CPI

16. Measuring the Cost of Living

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Questions in this chapter

CPI: 소비자 물가지수

- What is the Consumer Price Index (CPI)? How is it calculated? What's it used for?
- What are the problems with the CPI? How serious are they?
- How does the CPI differ from the GDP deflator?
- How can we use the CPI to compare dollar amounts from different years? Why would we want to do this, anyway?
- How can we correct interest rates for inflation?

How the CPI Is Calculated

장바구니

통계청

- Fix the "basket." The Bureau of Labor Statistics (BLS) surveys consumers to determine what's in the typical consumer's "shopping basket."
- Find the prices. The BLS collects data on the prices of all the goods in the basket.
- Compute the basket's cost. Use the prices to compute the total cost of the basket.
- Choose a base year and compute the index. The CPI in any year equals

$$\frac{\text{cost of basket in current year}}{\text{cost of basket in base year}} \times 100$$

- Compute the inflation rate. The percentage change in the CPI from the preceding period.

$$\frac{\text{CPI this year - CPI last year}}{\text{CPI last year}} \times 100$$

EXAMPLE:

basket: {4 pizzas, 10 lattes}

year	Pizza	Latte
2011	\$10	\$2.00
2012	\$11	\$2.50
2013	\$12	\$3.00

Cost of basket:

2011:	\$10 x 4	+	\$2.00 x 10	=	\$60
2012:	\$11 x 4	+	\$2.50 x 10	=	\$69
2013:	\$12 x 4	+	\$3.00 x 10	=	\$78

Compute CPI using 2011 as the base year:

2011:	100 x (60/60)	=	100
2012:	100 x (69/60)	=	115
2013:	100 x (78/60)	=	130

What's in the CPI basket?

지출목적별 부문	품목수	가중치
< 총 지 수 >	481	1000.0
식료품 및 비주류음료	134	139.0
주류 및 담배	8	11.8
의류 및 신발	34	66.4
주택, 수도, 전기 및 연료	21	173.0
가정용품 및 가사서비스	49	38.2
보 건	28	72.9
교 통	32	111.4
통 신	8	59.1
오락 및 문화	64	53.0
교 육	20	103.5
음식 및 숙박	42	121.6
기타상품 및 서비스	41	50.1

Problems with the CPI: Substitution Bias

대체재 반영 X

- Over time, some prices rise faster than others.
- Consumers substitute toward goods that become relatively cheaper, mitigating the effects of price increases.
- The CPI misses this substitution because it uses a fixed basket of goods.
- Thus, the CPI overstates increases in the cost of living.

과장하여 발표할 가능성

Problems with the CPI: Introduction of New Goods

새로운 상품! 반영 X

- The introduction of new goods increases variety, allows consumers to find products that more closely meet their needs.
- In effect, dollars become more valuable.
- The CPI misses this effect because it uses a fixed basket of goods.
- Thus, the CPI overstates increases in the cost of living.

