

Realities.

The multiplier is the maximum money creation.

It does not work to the extent that:

- Households do not leave loaned funds in DDA.
They hold cash in the mattress, rather than leave DDA.
- The banks do not fully "loan up." They keep excess reserves

Terminology

Legal/required reserves: The amount required by the Fed.

Excess reserves: Any cash kept by the bank beyond that required.
Usually assumed to be zero.

Recapping two items:

- 1) What drives money's valuation in the economy?

Like all things, supply and demand

Money is demanded to execute transaction, we will discuss supply further

- 2) The purchasing power of the dollar changes over time
The number of dollars need for any specific fixed good changes over time.

If this decays too rapidly, then money loses its value as a tool facilitating transactions.

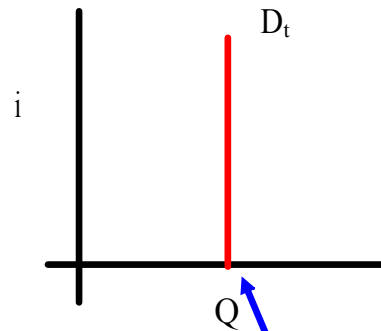
Also, it loses worth as a store of value (see costs of inflation)

=>The government must manage fiscal policy and monetary policy to keep value of money stable.

The supply of money: Fixed, perfectly inelastic.
 Through fiscal policy the fed controls the supply of money.

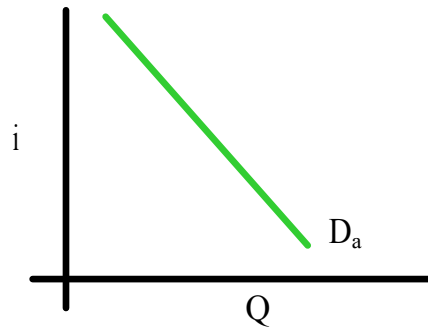
Demand for money.

Transaction Demand
 (I want it to spend it)



Directly linked to GDP
 GDP = Expenditures = \$ value of transactions

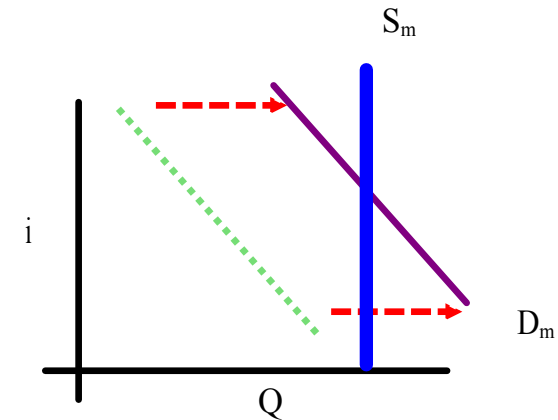
Asset Demand (as store of value)
 (I want to hold cash)



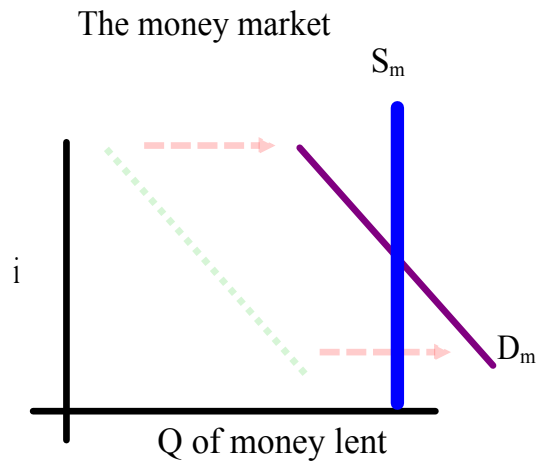
- Cash: Ultimately liquid asset
 Opportunity cost of liquidity:
 What someone will pay you to reduce your liquidity by giving them the cash for a while.

- Why down slope?

The higher rates, the less I will keep in my wallet.

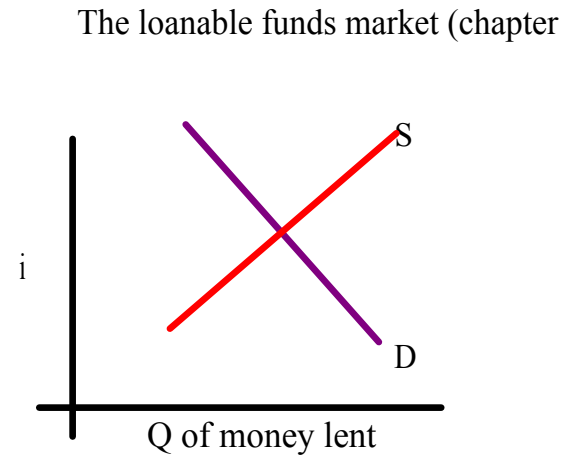


Two things to reconcile



Two ways to determine i !?

Yes
&
No



The two graphs are distinct but related.
Remember lending for different time periods is at different rates.

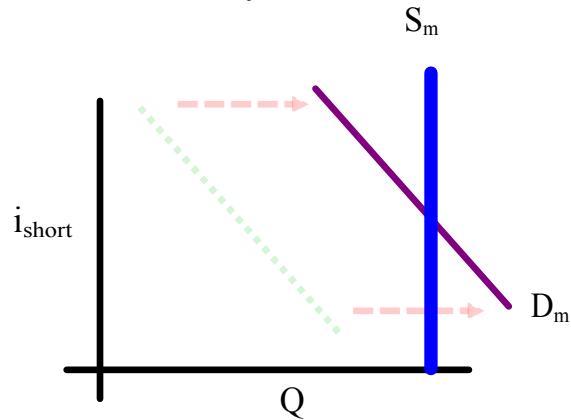
This is the market for short term funds.
This is the basic, shortest rate.
Think overnight loans
These are not funds lent long enough to finance projects, they are just lent long enough to transfer my short term liquidity to you.

