

Lecture 3: Economic Growth, Financial System, and Business Cycles

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Course: Macroeconomics 201

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The Road Ahead

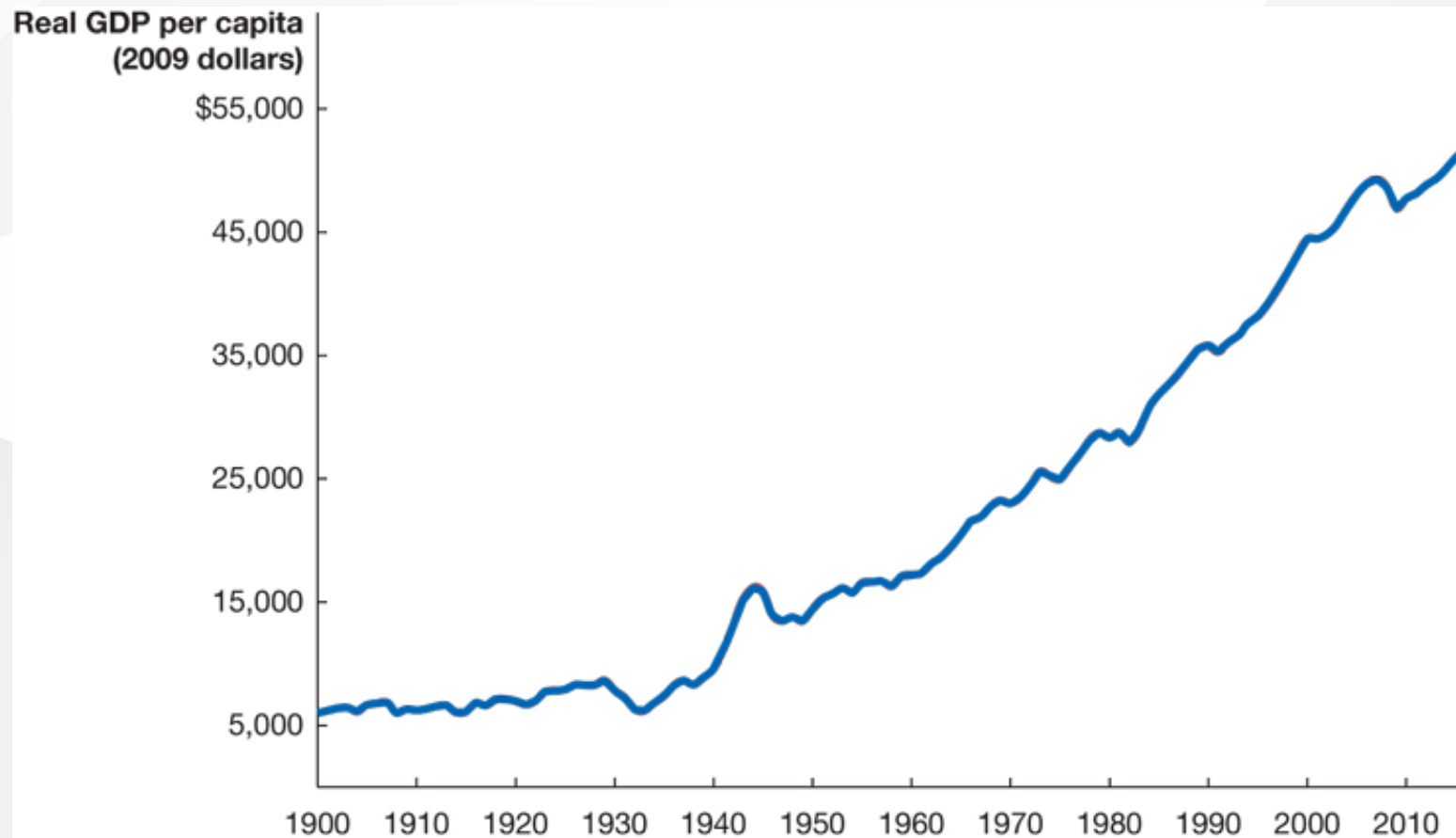
1. Long-Run Economic Growth
2. Saving, Investment, and Financial System
3. Business Cycle

What is Economic Growth?

