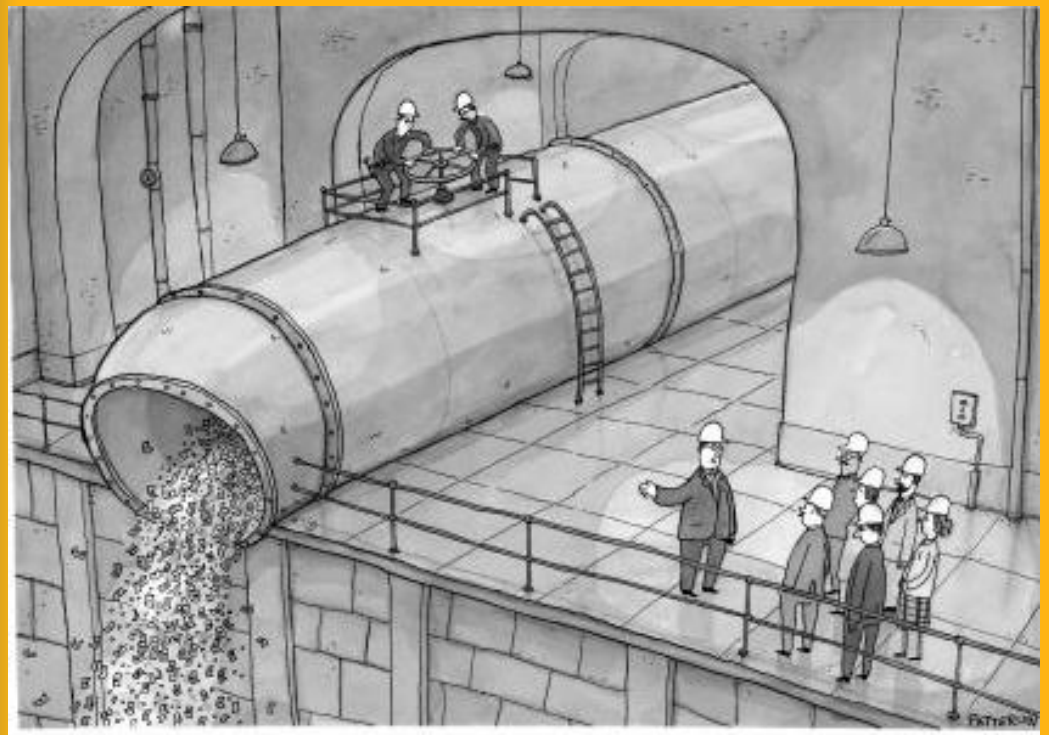
ECON 2:
Principles of Macroeconomics



"And this is where we adjust the interest rate."

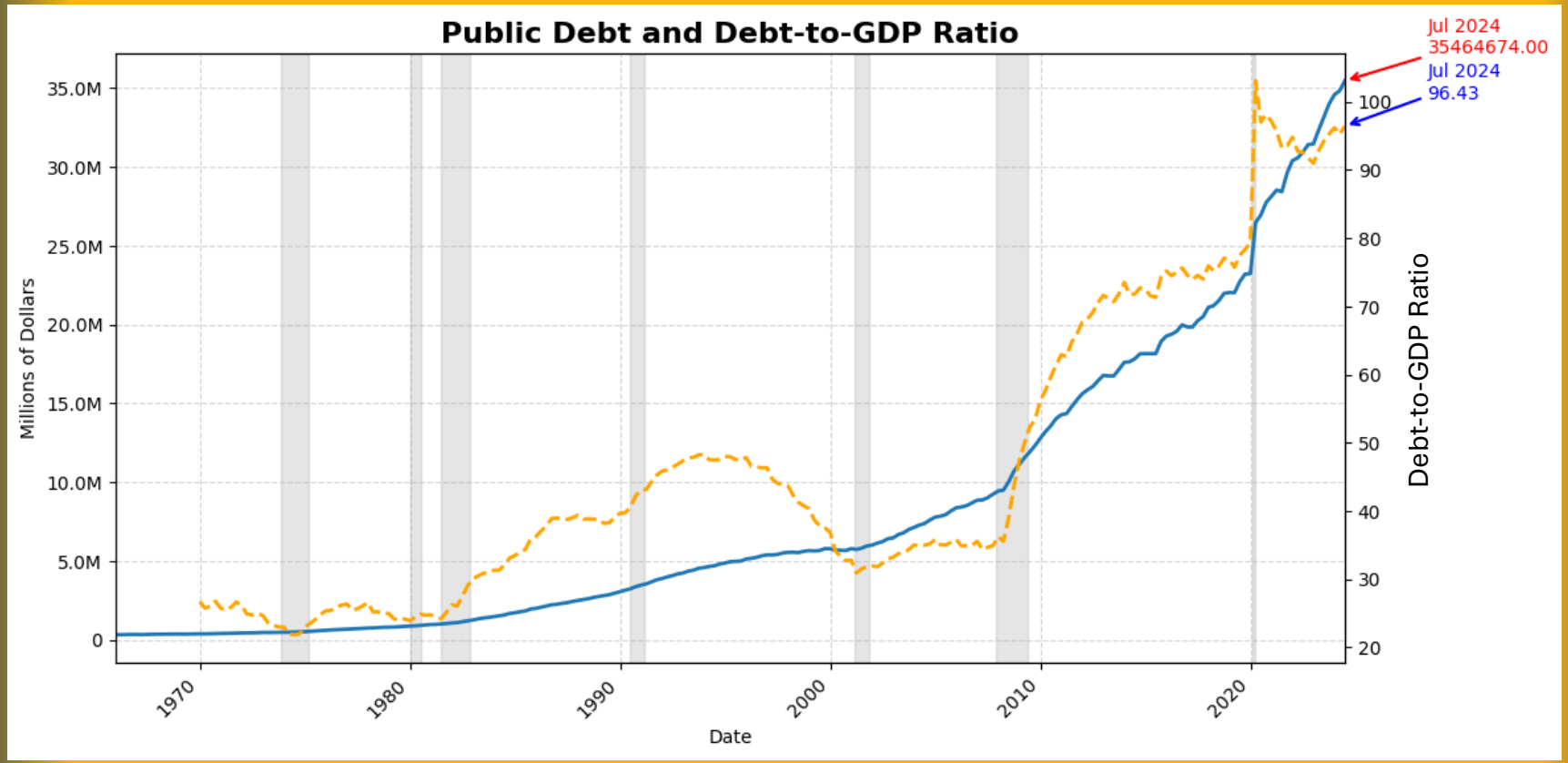
Lecture 14:
Monetary Policy

National Debt Facts

Fact #3:Debt-to-GDP Ratio

National Debt Facts

- Debt-to-GDP Ratio:



National Debt Facts

Fact #4: National Debt Interest Payments

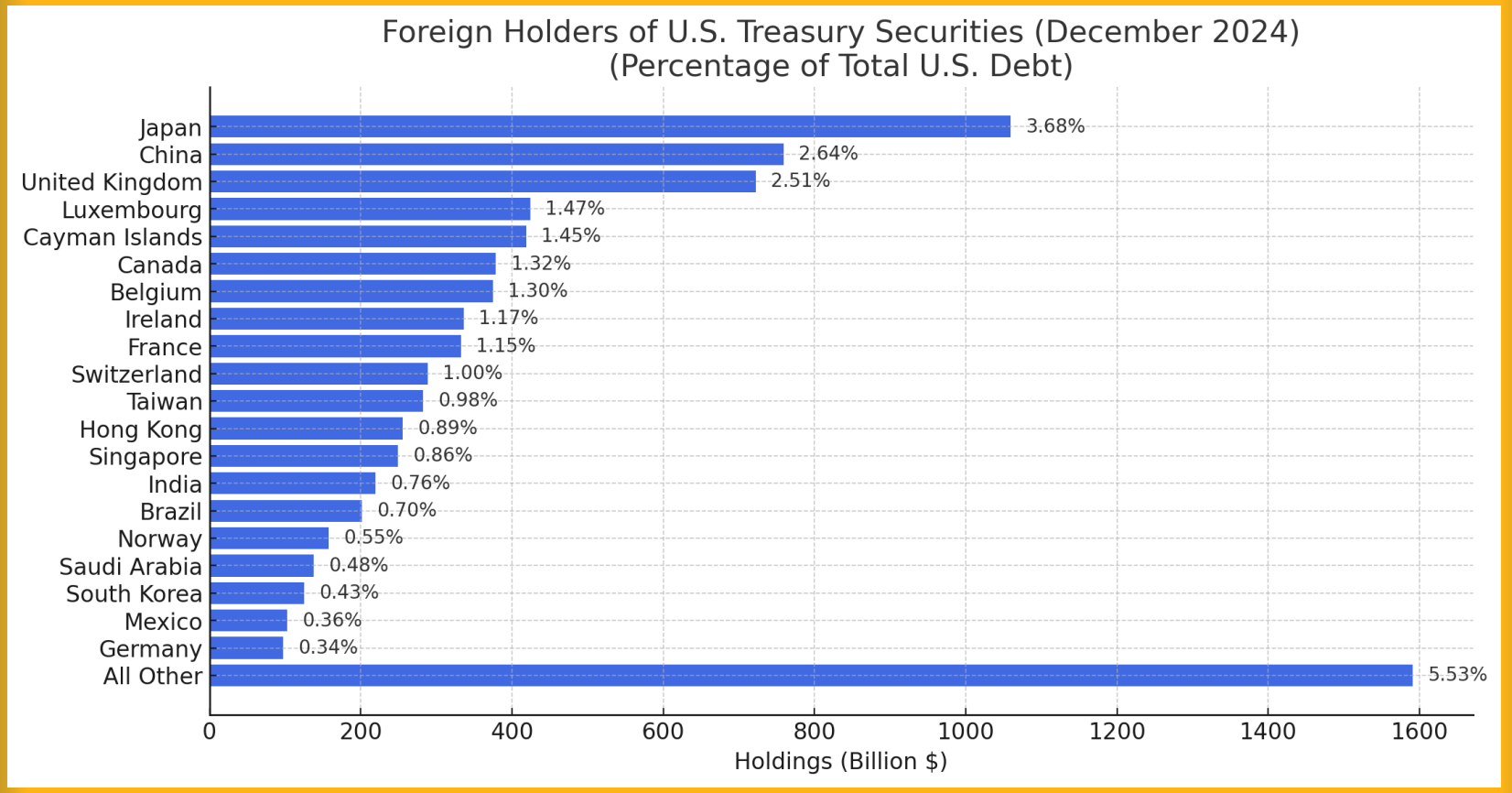
Spending Interest Payments

$1m debt

5% annual interest

$1m cash

Who Owns the US Debt

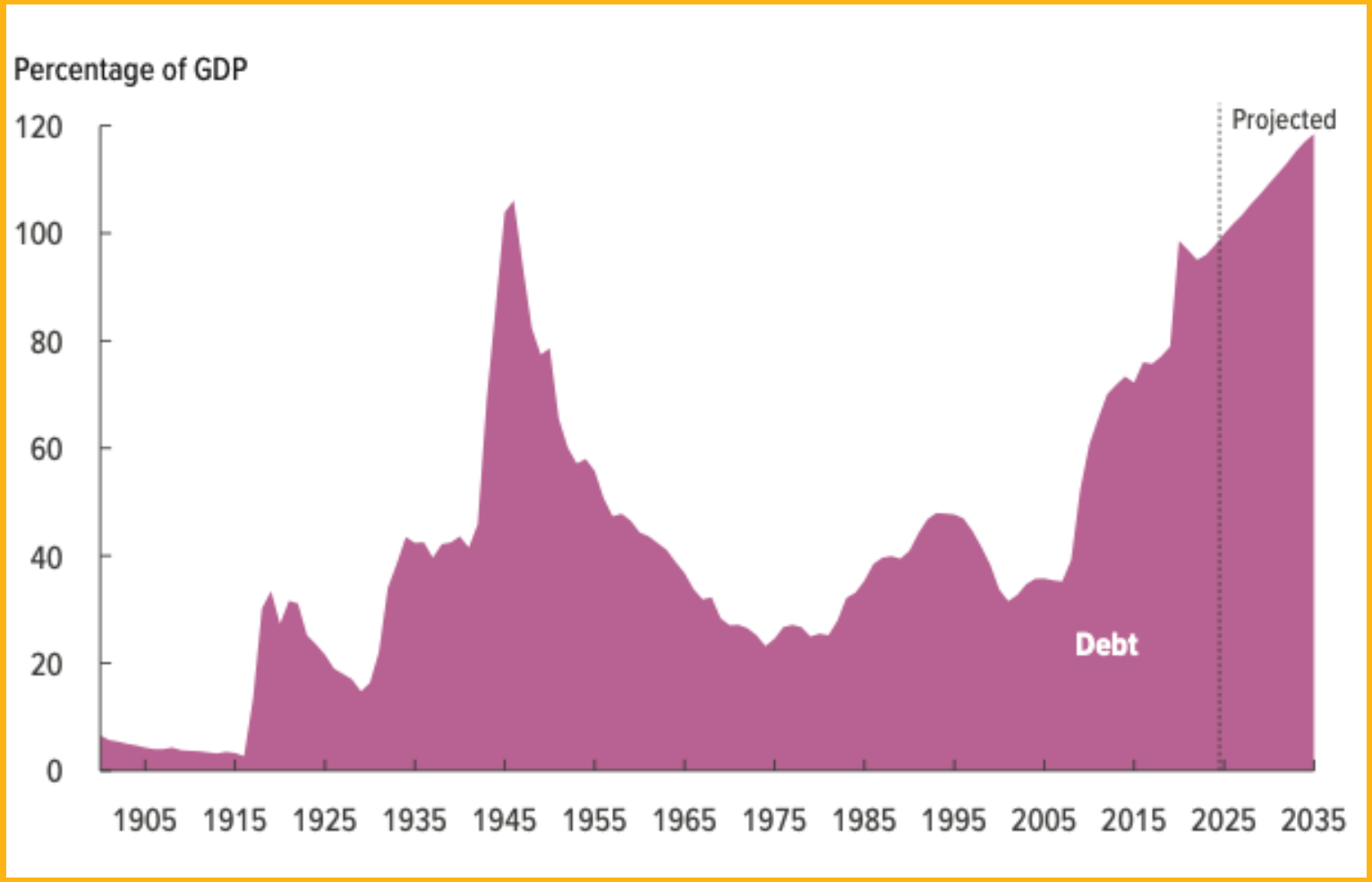


Debt Projections and Aggregate Expenditures

What can be done?

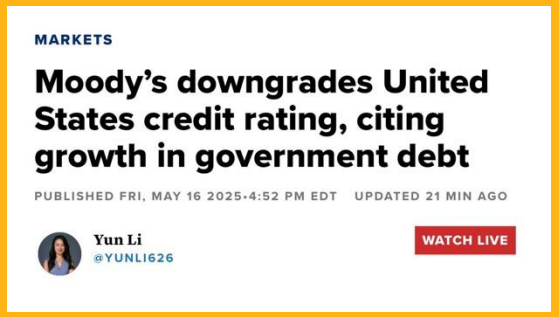
- Decompose the Minimum Tax Rate:

CBO Debt Projections



US Government Credit Score

- Friday's News


MARKETS

Moody's downgrades United States credit rating, citing growth in government debt

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WATCH LIVE

- Why?
  - YoY National Debt near 5%
  - Interest Payment at 9% of GDP in 2035
  - Fiscal Reform Nonsense

