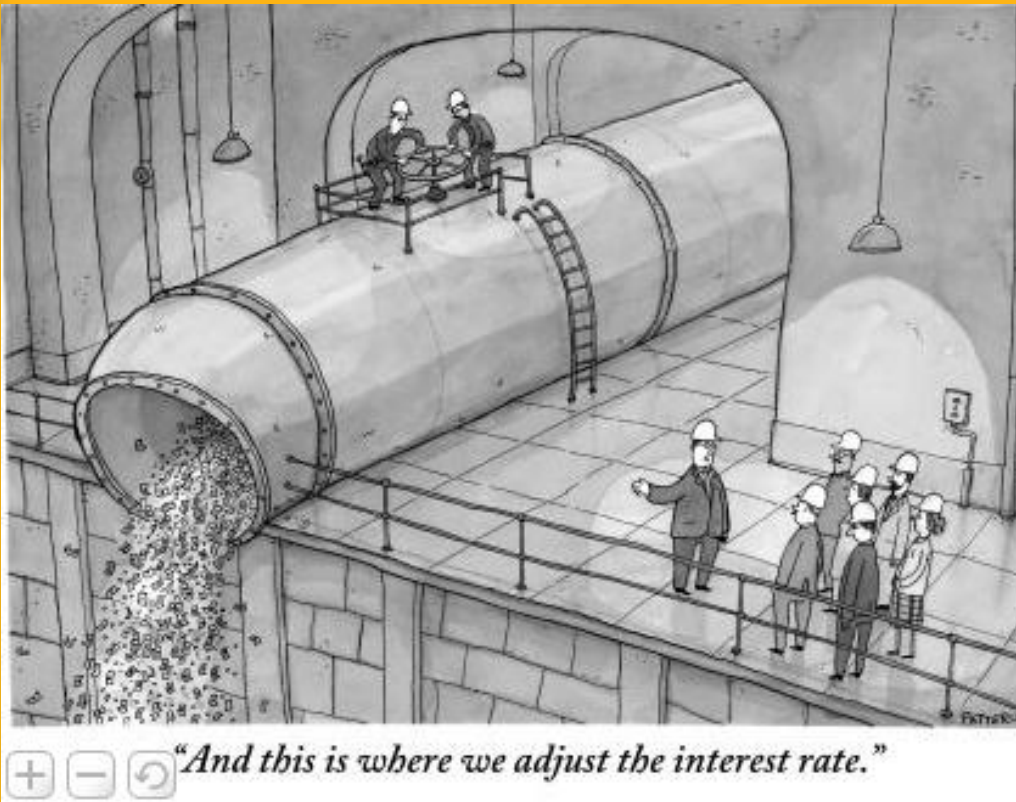


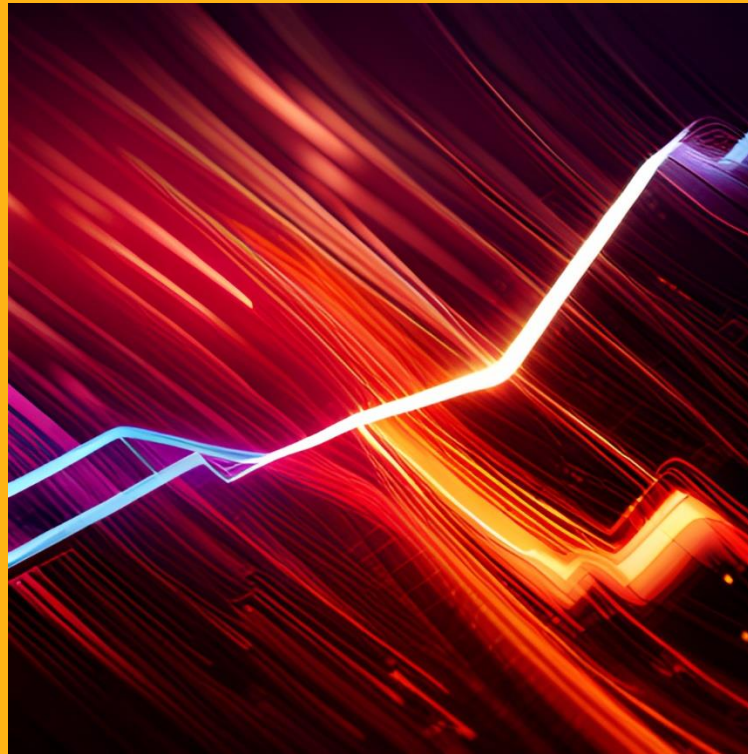
ECON 2: Principles of Macroeconomics



Lecture 14: Debt and Monetary Policy