- A process by which rising productivity increases average standard of living
- How to measure average standard of living
 - real GDP **per capita** (most common)
 - production per person, adjusted for inflation
- We measure long-run economic growth by percentage increase in real GDP per capita over long periods

$$\text{growth rate} = \frac{Y_t - Y_{t-n}}{Y_{t-n}} \times 100\%, \quad n \sim \text{decades}$$

U.S. Economic Growth, 1900-2016



- Growth in real GDP per capita (source: BEA)
- Average American can buy more than 8 times now

Calculating Growth Rates

- Growth rate over long periods
 - annual growth rates: g_1, g_2, \dots, g_n

$$Y_{t-n} \times (1 + g_1) \times (1 + g_2) \times \dots \times (1 + g_n) = Y_t$$

- average annual growth rate: g

$$Y_{t-n} \times (1 + g)^n = Y_t$$

- A useful approximation: for small n

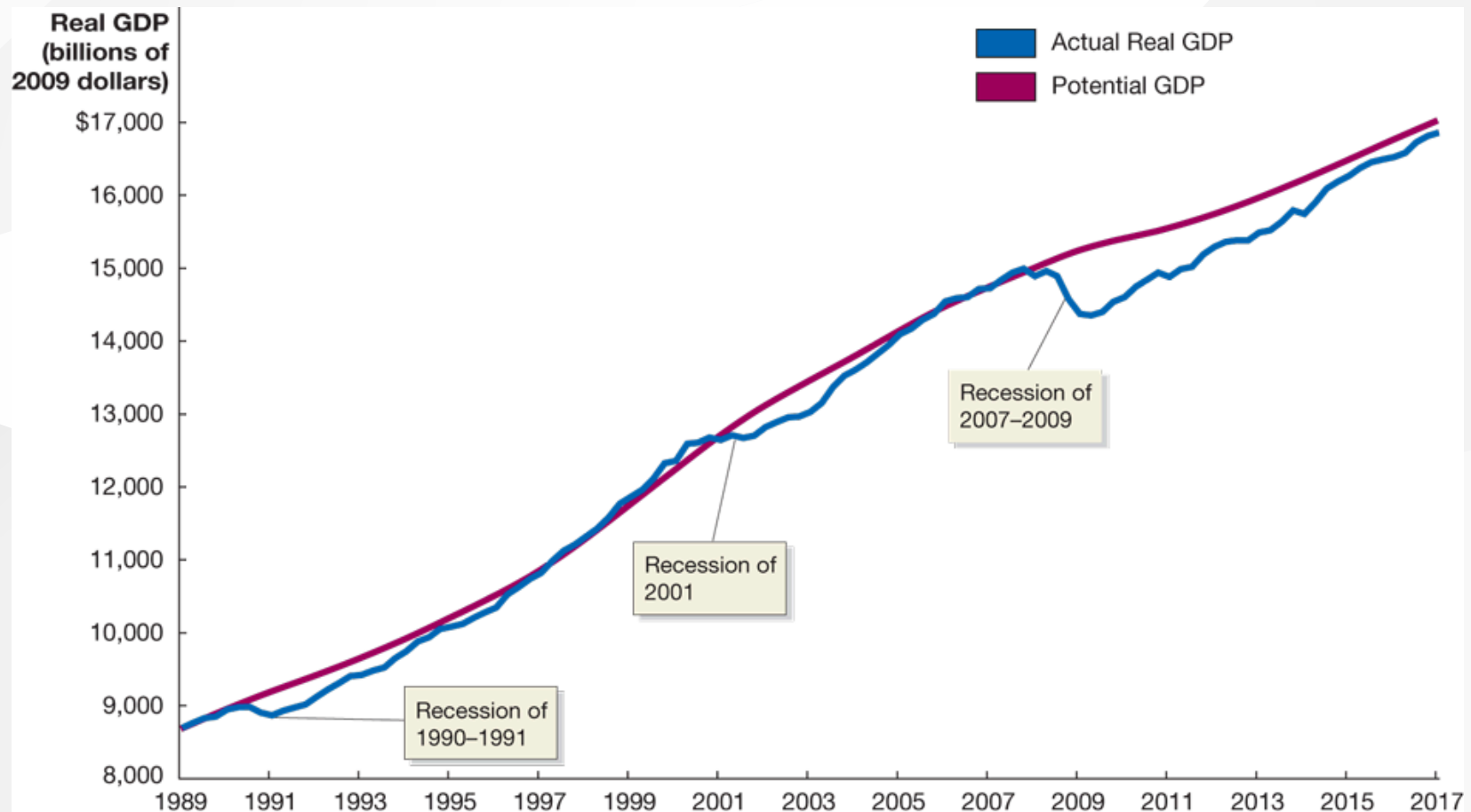
$$g \approx \frac{g_1 + g_2 + \dots + g_n}{n}$$

