Lecture 3 Unemployment and Inflation

Fei Tan

Department of Economics
Chaifetz School of Business
Saint Louis University

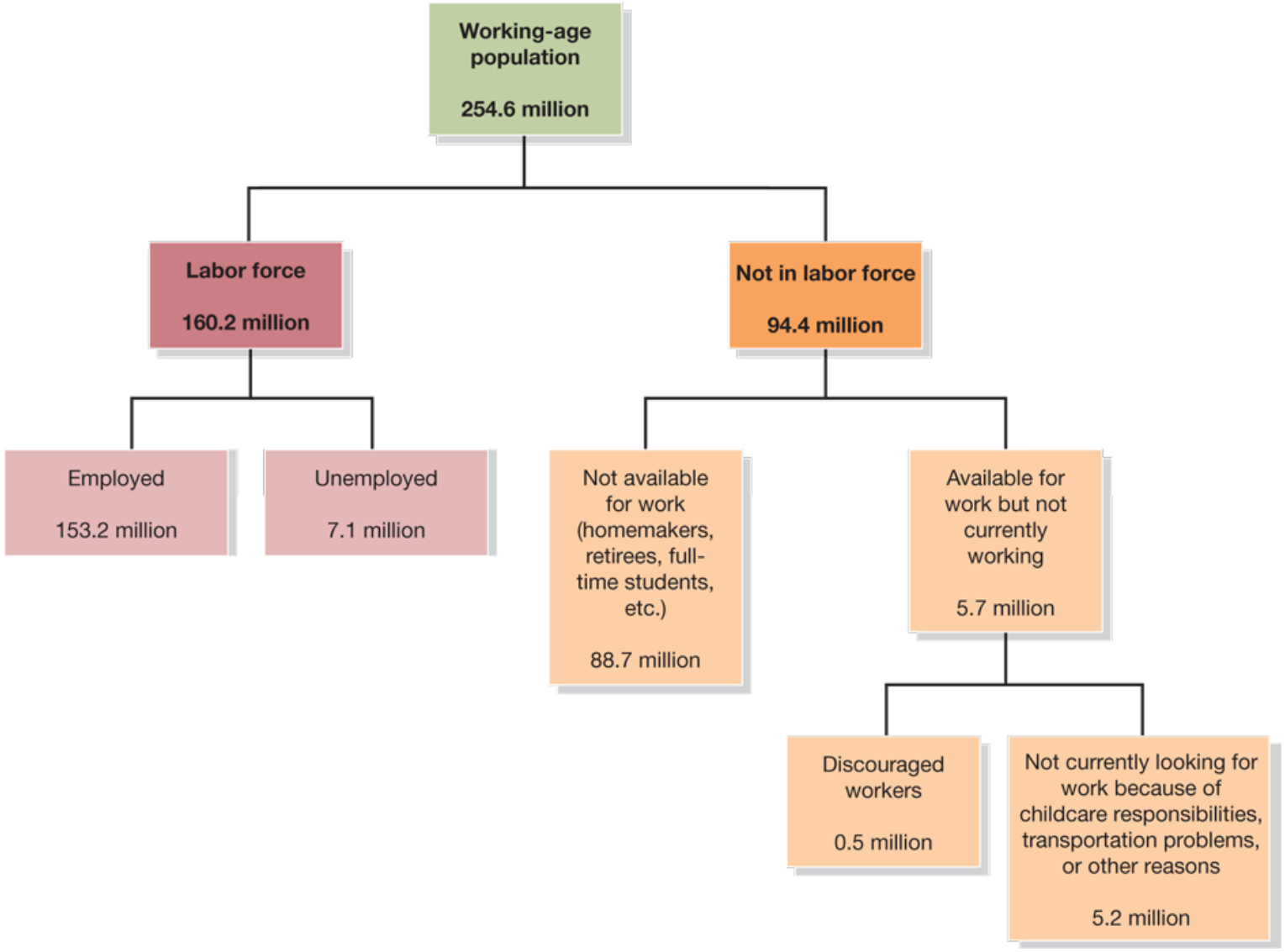
E3120 Intermediate Macroeconomics

August 31, 2021

How to Measure Unemployment?

