

INTERMEDIATE MACROECONOMICS

3 – THE MONETARY SYSTEM AND FINANCIAL MARKETS

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Write down 3 take-aways from the reading (lecture notes on money & finance)

The Monetary System and Financial Markets: an Introduction*

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The aim of this Section of the course is to introduce the monetary system and financial markets in our picture of the economy. First, we will define what money is and discuss its functions. We will introduce the so-called ‘broad money’ aggregate and understand how money is created by bank lending. Second, we will introduce bonds and interest rates. We will define the real interest rate and derive the formula through which it is determined. Third, we will focus

Section 3: The roadmap

1. Money.
2. Bonds & interest rates.
3. The Central Bank & monetary policy.
4. The stock market



Section 3: The take-aways

- Money is a financial asset (a form of debt) that everyone in the economy trusts and accepts as payment.
- Bank lending decisions are the main determinant of the quantity of money in circulation.
- Firms use bonds and stocks to obtain external financing.
- The higher the interest rate on a bond, the lower the bond price.



3.1 MONEY



What is money

Money is a *financial asset* that serves simultaneously as:

- medium of exchange.
- unit of account.
- store of value.



Money is a IOU that everyone in the economy trusts

The hierarchy of money

Liquidity determines the hierarchy of money.

1. Government money [*narrow money, M0*]:

- currency & bank reserves.

2. Bank deposits:

- saving & checking accounts.



Broad money
(M2)

Currency

- Banknotes & coins.
- They represent a debt of the Central Bank.
- In the past: redeemable in gold.
- Today: *fiat money*.



Bank reserves

- Balances held by commercial banks at the Central Bank.
- Convertible in currency.
- Why banks hold reserves?
 - to make payments to one another
 - to have some liquidity to face withdrawals.
- Some CBs force banks to hold some reserves.
 - In the US, 10% of deposits.

