

## Macro Unit 4: Lesson 1

Money has been around forever.

Barter system: Problem with Barter system is **double coincidence of wants**. You have to want what I have and vice versa. We would have to spend time searching for others to trade with. Huge waste of time!

Functions of Money:

- 1) Medium of Exchange: It must be able to be used to buy goods and services.  
That way I do not have to trade Bonsai for hamburgers.
- 2) Measure of Value: It must be capable of being a measurement as to the relative worth of a good or service.  
Which is worth more a Bonsai or a hamburger?
- 3) Store of Value: You can hold it without worrying about it spoiling.

Three definitions of money

$$M1 = \text{Currency} + \text{Checkable Deposits}$$

Currency: Coins and Paper Money

Coins are token money because the value of the metal is not worth what the actual coins represents.

Paper money is actually Federal Reserve Notes.

plus

Checkable Deposits: (the largest component of M1 (It constitutes around 70%))

Checking accounts are a way of transferring money from one account to another. They can be easily converted into liquid cash.

\*\*\* Notice that M1 must be in the hands of individuals. Not in the hands of the treasury or the banks. This avoids double counting money. (Your money is in your checking account but it is yours. It is counted as part of yours. It is not counted as part of the banks money.)

$$M2 = M1 + \text{savings accounts} + \text{small time deposits} + \text{money market deposit accounts} + \text{money market mutual funds}$$

Savings accounts: you can readily convert this to cash. (Sometimes called near money)

Time deposits: money that can only be gotten when they mature. (C.D.'s of less than \$100,000...)

Money Market Deposit Accounts: you buy shares in a money market. This money is then used by the bank to make large loans. You get a larger rate of return.

Money Market Mutual Funds: This money is used to buy short-term securities such as T bills (treasury bills).

$$M3 = M1 + M2 + \text{large time deposits}$$

Large Time deposits: These are usually held by business.

For the most part M1 is a good definition of money. Other times we will use M2. Rarely will economist use M3 because it is so broad. No matter what the definition the models work.

Credit cards are not included because they do not represent money. Instead, they are short term loans from the creditor.

## Unit 4 Lesson 2, Day 1

### Equation of Exchange

$$MV = PQ$$

M = supply of money

V = velocity of money (number of times a year that a dollar is spent on final G & S.

P = price level (average price of each unit of output)

Q = physical volume of G & S produced.

MV is the amount spent by consumers This is the same as the total  $C + I + G + X_n$

PQ is the amount received by sellers. This is the same as nominal GDP (current output at current prices)

What happens if M changes? When M increases you have to look to see if the economy is in full capacity. If it is not then Q increase. If it is then P increases.

One argument about V is that it is determined by people's willingness to hold money in a non-interest-bearing form. If the interest rates go way up people are willing to hold less money. This means that the money they are holding must turn over quicker so V increases.

V is actually fairly stable.

Unit 4 Lesson 3 Days 2 and 3

**Balance Sheet:** a statement of assets and claims summarizing the financial position of a firm or bank at **some point in time.**

A balance sheet must always balance. Every asset is claimed by someone.

net worth: the claims of the owners against the firm's assets

liabilities: claims of the non-owners.

$$\text{Assets} = \text{net worth} + \text{liabilities}$$

In the beginning people would not want to carry around large sums of gold. They would therefore bring the gold to goldsmiths who would issue them receipts. Eventually people found it easier to trade receipts rather than gold. They knew that they could get the gold if they wanted to. The receipt was backed by gold.

Soon the goldsmiths saw that more gold was deposited than taken out. They decided to issue receipts that were not backed by gold. They did this in the form of loans.

The fractional reserve system of banking was started. Only a fraction of the receipts were covered with gold.

The goldsmiths created money. Today the same thing occurs. Banks make loans based on an amount that the Federal Reserve requires them to keep in reserve.

Let's start a bank:

We start by selling stock so that we can get cash. We will sell \$250,000.

The cash we get is an asset. Yet we owe people for that cash. This makes it a liability.

Assets	Liabilities and Net Worth
Cash 250,000	Capital Stock 250,000

We will now build a 220,000 dollar building and buy 20,000 in equipment. These are assets. Remember we must balance

Assets	Liabilities and Net Worth
Cash 10,000	Capital Stock 250,000
Property 240,000	

**To make this easier, let's ignore the previous transaction.**

As a bank we will make loans and accept deposits. Let's start by taking in \$100,000 in deposits

Assets		Liabilities and Net Worth	
Cash	350,000	Capital Stock	250,000
		Demand Deposits	100,000

In doing this the makeup of M1 has changed. Currency is down by 100,000 and Demand Deposits are up by \$100,000. By definition of M1 the money held by banks is not included in demand. This avoids double counting of money. Only when the people get the money back from the bank is the money counted.

We now have money in the form of deposits. In order to avoid the bank panics we are required to keep a legal reserve (reserve).

legal reserve (reserve): an amount of funds equal to a specified percentage of its own deposit liabilities which a member bank must keep on deposit with the Federal Reserve Bank in its district or as vault cash.

reserve ratio: this is the specified percentage of its demand liabilities, which the commercial bank must keep as reserves.

Reserve ratio = banks required reserves / banks demand-deposit liabilities.

EX: 10% = 10,000/100,000

From here on we will for simplicity reasons assume a rate of 20%.

Lets assume that the bank foresees many more deposits. They do not want to keep sending money so they are going to send not 20,000 but 110,000 up front. (Usually they will hold 1 to 2% in their vaults. This vault cash would be considered part of the reserves.)

Assets		Liabilities and Net Worth	
Cash	0	Capital Stock	250,000
Reserves	350,000	Demand Deposits	100,000

Notice the amount by which the banks actual reserves exceed its required reserves is called excess reserves.

actual reserves - required reserves = excess reserves.

110,000 - 20,000 = 90,000

\*\*\*\* It is very important that you understand this concept. You must be able to compute all of these numbers. It is the excess reserves that allow a bank to create money. \*\*\*\*

This is called the Fractional Reserve Banking System: A system in which depository institutions hold reserves that are less than the amount of total deposits.

The required reserves are not there for the banks to draw on if a run occurs. Instead the required reserves are there so that the Fed can control the amount of money the bank lends.

When the bank puts its reserves in the Fed what does this represent for the Fed? **a liability for the Fed.**

Lets look and see what happens if one of our banks customers writes a 50,000 dollar check. This check will go through another bank. This bank will credit the account of the person that our customer paid.

The other bank will now send the check to the Fed. (This actually happens electronically now.) The Fed will take this check and increase the other banks reserves by 50,000.

It will then take 50,000 out of our reserves. The check will then be sent to us. We will then take the money out of our customer's account (reducing our demand deposit by 50,000 and reduce our reserves by the 50,000.

\*\*\* A check drawn against a bank and deposited in another bank means a loss in both reserves and demand deposits. This also works in the opposite.

IF time, have students try it if the check is \$10,000.

Given the following balance sheet:

Assets		Liabilities and Net Worth	
Cash	0	Capital Stock	250,000
Reserves	300,000	Demand Deposits	50,000

Let's assume we want to make a loan equal to 50,000. We must first look and see if we can.  $.20 \times 50,000 = 10,000$ . This means we must have 10,000 in excess after making the loan. We will.

The bank will loan 50,000 and put it in the customers account.