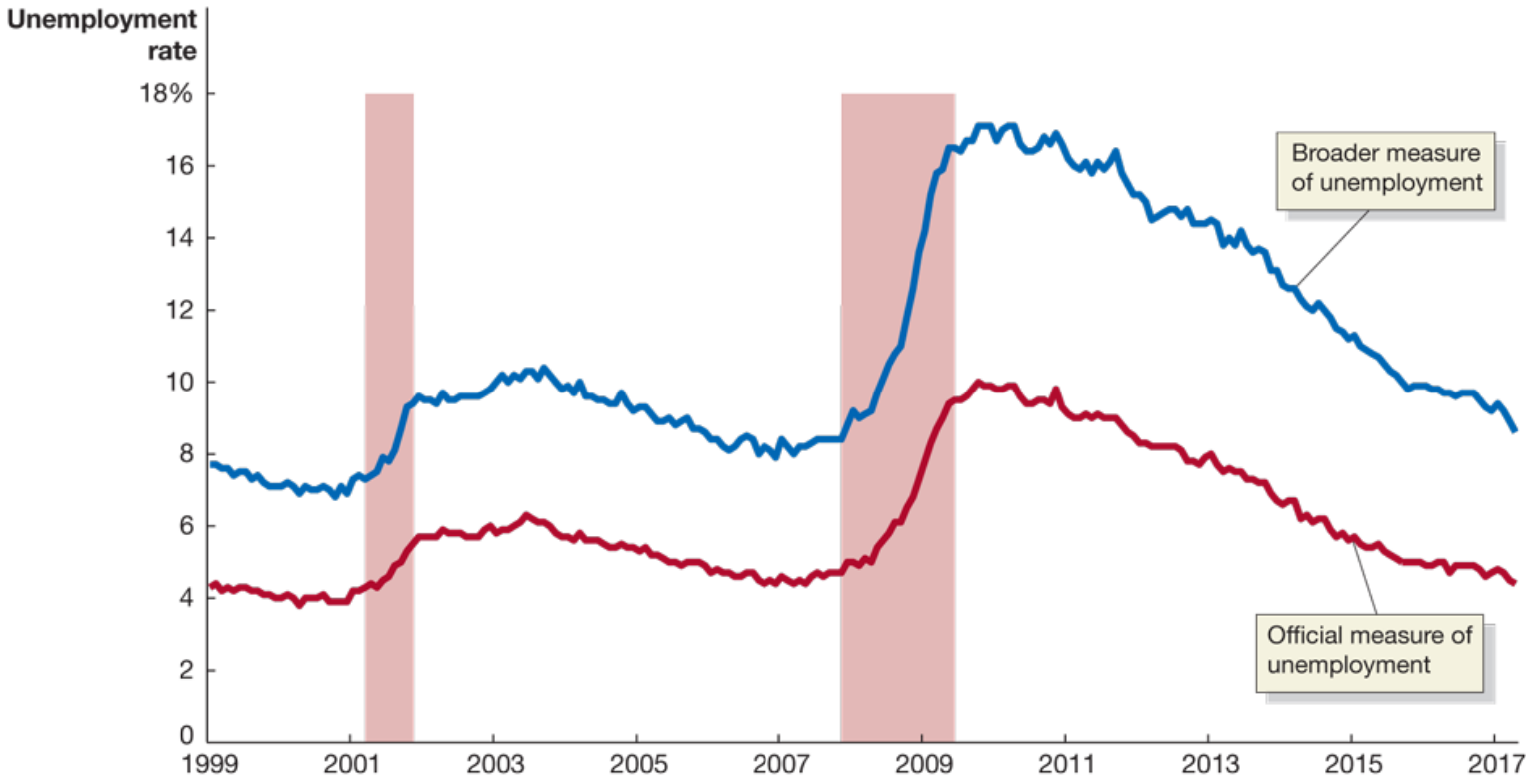
- Bureau of Census conducts Current Population Survey (CPS) to classify people as
  - employed (N): people who have job
  - unemployed (U): people who don't have job but are actively looking for one
  - not in labor force: neither, e.g. discouraged worker
- Bureau of Labor Statistics (BLS) uses CPS data to calculate
  - labor force (L) = N + U
  - unemployment rate (u) = U / L $\times$ 100% (series U-3)
  - participation rate = L / working-age population (civilian noninstitutional population) $\times$ 100%
- CPS vs. Establishment Survey

