

## Money, Monetary Policy, and the Fed

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### Money

- Money is an asset
- 4 main functions
  - Medium of Exchange
  - Store of Value
  - Standard of Value
  - Standard of Deferred Payment
- Kinds of money
  - Commodities
  - Paper
  - Deposits

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### US Monetary Systems

- US - “Fiat Money” – intrinsically worthless green pieces of paper that serves as money
- What backs our money – Reliance and faith of citizens that there is work to these pieces of paper
- This is not always the case – only since 1971 has the US had “fiat money” – pre-1971 the US had “convertible paper money” – money backed by a commodity (usually gold)

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### Measurements of Money

- How does the government measure the amount of money in the economy?
- M1 – closest measurement to what we have been calling money
  - Total Stock of currency, coins, checkable deposits and travelers checks
  - Does not include vault cash, interbank deposits, government accounts
  - 70% is checkable deposits
  - M1 is the most liquid form of money
- M2 – M1+ savings deposits, small time deposits, MMMFunds, Eurodollar

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### The Money Market

- In the money market real supply of, and demand for, money interact to determine the interest rate.
- The **real money supply** ( $m^s$ ) is the nominal money supply ( $M^s$ ) adjusted for the price level.
- $M^s$  is determined by the money multiplier and controlled by the Fed
- The price level is taken as given (for now)

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### Real Money Demand

- The demand for real money balances ( $m^d$ ) is positively related to income and inversely related to the interest rate.
- An increase in income raises the level of transactions
- An increase in the interest rate increases the opportunity cost of money

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**Changes in the Money Supply**

- Increase in  $M^s$  shifts the supply curve to the right causing interest rates to fall.
- The Fed can cause this by:
  - 1) Buy (sell) securities in the open market
  - 2) Lower (raise) the discount rate
  - 3) Lower (raise) the reserve requirement
- These actions are expansionary (contractionary) uses of monetary policy.

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**Changes in the Price Level**

- Increases in the price level shift the real money supply curve to the left, increasing the interest rate
- Inflation will tend to raise interest rates unless the Fed allows the money supply to increase
  
- Real Interest Rate = (Nominal Interest Rate) – Inflation Rate

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**Changes in Real Income**

- Increases in real income shift the demand for money to the right causing interest rates to rise.
  
- During an economic expansion, interest rates will tend to rise unless the Fed allows the money supply to increase.

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### Money Creation

- 1) Money (deposits) is created when banks make loans (or buy securities)
- 2) Banks must have excess reserves to make loans.
- 3) Excess Reserves are created when:
  - The Fed buys securities in the open market
  - Banks borrow from the Fed through the Discount Window
  - The Fed buys foreign exchange in the foreign exchange market
- 4) Lending/deposit creation “uses up” excess reserves. Each \$ of new deposits uses up  $rr$ \$ of excess reserves

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### Bank's Balance Sheet

- Reserve Accounts – Deposits that banks have at the Fed, required to hold reserves as a percentage of their checkable deposits
- Reserve Requirement Ratio - % of checkable deposits that banks are required to hold
- Vault Cash – currency held by banks to meet depositor needs and reserve requirement
- Loans/Securities - earning assets for banks

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### Reserve Requirement

- Required Reserves (RR) = Reserve Requirement \* Deposits

$$RR = rr * D$$

- RR can be held as Vault Cash (VC) or in a reserve account. The amount held at a bank are its total reserves (TR).

$$TR = R + VC$$

- If the actual total reserves of a bank exceed its required reserves, it has excess reserves (ER)

$$ER = TR - RR$$

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### Money Creation II

- Suppose that a bank receives an initial deposit of \$200. How much new money can be created with a reserve requirement of 10%?
- Simple money multiplier =  $(1/rr)$
- The key to money creation is the “fractional reserve system” and the assumption that all of the ER are being loaned out.
- What happens if not all the ER is loaned out? What happens if  $rr$  is increased?

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### Monetary Policy

- The Federal Reserve can change the money supply in the economy through three methods:
  - Changes in  $rr$
  - Changes in the discount rate
  - Open market operations in the securities markets
- Each of these serves to increase (decrease) the nominal money supply, which in turn affects interest rates in the country.
- Changes in interest rates affect investment by firms and savings/consumption by households, therefore affecting GDP.

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### Expansionary (Contractionary) Monetary Policy

- Decrease (Increase)  $rr$  – allows banks to hold less (more) of all deposits in reserve – increases ER
- Decrease (Increase) discount rate - cheaper (more expensive) for banks to borrow from Fed
  - Announcement Effect
  - Actual Effect
- Purchase (Sell) securities in open market – banks sell (buy) securities - additional (less) money that can be loaned out

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### **Money and the Goods Market**

- Monetary Policy affects  $M^s$ , which in turn affects interest rates
- Interest rates in turn affect the level of investment expenditures, a component of AD
- Changes in AD affect output and prices
- Expansionary MP – increase AD - raise output and price level
- Contractionary MP – decrease AD – lower output and price levels

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