Assets		Liabilities and Net Worth	
Cash	0	Capital Stock	250,000
Reserves	300,000	Demand Deposits	100,000
Loans	50,000		

\*\*\*\* When the bank loaned the money it has created 50,000 dollars of new money. The demand deposits are considered money. \*\*\*\*

Now lets see what happens when the 50,000 is paid by check to someone else. After the check clears the Fed our account will look like this.

Assets		Liabilities and Net Worth	
Cash	0	Capital Stock	250,000
Reserves	250,000	Demand Deposits	50,000
Loans	50,000		

The bank could not have loaned more than the 50,000. Any one bank can only loan an amount equal to the excess reserves. A single commercial bank in a multi-bank system can only lend an amount equal to its initial pre-loan excess reserves.

Have students try a \$270,000 loan. (Notice you can not do it.)

Have students try a \$10,000 loan.

Now let's see what happens when the loan is repaid by check. Assume a lump sum payment with no interest.

Assets		Liabilities and Net Worth	
Cash	0	Capital Stock	250,000
Reserves	250,000	Demand Deposits	0
Loans	0		

We now have a situation where money has been destroyed.

If he had paid in cash we would have 50,000 in cash and 50,000 in demand deposits. The money has still been destroyed because cash held by banks is not considered money.

If banks find their reserves to be low they can borrow from other banks reserves (the Federal funds market). This is temporary situation (overnight) and interest must be paid equal to the Federal funds rate.

## Multiple-Deposit Expansion

If one person deposits 100 in currency and another takes out a loan for 500 the money supply only increases by 400 because the original 100 was already M1 money.

We know that each individual bank can only loan money equal to its excess reserves. This means it can only create money equal to its excess reserves.

Yet when we combine all the banks we will see that they can create an amount in excess of their combined reserves.

- 1) assume that the reserve ration is 20%.
- 2) assume each bank exactly meets the reserve ratio.
- 3) assume all loans are made to one individual and that check is deposited in another bank.

No money is kept out. It is all left in the bank.

Start with 100 found by someone. They deposit it in bank A.

Deposit	Loans (Money Created)
100	80
80	64
64	51.20
51.20	40.96
40.96	32.77
32.77	26.21
.	.
.	.
.	.
<b>Total is \$500</b>	<b>Total is \$400</b>

We find that the initial 80 dollars in reserves produced 400 dollars in new money. That is a multiple of 5.

Remember the Keynesian Multiplier:  $1/1-MPC$ . also  $1/MPS$ .

**Money Multiplier (m) = 1/ Required Reserve Ration (R)**

$m = 1/R$  tells us the amount of **new money generated** by the acquisition of new reserves. (NOT NEW DEPOSITS)

In this case  $m = 1/.20 = 5$

We can now calculate the Maximum demand-deposit expansion (D)

$D = \text{excess reserves (E)} \times \text{monetary multiplier (m)}$

$D = E \times m$

$5 \times 80 = 400$  (**NOT 5x 100**)

How much of the initial money will go to required reserves? (.20) How much to Excess Reserves? (Required Reserves x multiplier)

### Leakages:

1) Currency Drain: borrower may request part of payment in cash. Currency in circulation is outside the banking system and cannot be held by banks as reserves from which to make loans. The greater the amount of cash leakage, the smaller is the actual deposit expansion multiplier.

2) Excess reserves: Since depository institutions keep some excess reserves, deposits do not increase as much as they could. The greater the excess reserves, the smaller the actual deposit expansion multiplier. If a bank does hold money in excess you just add the percentage to R. This will get the new multiplier

3) Real World Money Multipliers: Because of leakages, actual deposit multipliers are smaller than the maximum possible. The reserve requirement on transactions deposits is currently around 10 percent implying a potential deposit expansion multiplier of about 10. The actual M1 multiplier is between 2.5 and 3.0. The actual M2 multiplier has ranged from 6.5 in the 1960's to over 12 in the 1990's

Allow students to get this from the reading on their own.  
The U.S. Financial System:

Due to the importance of controlling the money supply our banking system is regulated. You can not just go out and create a bank.

Board of Governors: seven members appointed by the President and confirmed by the senate. They are in term for 14 years. A new one is appointed every two years.

They control the operation of the money and banking system of the nation.

Federal Open Market Committee: part of the Board of Governors. It is made up of seven members of the Board plus five of the presidents of the Federal Reserve Banks.

They are in charge of the purchase and sale of government bonds in the open market. This is an important monetary control. It will be discussed later.

Federal Advisory Council: also part of the Board of Governors. It has 12 commercial bankers. They are each selected by one of the local Federal Reserve Banks.

They are advisory to the Board. They hold no power.

There are 12 Federal Reserve Banks in the nation. They have three characteristics.

1) Central Banks: We have 12 Central Banks. This balances out the size of the nation and the political problems (some want it to be totally decentralized and some want it to be totally centralized.)

2) Quasi-Public Banks: These banks are like being partly government owned and part privately owned. Member banks are required to buy stock in the Fed. Reserve banks. This gives them part ownership. Even though the banks own the Fed Reserve Banks they have no control over them.

The Fed. Reserve Banks have no profit motive. Their only role is to provide for the well being of the economy.

3) Bankers Banks: They perform banking functions for their member banks. They accept deposits and make loans to the member banks. In addition to this they issue currency.



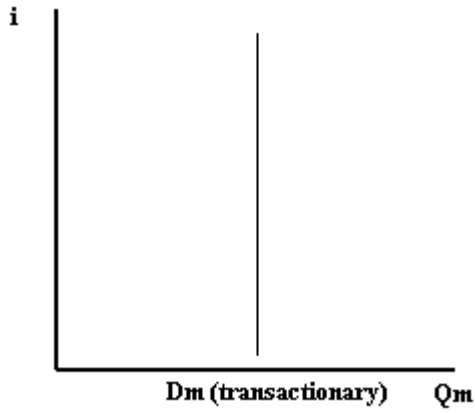
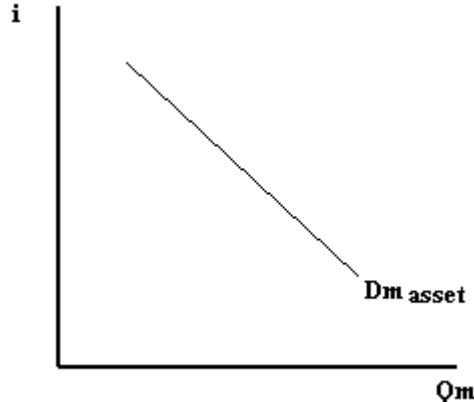
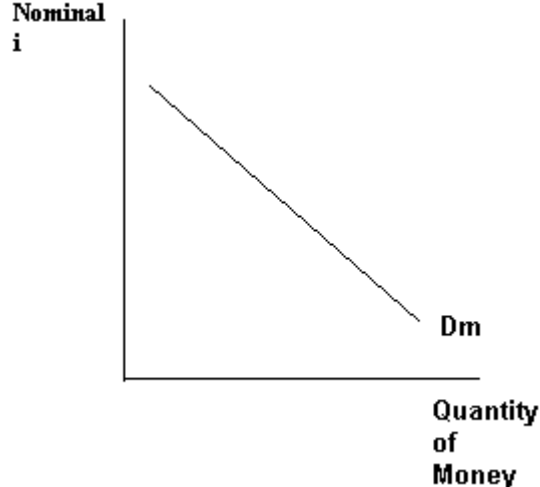
Commercial Banks: state banks (operated under a state charter) and national banks (operate under charter from the Federal government).