Working-Age Population



- Employment status, April 2017 (source: BLS)

Broader Measure of Unemployment



- Series U-6 = U-3 + discouraged + part-time (source: BLS)
- Official U-3 is not exact measure of joblessness

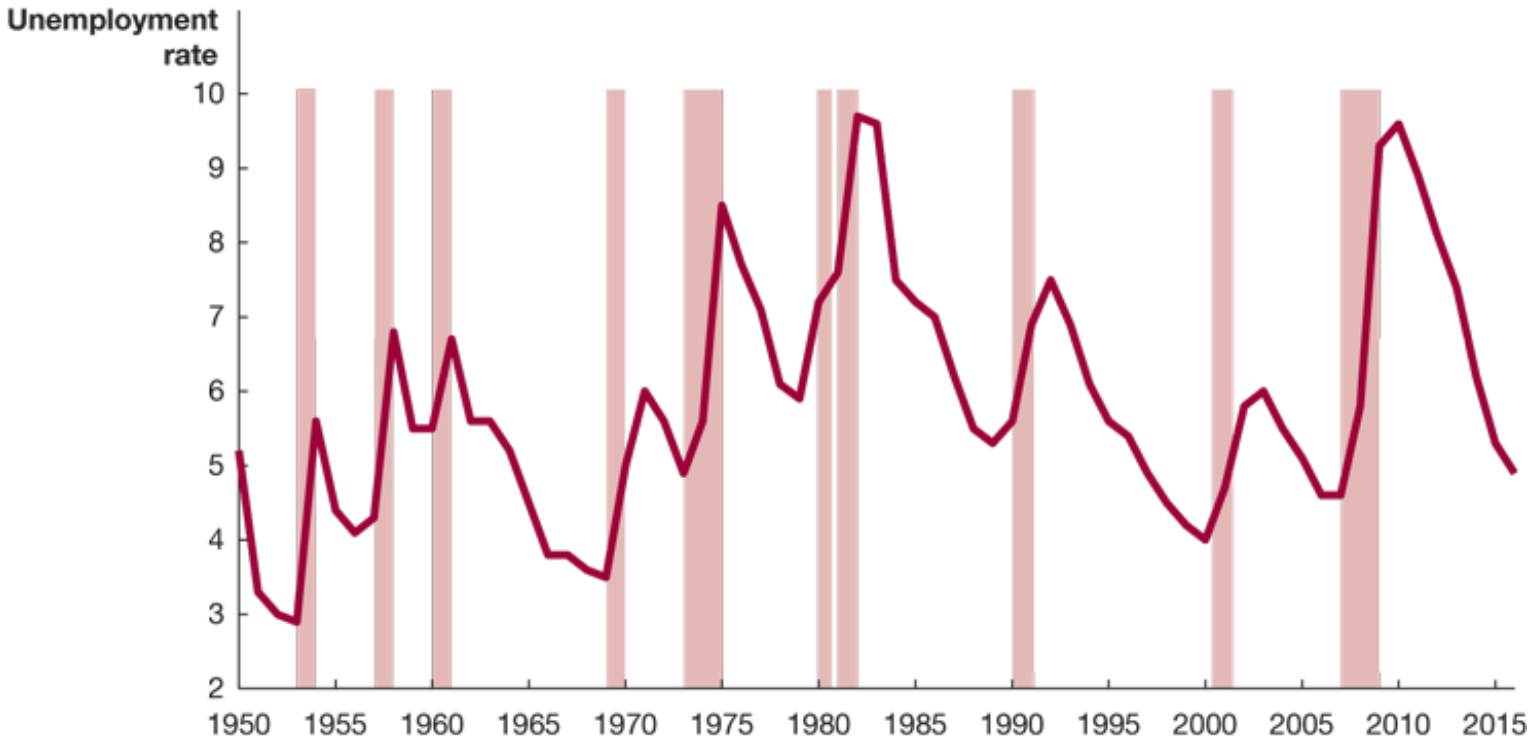
The Road Ahead...