This is the market for term loans.
This represents longer rates.
Think bond rates.
These are the funds made available for long enough to finance projects.

So, these are different demand and supply curves.

Two things to reconcile

The money market



The short term liquidity market:

Supply curve - the quantity of M

Demand curve:

Transaction demand

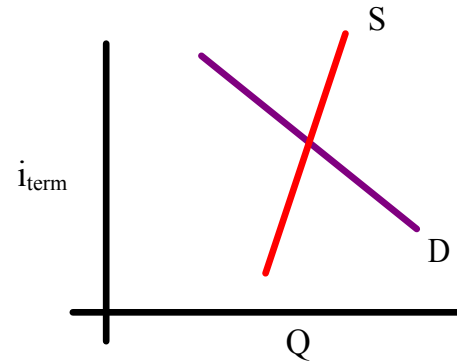
Short term liquidity desires (asset demand)

Notes:

The household is the demander in the money market.

The household is the supplier in the loanable funds market.

The loanable funds market (chapter



The loanable funds market:

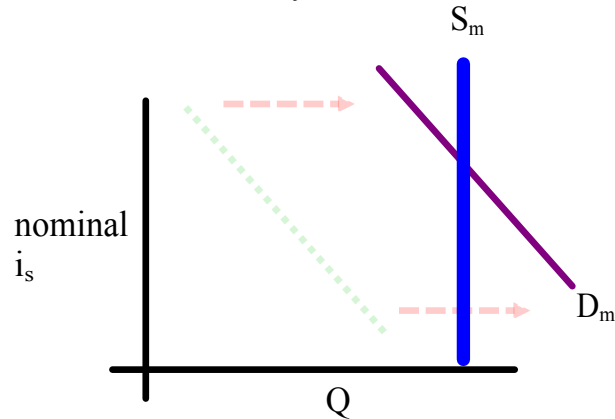
Supply curve - the quantity of liquidity people are willing to give up for a long time.

From M1 past M3, out of the Ms

Demand curve - the funds needed for projects.

Two things to reconcile

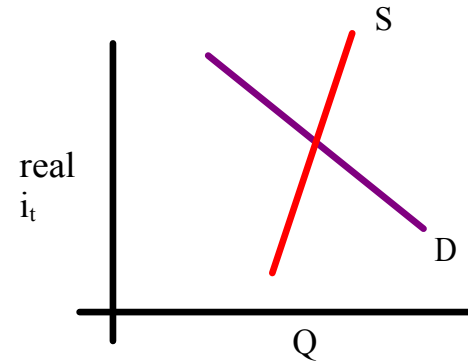
The money market



Remember:
 Equilibrium here does not determine quantity.
 The fed does that by setting the supply.*
 The demand here just sets price for overnight money.
 The people who borrow overnight have to borrow at this rate.

*Assuming mechanisms we will discuss.

The loanable funds market



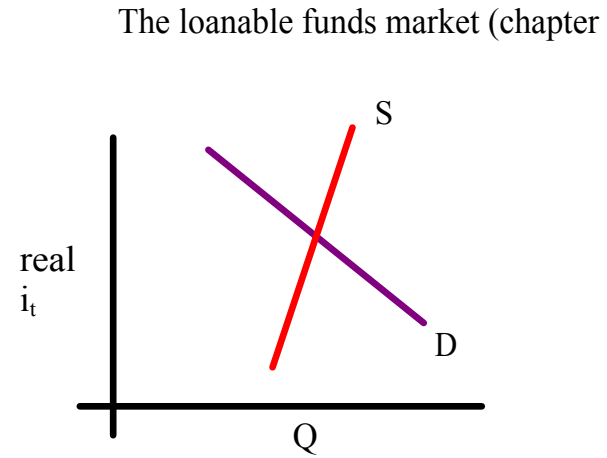
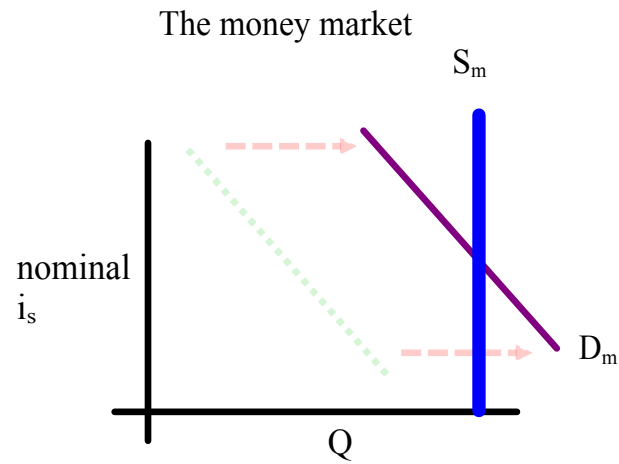
Equilibrium here DOES determine the quantity of money that is lent in the term lending market.

If people are less willing/ABLE to forego liquidity then supply decreases and we have a lower Q and higher i .

If firms have more high return projects they pay more.

SO THESE RATE MUST BE MM++

Two things to reconcile



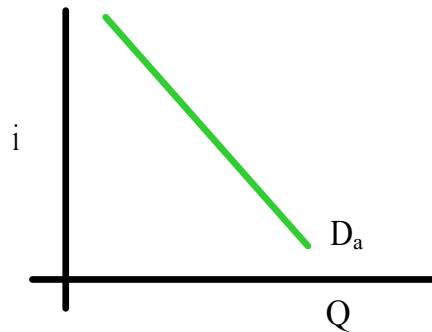
The household is the demander in the money market.
The household is the supplier in the loanable funds market.