- Rule of 70: number of years to double = $\frac{70}{g}$

What Determines Growth Rates?

- Labor productivity: quantity of goods and services produced by one worker or one hour of work
- What determines labor productivity
 - increases in capital per hour worked
 - technological change
- Potential GDP: level of real GDP attained when all firms are operating at capacity
 - "normal" hours & "normal" sized workforce
 - U.S. potential GDP: average annual rate of 3.2%

Actual versus Potential GDP



- U.S. actual and potential GDP (source: FRED)
- Actual GDP falls below potential during recessions

What is Financial System?

- A system through which firms acquire funds from households
 - financial markets, e.g. bond/stock markets
 - financial intermediaries, e.g. banks, mutual funds
- Three key services of financial system
 - risk-sharing: portfolio diversification
 - liquidity: ease with which financial security can be exchanged for money
 - information: facts about borrowers and expected returns on financial securities

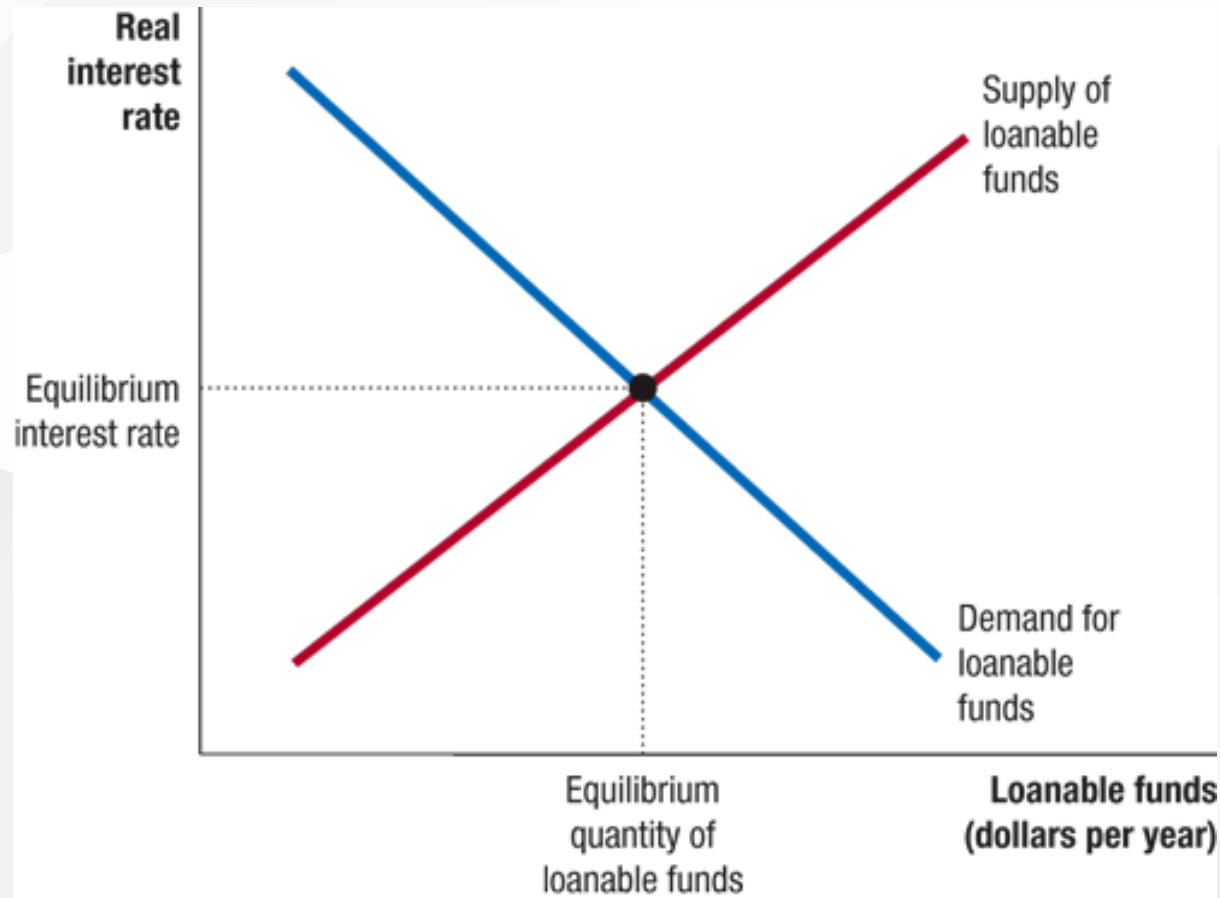
Saving Equals Investment

National income identity

$$\underbrace{S}_{\text{national saving}} = \underbrace{Y - T - C}_{\text{private saving}} + \underbrace{T - G}_{\text{gov't saving}} = I + NX$$

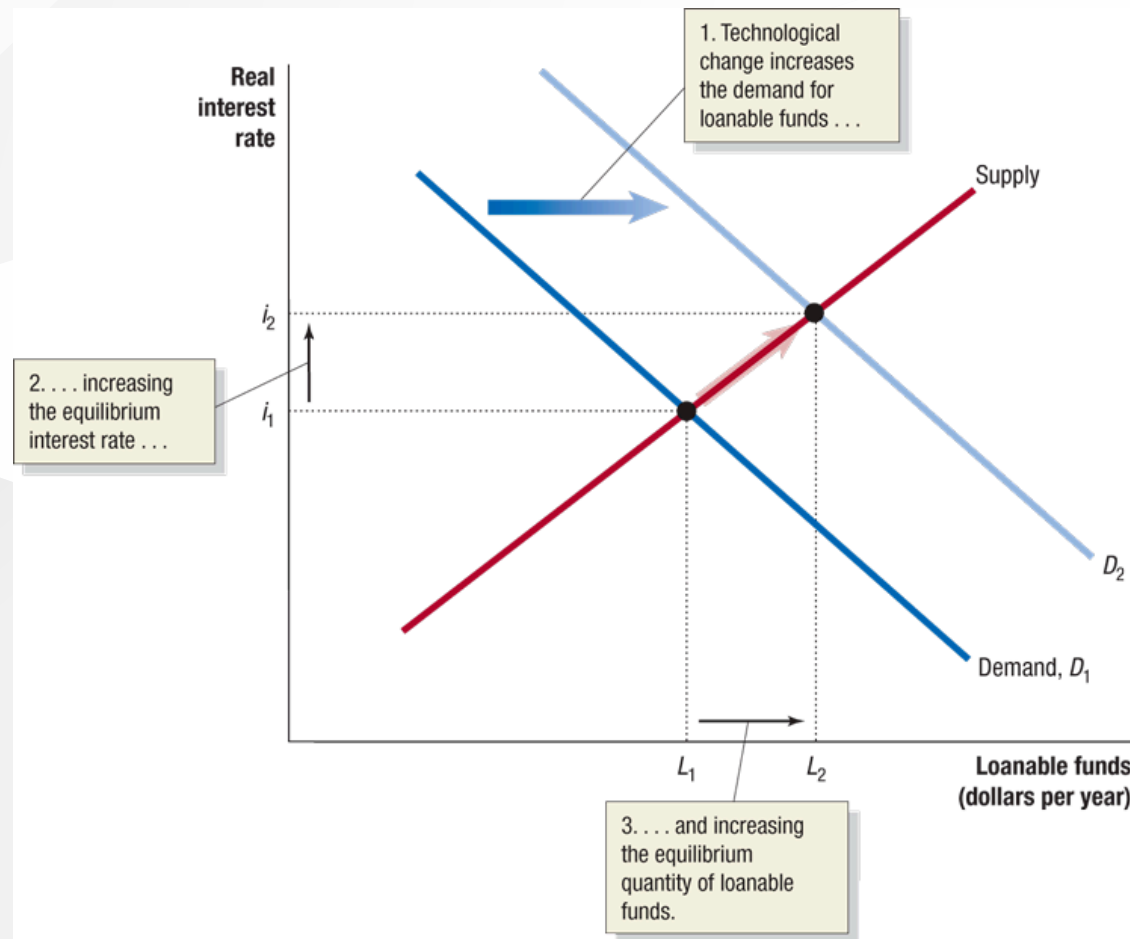
- Some notations
 - T = taxes net of transfers (net taxes)
 - $Y - T$ = disposable income
 - S^p = private saving, S^g = gov't (public) saving
 - $G - T$ = primary deficit/newly issued gov't debt
- Ways to raise national wealth
 - Closed economy: only accumulate capital ($S = I$)
 - Open economy: also net foreign investment (NX)