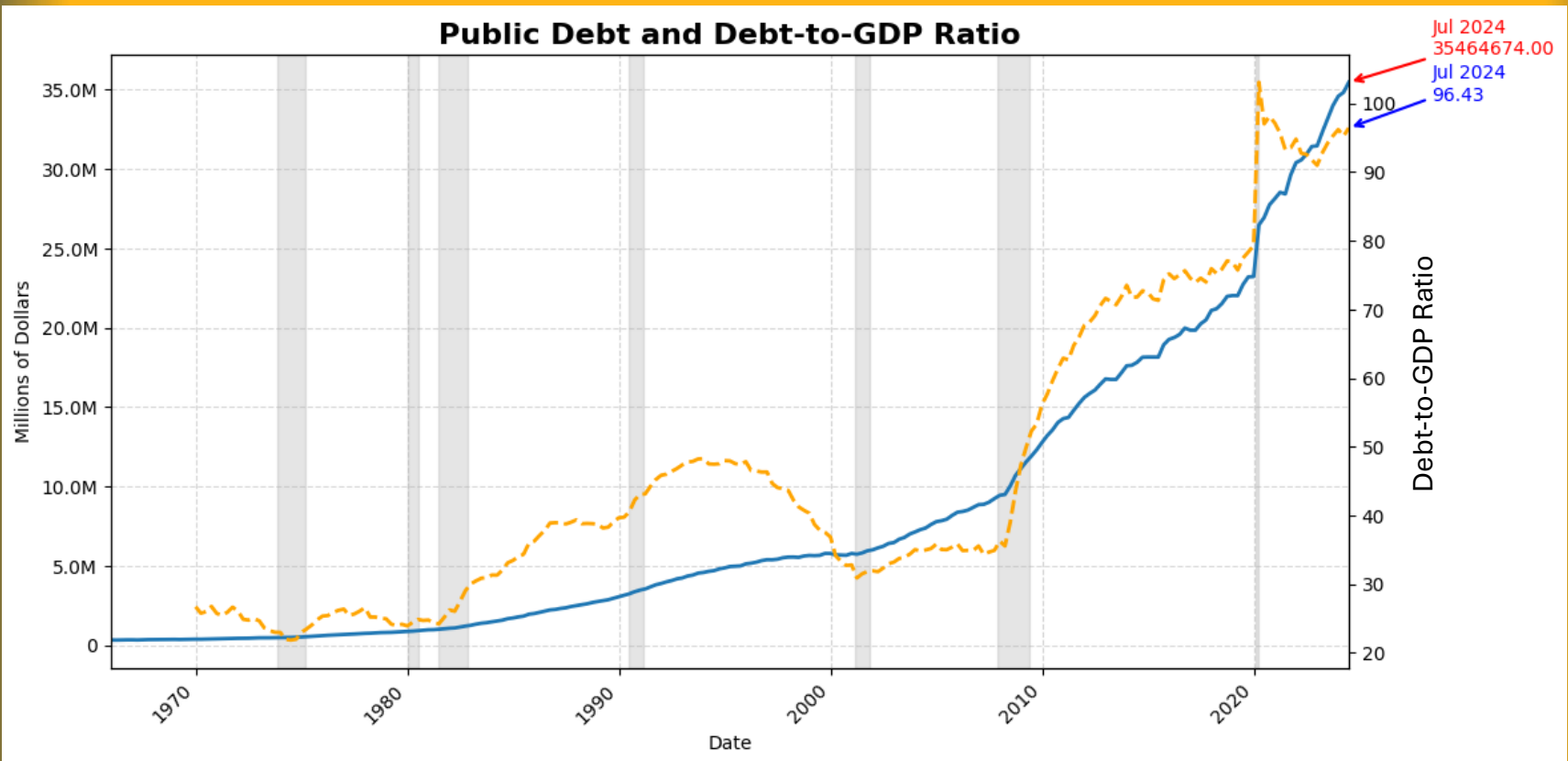
National Debt Facts

Fact #3: Debt-to-GDP Ratio



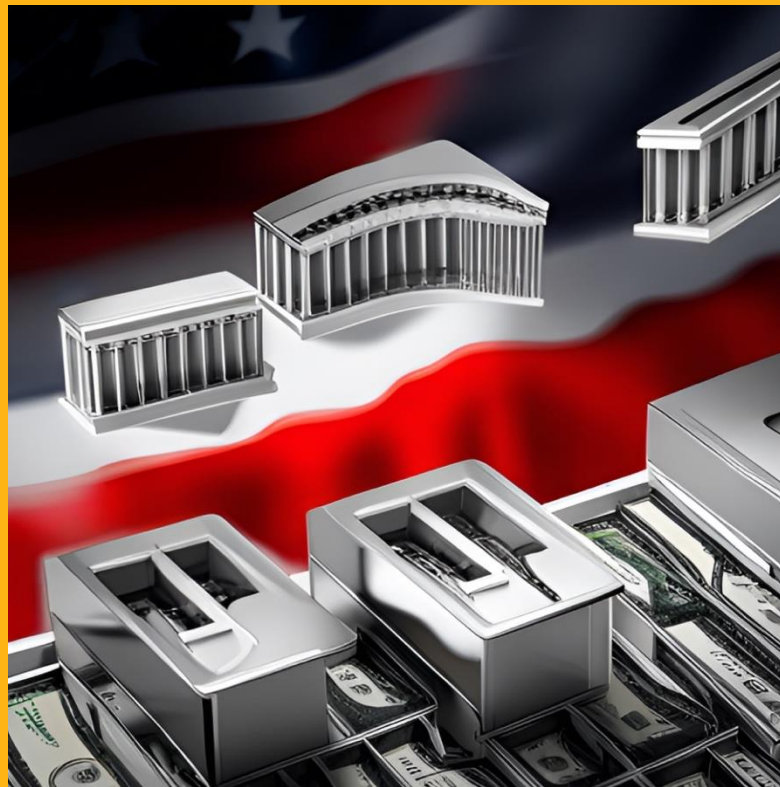
National Debt Facts

- Debt-to-GDP Ratio:



National Debt Facts

Fact #4: National Debt Interest Payments



Spending Interest Payments

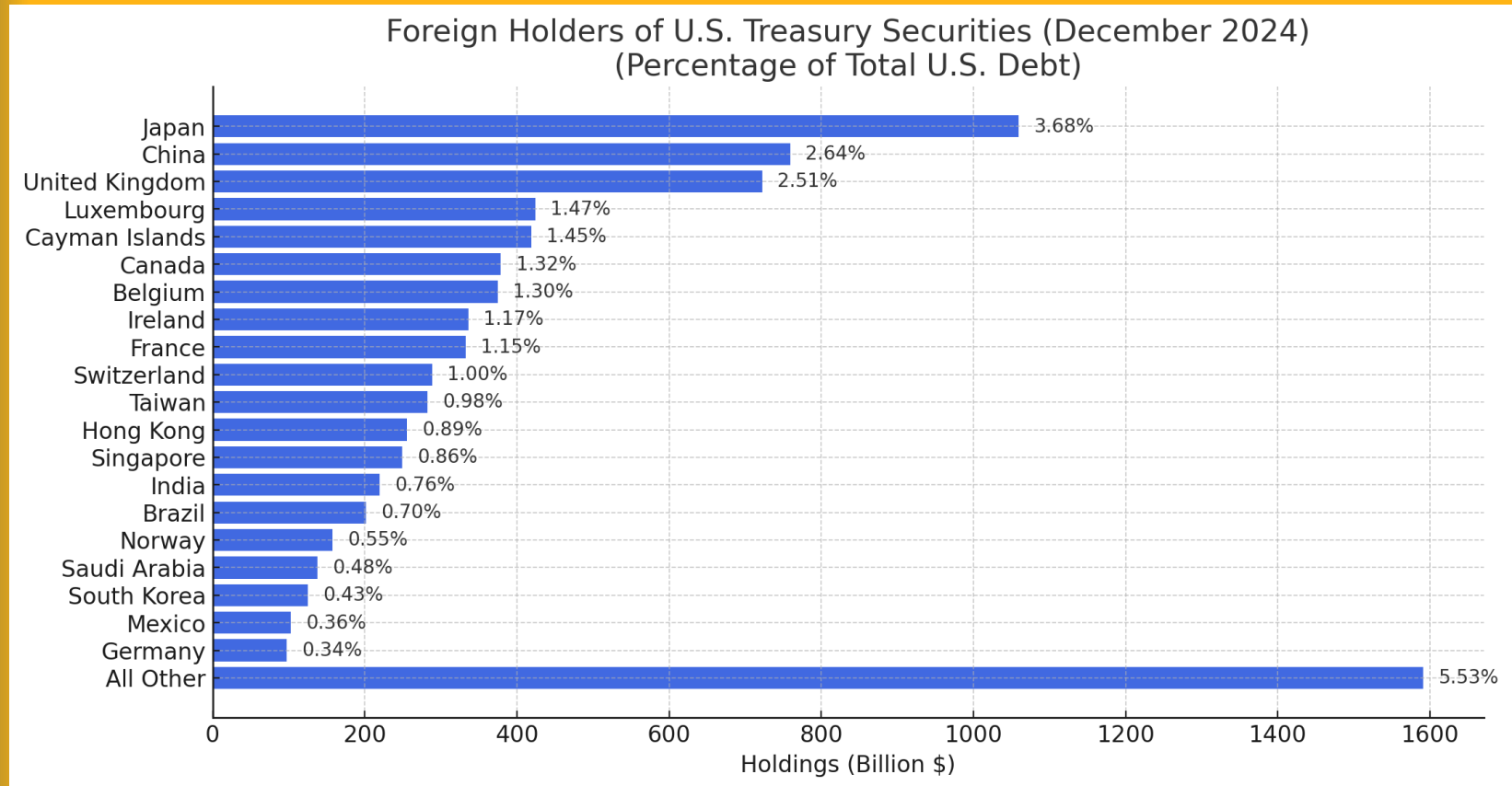