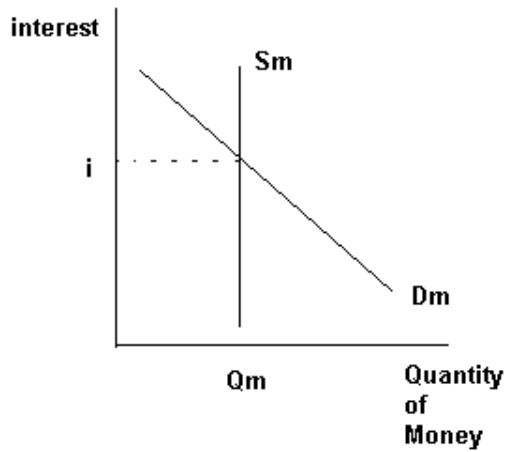
Thrift Institutions: They are not regulated directly by the Fed. Yet they still must maintain a reserve with the Fed and they can still get loans from the Fed.

#### Functions of the Federal Reserve System (Fed)

- 1) Supplies the Economy with Fiduciary Currency: The Fed issues paper currency in the form of Federal Reserve notes
- 2) Provides a system for check collection and clearing: It provides means by which a check written on an account at one bank and deposited in another bank can be cleared
- 3) Holds Depository Institution Reserves: Vault cash and deposits at the Federal Reserve Banks
- 4) Acts as the Government's Fiscal Agent: The Fed maintains the U.S. Treasury's checking account. The Fed also helps the government collect tax revenues and aids in the purchase and sale of government securities.
- 5) Supervises Member Banks: The Fed is one of the regulators of member banks.
- 6) Acts as a "Lender of Last Resort": The Fed stands ready to "bail out" any part of a banking system that is in trouble and those depository institutions it has decided should not fail.
- 7) Regulates the Money Supply: The Fed's most important function is to control the amount of money in the economy.

Unit 4 Lesson 4 Part 1  
Demand for money

	<p><b>Dt: transaction demand:</b> we need money to make day to day purchases (transactions). The larger the nominal GDP (total value of G &amp; S in the economy) the larger the Dt. For simplification purposes we must assume that Dt is independent of interest rates. Therefore the Dt is a vertical line.</p>
	<p><b>Da: asset demand:</b> When money is not being held it can be put into interest earning accounts. The money that is held is Da. Notice the Da is inversely related to interest rates. When the interest rates increase the opportunity cost of holding money is too great so people will put their money in investments.</p> <p>i is nominal not real</p>
	<p><math>D_m = D_t + D_a</math></p>



When you add in the vertical supply of money to the Dm you can get equilibrium. (Sm is vertical because the supply should be constant at interest rates

ON THIS GRAPH THE INTEREST RATE WE ARE DEALING WITH IS NOMINAL INTEREST RATE NOT REAL.)

Unit 4, Lesson 4 Part 2  
Tools of Monetary Policy

**Monetary Policy:** goal is to assist the economy in achieving a full-employment, non inflationary level of total output.

This means using the money supply to stabilize aggregate output, employment and price level.

Three major instruments of monetary policy.

**1) Open Market Operations:** This is the buying and selling of securities. This is the most important control of the Fed.

When the Fed buys securities from banks it directly increases the reserves of the commercial banks.

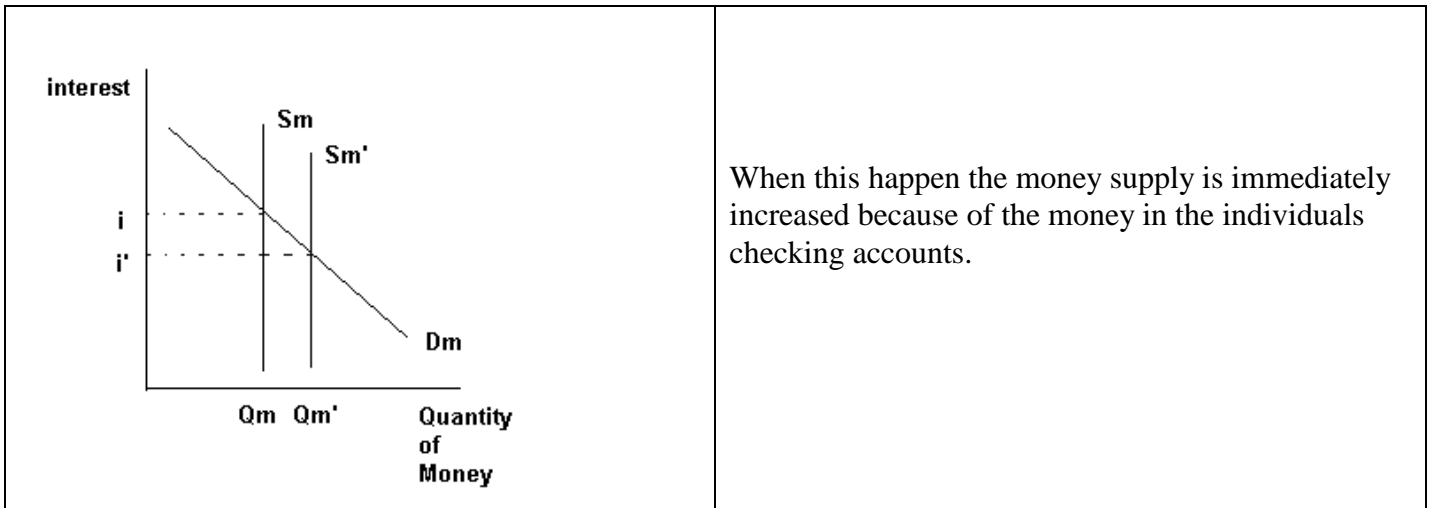
If they buy from individuals, the individuals end up putting the money in their banks which increases the bank reserves.

If the Fed purchases securities from the public:

- a. Individual (Bob) sells securities and is given a check drawn on the Fed's account.
- b. Individual (Bob) deposits check in his account.
- c. Bank send check to Fed and Fed increases banks reserves.

\*\*\* This will increase the lending ability of the member banks. \*\*\*

When banks purchase securities from the government it is just like making a loan to them. In doing so they are creating money.



One advantage of the purchase of securities from the banks is that it increases the excess reserves of the commercial banks. This is not the case when they purchase from individuals. For purchases from the individual the Reserves increase but they have to take out the 20% (reserve ratio).

\*\*\* Either way the increase in the money supply will be the same amount.

When the Fed sells securities: the opposite occurs. Bank reserves are reduced.

\*\*\*\*\*It is through open market operations that the Federal Reserve adjusts the Federal Funds Rate.

Why would people buy or sell bonds. They do it because of the profits they can make from the interest.

## Here is how bonds work.

Bonds:

Bonds are a fixed maturity investment that pays a fixed dividend each period. The investor will then get back his original investment unless the company goes out of business.

The lower the price of a bond the higher the yield (interest earned).

\$50 interest payment on a \$1000 bond =  $50/1000 = 5\%$  yield

\$50 interest payment on a \$800 bond =  $50/800 = 6.25\%$  yield.

If the Sm decreases people must sell bonds to get cash. When they sell bonds the price drops and the yield goes up. Competition in the market place will then cause interest rates to go up.

In general the lower the price of the bond the higher the interest rate and vice versa.