Loanable Funds Market



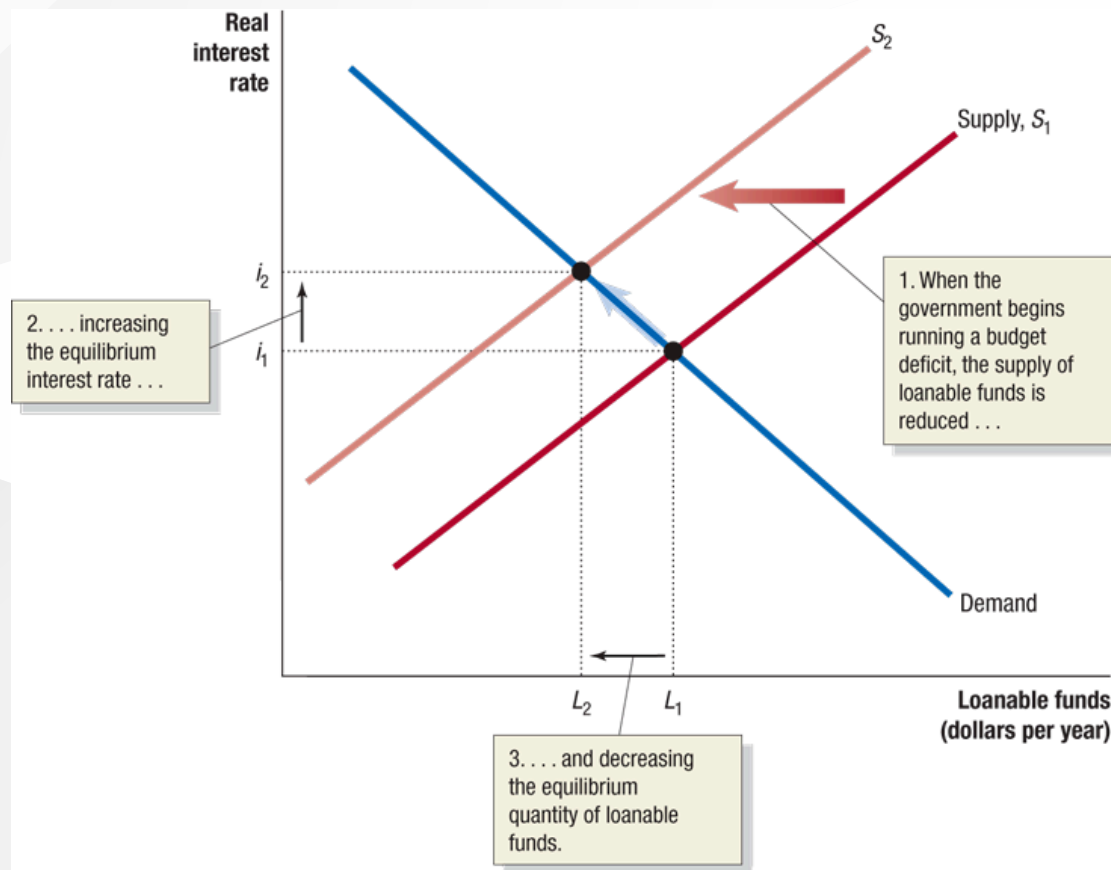
- Assume closed economy; single market for loanable funds
- Loanable funds market determines **real** interest rate