Roughly speaking, if MM demand shifts up, loanable funds decrease.
Why? They want money now, they are not lending it longer.

In fact, changes in the short term rate will shift the loanable funds supply curve.

Asset Demand (as store of value)

(I want to hold cash)



- Cash: Ultimately liquid asset

Opportunity cost of liquidity:

What someone will pay you to reduce your liquidity by giving them the cash for a time.

- Why down slope?

The higher rates, the less I will keep in my wallet.

The asset demand trade is:

Liquid cash for an interest bearing instrument (bond)

An interest bearing instrument is a contract where I give you money now and you give me my money + interest later.

	<u>now</u>	<u>later</u>
Me:	(\$100)	\$105
You	\$100	(105)

If you are willing to give up liquidity you can:

- 1) Negotiate a new deal
- 2) Buy the receiving end of the deal from someone who owns the receiving end of deal.

Assumption buy a bond from a current bond holder.

Joe owns a 1 year bond issued last week. This was his deal:

	<u>last week</u>	<u>1 year later</u>
Joe:	(\$100)	\$105
Borrower:	\$100	(\$105)

This week interest rates are now $X\%$. To buy the bond this will happen:

	<u>now</u>	<u>51 weeks later</u>
You:	(X)	\$105
Joe:	X	
Borrower:		(\$105)

What can we say about X?

Joe owns a 1 year bond issued last week. This was his deal:

	<u>last week</u>	<u>1 year later</u>
Joe:	(\$100)	\$105
Borrower:	\$100	(\$105)

This week interest rates are now 7%. To buy the bond this will happen:

	<u>now</u>	<u>51 weeks later</u>	
You:	(X)	\$105	$X * (1 + .07) = 105$
Joe:	X		
Borrower:		(\$105)	

The price of bonds go down when interest rates go up.

so that fixed interest becomes a large enough percentage of your investment

The price of bonds go up when interest rates go down.

because you are willing to accept interest that is smaller percentage of your investment

If I flood the market with bonds, then I can describe what I am doing in two ways:

- I am flooding the bond market with, supply so price will fall and interest rates will rise.
- I am demanding a tremendous amount of borrowing, so interest rates will rise.

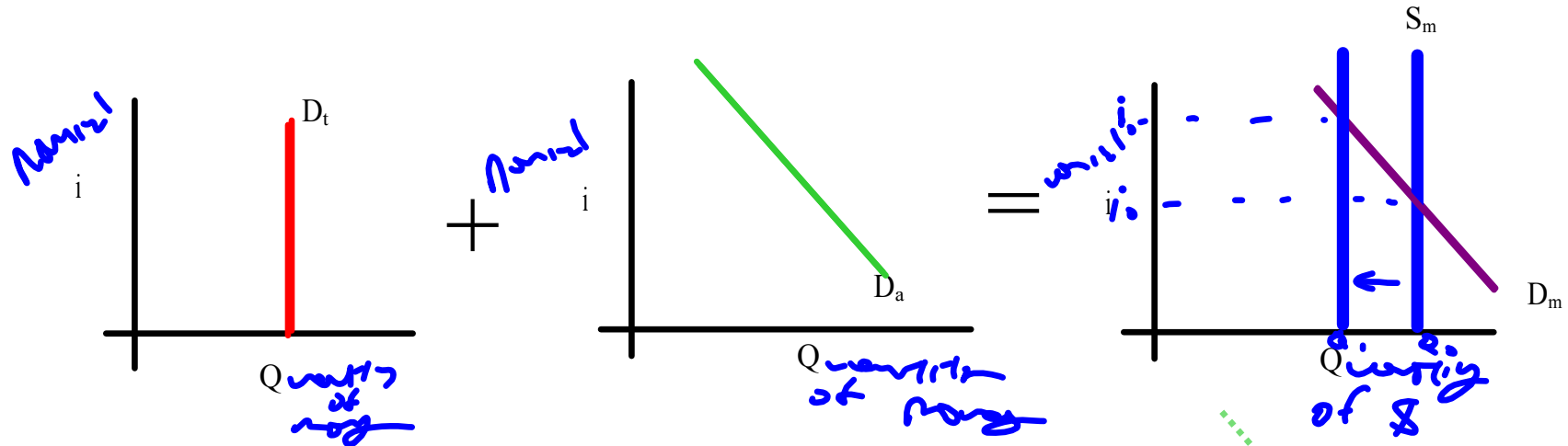
If I buy lots of bonds, then I can describe what I am doing in two ways:

- I removing bonds from the bond market, increasing demand, raising prices, lowering interest rates.
- I am supplying a tremendous amount of lending, so interest rates will fall.

Bond Price Interest rate Lending/Borrowing

Transaction Demand

Asset Demand (as store of value)



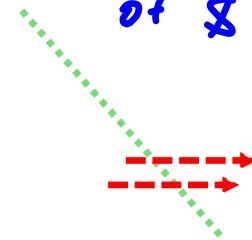
Construct implication chains ending in a new equilibrium rate.