- Consequences
  - All 3 Credit Rating agencies have downgraded US Bonds, still "safe"
  - Increased risk of bonds → higher return demanded
  - US bond rates higher → other interest rates rise (next part of course)

Maturing National Debt

- US rolls over ~1/3rd of the total debt every year
- Unlikely to default: Debt Ceiling always raised
- Bigger concern is fiscal path leading to rising interest payments

- Average Interest Rate on Debt
- Unsustainable Fiscal Path, Bureau of the Fiscal Service
- Fiscal Data (from Treasury.gov)

Next Part

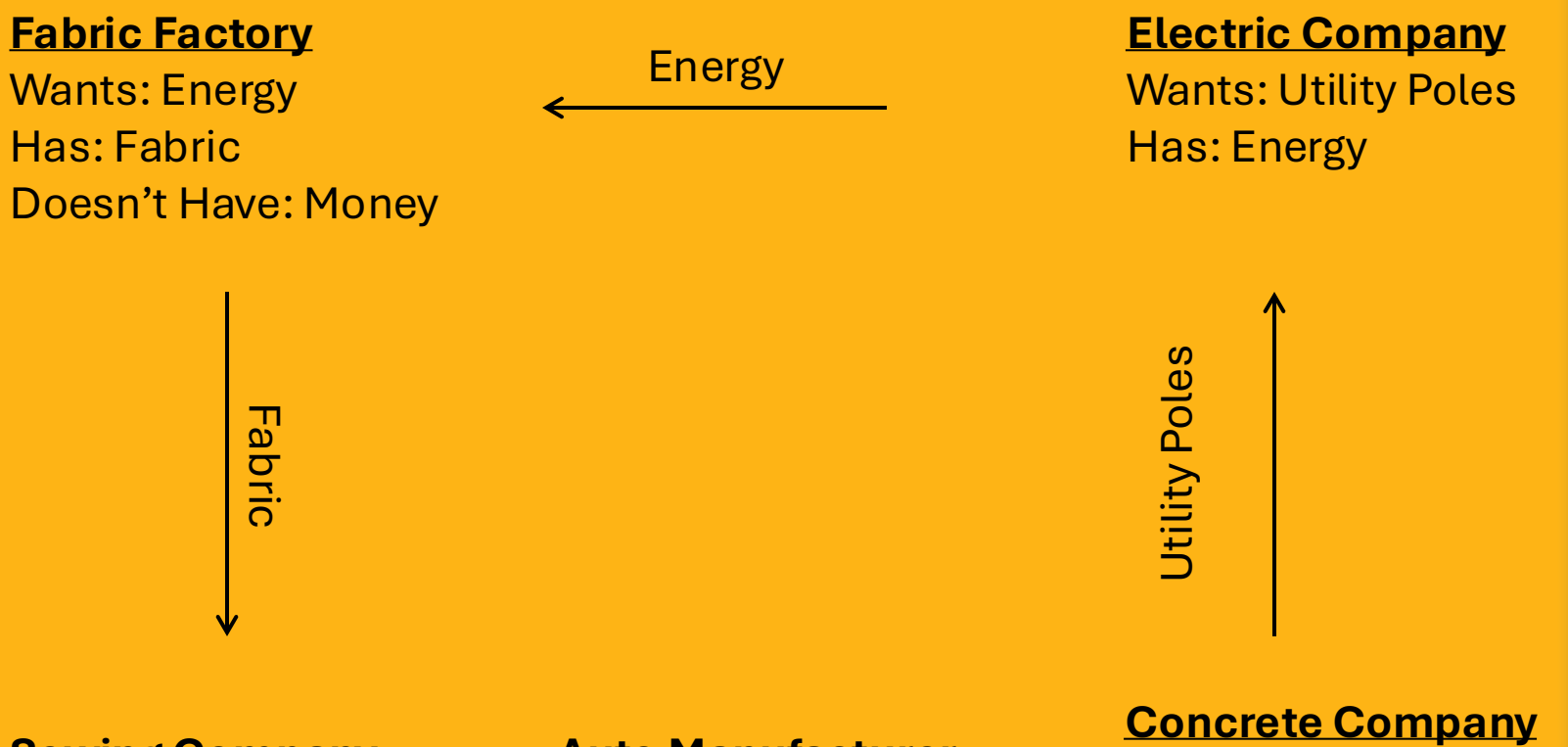
- Money
- Federal Reserve
- Monetary Policy
- Connecting Monetary Policy to Aggregate Expenditures