If we have a 1000 dollar bond that pays 50/year in interest the yield =  $50/1000 = 5\%$

If the price of the bond fell to \$667 the yield would increase

$50/667 = 7.5\%$

As the interest rate on bonds increase. This means the opportunity cost of holding money will increase and people will be willing to buy.

### **2) The Reserve Requirement:**

The Fed influences the banks ability to lend through the reserve ratio.

If the fed increases the reserve requirement they take away part of the banks excess reserves. This takes away the banks ability to create money.

In some cases banks have to cut down on checking accounts in order to meet the reserve requirement.

Banks may also call in outstanding loans.

Banks may also sell securities and put the money into reserves.

Changing the reserve requirement does two things:

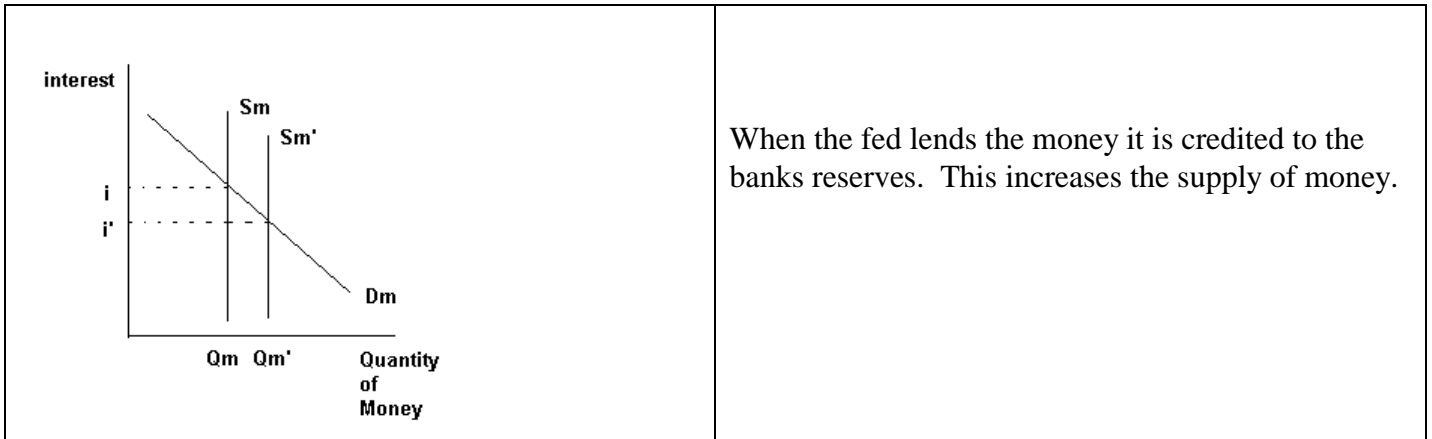
1) It affects the size of excess reserves

2) It changes the size of the multiplier

Reserve requirements are changed infrequently.

### 3) The Discount Rate:

The Fed loans money to banks if they are in need of money. The rate of interest that they charge is the discount rate.



Banks usually borrow very little. However, if the rate is low enough they will borrow more because they can then turn around and lend it out.

The problem is that the Fed really has no say so in if the banks will borrow. This tends to make this very inefficient.

The following will not be on the AP exam:

Due to the banking crisis and the slumping economy the following things have changed:

1. The FED began paying interest on reserves in an effort to "box in" the federal funds rate. The discount rate has been used this way on the high side for a number of years. If the fed funds rate were to rise above the discount rate more banks will borrow from the Fed (discount rate) and not each other Federal Funds rate). This would drive the federal funds rate back towards its target.

Paying interest on bank reserves works the same way on the low side. The interest rate paid on reserves is set lower than the federal funds rate (rate that they can borrow from other banks). In theory banks would never loan out at rates lower than the interest rate on reserves.

This allows the FED to be very aggressive in adding to the monetary base without worrying about the federal funds rate falling to zero. (although now even that's ok with the FED).

This link provides a great one page summary of the FEDs lending programs.

[http://www.newyorkfed.org/markets/Forms\\_of\\_Fed\\_Lending.pdf](http://www.newyorkfed.org/markets/Forms_of_Fed_Lending.pdf)

Now back to AP Material:

If the economy is faced with unemployment and deflation, then the Fed can increase the supply of money. To do this they have three possibilities. (These are called **Easy Money Policies**)

- 1) Buy securities:
- 2) Reduce the Reserve Ratio:
- 3) Lower the Discount Rate:

If the economy is faced with excess production and inflation the fed can decrease the supply of money. To do this they have three possibilities. (These are called **Tight Money Policies**)

- 1) Sell Securities
- 2) Increase the Reserve Ration
- 3) Raise the Discount Rate:

\*\*\*Of all of these the Open Market Operation is the most important and the most widely used.

If the FED tells the banks to do something they do it. They can influence the money supply using this tactic.

The FMOC is more than just Bernanke. There are 6 governors that vote.

The Fed is charged with the task of keeping stable prices, low inflation and a stable dollar. They must testify before congress every 6 months based on the Humphrey Hawkins Act.

The discount rate is actually determined on a bank-by-bank basis. If Atlanta wants to change its rate then it submits it to the board of governors who then approve or disapprove.

The Desk: Every morning at 9:15 a call is made to Member board of Governors. A president and The Desk then make a decision on how to act or implement the latest OMOC policy.

The FED worries about:

1. The weather: Bad weather can cause money to not flow into a region.
2. Time of the month: Social security checks enter the market at the beginning of the month.
3. Christmas
- 4.....

Who Pays for the FED?

1. Cost of transaction checks for private organizations
2. Income from Treasury Securities: The FED actually turns over around 20 billion to the Treasury after taking their 2 billion to run things.

The following is not on the AP Exam:

## Moral Suasion

The Fed's new recipe for dealing with credit market turmoil includes lengthening the maturity of loans and policy operations, broadening the assets accepted as collateral in policy operations, and extending credit to more institutions than was customary.

The Fed has taken six main steps to address liquidity needs:

1. Make loans to depository institutions via the Primary Credit Facility.
2. Provide more reserves to depository institutions via Open Market Operations.
3. Extend the maturity of loans made to depository institutions using the new Term Auction Facility.
4. Extend the maturity of the deals used to conduct open market operations (introduce the Term Repurchase Agreements).
5. Extend (implicitly) the types of assets used to conduct open market operations by swapping Treasury securities for other securities --- including the better class of mortgage-backed stuff. (That is, create the Term Security Lending Facility).
6. Make direct loans to non-depository institutions with the new Primary Dealer Credit Facility).

Now, more than ever, it's important for students to understand the independence of the Fed within the federal government. Also, the Fed's ability to respond quickly and creatively to this crisis is a huge improvement from its response during, say, the Great Depression, when the Fed didn't even attempt to inject liquidity and credit into the markets.

With respect to teaching these new Fed tools, this information is so new, that assigning an online research project may be your best bet. You could have them categorize the Fed's six (at least) steps into one of the components of the recipe. Or, find similarities between these tools and the more traditional tools.