- Types of unemployment
- How to measure inflation
- Real versus nominal interest rates

Types of Unemployment

- We identify three types of unemployment
  - frictional: temporary unemployment due to process of matching workers with jobs
  - structural: longer unemployment due to mismatch b/w worker's skills/attributes and job requirements
  - cyclical: unemployment due to business cycle recession
- When cyclical unemployment drops to zero
  - economy is at full employment
  - natural rate of unemployment (u_n)
  - general consensus for U.S.: b/w 4% and 5%
- Why unemployment rate never falls to zero?

U.S. Unemployment Rate



- U.S. unemployment rate, 1950-2016 (source: BLS)
- u rises during recessions and falls during expansions

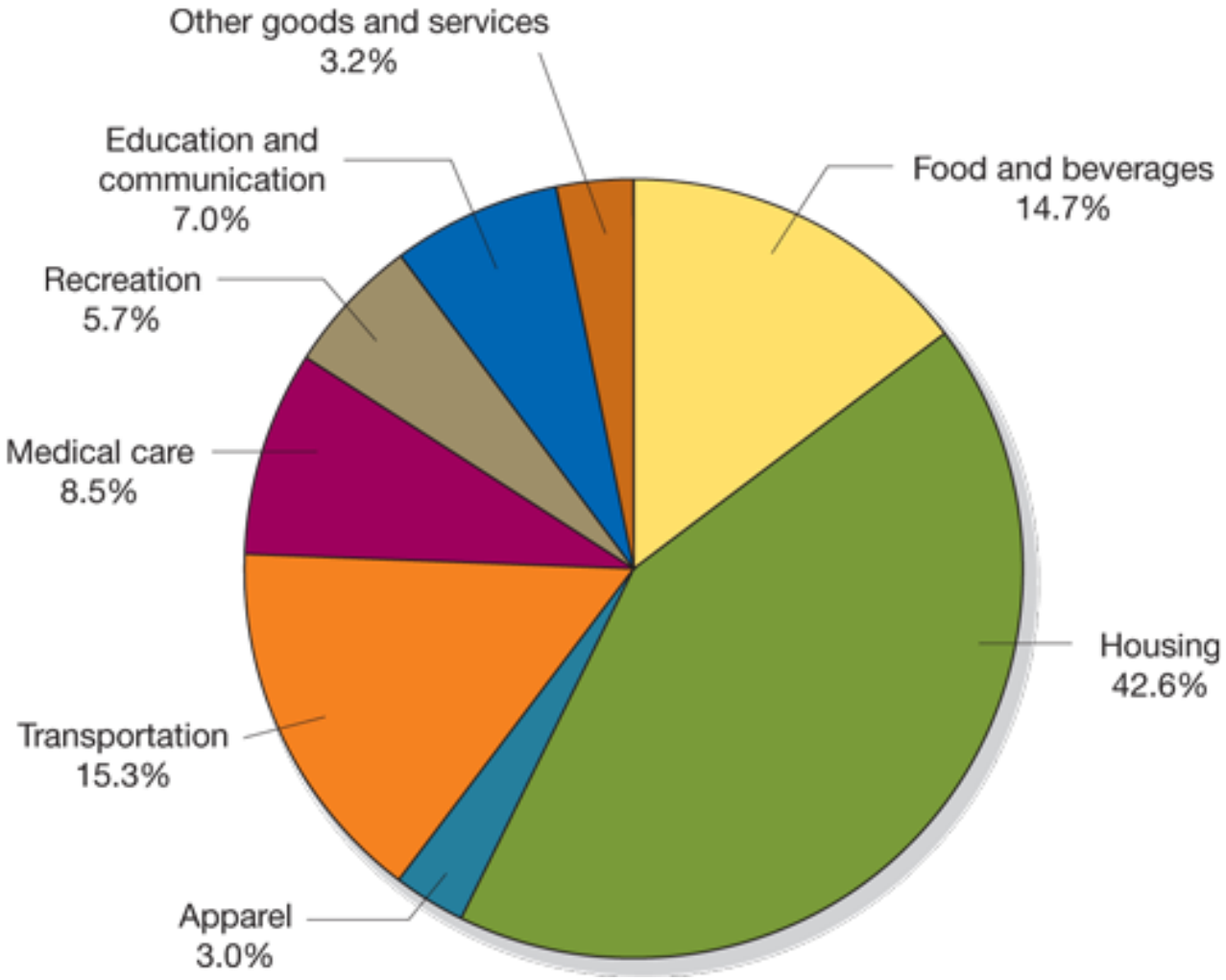
How to Measure Inflation

- Three common measures of price level
  - GDP deflator (broadest)
  - consumer price index (CPI): price of basket of goods and services purchased by consumer (cost of living)
  - producer price index (PPI): price received by producers of goods and services at all stages of production
