Topic 8
Money

Agenda

- Some motivating questions
- Money – how economists define it
- Money Demand
- Central Banks and the Money Supply
- Banks and the Money Supply
- Money Multiplier
- Money Market Equilibrium Interest Rate

Motivating Questions

- Why are we all so comfortable carrying around pieces of paper that have no intrinsic value?
- What makes people want to hold more or less money?
- Why do central banks matter?

Money

Is it correct to say, “he makes a lot of money?” Not if you’re talking to an economist.

What is money?

- **Money:** Anything that performs the following actions:
  - Medium of Exchange
  - Unit of Account
  - Store of Value
- **Medium of Exchange:** An item that buyers give to sellers in exchange for goods and services.
  - USA Medium of Exchange: Federal Reserve Note

- **Unit of Account:** The measure people use to post prices and record debts.

- **Store of Value:** An item used to transfer purchasing power from the present to the future.

More specifically...

- **Examples of money:** Currency (coins and paper bills), cigarettes, shells, beads
- **Not Money:**
  - Gift cards – not a common medium of exchange
  - Credit Cards – not really a method of payment but a method of *deferring* payment

MONEY IS NOT INCOME

- You shouldn't say, "How much money do you make at your job?"
- You make income!

- So what do economists call "money"?
- There are different groups of things we call money…

Components of Money Supply

- **M1:** currency and checkable deposits
  - Currency held by public ("token" money. Paper currency is issued by Fed)
- **M2:** M1+Savings Deposits, Small Time Deposits, Money Market Mutual Funds
- Difference is in **Liquidity**
- **Liquidity:** How easy it is to convert an asset into the economy's medium of exchange.
  - Houses and cars are the least liquid items

What “backs” the money supply?

- **Commodity Money:** a commodity with intrinsic value (i.e. cigarettes, gold, etc.)
- **Fiat Money:** money without intrinsic value, but is money by government decree
- USA dollar is **fiat money.** People get nervous about this
- Currency is a liability (debt) of Federal Reserve Banks. In a sense they owe you “purchasing power.”

Gold standard

- Used to be that the Federal Reserve owed you gold, rather than "purchasing power"
- So the value of gold in Fort Knox (or elsewhere) equaled the value of money in circulation.
- This ended in 1971. Why do you think it ended?

Pros and Cons of Commodity Money

- Pros
  1. Money has some inherent value
- Cons
  1. Limits amount of money that can be printed.
  2. Resources could be better used.
  3. Value of resource may not be stable (e.g. sudden change in amount of gold)

Money Demand

What makes people want to hold more or less money?

Why do people hold money?

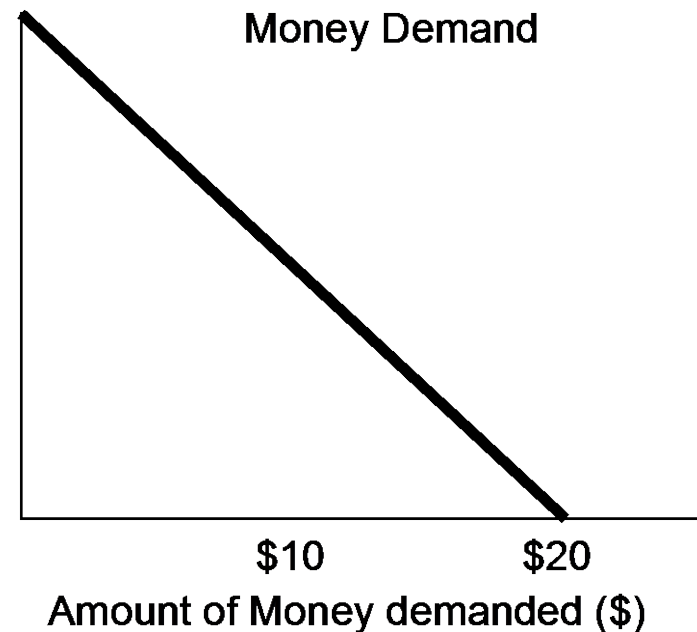
- For 2 reasons:
  1. To undertake transactions (this money is usually held as currency, rather than a checking account, etc.)
  2. As a store of assets (this money is usually in a checking or savings account. Note: a stock or bond is NOT counted as money)

So what changes money demand?

- Money demand for transactions (reason #1) is usually constant (e.g. you need to withdraw $50 a week for transactions)
- Money demanded for asset holdings depends on the **opportunity cost** of holding money.