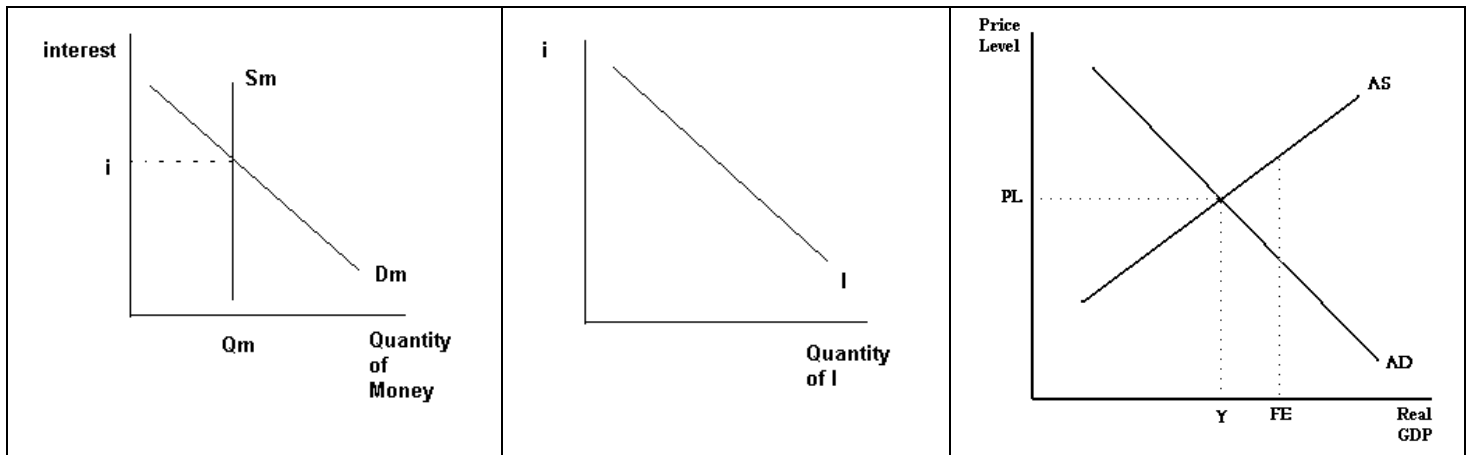
I don't really think we can simplify these tools into talking about them in terms of a "bailout." We're way past the point where we should be worried about moral hazard and definitely at the point where we should be concerned about keeping the real economy from getting any worse.



## Unit 4, Lesson 5

Remind students that:

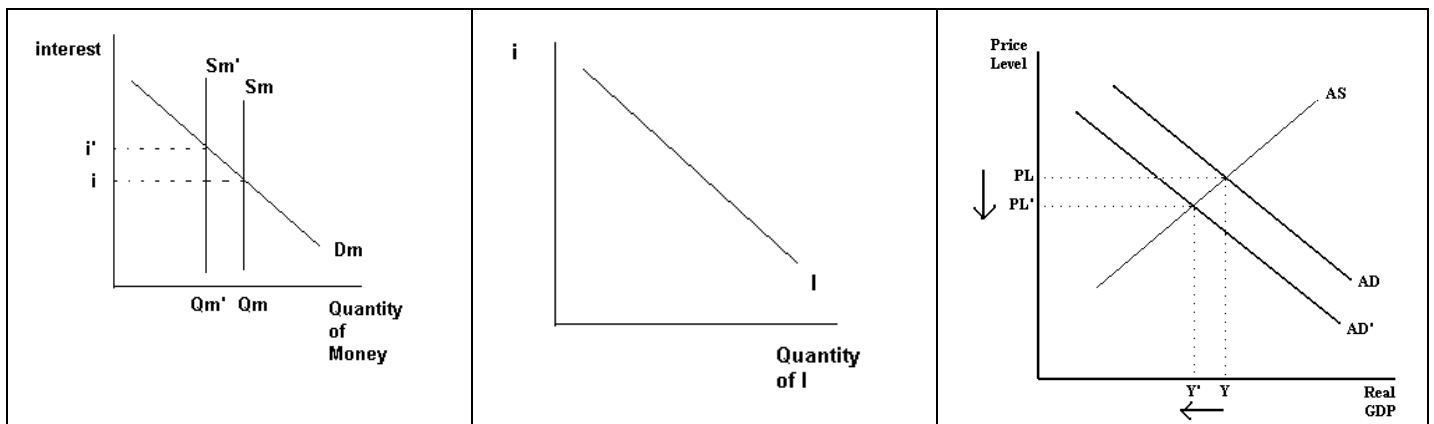
- 1) transactionary demand is a vertical line and that it directly affects GDP.
- 2) asset demand: is inversely related to interest rates. The higher the interest rate the greater the opportunity cost of holding money. This means people will not hold the money as an asset.



Next we see an investment demand curve. We know that investment is directly related to interest rates. A business will not undertake a new project if the interest rates are very high. Furthermore if the interest rates are low they are more likely to take on a new project. (The lower the interest rate the less the return needed in order to make money.)

The interest rates decrease you will have an increase in the Investment demand and you will have an increase in the Consumption demand. (People buy more cars and houses... at lower interest rates.)

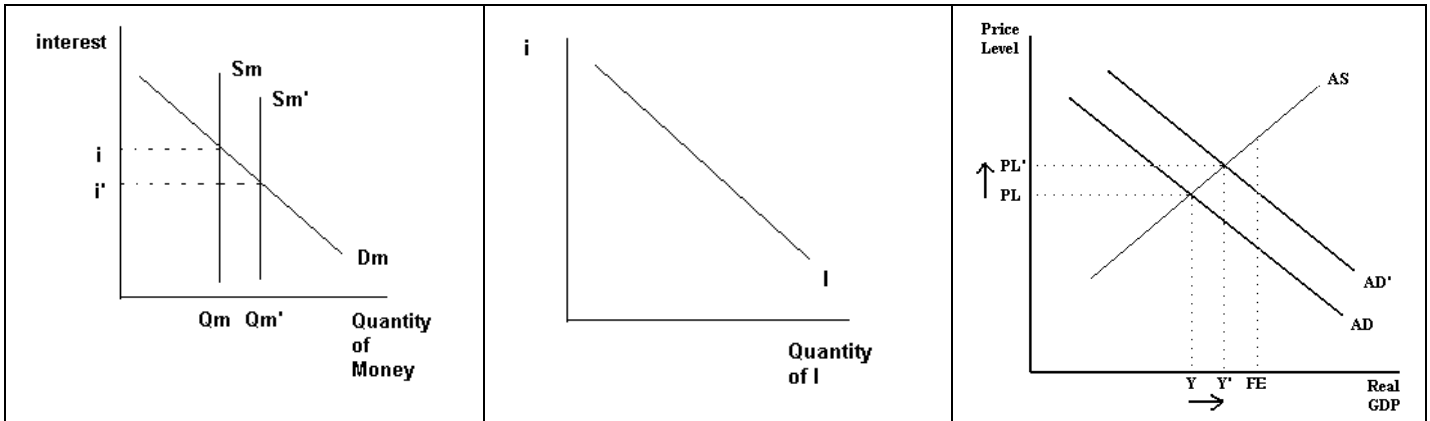
**WHAT WOULD HAPPEN IF THE  $S_m$  decreases? THIS IS A TIGHT MONETARY POLICY**  
( $i$  increases,  $I$  decreases and GDP drops )