Six events:

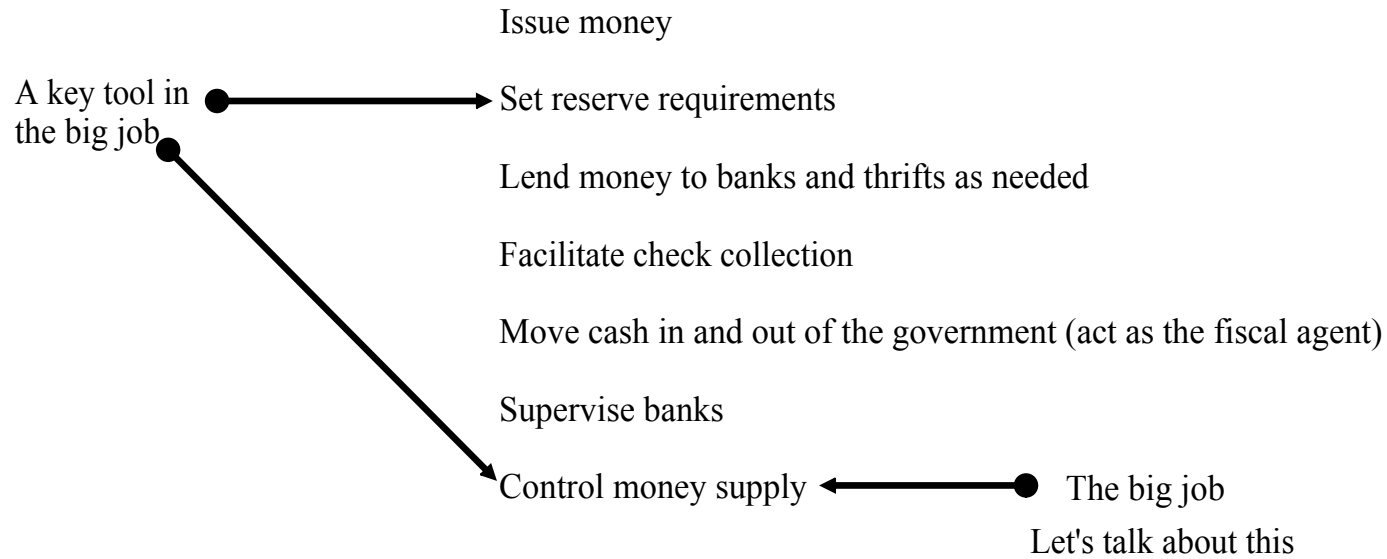
GDP up or down

People decide to hold more or less wealth as cash

The Fed increases or decreases supply



Jobs of the Fed - Our central bank.



Notes:

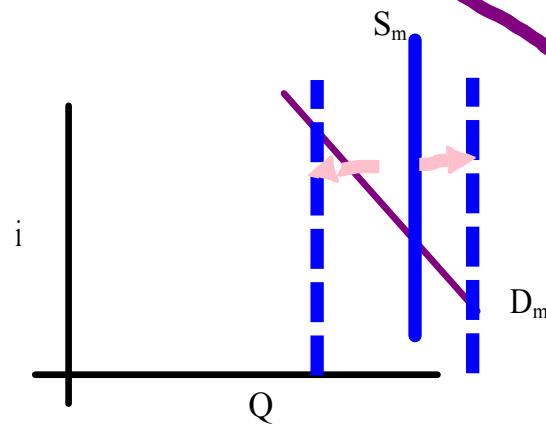
An independent Federal Agency, not beholden to congress or the president, in theory.

The Federal Reserve controls the money supply in order to stimulate or contract the economy.

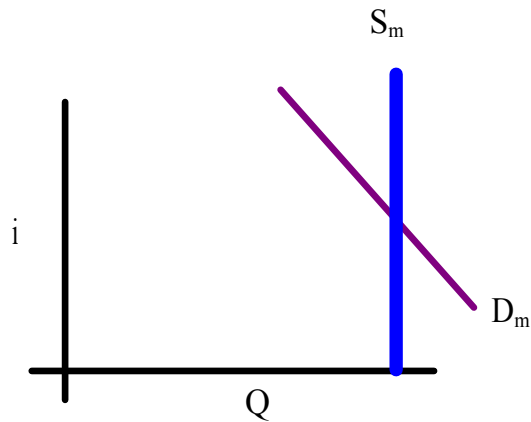
They have three basic tools

Buy and sell bonds to draw or provide liquidity.
Change interest rates that they control.
Change the reserve ratio.

We need to understand the full implication chain cause and effect.



The big question is
What the heck is this?



The fed controls two key short term rates.

1)The Fed Funds rate:

Every day the computers of the banks figure out their required reserves. No one gets it right.

The ones with extra want to lend the money to the ones that are short.

There is little time for the bidding process so most transactions happen at the rate the Fed "sets**".

This is the fed funds rate. Banks lending to banks.

2) If a bank has goofed up, then sometimes they have a significant need for sure funds.

The Fed is the lender of the last resort - the will lend to the banks in times of need.