5% annual interest



\$1m cash

Who Owns the US Debt



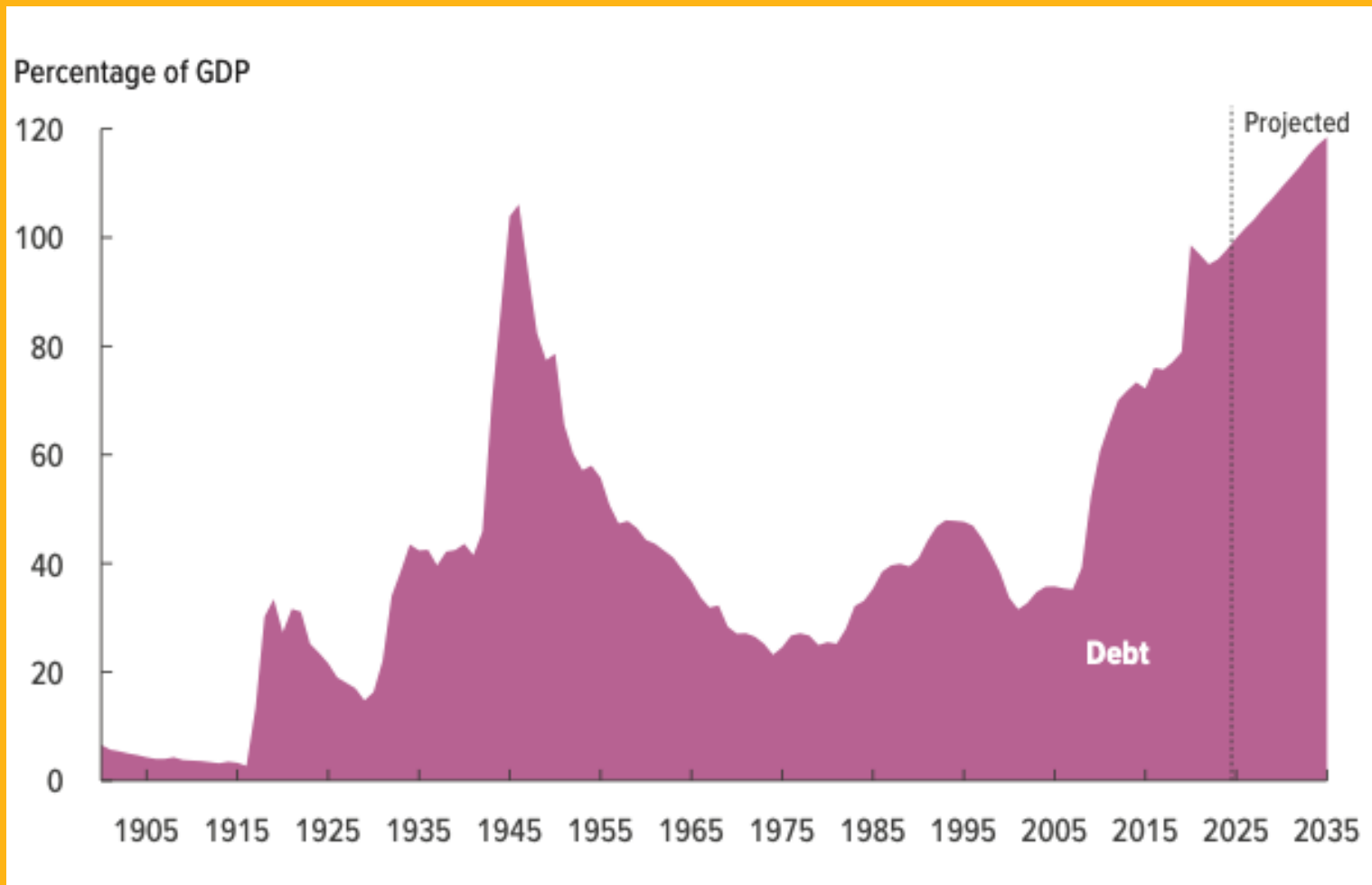
Debt Projections and Aggregate Expenditures