An Economy without Money

Bartering in the 1990s?

"A supervisor at a *fabric factory* here on the outskirts of Moscow, heard good news a couple of weeks ago. Three carloads of *concrete utility poles* had arrived at the train station."

An Economy without Money



An Economy without Money

Fabric Factory
Wants: Energy
Has: Fabric
Doesn't Have: Money

Energy

Electric Company
Wants: Utility Poles
Has: Energy

Does Bartering Still Exist?

- Barter for a Better Fiji group

- Membership = 190,000 = 20% of Fiji's population
  - pigs for kayaks
  - a violin for a leather satchel
  - doughnuts for building bricks

"I knew that money would be tight to stretch out and even harder to come by. I asked myself what happens when there's no more money? Barter was a natural solution to that."

- Bartering Time (one hour X for one hour of Y)

What is Money?

- Three main characteristics:

1. Medium of Exchange:
    - Consumers use money to buy things and services
    - Merchants accept money as payment due to its convenience in buying products and services
    - Bypass the restrictions of a one-on-one bartering system

2. Unit of Account:
    - It's a unit for measuring the market value of goods, services, and transactions.
    - Conveniently compare product prices and assess their respective worth.
    - In a barter system, each exchange has a unique terms-of-trade

3. Store of Value: Unused money today can be stored for future use
    - Money can maintain its value over time and withstand inflationary pressures

What is Money?

- Commodity Money
  - Good, such as gold or another metal, is used as money
  - Commodity has its own value separate from its use as money
- Fiat Money
  - Declared by a government to be legal tender
  - Not backed by an intrinsic value
- Electronic Money
  - Only in banking computer systems
  - Increasingly more popular
- Cryptocurrencies
  - Digital or virtual currencies that use cryptography for security
  - Not issued by a central authority

Categories of Money

- How much money is in the economy today (money supply)?
- Liquidity: The ability of an asset to be used to purchase a good or service
- Most liquid form of money:
- M1 money supply:
- M2 money supply:
- Credit Cards:
- Moving forward M1 money supply = money supply = money available today to be used for spending

Fractional Reserve Banking

- Bank: a firm that specializes in brokering between savers and borrowers, allowing borrowers to go to one firm instead of 1000s

- Banks are only required to keep a fraction of their deposits on hand as reserves
- Lends out the rest
- Creates new money in the form of a deposit in the borrower's account
- Deposit effectively increases the overall money supply
- Governments regulate banks and provide deposit insurance to protect depositors' funds.

The Federal Reserve

- The Mint Act of 1792 established the dollar as the principal unit of currency
- 1793 to 1861: 1,600+ banks issued their own currency
- 1863: National Banking/Currency Act: National Banking System, Uniform Currency
- Bank Panics in late 1800s/early 1900s: fears that banks would not have funds
- Federal Reserve Act of 1913Central authority to stabilize system Authorized the issuance of Federal Reserve notes, which are still in use today

The Federal Reserve

- Today there are five key functions of the Federal Reserve:

1. Overseer of all banks/bank for banks
2. Bank for the government
3. Provides loans to banks (discount rate)
4. Facilitates Issuing of Bonds (auctions)
5. Carry out monetary policy

- The decisions about monetary policy are carried out at Federal Open Market Committee meetings about 8 times a year (March 18-19)
- Chair: Jerome Powell
  6 Board of Governors
  12 Independent Branch presidents
- Chair, Board, NY Fed president and rotation of remaining branch presidents vote on policies