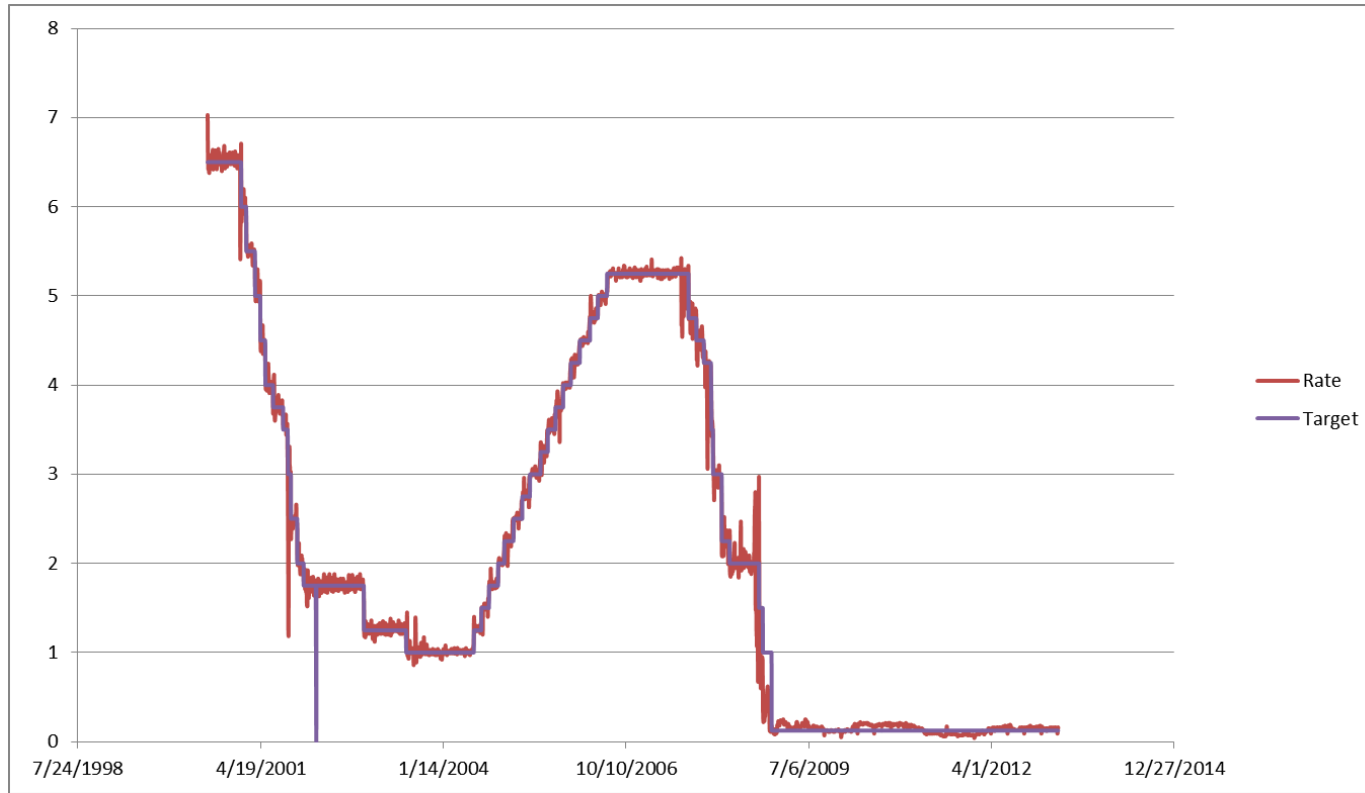
The banks can borrow at the "discount window" at the "discount rate."

This is generally frowned upon and not used much.

But this rate at which a bank knows they can always borrow has great economic significance.

Discount rate: The Fed lending to banks.

**The Fed targets a certain rate and will manage MS to achieve it. Thus the banks believe it.



We will cover later how changing these rates stimulates.

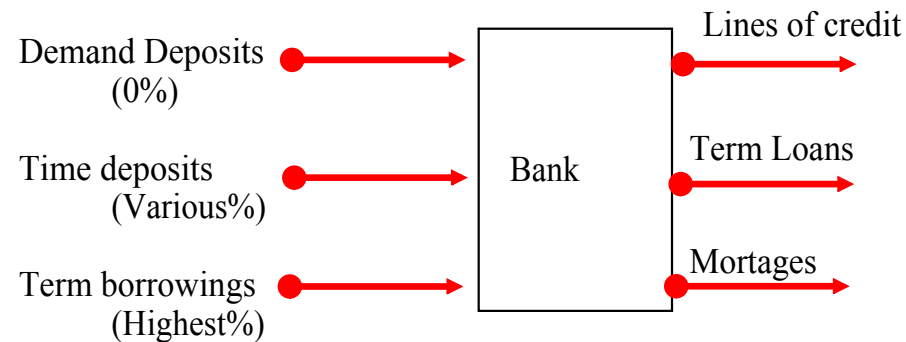
(You can probably guess most of it)

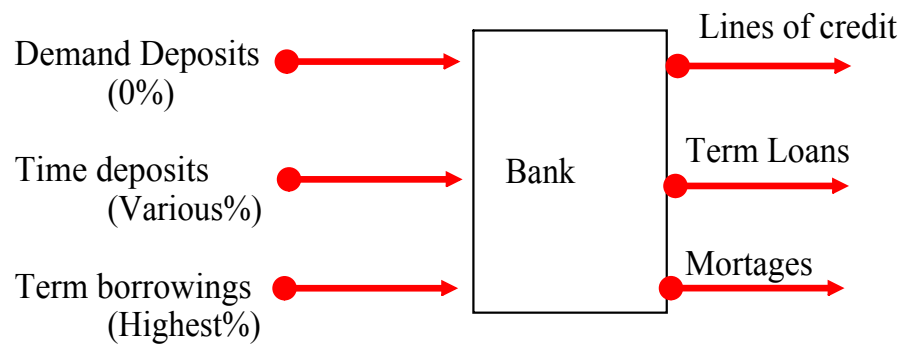
But changing the Fed Funds rate and the Discount Rate are key tools.

How do banks make money?

Step 1: Borrow money.
(Deposits, DDA, Selling shares, issuing their own bonds)

Step 2: Lend the money under two conditions:
- What you loan out is back to you in time to pay back your own debts.
(ARBLLRBA)
- The average rates you lend at are high enough
o cover the cost of your borrowings.
o cover the money lost from loans not repaid.





Problem: How can I lend DDA? I have deliver them on demand?

Answer: But history will tell you that a certain % consistently stay in the vault.
So, lend anything over that %

OK, but OUCH, I make nothing on the unlent. YUP.