What can be done?

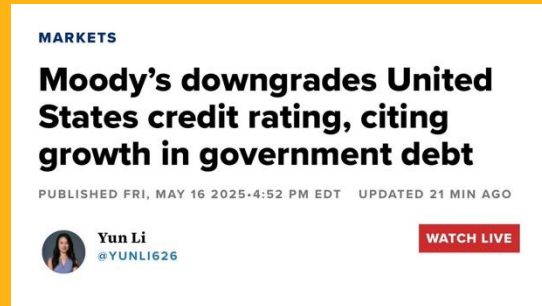
- Decompose the Minimum Tax Rate:

CBO Debt Projections



US Government Credit Score

- Friday's News



- 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

Fabric Factory

Wants: Energy

Has: Fabric

Doesn't Have: Money

Electric Company

Wants: Utility Poles

Has: Energy



Sewing Company

Wants: Fabric

Has: Work Shirts



Auto Manufacturer

Wants: Work Shirts

Has: Car and Truck



Concrete Company

Wants: Car and Truck

Has: Utility Poles

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)

Two piglets for a kayak: Fiji returns to barter system as Covid-19 hits economy



▲ Vaziti Masi lost her job due to the coronavirus outbreak, but has been able to keep her flower business afloat

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 $M1 \text{ money supply} = \text{money supply} = \text{money available today to be used for spending}$



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 1913 Central 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 (June 17-18)
- 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