- Changes in PPI signifies future movements in CPI
- Inflation rate is percentage increase in price level

$$\pi_t = \frac{P_t - P_{t-1}}{P_{t-1}} \times 100\%$$

- Changes in CPI tend to overstate true inflation

CPI Market Basket



- CPI market basket, December 2016 (source: BLS)
- Housing, transportation, and food make up about 75%

Example 1: Calculating CPI

Product	1999 Quantity	1999 Price	2018 Price	2019 Price
Eye examinations	1	\$50	\$100	\$85
Pizzas	20	\$10	\$15	\$14
Books	20	\$25	\$25	\$27.5

- Assume base year is 1999
- Calculate CPI for year 2018 & 2019

$$\text{CPI} = \frac{\text{expenditures in current year}}{\text{expenditures in base year}} \times 100$$

Answer: $P_{2018} = 120, \quad P_{2019} = 122$

- 2019 inflation: $\pi_{2019} = (122 - 120)/120 \times 100\% \approx 1.7\%$

Example 2: Purchasing Power

Year	Nominal Average Hourly Earnings	CPI (1982-1984=100)
2012	\$19.73	230
2013	\$20.14	233
2014	\$20.60	237

- Nominal variables are values in current-year dollars
- Calculate real values for years 2012-2014

$$\text{real variable} = \frac{\text{nominal variable}}{\text{current-year price index}} \times 100$$

