  then it is solvent; when net worth is  $<0$  it is insolvent.

Federal Reserve Treasury Bills: T-bills 3 months, 6 months, 1 year sometimes 30 years maturity: pays face value when the note matures.

Federal Reserve Balance Sheet		
Assets		Liabilities
securities		Federal reserve notes
loans		reserves on deposit
other		other
		net worth
total assets	=	liabilities + net worth

The net worth of the Fed is very large.

### Functions of the Federal Reserve

- 1) Oversee the banking system
- 2) control the money supply (imperfectly)
- 3) lender of resort

Reserve requirements: rules stating banks must keep on hand reserves to back deposits

required reserve ratio: amount of reserves required for each dollar of deposits  
banks borrow from the Fed at the discount window via discount rate thus the Fed can encourage or discourage bank borrowing by raising or lowering the discount rate.

Money and Banking, continued

Fed's influence on the money supply

Money Supply = currency held by the public + demand deposits

Money Supply = monetary base x money multiplier

Monetary base = currency held by the public + bank reserves

where bank reserves = vault cash + reserves at the Fed.

The Fed directly controls the monetary base and indirectly controls the money supply.

- determines the amount of currency
- sets reserve requirement which determines the amount of reserves that a bank must hold with the Fed.

Money multiplier tells how much the monetary base expands to create the money supply.

$$\text{money multiplier} \quad \text{deposit expansion multiplier} = \frac{1}{\text{required reserve ratio}}$$

$$\text{required reserve requirements} = rr = \frac{\text{reserves at bank}}{\text{total deposits}}$$

money multiplier < deposit expansion multiplier if

- 1) public holds currency
- 2) banks hold excess reserves

Examples

assume:

- 1) only one private bank
- 2) public holds no currency (all in demand deposits)
- 3) banks keep no excess reserves

here,

let the reserve requirement = 10%

this implies that the money multiplier = the deposit expansion multiplier = 1/.10=10

money supply = demand deposits (assumption 2)  
 monetary base= bank reserves (assumption 2)

A. Suppose, initially, that banks required to hold all deposits in reserves, then

Assets		Liabilities
MB=reserves	1,000.00	MS = d.d.
		1,000.00

money supply (MS) = 1,000  
 monetary base (MB) = 1,000

Assets		Liabilities	
reserves	1,000	d.d.	10,000
loans	9,000		
	10,000		10,000

$$MS = MB \times mm$$

$$d.d. = MS$$

$$MS = 1,000 \frac{1}{.10} = 10,000$$

there are 1,000 in reserves, which means that we can have demand deposits of up to 10,000. Banks create new demand deposits of \$9,000 by making loans of \$9,000.

The bank lends out \$9,000 which is eventually redeposited as \$9,000 in demand deposits.

money supply = 10,000  
 monetary base = 1,000 (here we assume that the currency held by the public and bank reserves are zero)

### How Does the Fed Influence the Money Supply?

1) change reserve requirements which changes the money multiplier. For example, by increasing the required reserve ratio, the money multiplier must fall. That is the total amount by which a dollar deposited in the bank can expand must fall if the percentage of each \$ deposited in the bank that must be held in the form of reserves rises.

$$rr \quad mm$$

2) change discount rate-the rate paid by banks on loans taken out from the Fed. The bank may need a loan to meet the reserve requirement.

Increasing the discount rate encourages the banks to hold excess reserves so as not to need loans from the Fed.

Increasing excess reserves will reduce the money multiplier

$$excess\ reserves \quad mm$$

The Fed uses this tool occasionally sometimes as a signal for overall Fed policy

Note: banks can borrow from other banks to cover reserve requirements (Federal Funds Rate)

3) Open Market Operations-sale/purchase of government bonds on secondary market-most important tool on day to day basis

Example  $rr = 10\%$  so  $mm = 10$   
 $MS = dd \times mm$   
 $MS = dd \times mm = \$1,000 \times 10 = \$10,000$

Assets		Liabilities
reserves	\$1,000	dd
loans	\$9,000	\$10,000
	\$10,000	\$10,000

money supply = \$10,000  
monetary base = \$1,000

$MS = dd$   
 $MB = \text{Bank Reserves}$

- 1) Suppose Fed buys \$1,000 bond. Person gives bond to the Fed, gets check from the Fed for \$1,000
- 2) Person deposits check to bank.

Assets		Liabilities
reserves	\$2,000	dd
loans	\$9,000	\$11,000
	\$11,000	\$11,000

3) But since  $rr = 10\%$ , bank has excess reserves, could cover \$20,000 in demand deposits. This will make loans of \$9,000

Assets		Liabilities
reserves	\$2,000	dd
loans	\$18,000	\$20,000
	\$20,000	\$20,000

money supply = \$20,000 (an increase of \$10,000)

recall that  $MS = dd = MB \times mm = \text{reserves} \times 10 = \$2,000 \times 10 = \$20,000$

Summary: Fed buys bonds from the public which increases reserves held by the banks. This excess reserves are then loaned back to the public, increasing  $dd$  and the money supply.