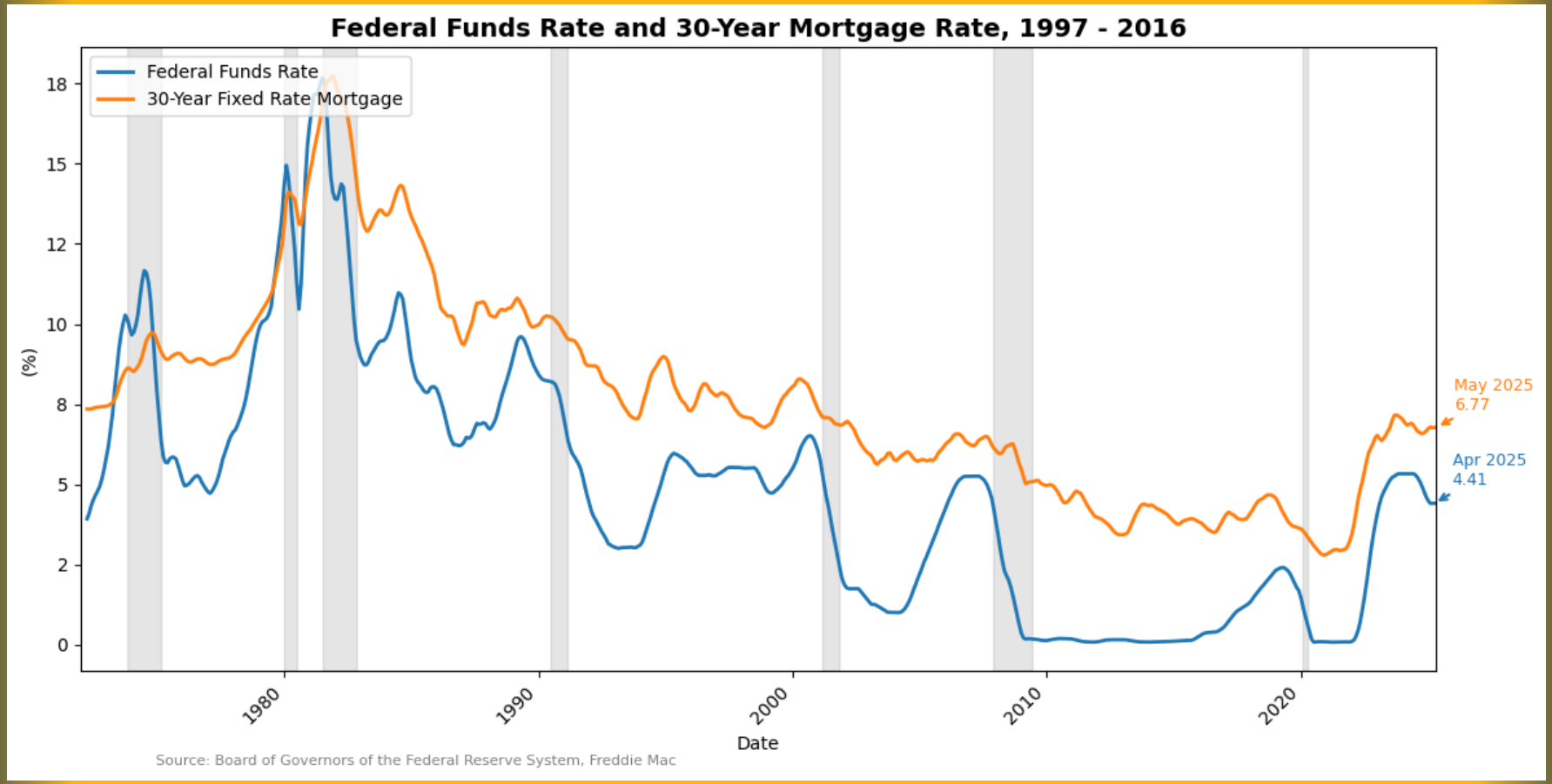
Monetary Policy

- Monetary Policy: managing the money supply in order to maximize employment and keep prices stable
- How does the Fed change the Money Supply?
- Typically done through Open Market Operations: buying and selling of Treasury bills (mature in 1 year), notes (2 to 10 years) or bonds (30 years)
- **Open market purchase**→Federal Reserve purchases Treasury securities from banks and the public→more money deposited in banks→**Money Supply Increases!**
- **Open market sale**→Federal Reserve sells Treasury securities that the government has created→less money deposited in banks→**Money Supply Decreases!**

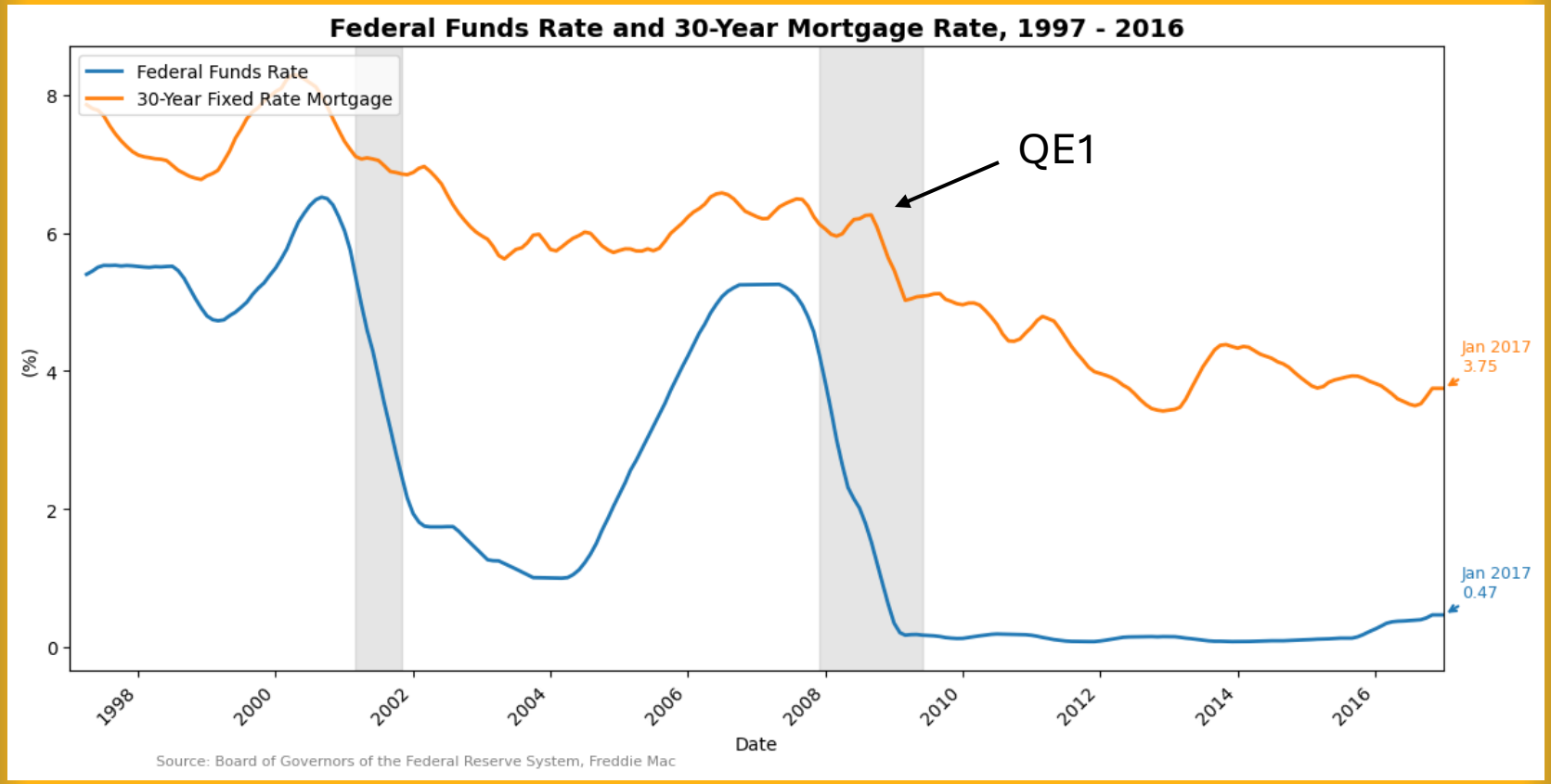
Monetary Policy

- Buying and selling Treasuries changes the interest rate
- Target the Federal Funds Rate: the interest rates banks charge other banks for loans
  - determines flexibility in the banking system since banks can loan out more than they borrow
  - other important interest rates tend to follow the Federal Funds rate