Problems with the CPI: Unmeasured Quality Change

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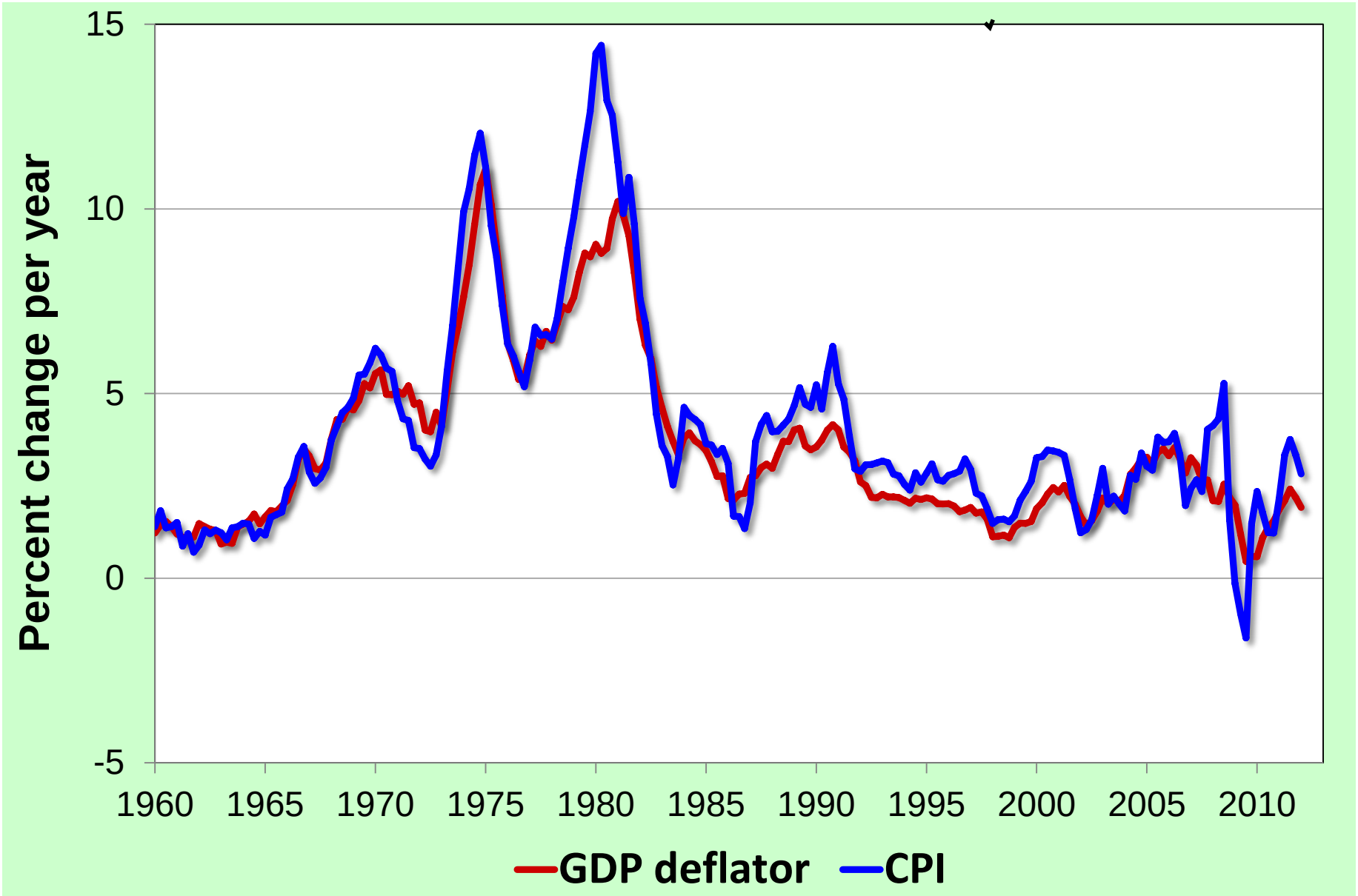
- Improvements in the quality of goods in the basket increase the value of each dollar.
- The BLS tries to account for quality changes but probably misses some, as quality is hard to measure.
- Thus, the CPI overstates increases in the cost of living.

Problems with the CPI

- Each of these problems causes the CPI to overstate cost of living increases.
- The BLS has made technical adjustments, but the CPI probably still overstates inflation by about 0.5 percent per year.
- This is important because Social Security payments and many contracts have COLAs tied to the CPI.

Two Measures of Inflation, 1960-2012



Contrasting the CPI and GDP Deflator

수입된 한 소비자 상품

- *Imported* consumer goods:
  - included in CPI
  - excluded from GDP deflator
- Capital goods:
  - excluded from CPI
  - included in GDP deflator (if produced domestically)
- The basket:
  - CPI uses fixed basket
  - GDP deflator uses basket of currently produced goods & services

This matters if different prices are changing by different amounts.

EXAMPLE

- Starbucks raises the price of Frappuccinos.

The CPI and GDP deflator both rise.

- Caterpillar raises the price of the industrial tractors it manufactures at its Illinois factory.

The GDP deflator rises, the CPI does not.

- Armani raises the price of the Italian jeans it sells in the U.S.

The CPI rises, the GDP deflator does not.

Correcting Variables for Inflation: Comparing Dollar Figures from Different Times

- Inflation makes it harder to compare dollar amounts from different times.
- Example: the minimum wage
- Did min wage have more purchasing power in Dec 1964 or Dec 2010?
- To compare, use CPI to convert 1964 figure into "2010 dollars"...
- Researchers, business analysts, and policymakers often use this technique to convert a time series of current-dollar (nominal) figures into constant-dollar (real) figures.
- They can then see how a variable has changed over time after correcting for inflation.

Correcting Variables for Inflation: Indexation

2015년의 250만원가치의 돈을 미래에 주겠다 X

A dollar amount is indexed for inflation if it is automatically corrected for inflation by law or in a contract.

- For example, the increase in the CPI automatically determines
- the COLA (cost-of-living allowance) in many multi-year labor contracts
- adjustments in Social Security payments and federal income tax brackets

소득이 매한 세금 차이를 요구할때
소득구간을 물가지수와 연동하여 정해져 있다.