Shift in Demand Curve



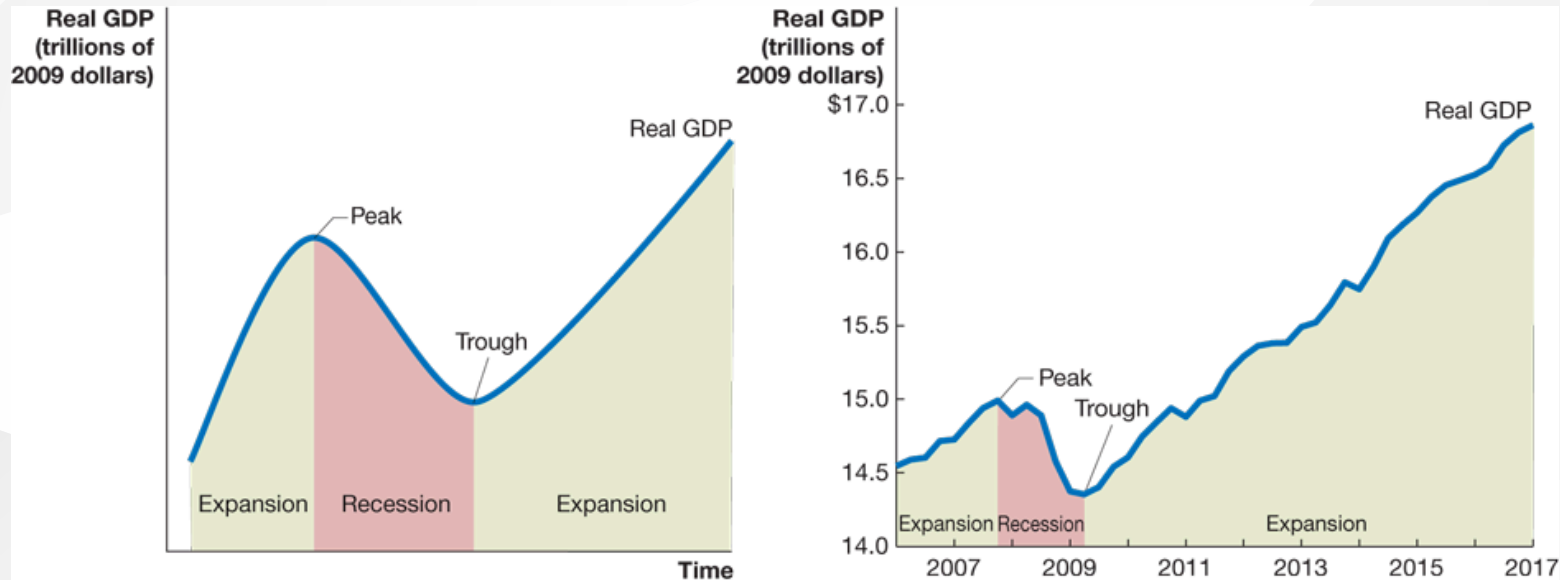
- Effect of technological change: real interest rate \uparrow , loanable funds \uparrow
- Effects of expected future profits, corporate taxes?