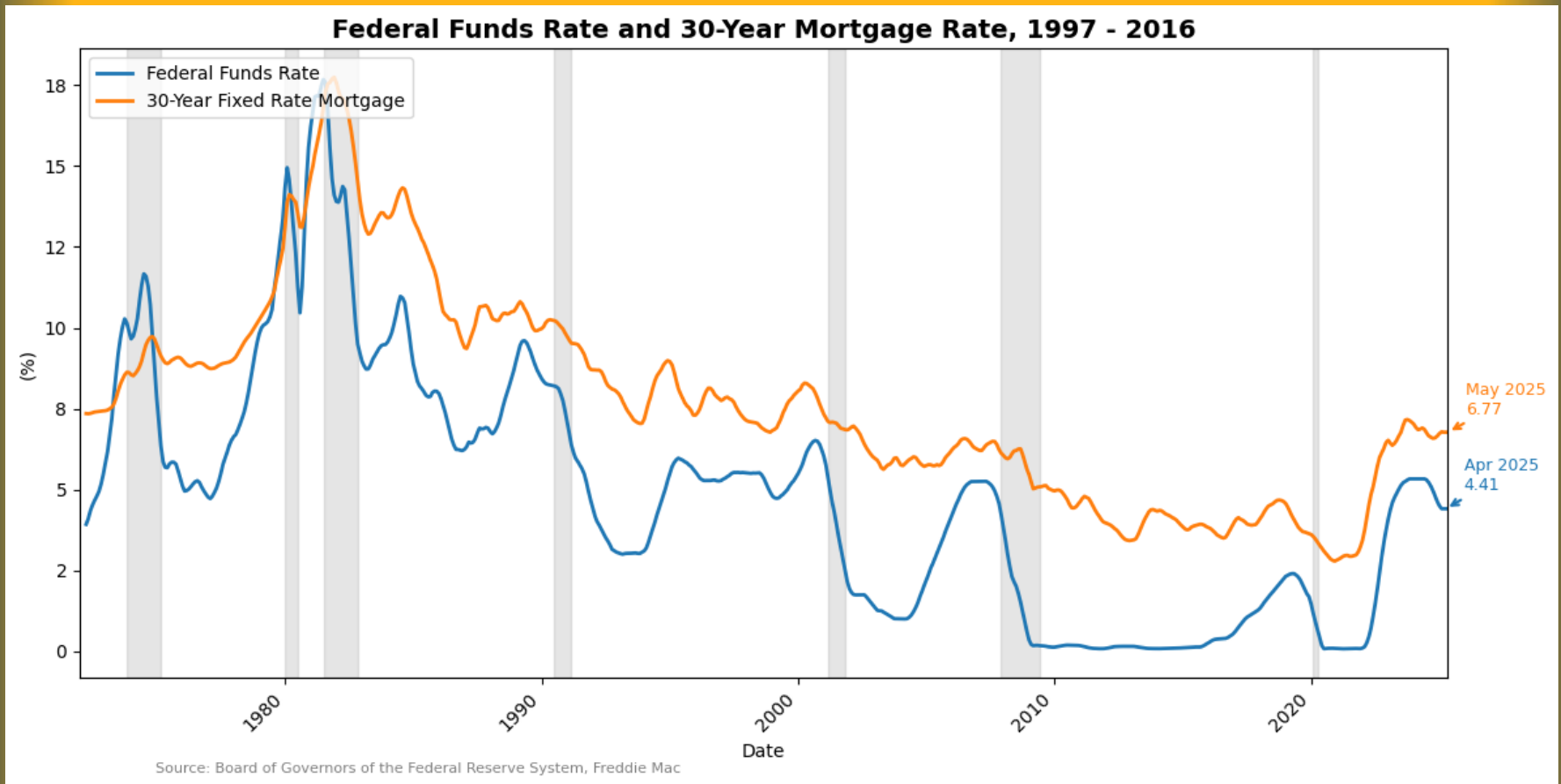
Monetary Policy

- 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!**

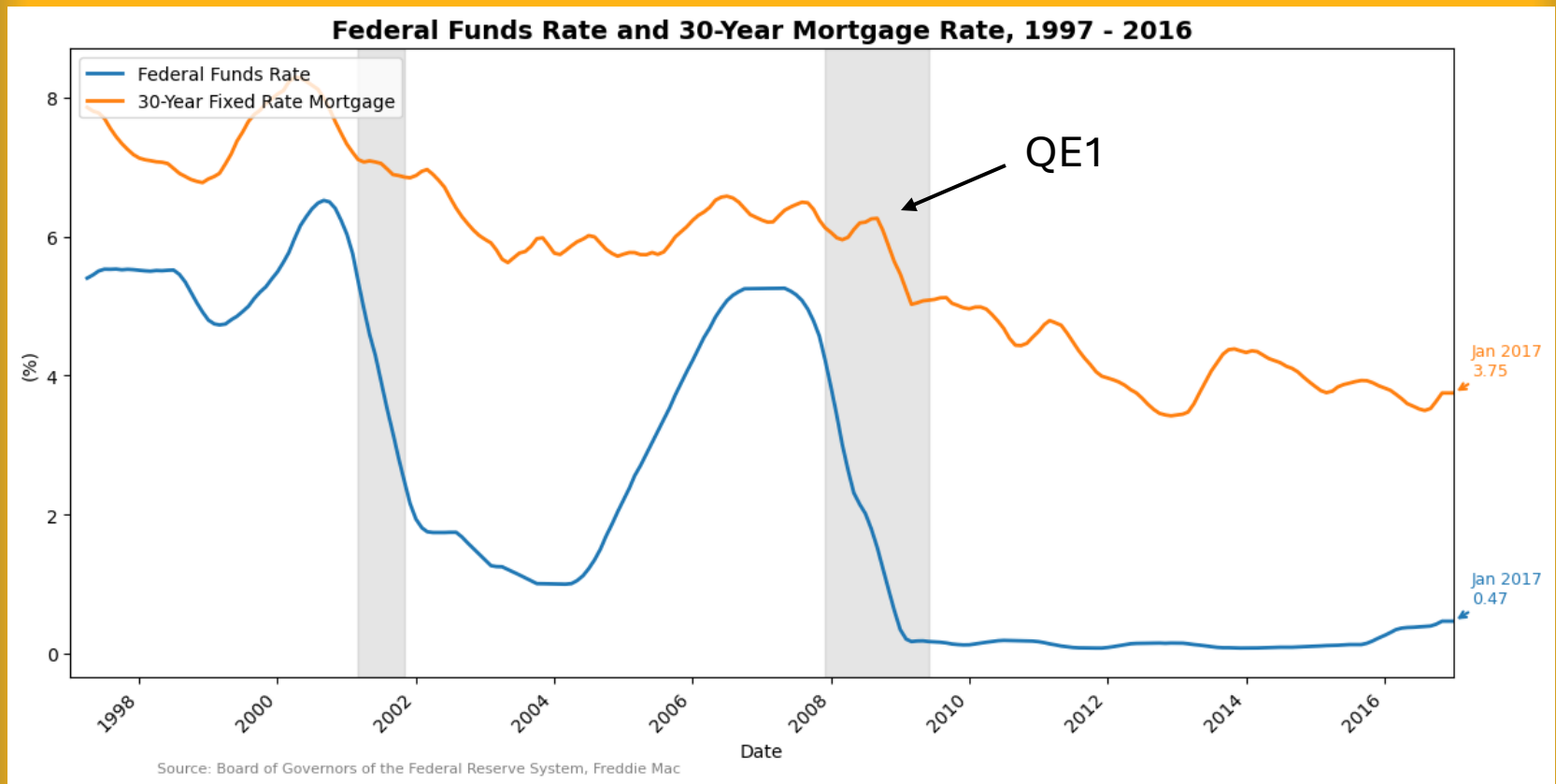
Monetary Policy

- 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

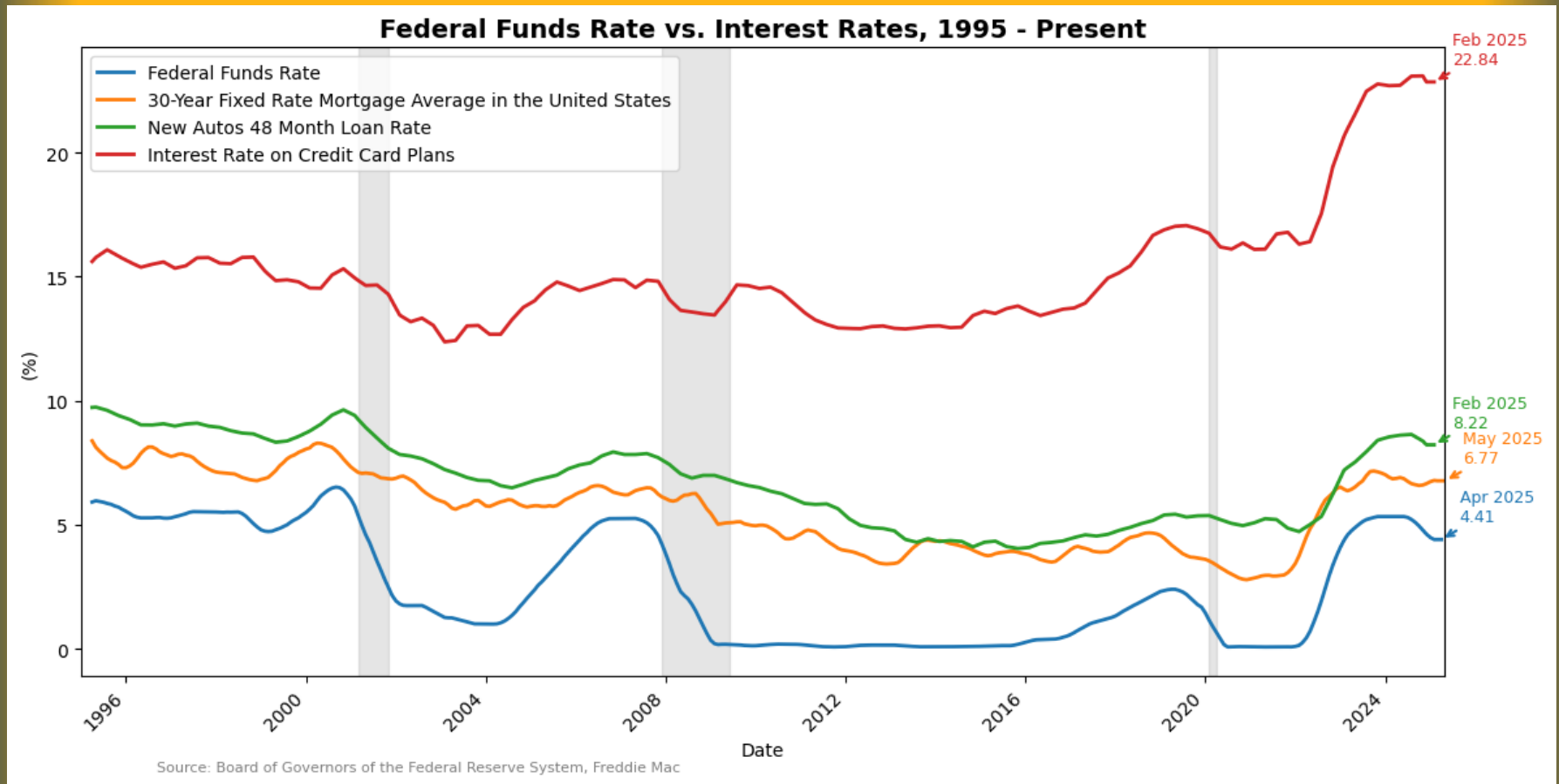
Federal Funds Rate vs 30 Year Mort. Rate



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



Federal Funds Rate vs Interest Rates



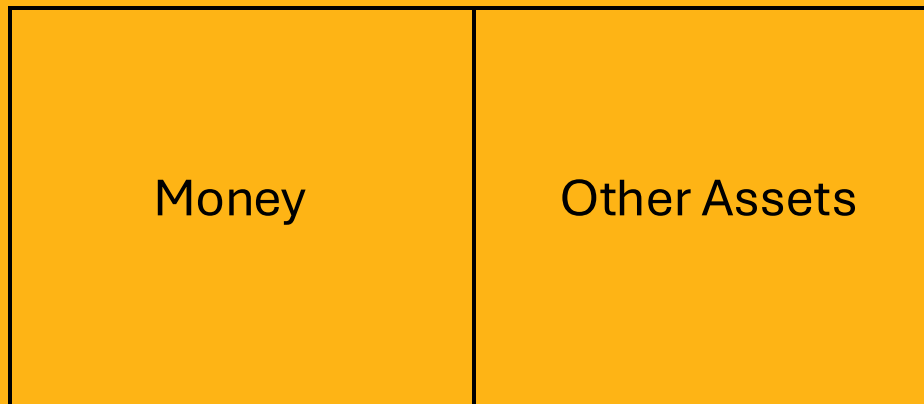
Demand for Money

- 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:



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:

$$r = 5\%$$

Money 1 trillion	Other Assets
---------------------	--------------

Demand for Money

- Point A to Point B:

$r = 5\%$ $r = 4\%$	
Money = 2.0 trillion	Other Assets

Demand for Money

- What shifts the demand for money?



Demand for Money

- Point A: $r = 5\%$

$P = 100$

Money = 1 trillion	Other Assets
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Demand for Money

- Point A to Point D:

P = 100		P = 120
Money = 2.5 trillion		Other Assets

Demand for Money

- What shifts the demand for money?



Demand for Money

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

$$Y = 2$$

Money = 2 trillion	Other Assets
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Demand for Money

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

$$Y = 1$$

	Money = 0.5 trillion	Other Assets	
--	-------------------------	--------------	--

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 = $(\text{Return on the bond} / \text{Price of bond}) \times 100$
- Bond Price Change \rightarrow Return on bond Change $\rightarrow r^*$ 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, $CPI_1 = 100$