Banks are motivated to lend all they dare.

Part of the Fed's supervisory role is to make sure they keep enough aside.
They set reserve requirements.
The money is kept with the Fed.

Tools of the Fed.
 Open market operations
 Changing reserve requirement
 Changing rates

	Implication chain	T-A/C	Graphs	Special comment
Open markets - tighten				Impact slightly different trading w/ banks
Open markets - easy				
Change reserve requirement - tighten				
Change reserve requirement - easy				
Change rates - tighten				
Change rates - easy				

Easy vs. Tight

Implication chain:

Money market:

Nominal interest rate:

Just the price paid for the transaction, want more pay more -
very difficult to decompose/analyze components (inflation, risk etc.)
not a rate related to investment return

Loanable funds market:

Real interest rate.

The compared to project plans, thus real return excluding inflation.

What is the difference?

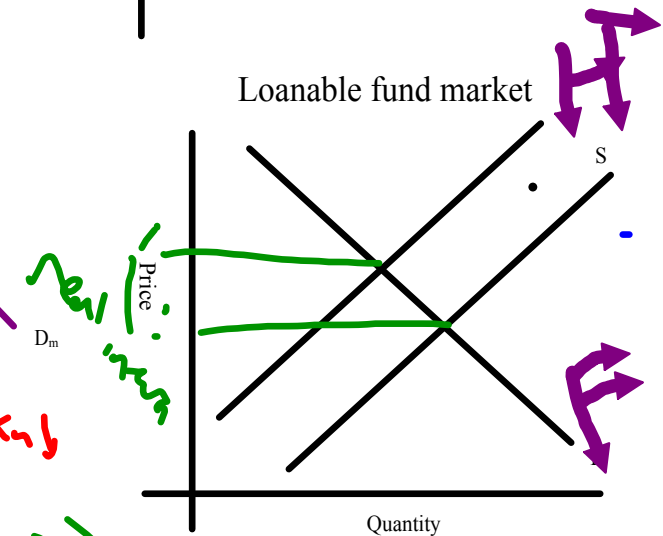
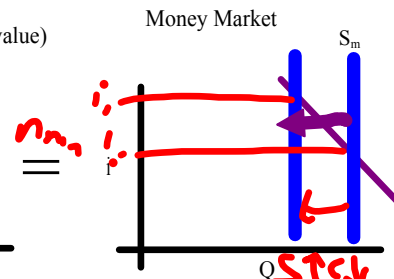
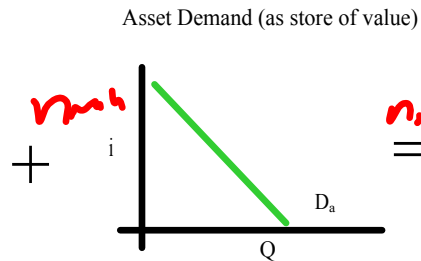
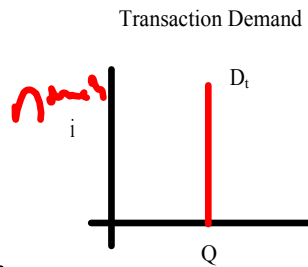
Tools of Monetary Policy

Open Market Operations.

Trading bonds. Is buying or selling bonds expansionary? Why?

Assets	Liabilities + Equity

Assets	Liabilities + Equity



$Fed\ decreases\ to\ tighten \Rightarrow falls\ S_{B.V.} \Rightarrow BP \downarrow \Rightarrow MS \downarrow \Rightarrow i \uparrow \Rightarrow IS \downarrow \Rightarrow AD \downarrow \Rightarrow P \downarrow Q \downarrow$

Who they BUY FROM alters the story

Fed	
Assets	Liabilities + Equity
Bonds \$1,000	\$1,000 Equity

Bank	
Assets	Liabilities + Equity
Loans \$1,000	\$1,000 Equity

Gave up Bonds of \$1,000

Fed	
Assets	Liabilities + Equity
Bonds \$1,000	\$1,000 Equity
Cash \$100	Res \$100

Customer	
Assets	Liabilities + Equity
DDA \$1,000	\$1,000 Equity

Gave up Bonds of \$1,000

Customer	
Assets	Liabilities + Equity
DDA \$1,000	\$1,000 Loan

ETC.

Loans generated = money = \$1000 * mult

1000 *10*

Loans generated = 9000 money = \$9000 + initial DDA \$1000

1000

Bank	
Assets	Liabilities + Equity
Res \$100	DDA \$1,000
Loans \$900	

Who they SELL TO alters the story

Fed	
Assets	Liabilities + Equity
Cash \$1,000	\$1,000 Equity

Fed	
Assets	Liabilities + Equity
Cash \$1,000	\$1,000 Equity
<i>Gave up Cash of \$100</i>	

Customer	
Assets	Liabilities + Equity
Bond \$1,000	\$1,000 Equity

Bank	
Assets	Liabilities + Equity
Bonds \$1,000	\$1,000 Equity
<i>Gave up Loans of \$1,000</i>	

Bank	
Assets	Liabilities + Equity
<i>Gave up Loans of \$900 & Reserves of \$100</i>	

Loans generated
money = \$1000 * mult

Loans generated
money = \$9000
+ initial DDA \$1000

Tools of Monetary Policy

Change reserve requirement

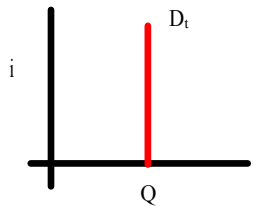
RR \downarrow 5%

Bank

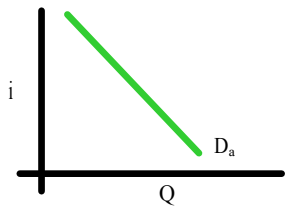
Customer

Bank		Customer	
Assets	Liabilities + Equity	Assets	Liabilities + Equity
\$100 RR	\$1,000 PDA	\$1,000 PDA	\$1,000 Equity
\$900 loans			
\$50 cash			
(50) loan			
(50) RR			