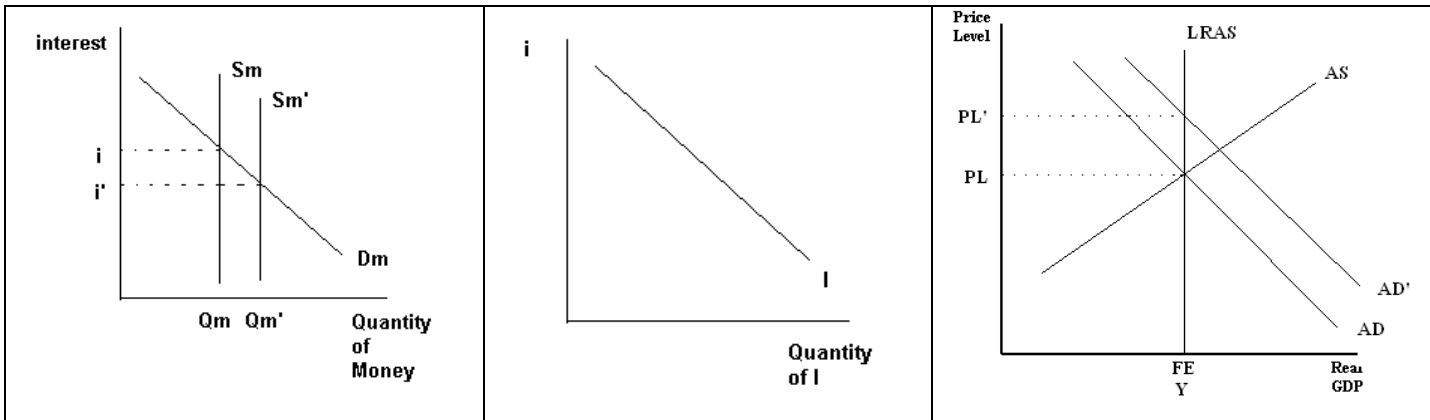
**When playing with this you have to remember that the effects seen all depend on the slopes of the Dm and the I curves.**

Furthermore the Dm (transactionary) depends on the GDP. If GDP is high this means that people need more money. This is because the price level is high so people need to hold more money to make day to day purchases.

What happens if The Fed imposes expansionary monetary policy?



When  $i$  decreases and  $I$  increases we have a shift in the AD curve equal to the change in  $I$ . Depending where you are on the AS curve has an effect on how this will affect GDP. If you are at full employment and you increase the money supply all you will do is raise prices.



**Value of a dollar** =  $1/\text{price level}$  (index based on set year)

The price level: is a reciprocal relationship that exists between the general price level and the value of the dollar. As inflation goes up the dollar becomes worth less.

If the Fed got sloppy and allowed too much money out in the economy inflation would result. This would mean the dollar would be worth less. If too much money got out into the economy the value of money would collapse. Money is nothing more than our belief that the government will maintain its value.

Nominal Interest rates are the stated rates. Real Interest rates are adjusted for inflation.

Real Interest Rate = Nominal – inflation rate.

Nominal Interest Rate = Real Interest Rate + Inflation

**Fisher Effect:** When the Fed increases the rate of money growth, the result is both a higher inflation rate and a higher nominal interest rate. This one for one adjustment of the nominal interest rate to the inflation rate is called the Fisher Effect. It does not hold true in the short run because unanticipated inflation catches lenders and borrowers by surprise. However, in the long run the adjustment is made.

However, if they did move in opposite directions:

Real = Nominal – Inflation  
 = inc - inc  
 = dec – dec  
 = inc – dec  
 = dec - inc

<u>Nominal Interest Rates</u>	<u>Price Level</u>	<u>Real Interest Rates</u>
Increase	Increase	Indeterminate
Decrease	Decrease	Indeterminate
Increase	Decrease	Increases
Decreases	Increases	Decreases

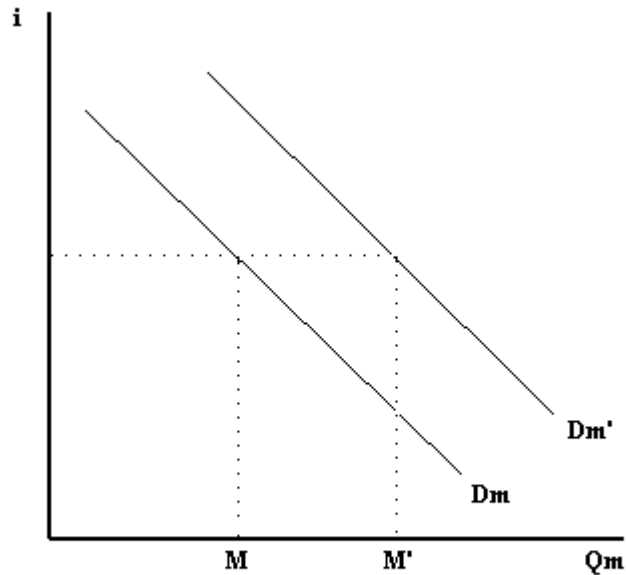
The reasoning behind this is that if the Nominal interest rate increases while price level increases we do not know if prices increased more or less than the nominal rate. This also goes for the decrease and decrease. Another way to explain this is that if the Nominal interest rate goes up and the price level goes up it may or may not be possible to explain this increase in nominal interest rates with the increase in prices. The net effect is that you do not know what happens to the real interest rate.

However, if the nominal interest rate increases and the price level decreases we know that your real increases. You know this because if Nominal goes up and there is not increase in the price level to explain this increase then you know that real also had to increase.

## Change in the Demand for Money:

Like all demand curves, they can shift. The following are things that change of the demand for money:

1. Changes in Price Level. If things become more expensive, people demand more money. In fact, if price level increases by 10% the  $D_m$  will shift to 10% to the right. This makes sense because people need that much more money to buy products.



**An increase in PL of 10% leads to an increase of  $D_m$  of 10%. This is represented by distance from M to M'.**

2. Changes in GDP: Since people hold money to purchase goods, when GDP increases the  $D_m$  increases.

3. Increase in income of population. People spend more money when they have more money. As incomes increase the demand for money increases because people want to hold more money.

Three things affect Net Exports:

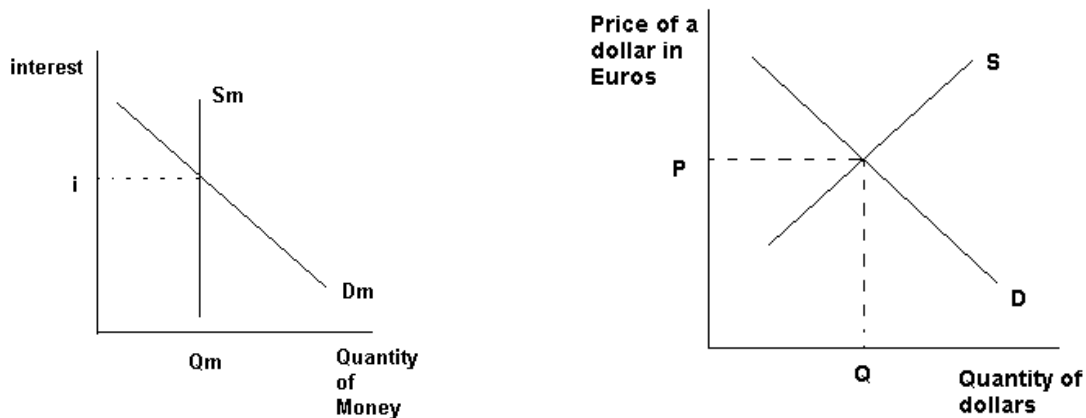
1. Relative Price Level:

PL increase X decrease M increase Xn decrease

2. exchange rate:

Dollar Appreciates X decreases M increases Xn decreases

3. Relative interest rates:



Increase in demand from money in money market drives up interest rates. The increase in demand for American money because of the higher interest rates (relative to the rest of the world) means the dollar will strengthen.