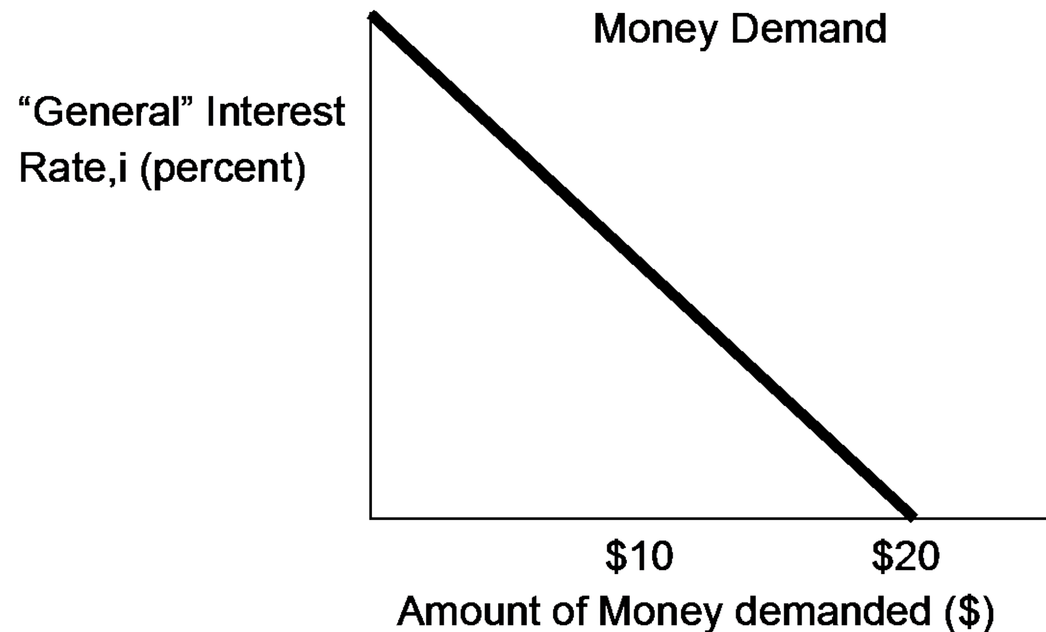
Money demand is downward-sloping

- Higher interest rate means higher opportunity cost of holding money
- So higher interest rate means lower money demand



Another way to think about this

- Money is a good, and people want a certain amount of it
- The interest rate is the “price” of money (what you give up by having cash instead of putting the money in a savings account)
- Lower prices mean higher demand



Money Supply

How much money should be printed and in circulation?

Central Bank and Money Supply

- Name of USA central bank: Federal Reserve Bank ("the Fed")
- Someone has to regulate our money, since it's a fiat currency
- The Fed is quasi-public. Any profits go to the Treasury, so no profit motive. It's not controlled by politicians

Federal Reserve Independence

- Fed Board of Governors make the decisions. Governors appointed for 14-year terms. Bank is technically private.
- What do you think the Fed would do if it were controlled by the president?
- Most likely, follow expansionary policies when election is coming up, boosting the economy but creating too much inflation, leading to unstable currency.

Fed's functions with regards to money supply

1. Supervising banks
   a. Lend Money
   b. Check collection and cashing
2. Controlling the Money Supply
   a. Issue Currency
   b. Set Reserve Requirements, hold reserves
   c. Conduct Open Market Operations

Banks and the Money Supply

- How to banks make profit?
  - Primarily from interest on loans and securities they hold
- So banks will lend out as much money as possible, to maximize profit
- How much can they lend out? Depends on the Reserve Requirement…

Reserve Requirement

- **Reserve Requirement (RR):** minimum fraction of checkable deposits a bank must keep "in reserve" (on deposit at the Fed or as Federal Reserve Notes in its own bank vault.)
- **Excess Reserves:** The quantity of money a bank holds that exceeds its required reserves. "Leftovers"

Examples

Suppose I deposit $1000 in a bank. How much can the bank lend out if

- RR = 0%
- RR = 100%
- RR = 50%

Fractional Reserve Banking: A banking system in which banks are only required to keep a fraction of deposits as reserves

Wait, banks are lending out my money?

- What if people don’t pay back their loans? Do I lose my money?
- Answer USED to be YES. During bad economic times, there was a “bank run” – everyone trying to withdraw their money at the same time.
- Now deposits are insured by FDIC

OK, but why let banks do this?