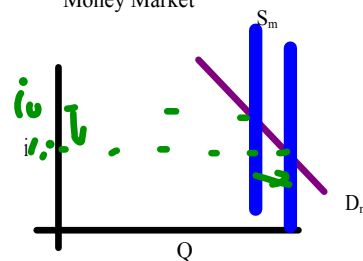
Transaction Demand



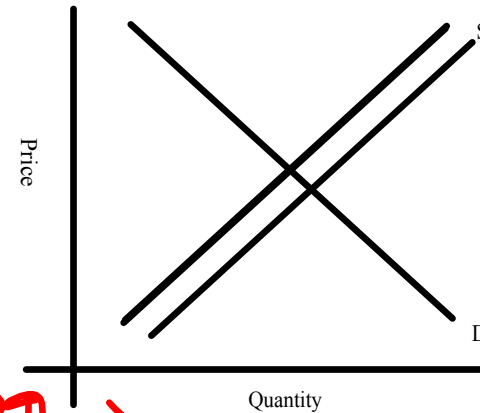
Asset Demand (as store of value)



Money Market



Loanable fund market



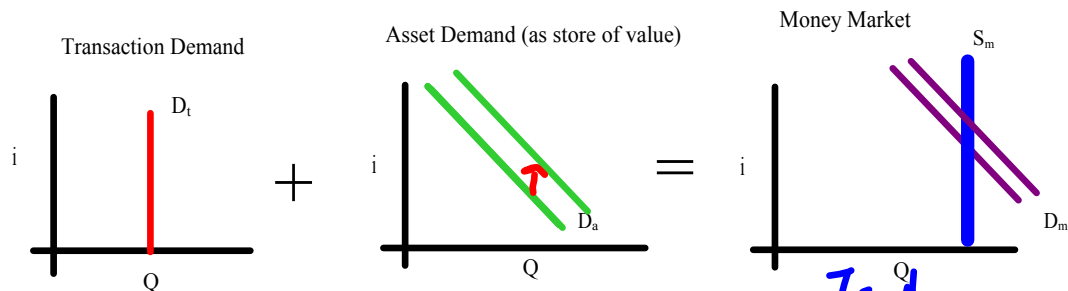
$\downarrow RR \Rightarrow MS \uparrow \Rightarrow i \downarrow \Rightarrow I \uparrow \Rightarrow AD \uparrow \Rightarrow RT \uparrow$

 $\uparrow S$
 $\downarrow X$

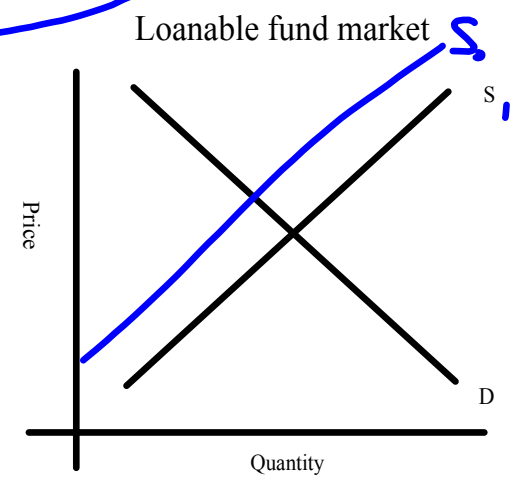
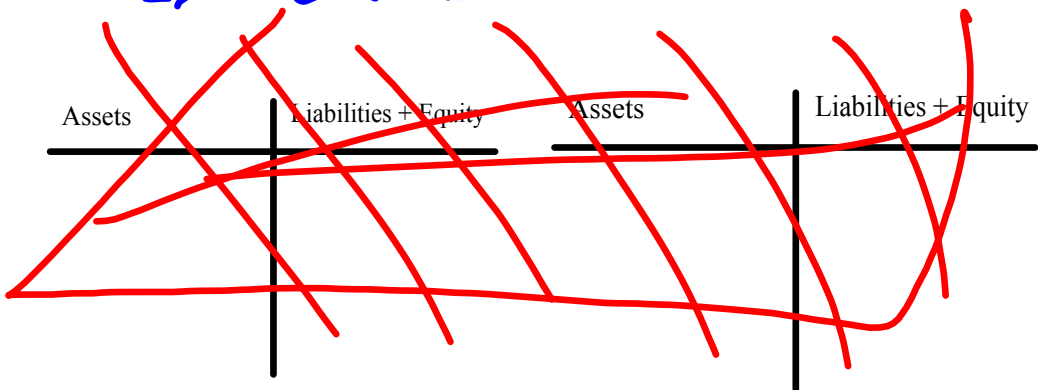
Tools of Monetary Policy

Change rates

- How do you deal with cash shortage?
eh
- They will get it there



Fed \uparrow Target Rates \Rightarrow Asset Demand $\uparrow \Rightarrow i \uparrow \Rightarrow I_s \downarrow$
 \Rightarrow AD \downarrow
 \Rightarrow AR \leftarrow m_b



$$PQ = MV$$

- This is definitional

- If you follow the logic to its end, which we don't have to do, there is no gain from AD manipulation and interest rates can not be played exactly how we have said.