Correcting Variables for Inflation: Real vs. Nominal Interest Rates

명목이자율

- The nominal interest rate:
  - the interest rate not corrected for inflation
  - the rate of growth in the dollar value of a deposit or debt
- The real interest rate: 실질이자율
  - corrected for inflation
  - the rate of growth in the purchasing power of a deposit or debt

Real interest rate = (nominal interest rate) – (inflation rate)

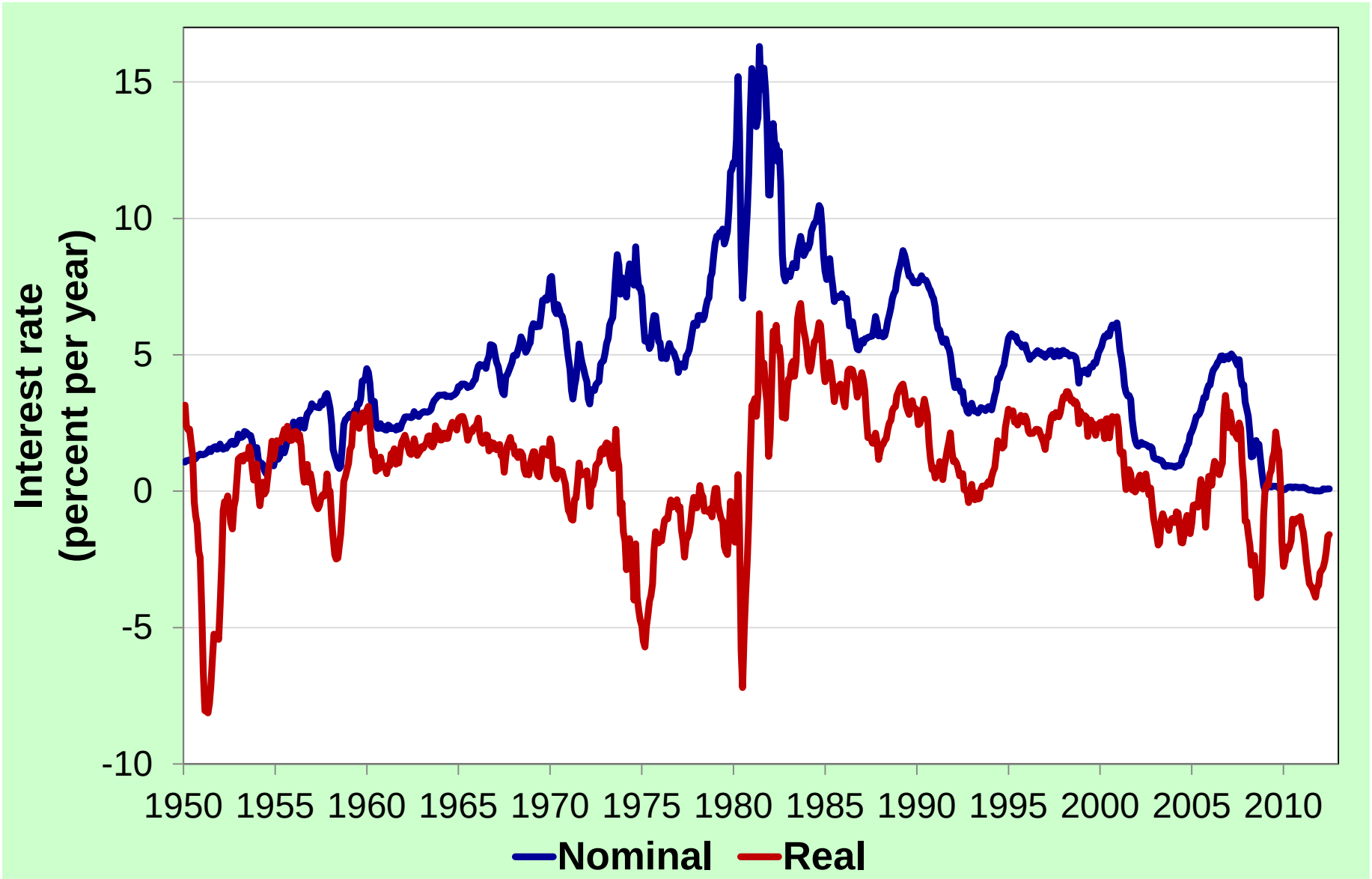
앞으로 중요하다. 명목이자율 – 물가상승률

Correcting Variables for Inflation: Real vs. Nominal Interest Rates

Example:

- Deposit \$1,000 for one year.
- Nominal interest rate is 9%.
- During that year, inflation is 3.5%.
- Real interest rate = Nominal interest rate – Inflation = 9.0% – 3.5%
- The purchasing power of the \$1,000 deposit has grown 5.5%.

Real and Nominal Interest Rates in the U.S., 1950-2012



SUMMARY

- The Consumer Price Index is a measure of the cost of living. The CPI tracks the cost of the typical consumer's "basket" of goods & services.
- The CPI is used to make Cost of Living Adjustments and to correct economic variables for the effects of inflation.
- The real interest rate is corrected for inflation and is computed by subtracting the inflation rate from the nominal interest rate.