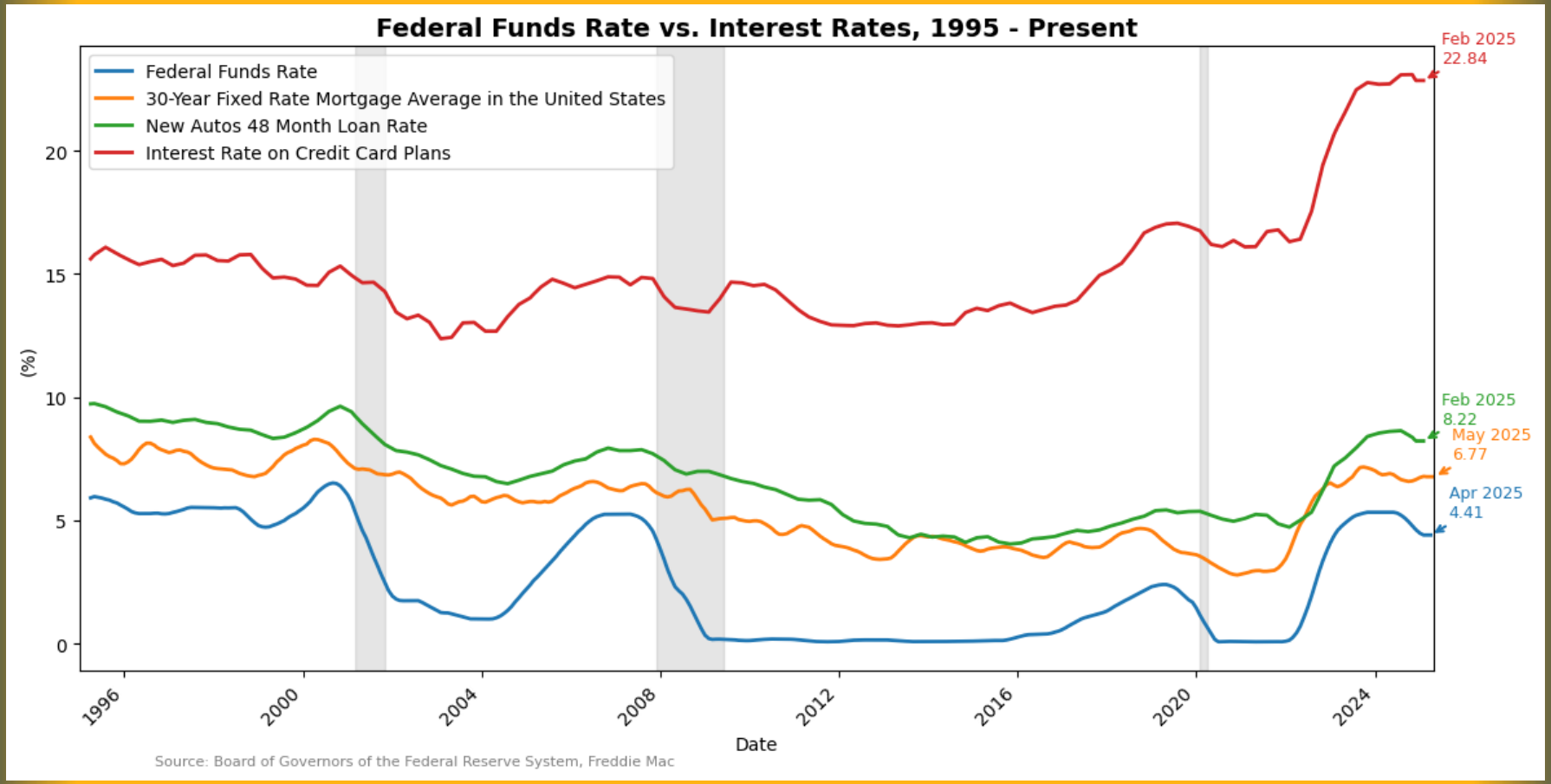
Federal Funds Rate vs 30 Year Mort. Rate



Federal Funds Rate vs 30 Year Mortgage Rate, 97-16



Federal Funds Rate vs Interest Rates



Demand for Money

- Connect Monetary Policy to Interest Rates through the market for money
- Demand for Money: Why hold on to money (M1 Money)?

Demand for Money

- Wealth Box:

Money	Other Assets

Demand for Money

- Benefit of holding wealth in the form of money :
- Cost of holding wealth in the form of money:
- Price of money vs. Return on illiquid assets?

Demand for Money

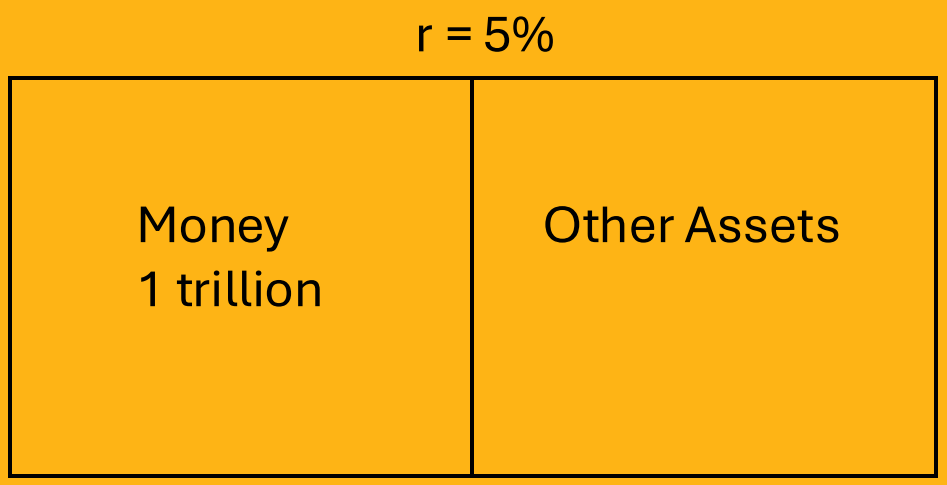
- Interest Rate = r

- Demand for Money:

Demand for Money

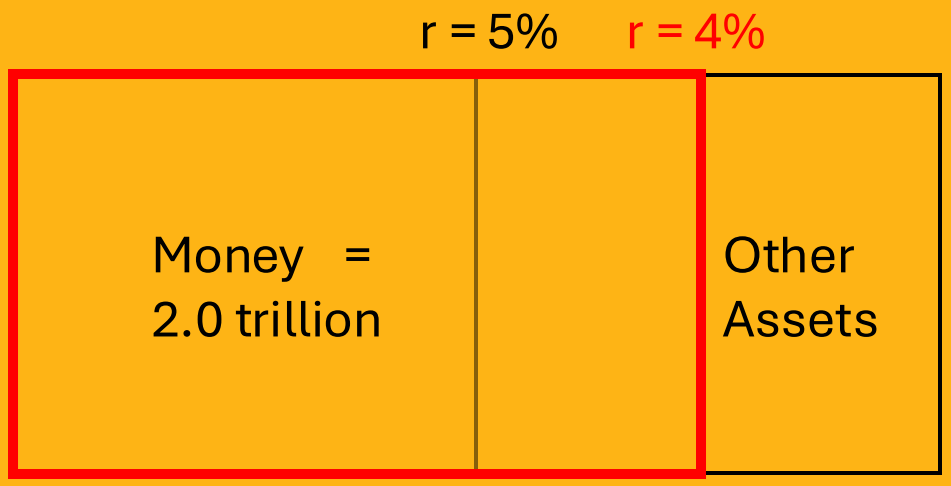
Demand for Money

- Point A:



Demand for Money

- Point A to Point B:



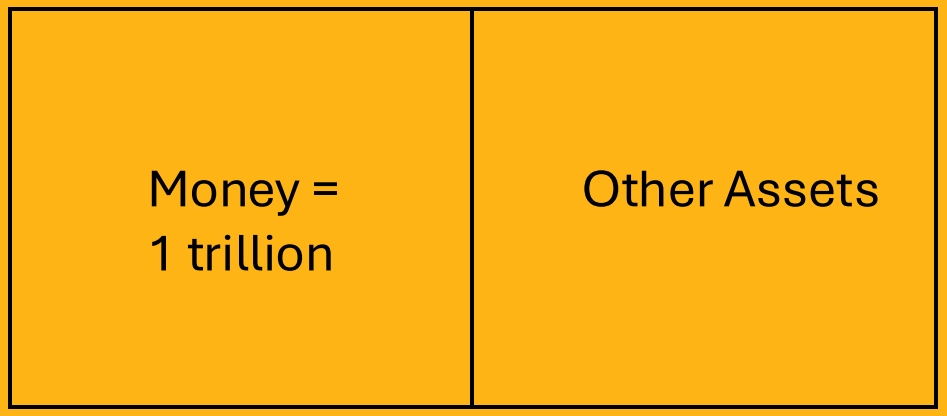
Demand for Money

- What shifts the demand for money?

Demand for Money

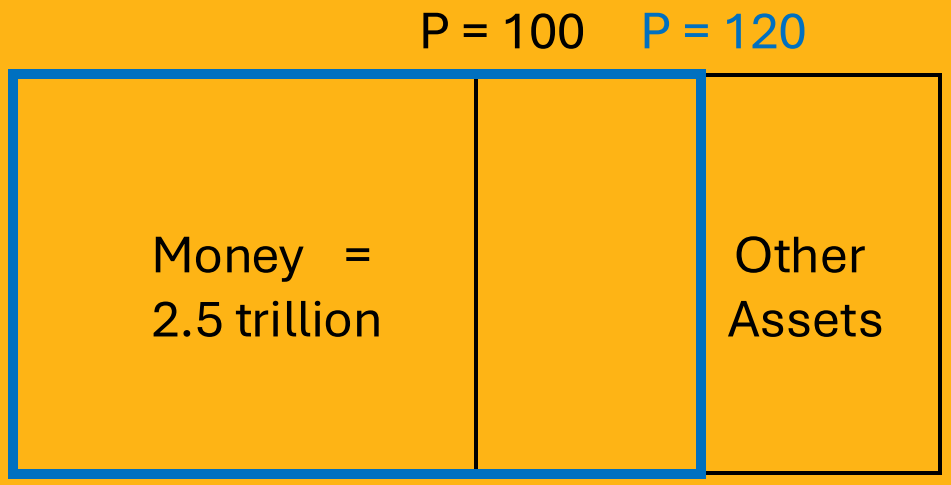
- Point A: r = 5%

P = 100



Demand for Money

- Point A to Point D:

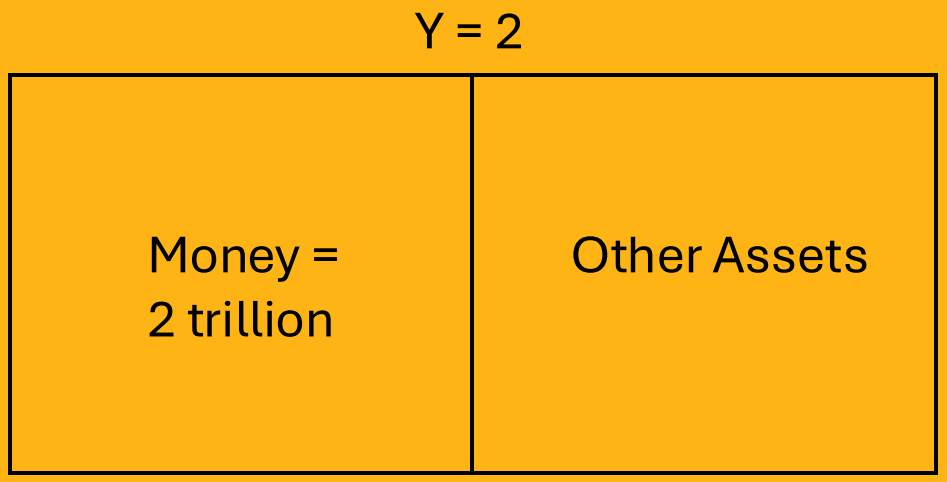


Demand for Money

- What shifts the demand for money?