- It helps the economy – more money for people to use
- We can see this by looking at the balance sheet for an imaginary bank…

Example: RR = 0.20

1. Jo finds $1000 in her mattress and deposits it at Wells Fargo. Initial deposits = $1000

	Assets	Liabilities
	$200 Reserve	$1000 Deposit (Jo's saving)
	$800 Excess Reserves	
total	**$1000**	**$1000**

Example: RR = 0.20

2. Mike needs money to repair his car, takes an $800 loan and pays Ann of Quick Repair

Assets	Liabilities
$200 Reserve	$1000 Deposit (Jo's saving)
$800 Loan (Mike)	

total	$1000	$1000

Example: RR = 0.20

3. Ann deposits the money in Wells Fargo

	Assets	Liabilities
	$200 (Jo Reserve) + $160 (Ann Reserve)	$1000 Deposit (Jo's saving)
	$800 Loan (Mike)	$800 Deposit (Ann's)
	$640 Excess Reserves	
total	**$1800**	**$1800**

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Example: RR = 0.20

4. Smith family takes out $640 loan to paint house. They hire Jo, who deposits it.

	Assets	Liabilities
	$200 (Jo Reserve) + $160 (Ann Reserve) + $128 (Jo Reserve #2)	$1000 + $640 Deposit (Jo's saving)
	$800 Loan (Mike)	$800 Deposit (Ann's)
	$640 Loan (Smith)	
	$512 Excess Reserves	
total	**$2440**	**$2440**

Example recap

- At the beginning of this economy:
  - M1 = $1000
  - Only Jo had money to spend ($1000)
- At the end of this economy
  - M1 = $2440 and growing
  - Jo has $1640 to spend, Ann has $800
  - Repaired a car; painted a house

How can this be?

- This system of banking creates money, but **it does not create any wealth**
- Loans give borrowers the ability to pay for goods and services, but also increase their debt, so they're not any richer
- Economy is more liquid (more of the medium of exchange) but not wealthier

Money Multiplier

How much can we increase the money supply? Is it limitless?

Estimating the Maximum Money Supply

- (Initial Deposits)
  +(1-RR) * (Initial Deposits)
  +$(1\text{-}RR)^2$ * (Initial Deposits)
  +…
  = 1/RR * (Initial Deposits)
  … using a math rule for infinite sums
- **(MM) Monetary Multiplier = 1/RR**
- So **Maximum Money Supply**
  = MM * Initial Deposits

Estimating the Maximum Money Supply

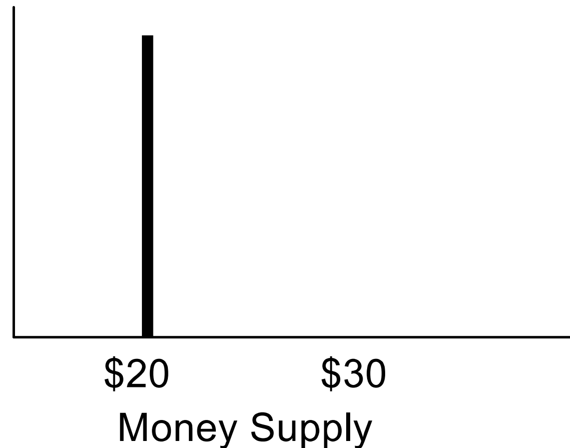
- **(MM) Monetary Multiplier = 1/RR**
- In the example, RR = 0.20, so MM = 5
- Maximum Money Supply
  = 5($1000) = $5000
- So $5000 - $1000 = $4000 was created
- Notice that higher reserve ratios generate lower MM's, i.e. less money is created

Money Supply = Maximum

- Banks always want to maximize profits, so they will loan all that they can, so the money in the economy right now is very close to the maximum money supply
- From now on “money supply” will mean “maximum money supply”

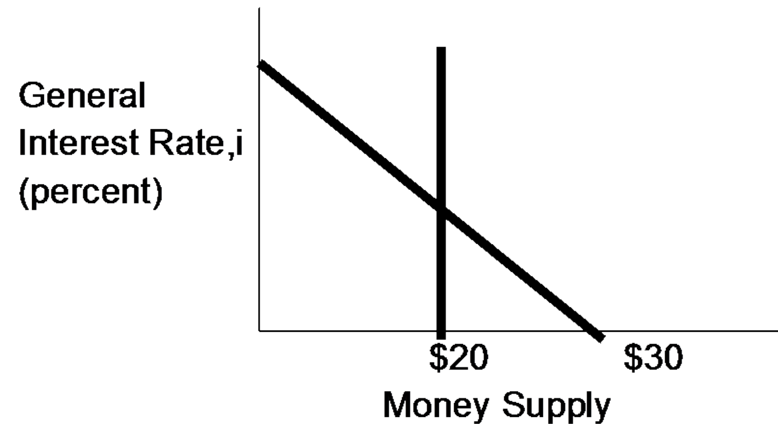
Money Market Equilibrium Interest Rate

Money Supply is very inelastic



- Think about currency. Whether interest rate is 5% or 10%, the series of loans will happen.
- Money supply depends on initial deposits and reserve requirement, not price

Money Demand = Money Supply



- If interest is above equilibrium rate, people want to hold less money than is supplied.
- People with surplus money try to get rid of it by buying interest-bearing bonds or depositing it in an interest-bearing bank account
- Banks and bond issuers will lower interest rates