Expansionary Fiscal Policy will drive up interest rates making our investments desirable for foreign countries. They will demand more of our dollars which will drive up the price of our dollars. This means we will now export less.

Expansionary Monetary Policy will drive down interest rates making our economy less attractive for foreign investment. This makes the demand for our dollars less. This will drive down the price of the dollar causing us to export more.

In general if the  $S_m$  should decrease there will be a shortage of money. This means people will sell the investments (bonds) they have to get money.

When these bonds are sold before maturity they interest rate is driven up.  $Yield = \text{dollar interest rate}/\text{price}$ . When the price drops the yield increases.

When interest rates are driven up people are more willing to hold money and therefore  $S_m = D_m$

In period of prosperity people will start spending more money. This in itself causes the savings accounts to diminish and can lead to even more inflation.

## Loanable funds market

	<p>S<sub>lf</sub> comes from people who have extra income they want to save and lend out.</p> <p>D<sub>lf</sub> comes from households and firms that wish to borrow to make investments.</p> <p>Real <math>i</math> because the assumption is that people borrow to purchase capital goods so the returns are real</p> <p>G could be either S<sub>lf</sub> or D<sub>lf</sub>. You will get the same answer for changes in <math>i</math> either way.</p>
	<p>A decrease in taxes will entice people to save more money. This will shift the S curve to the right. This drives down interest rates.</p>
	<p>One advantage of putting the government as S is that when they run a budget deficit they are pulling money out of the economy. The change in the Q is the actual amount crowded out.</p>

Understand that the loanable funds market is where business go to get money in order to finance capital growth.

# Money Market or Loanable Funds Market: What's the Difference?

## **Money Market:**

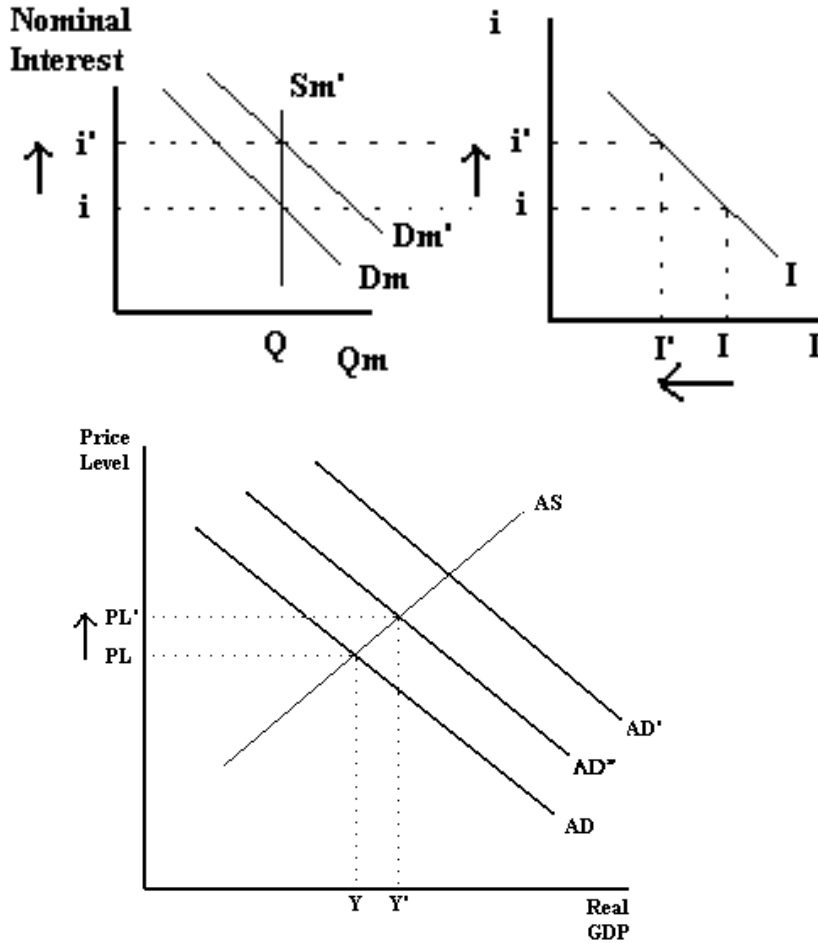
1. Short term
2. Money Supply controlled by Fed (perfectly inelastic)
3. Interest rates are nominal
4. Demand for money affected by economy

## **Loanable Funds Market**

1. Long term
2. Quantity supplied of loanable funds affected by real interest rate
3. Interest rates are real.
4. Supply and Demand for loanable funds affected by economy:
  - a. Households save more or less
  - b. Fed monetary policy
  - c. Demand for money

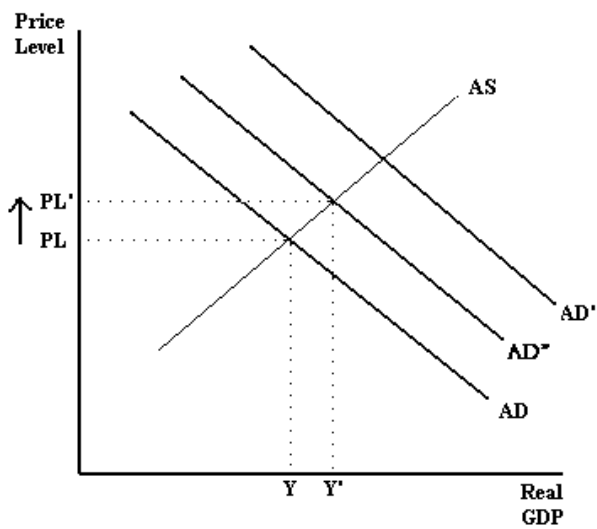
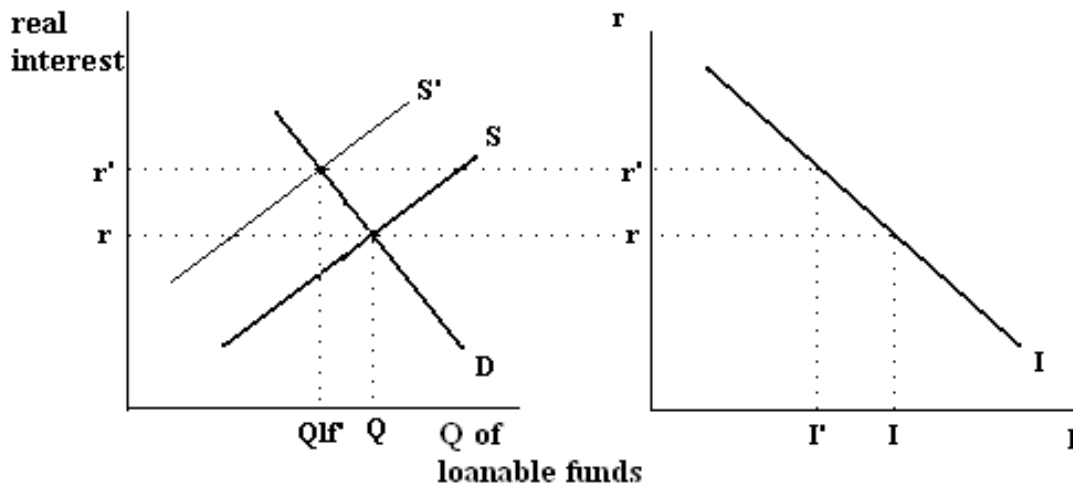
**Crowding out effect:** One problem we encounter in Fiscal policy is the crowding out effect. If the economy is in a recession and the government decides to expand what happens. AD increases this will in turn increase output. The problem is that it will also increase the interest rates because there is an increase in demand for money. This increase in interest rates will then drive out investment spending.