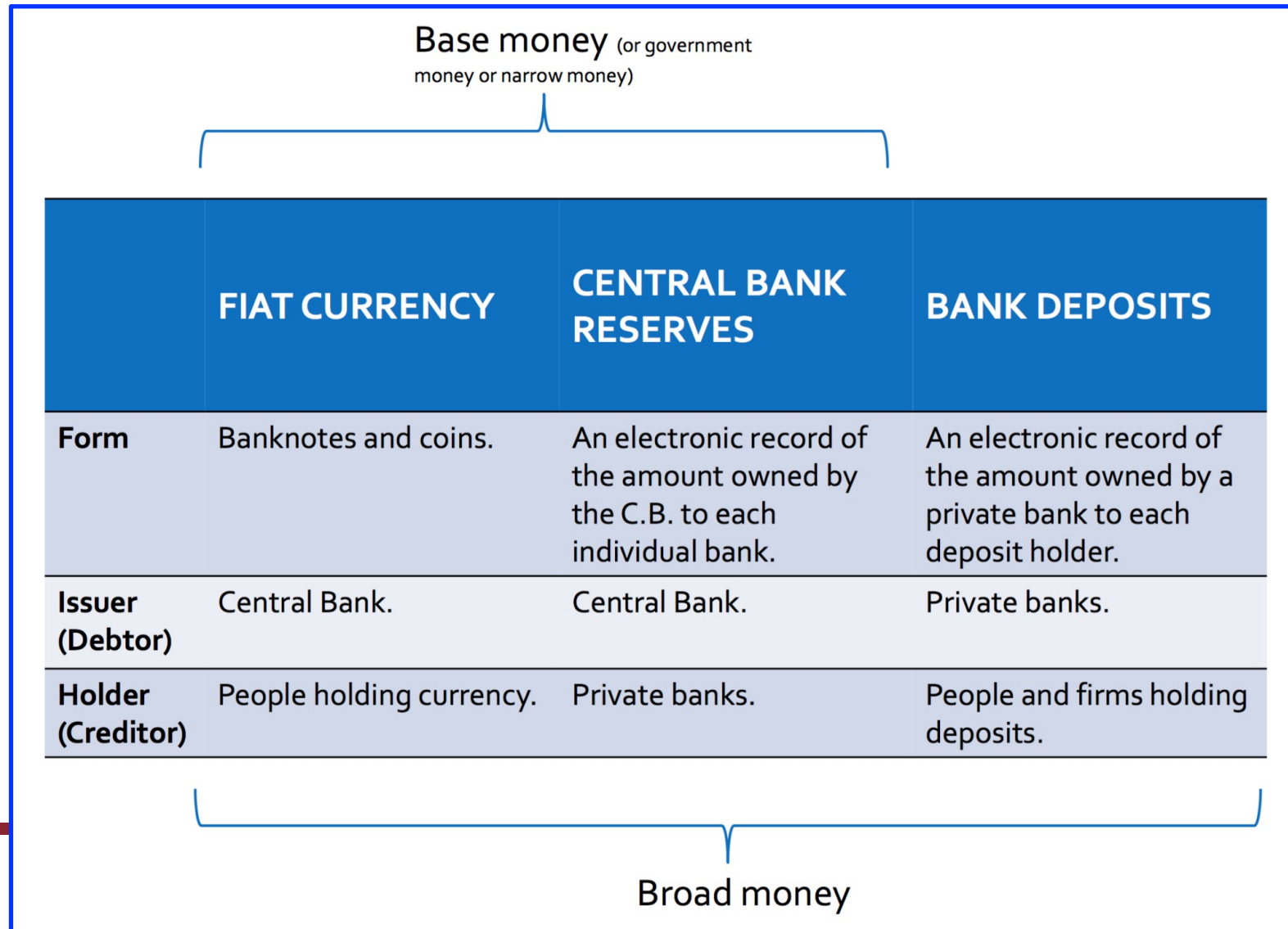


Bank deposits

- Checking accounts and savings accounts.
- Debts of commercial banks with their customers (households and firms).
- Convertible in currency.



The broad money aggregate



Why we trust (broad) money?

Because it is backed by the State.





Money creation

- Money holdings in the US (Aug 2019):
 - Currency: \$1,673 Billions (12%).
 - Bank deposits: \$11,715 Billion (88%).
- Banks create new deposits (= new money) when they lend.
- How about central bank reserves?



Limits to money creation by banks

1. Existence of profitable lending opportunities
 - can only make loans that they expect to be repaid *at the current interest rate*.
2. Demand for new loans is limited
 - willingness of people/firms to take up new loans *at current interest rate*.
3. By repaying previous loans, households and firms reduce M2.



3.2 BONDS & INTEREST RATES



A bond is a loan agreement

Example:

A firm sells a 1-year bond that pays $x = 110\$$

- Price of the bond: $P_B = 100\$$
- Interest rate: the rate of return earned by the bond buyer

$$i = \frac{x - P_B}{P_B} = \frac{\$110 - \$100}{\$100} = 0.10 = 10\%$$



Bond price and interest rate

- Yearly interest rate on a 1-year bond:

$$i = \frac{x - P_B}{P_B}$$

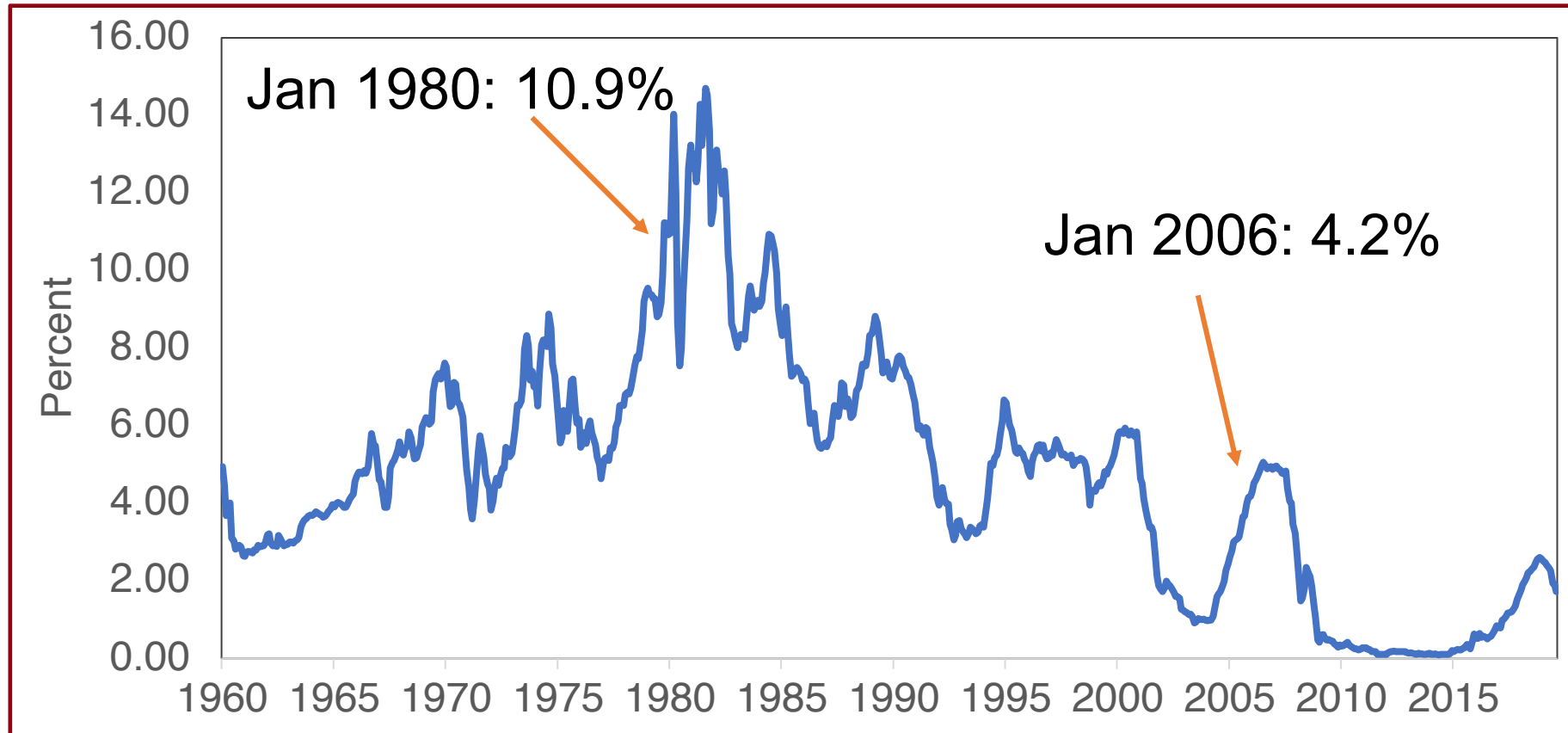
- Rearranging:

$$P_B = \frac{x}{1 + i}$$

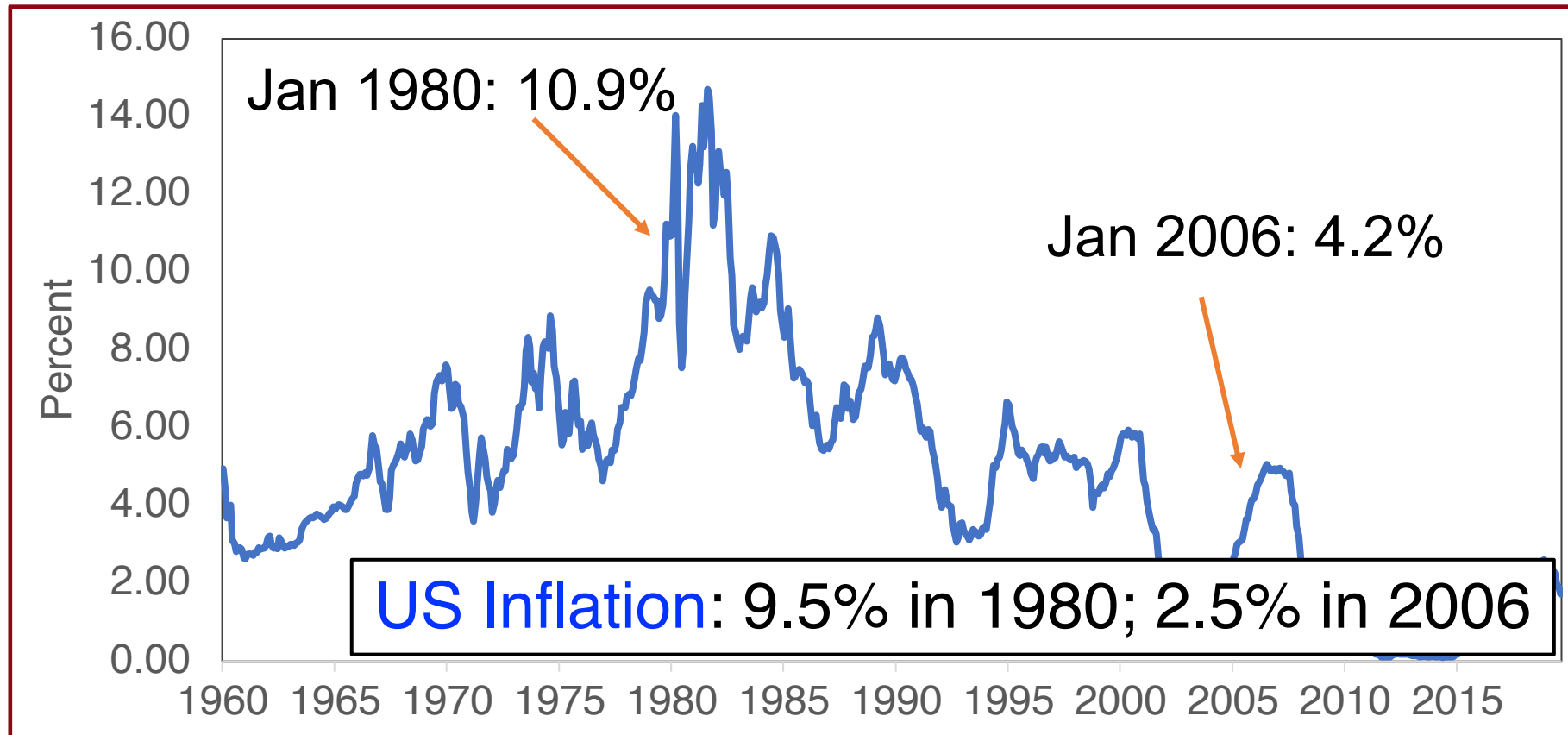
- The higher the interest rate, the lower the price of the bond;*



Interest rate on 1-year T-bills



Interest rate on 1-year T-bills



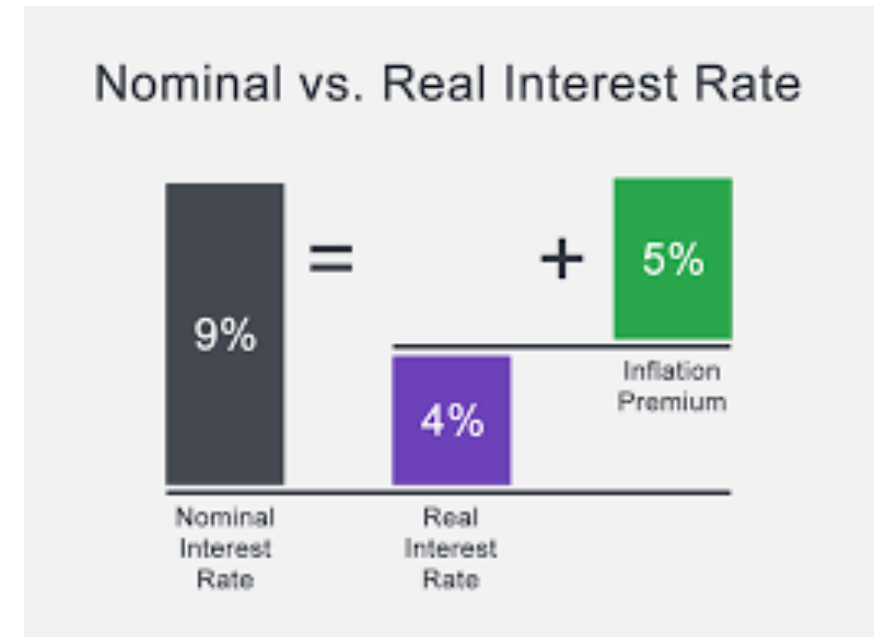
Nominal and real interest rate

- *Nominal interest rate*: in terms of current dollars.
- *Real interest rate*: in terms of real purchasing power (or constant dollars).
- *Ex-post* (realized) real interest rate:

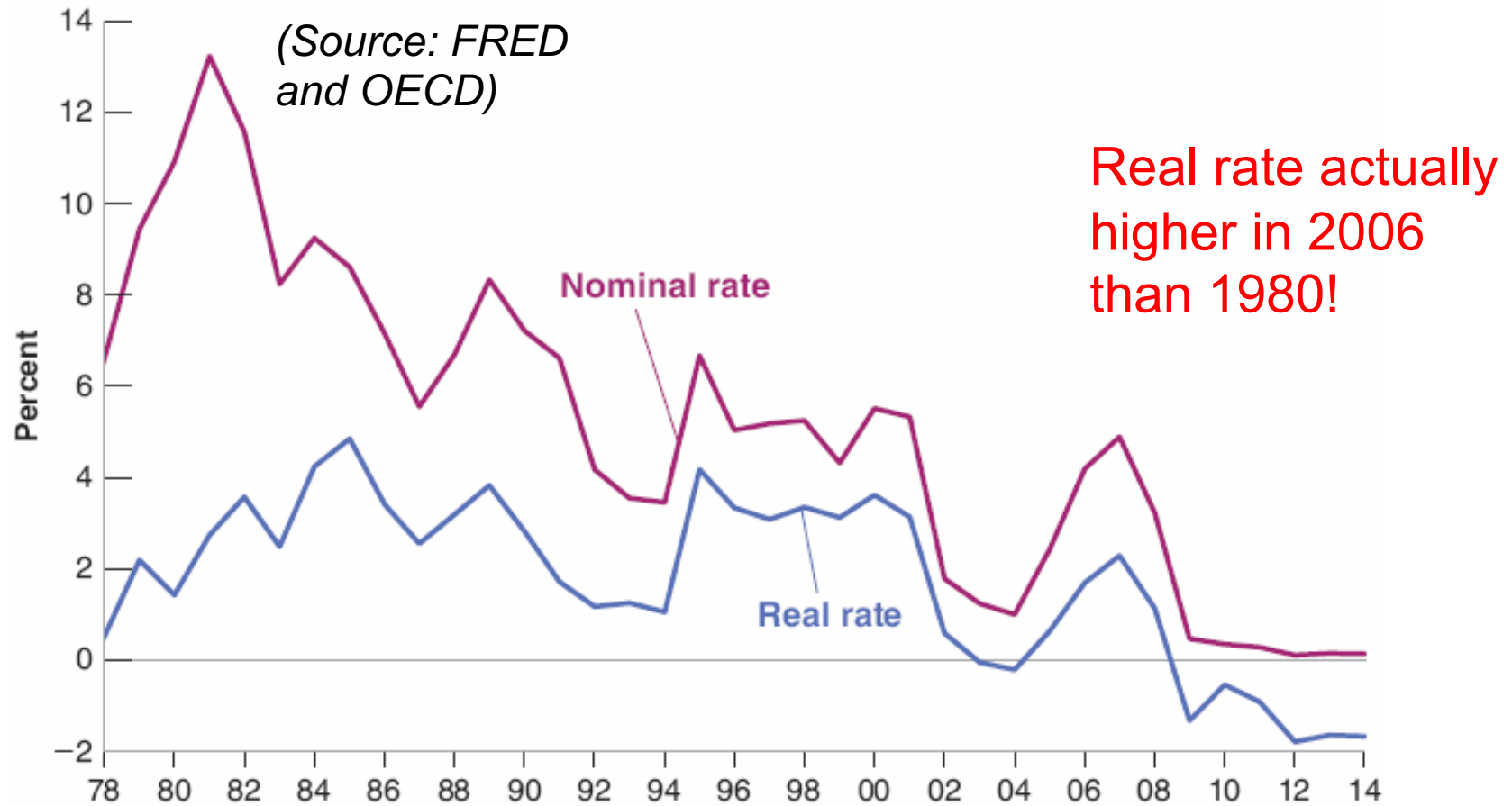
$$r_t \approx i_t - \pi_{t+1}$$

- *Ex-ante* (expected) real interest rate:

$$r_t \approx i_t - \pi_{t+1}^e$$



Nominal and real interest rate on 1-year T-bills



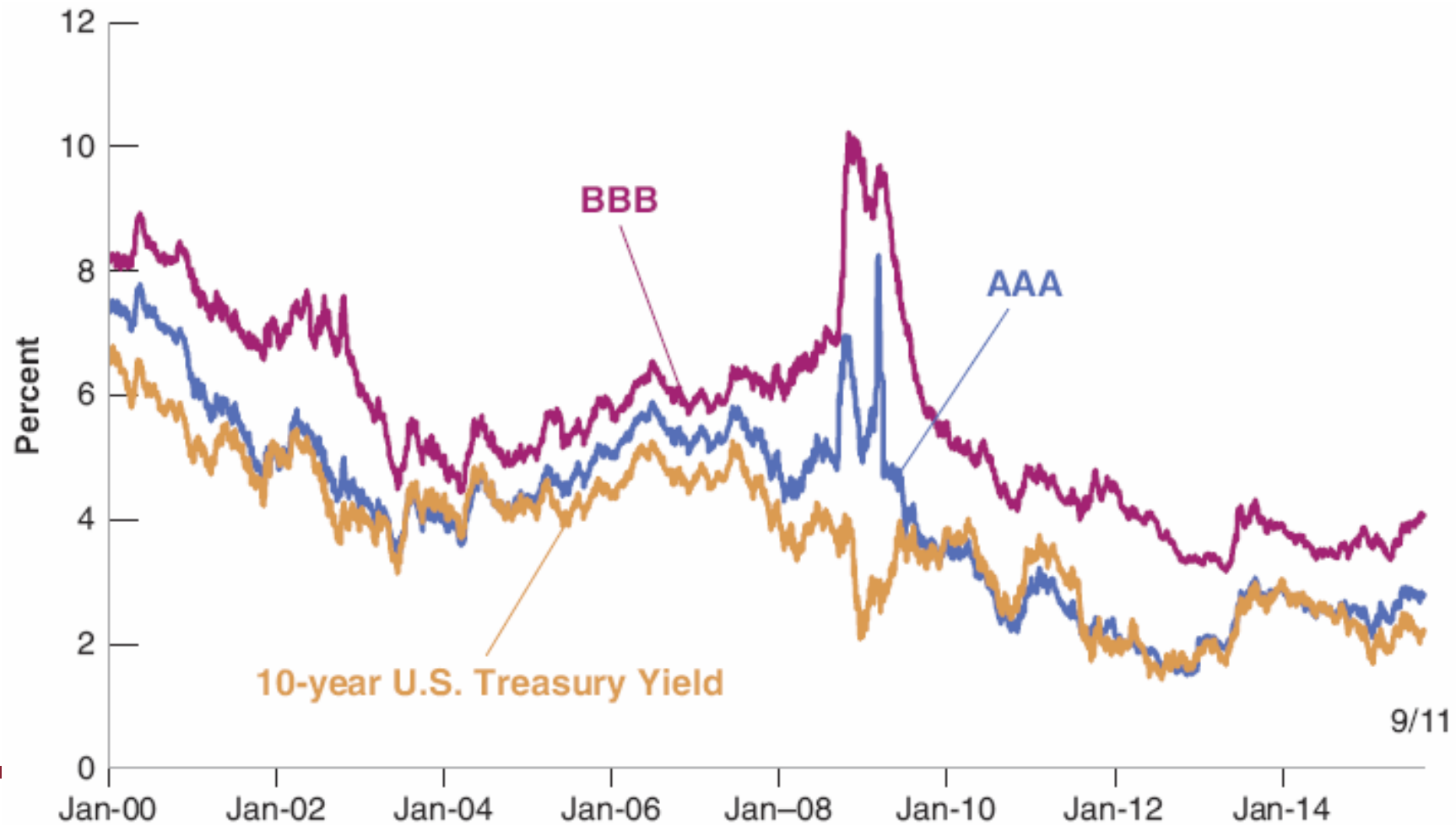
Interest rates & risk premia

- What determines the interest rate on a particular bond?
 - Economy-wide factors (monetary policy).
 - Bond-specific factors: *maturity & riskiness*
- Let's ignore maturity (assume 1-year) and focus on risk.
- Interest rate on a risky bond:

$$i_R = i + x_R$$

- x_R depends on prob. of default & *risk aversion* of investors.