Shift in Supply Curve



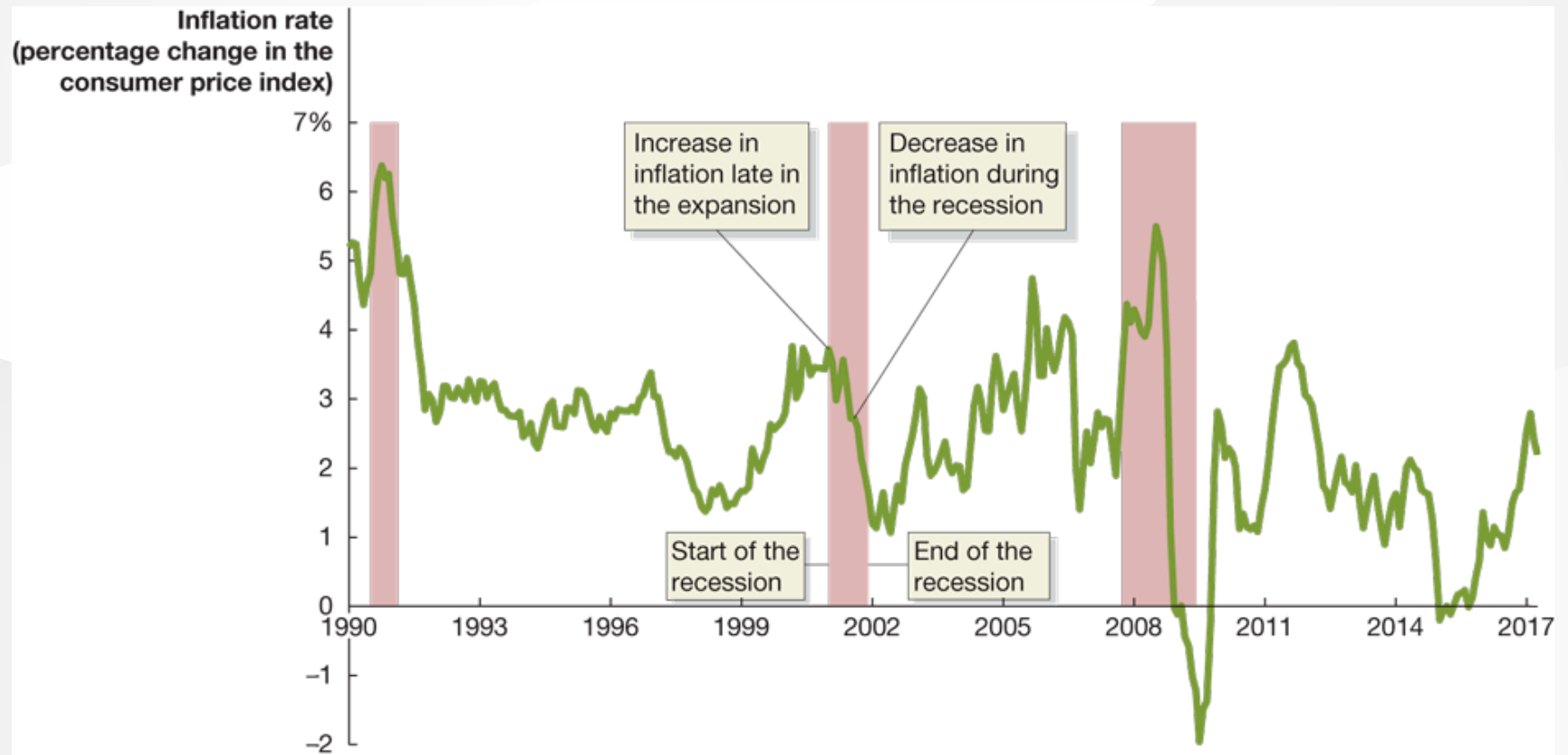
- Effect of budget deficit: real interest rate \uparrow , loanable funds \downarrow (higher G crowds out I)
- Effects of 401(k) retirement plan?

Idealized vs. Actual Business Cycle



- Alternating periods of expansions and recessions
- $(Y, N) \uparrow (\downarrow)$ during expansions (recessions)
- Recession: two consecutive quarters of declining real GDP
- National Bureau of Economic Research (NBER) Business Cycle Dating Committee