Answer: $W_{2012} = \$8.59, \quad W_{2013} = \$8.65, \quad W_{2014} = \$8.70$

- Calculate growth rates in nominal and real values

Real versus Nominal Interest Rates

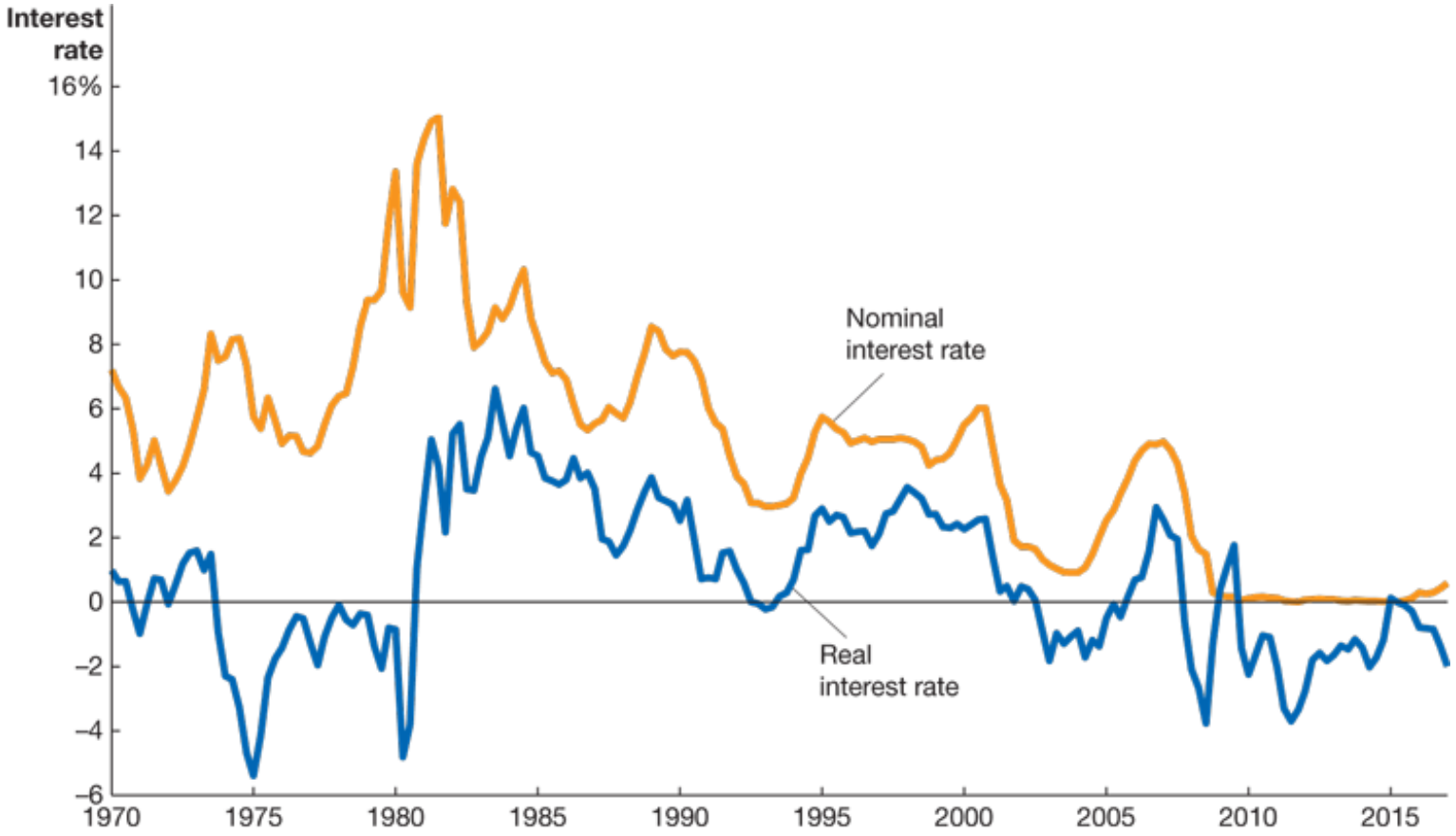
- Interest rate is cost of borrowing funds
  - nominal interest rate (i): expressed in terms of units of national currency; borrowing $\$1$ this year requires repaying $\$(1+i)$ next year

    $\Rightarrow$ this year's price of one dollar relative to next year
  - real interest rate (r): expressed in terms of baskets of goods; borrowing one basket this year requires repaying $(1+r)$ baskets next year

    $\Rightarrow$ this year's price of one basket relative to next year
- Borrowers/lenders care about r rather than i
- A useful (Fisher) relation

$$r_t \approx i_t - \pi^e_{t+1} \quad \text{for small } i_t \text{ and } \pi^e_{t+1}$$

U.S. Interest Rates



- i = interest rate on 3-month U.S. Treasury bills, π = percentage change in CPI (source: FRED)
- *ex-ante* versus *ex-post* real interest rates

Readings & Exercises

- Readings
  - HO: chapter 9
  - BJ: lecture 1 (sec. 2, 3, 4), lecture 5 (sec. 1), 12 (sec. 1) (supplementary)
- Exercises
  - HO: problem 1.7, 3.2, 4.6 & 5.5 (in-class quiz), 6.6, D9.2
  - In-class quiz: derive Fisher relation