Bond yields in the US, by category of risk



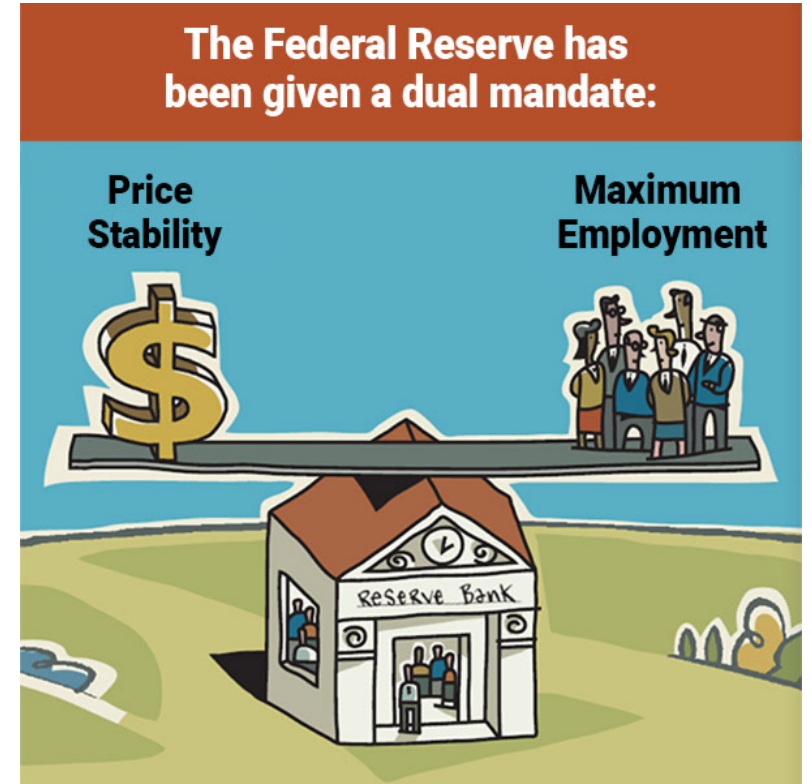
3.3 THE CENTRAL BANK AND MONETARY POLICY



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Instructor: Daniele Girardi

The Central Bank

- Manages the currency and monetary policy.
- Oversees the commercial banking system.
- The US Federal Reserve's *dual mandate*:
 - Price stability
 - Maximum employment



The Central Bank balance sheet

Liabilities	Assets
Currency	Foreign exchange reserves
Commercial bank reserves	Securities
Government's account	Other items
(Capital)	

Monetary Policy

- The Central Bank sets the risk-less interest rate in the economy.
 - Overnight interbank rate
 - Called Federal Funds Rate in the US
- CB *increases* rates to cool down the economy & reduce inflation.
- CB *decreases* rates to boost economic activity.



How does the CB control the overnight interbank rate?

Two alternative ways:

1. *Open market operations*

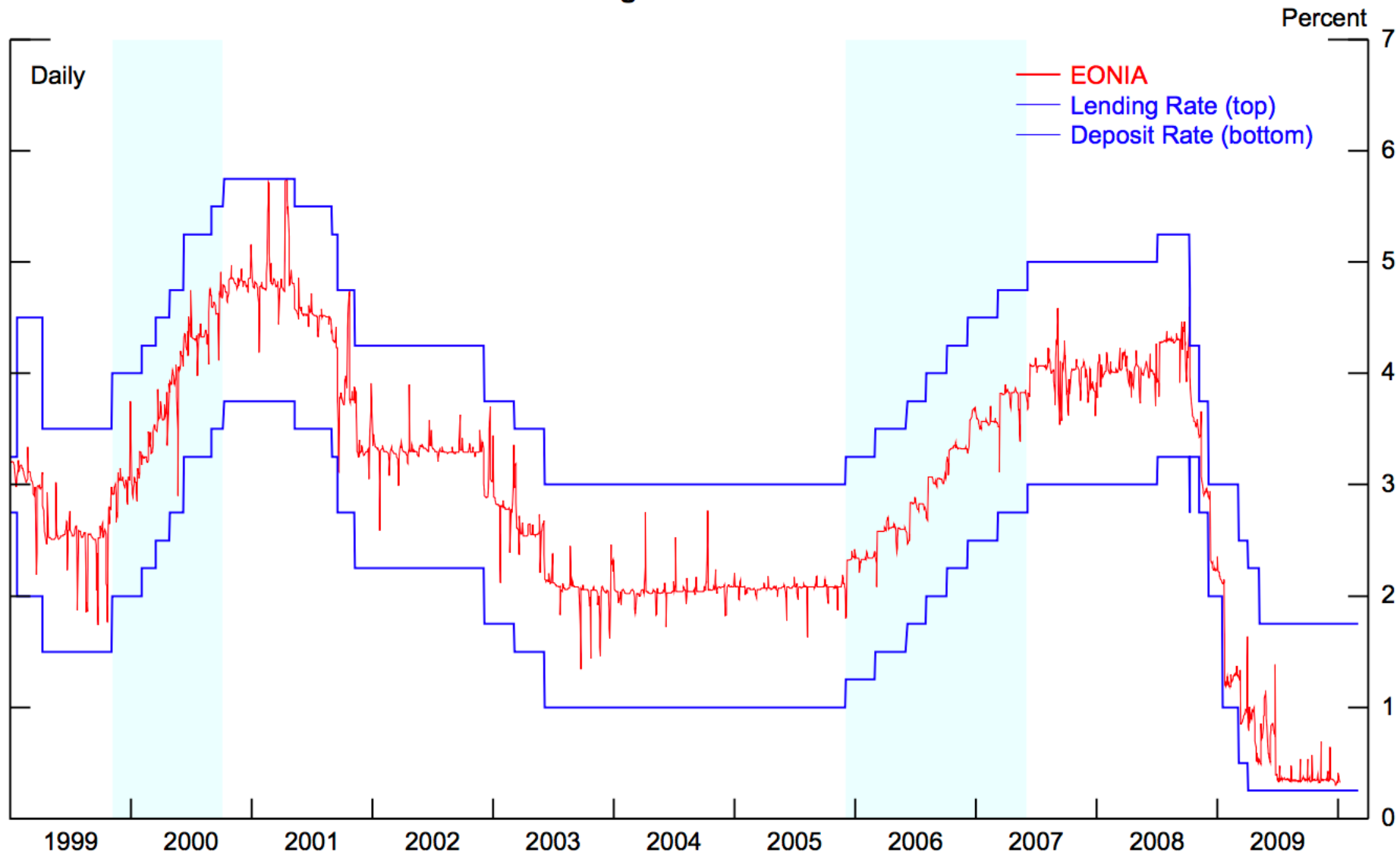
- Adjust supply of reserves to reach desired rate.
- US Federal Reserve.

2. *Corridor system*

- Directly sets a ceiling and a floor for the overnight rate.
- Lending rate (ceiling) & deposit rate (floor).
- ECB, BoE, BoC

European Central Bank

Overnight Interest Rate



Financial (in)stability: Bank runs



- *Liquidity mismatch* of commercial banks
 - Long-term assets vs short-term liabilities
- ‘Bank run’ can cause even a financially sound bank to fail.
- Federal Reserve can act as a ‘lender of last resort’.

3.4 THE STOCK MARKET



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A brief introduction to the stock market

- Another way for firms to raise external funds.
- Stock (or *share*) = an ownership share in the issuing company.
- Stock-holders receive *dividends*.
 - the retained (non-reinvested) profits of the company.
- Stock price determined by market supply & demand.



Stock market indices

- Measure overall stock market movements.
- Track the market value of a given portfolio of stocks.
- In the US:
 - S&P 500.
 - Dow Jones Industrial Average.
 - NASDAQ Composite.
 - ...



What moves stock prices?

- For a single stock: the firm's expected future profits.
- On aggregate: expected future profits in the economy.
- Higher expected GDP growth → higher share prices
- Higher share of profits in GDP → higher share prices.
- Higher interest rate → lower share prices.



QUESTIONS & ANSWERS

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