Net export effect AND crowding out effect

In fiscal policy net export effect was counterproductive:

Stimulus FUNDED by borrowing $\Rightarrow i \wedge \Rightarrow \$ \wedge \Rightarrow X_n \downarrow$

Monetary policy?

easy money \Rightarrow whole stimulus chain but also...

$\Rightarrow i \downarrow \Rightarrow \$ \downarrow \Rightarrow X_n \wedge$ (consistent with goal)

tight money \Rightarrow whole contractionary chain but also...

$\Rightarrow i \wedge \Rightarrow \$ \wedge \Rightarrow X_n \downarrow$ (consistent with goal)

Trade account impact

X_n up is an improvement in balance of trade. Good because it provide currency.

X_n down is an worse in balance of trade. Bad because it takes currency.

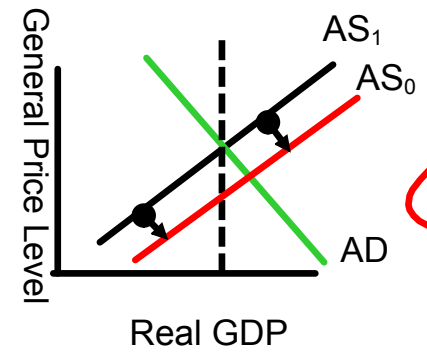
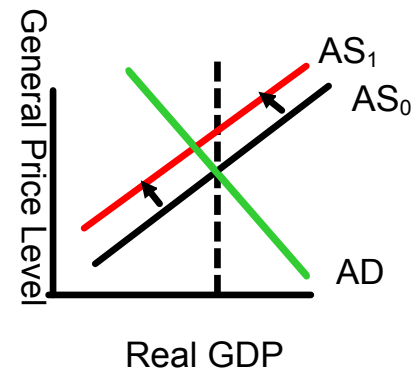
See above: Easy money \Rightarrow

helps balance of trade good, we get more currency than we pay out.

See above: tight money \Rightarrow

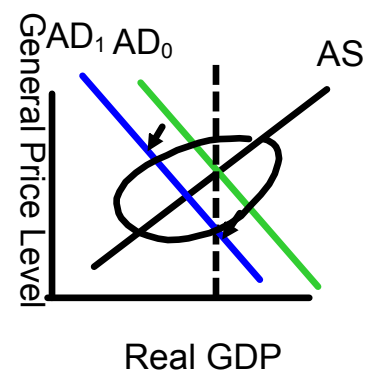
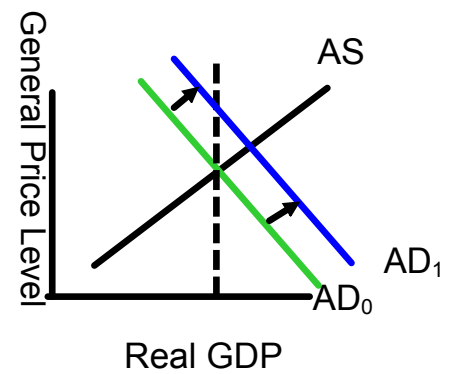
hurts balance of trade good, we pay out more money than we get.

Guess:
 Ease
 In practice:
 Have tried
 all.
 Best? Patience



Guess: Nothing.
 In practice:
 Low rate monetary
 policy

Guess:
 Tighten
 In practice:
 Loosen
 Best,
 Tighten.



Guess:
 Loosen
 In practice:
 Both, depending on
 speed and persistence.
 Best?
 Depends on monetary
 policy when trouble
 emerges.

- Realistically what do you expect to happen in each case?
- Market natural course
 - Gov. intervention
 - o Fiscal Policy
 - o Monetary Policy

Problems:

Recognition lag
Velocity

Can not push on a string - Cyclical asymmetry

Inflation targeting

Second stage issue (not a multiplier issue):

GDP is accounting over a period time, is each dollar of M1 spent only once?

No, there are many transactions with each dollar (of M1) a year.

The more often a dollar gets spent the more GDP it supports.

Monetarist:

Pointed out this equation -

$$\text{GDP} = \text{Price} \times \text{Quantity} = PQ$$

$$PQ = VM$$

where V is the velocity of money, the number of times a year each dollar gets spent.

Why of interest?

M^{\wedge} then P^{\wedge} or Q^{\wedge}


V^{\wedge} , then P^{\wedge} or Q^{\wedge}

Conclusions: - The key issue is whether P or Q is what goes up.
- Changes in velocity have real economic impacts.

Thinking of velocity, see end of 13.

- Disintermediation banks aren't the only institutions borrowing or lending.
- Complicating the Fed's job and changing the dynamics of its control.
- They face competition domestically and from foreigners, changing their strategies.
- ATMs, computer processing make money move faster.

1. The United States is experiencing a high rate of unemployment.
 - (a) Identify one fiscal policy action that Congress might initiate to decrease the unemployment rate.
 - (b) Assume that the policy you identified in part (a) reduced unemployment, but the economy is still operating below full employment. Using a correctly labeled aggregate demand-aggregate supply graph, show and explain how the action you identified would affect each of the following.
 - (i) Output
 - (ii) Price level
 - (c) Explain how the policy you identified in part (a) would affect short-term interest rates.
 - (d) Given that the economy is still below full employment, identify the open market policy the Federal Reserve could implement to increase the money supply.
 - (e) Using correctly labeled graphs, show and explain how the increase in money supply will affect each of the following in the short run.
 - (i) Short-term interest rates
 - (ii) Output
 - (iii) Price level

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Sketch of background so far:

What is M1, M2, M3?

T-accounts

The money market demand and supply.

The relationship of bond rates and prices.

Next background:

Money market vs. loanable funds market

What the Fed does.

How reserves work

Another multiplier

End story=>

How monetary policy works