There are several ways to show this!



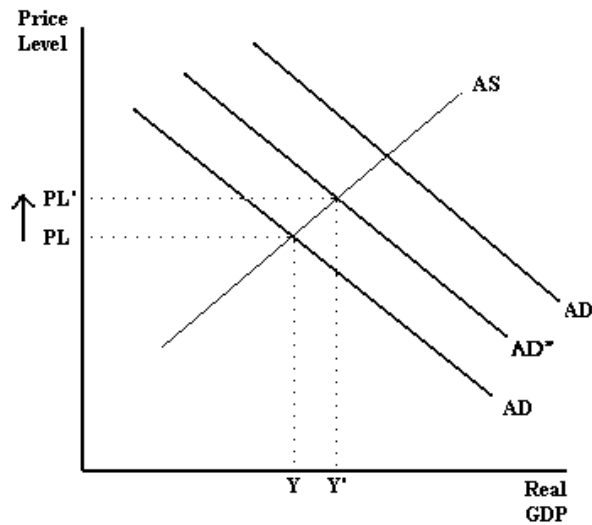
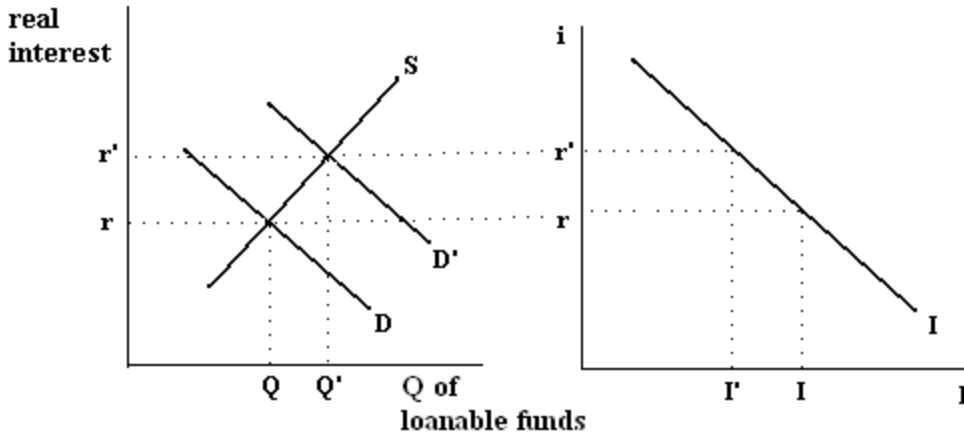
In the above example, the government entered the money market and increased the Demand for money. This drove up interest rates. The initial fiscal policy pushed AD from AD to AD'. However, since the interest rates were driven up by the government borrowing some Investment was crowded out of the economy. That means AD actually only increases to AD''.





Here you have another way of showing the crowding out effect. You are using the loanable funds market. You get a decrease in  $S_m$  because the Government has entered the market and sucked the funds out of the market. This drives up interest rates, decreases  $I$  and hence causes  $AD$  to not shift out as far as the original fiscal policy measure would have wanted it to.

Since the Government is just another player in the loanable funds market, you can also show this effect from the demand side.



Here the Government entered the market and increased the Demand for loanable funds. This drove up interest rates and crowded out investment.

When there is a change in anything that increases AD (for example G spending increases) this leads to an increase in the demand for money. This causes that curve to shift to the right and thereby raising interest rates and causing investment to be driven out... (Crowding out effect)

**A secondary effect** of this is that the increase in government spending increases aggregate demand which increases equilibrium incomes. This increase in incomes will increase the demand for money which will increase interest rates.

## Strengths of the Monetary Policy:

- 1) Speed and flexibility over the fiscal policy. It could be done on a daily basis if need be.
- 2) Isolation from political pressure.

Shortcomings and problems:

- 1) Cyclical Asymmetry:

EZ money does not mean that banks will loan or that people will borrow.

People may use the excess money to pay off loans.

- 2) Changes in V.

Velocity can sometimes go the opposite direction. If  $m$  increases,  $V$  may actually decrease. This will of course affect total spending.

If  $i$  decreases people will hold  $m$  for asset demand. This affects  $V$ .

- 3) Money demand is interest elastic. (It depends on the elasticity of the  $D_m$  curve)

- 4) Investment is interest elastic. (It depends on the elasticity of the  $I$  curve)

- 5) Inflow of international capital from the increase in interest rates leads to an expansion of AD.

### What should the fed target?

$i$ : If  $i$  is fluctuating this will affect the economy. If the economy is doing well and GDP is increasing, the interest rates will also be increasing. The way to decrease interest rates is to increase the money supply. This however, could lead to inflation.

$M$ : If the economy is taking off and interest rates are increasing the only way to slow down the economy is to cut back on the money supply. If they cut back on the money supply the interest rates will raise the interest rates further.

Monetary and Keynesian theory are related. When you take the two in combination it gets complicated.

Ex. If GDP is 25 billion short and the multiplier is 5 the government could increase purchases by only 5 billion. This however will cause interest rates to increase. As the economy picks up the transaction demand for money will increase. This will then crowd out some investment spending. This will keep some of the companies from increasing and therefore have an effect on the true multiplier. The only way to stop this from happening is to increase the money supply.

THE FOLLOWING IS A FREE RESPONSE QUESTION FROM 1995 (#2)

**Keynesians** believe that the free-market has problems and it is up to the government to react and control these problems.

They believe the markets are not totally competitive so the prices and wages cannot be driven down. This means that both fiscal and monetary policies are needed.

$$GDP = C + I + G + X_n$$

They believe that money supply is weak in controlling the economy. They see too many shortcomings.

They believe that  $V$  is unstable. (It changes in an unpredictable fashion: it is not related to  $M$ ) They think that if the money supply is increased in order to stimulate the economy then people will spend the same dollar less often and  $V$  decreases. When this happens  $V$  offsets the effects of  $M$ .

**Monetarist** believe the markets are competitive. They believe prices and wages are flexible (similar to idea of the classicalist: Says Law) They say the only problem with the market is the government interference. (Ex. minimum wage, union legislation, farm price supports...) They believe the **only stabilizers should be automatic stabilizers**. They believe that even the money supply should not be adjusted greatly. Instead, the supply should just increase at a pre announced steady 3-5 percent.

$$MV = PQ$$

They believe the money supply is the most important tool in controlling the economy.

They believe that  $V$  is stable. It changes in a predictable fashion. They believe there is no direct relationship to  $M$ .

If you take the Keynesians and the Monetarist you could say that:

$$GDP = PQ \text{ and} \\ C+I+G+X_n = MV$$

See p. 308 for a diagram comparing how the monetarist and Keynesians look at how a change in monetary policy will affect GDP.

In general:

The Keynesians say that the money supply affects the economy through the change in interest rates.

The monetarist say the change in monetary policy changes the aggregate demand and therefore affects the GDP.

<b>Deposit</b>	<b>Loans (Money Created)</b>
100	80
80	64
64	51.20
51.20	40.96
40.96	32.77
32.77	26.21
.	.
.	.
.	.
<b>Total is \$500</b>	<b>Total is \$400</b>