Since  $MS = MB \times mm$ , then  $MS = MB \times mm$ .

$$MS = \$1,000 \times 10 = \$10,000$$

monetary base rises by an amount of the bond.

money supply rises by  $MB \times mm$

if public holds currency, banks hold excess reserves means that  $mm$  less which means that the money supply expansion is less.

Monetizing the Debt- Fed buys new Treasury issues and holds them. This amounts to increasing the money supply by that amount of the debt.

Example  $rr=10\%$

Assets	Liabilities
reserves \$2,000	dd \$20,000
loans \$18,000	
\$20,000	\$20,000

money supply = \$20,000

- 1) Fed sells the bond for \$500 which means that the person gets the bond and gives the Fed a check for \$500
- 2) This means that the bank reserves and demand deposits fall by \$500

Assets	Liabilities
reserves \$1,500	dd \$19,500
loans \$18,000	
\$19,500	\$19,500

The bank pays the Fed out of reserves. Total assets declined by \$500 and total liabilities declined by \$500. Thus net worth is the same.

MS = dd  
MB = reserves

$$(1500)(10) = 15000 < MS = 19,500$$

- 3) with  $rr = 10\%$ , 1500 in reserves can support only 15,000 in dd which means that the bank needs to get more reserves.
- 4) in short-run, bank borrows to cover reserves in long-run, decrease amount of loans outstanding by \$4,500.

Assets	Liabilities
reserves \$1,500	dd \$15,000
loans \$13,500	
\$15,000	\$15,000

$$\text{money supply} = \$15,000 \left( \begin{array}{l} \\ \$5,000 \end{array} \right)$$

$$\text{monetary base} = \$1,500 \left( \begin{array}{l} \\ \$500 \end{array} \right)$$

$$\begin{aligned} MS &= MB \times mm \\ &= -\$500 \times 10 \\ &= -\$5,000 \end{aligned}$$

## Money and Banking continued

Government insurance of safety and the soundness of the banking system

late 1980's- many banks failed during panics as runs on banks are a serious problem with a fractional reserve system

runs are self-fulfilling-people think that a bank is in trouble and then withdraw all of their money resulting in the failure of the bank.

Who Do You Trust Savings and Loan		
Assets		Liabilities
reserves	\$50,000	deposits \$1,000,000
loans	\$950,000	
other assets	\$100,000	net worth \$100,000
	\$1,100,000	\$1,100,000

Suppose a run starts on our S and L and \$25,000 is withdrawn

deposits and reserves fall by \$25,000 which means that the bank is not meeting its reserve requirement. The bank must find additional money by the end of the day. The bank will obtain additional funds by borrowing.

if the bank closes, the public becomes insecure about the status of other banks which could cause more bank runs.

Government Policies fairly successful

- 1) Supervision and regulation to:
  - a) encourage banks to be prudent lenders
  - b) encourage honest bookkeeping-properly value assets
  - c) establish adequate level of net worth-capital requirements
- 2) Federal Reserve set up in 1913
  - a) lender of last resort-prior to 1913, banks had no such lender of last resort. Banks would fail if other banks wouldn't lend.
- 3) Deposit insurance established in 1934

Problems of 1980's-most failures since 1930's

- 1) many bad loans in 1980's-especially energy-related, farm-related third-world loans

bad loans mean that there is a decrease in asset values and a fall of net worth

- 2) increase in fraudulent management-problems in Ohio and Maryland where state-regulated S and L's were mismanaged.

1980s S and L Crisis:

- in 1960's and 1970's all S and L loans were for residential mortgages (long-term fixed rates) also, deposits limited to %5 interest rate ceiling
- in late 1970's, interest rates rose dramatically

- since S and L's has interest limits, depositors withdrew \$ means banks had to borrow to meet reserve requirements and pay high interest rates
- but loans were still earning very low rates of return which compounded the problem.
- By the 1980's some of the Sand L's already in trouble
- in the 1980's bank deregulation
  1. lifted interest rate ceilings on deposits
  2. allowed S and L to make loans to businesses
- S and L's offered high rates on deposits to attract them and made risky loans to get high rates of return

Who Do You Trust Savings and Loan		
Assets		Liabilities
reserves	\$50,000	deposits \$1,000,000
(good) loans	\$500,000	
other assets	\$100,000	net worth -\$350,000
	\$650,000	\$650,000

Who Do You Trust S and L is insolvent due to bad loans of \$450,000

in addition, Congress changed accounting laws which allowed insolvent banks to operate which made them more inclined to make bad loans

If an S and L is closed down after the sell off of the assets, most often they still had to get government money to pay off depositors.