Effect of Business Cycle



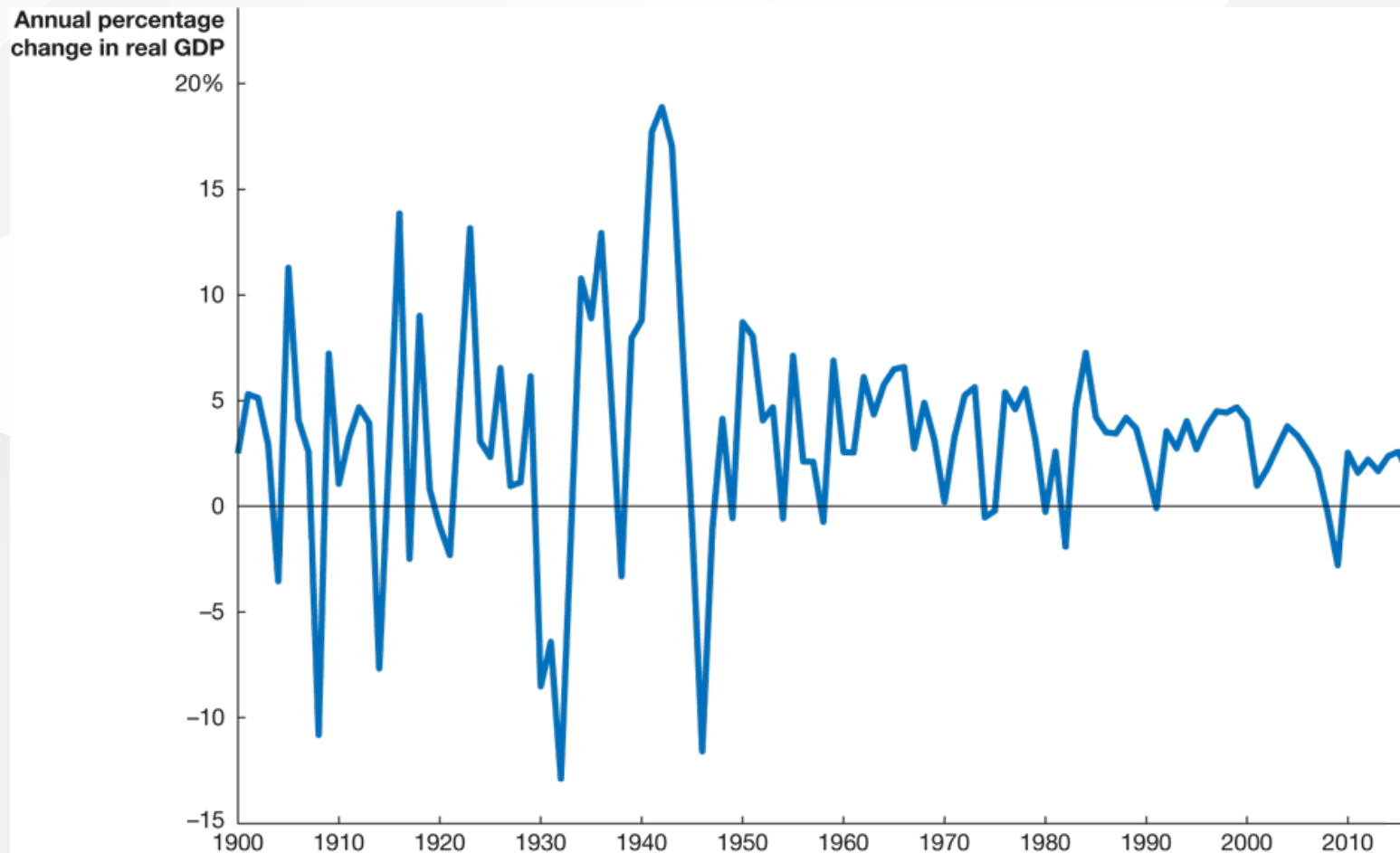
- Effect of business cycles on inflation (source: BLS)

Effect of Business Cycle (Cont'd)



- Effect of business cycles on unemployment (source: BLS)

Great Moderation



- Annual fluctuations in real GDP (source: BEA)
- Reduction in volatility of business cycles since mid-1980s

Readings & Exercises

- Readings
 - HO: chapter 10
 - BJ: lecture 2 (sec. 4) (supplementary)
- Exercises
 - HO: problem 1.8, 2.7, 2.8, 2.10, D10.1, D10.2