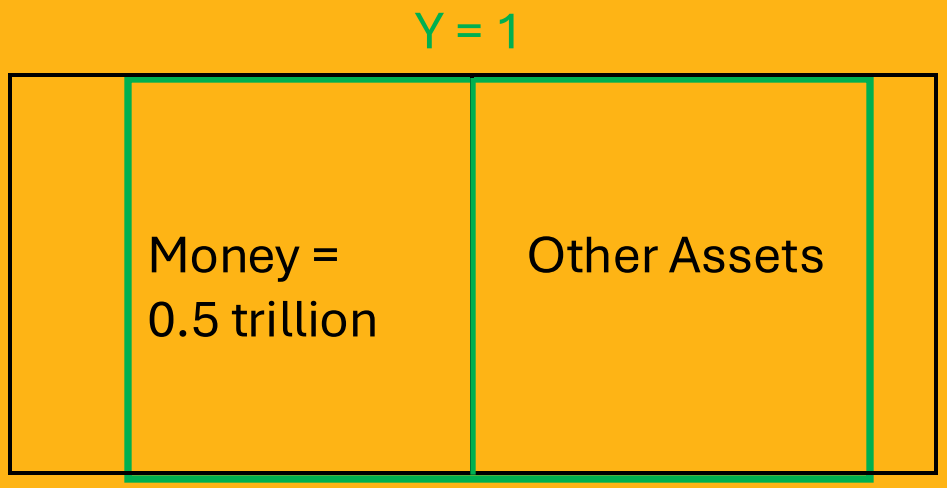
Demand for Money

- Point A: r = 5%, P=100



Demand for Money

- Point A to Point F: r = 5%, P=100



Supply of Money

- Set by the Central Bank/Federal Reserve
- Same supply of money at all interest rates

Money Market Equilibrium

Changing the Interest Rate

- Federal Reserve buys/sells bonds
  - Changes the interest rate

- 1-Year Bond with a value of $100
  - Buyer purchases bond today, gets $100 in 1 year
  - Price of bond today is less than $100

- Interest Rate = (Return on the bond/Price of bond) x 100
- Bond Price Change→ Return on bond Change→ r* Change

Carrying out Monetary Policy

- How does the Fed enact monetary policy?
- Example: r_1 = 5%, Fed wants to decrease r_2 = 4%

Carrying out Monetary Policy

- How does the Fed enact monetary policy?
- Example: r_1 = 5%, Fed wants to increase r_3 = 6%

Why is the interest rate so important?

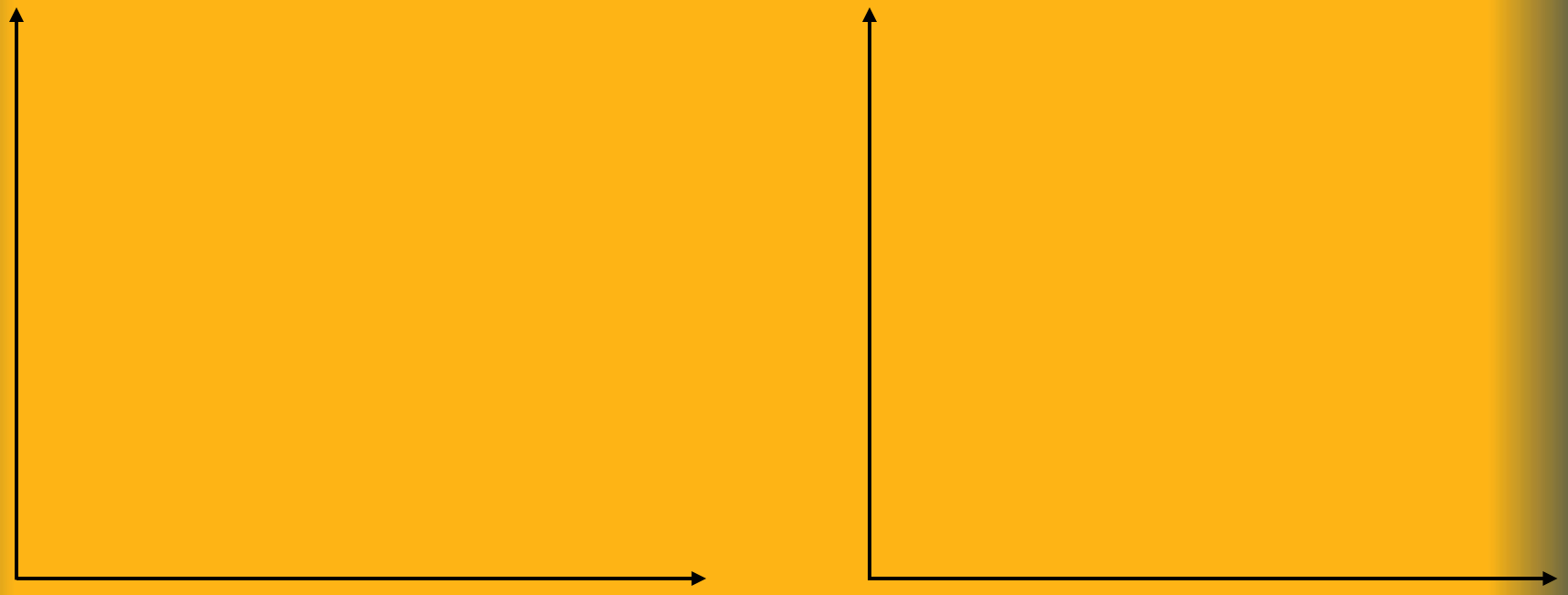
- What changes when r decreases?
- 1.
- 2.
- 3.

Monetary Policy in Action

- Example 1: $Y_1 = 8{,}000$, $r_1 = 6\%$ and $M_1 = 1$ trillion
- $\bar{Y} = 10{,}000$ (full employment GDP)

Monetary Policy in Action

- Example 1: $Y_3 = 12{,}000$, $r_3 = 2\%$ and $M_3 = 4$ trillion
- $\bar{Y} = 10{,}000$ (full employment GDP)



Effects of Inflation

- Example: $\bar{Y}$ = 10,000 (full employment GDP), r_1 = 5%, M_1 = 1 trillion, CPI_1 = 100