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Measuring the Cost of Living





The Consumer Price Index

- Consumer price index (CPI)
 - Measure of the overall level of prices
 - Measure of the overall cost of goods and services
 - Bought by a typical consumer
 - Bureau of Labor Statistics



Calculating CPI

1. Fix the basket

- Which prices are most important to the typical consumer
- Different weight

2. Find the prices

- At each point in time

3. Compute the basket's cost

- Same basket of goods
- Isolate the effects of price changes



Calculating CPI

4. Chose a base year and compute the CPI

- Base year = benchmark
 - Price of basket of goods and services in current year
 - Divided by price of basket in base year
 - Times 100

5. Compute the inflation rate

$$\text{Inflation rate in year 2} = \frac{\text{CPI in year 2} - \text{CPI in year 1}}{\text{CPI in year 1}} \times 100$$

Table 1

•Calculating the Consumer Price Index and the Inflation Rate: An Example

Step 1: Survey Consumers to Determine a Fixed Basket of Goods

Basket = 4 hot dogs, 2 hamburgers

Step 2: Find the Price of Each Good in Each Year

Year	Price of Hot Dogs	Price of Hamburgers
2013	\$1	\$2
2014	2	3
2015	3	4

Step 3: Compute the Cost of the Basket of Goods in Each Year

2013	$(\$1 \text{ per hot dog} \times 4 \text{ hot dogs}) + (\$2 \text{ per hamburger} \times 2 \text{ hamburgers}) = \8 per basket
2014	$(\$2 \text{ per hot dog} \times 4 \text{ hot dogs}) + (\$3 \text{ per hamburger} \times 2 \text{ hamburgers}) = \14 per basket
2015	$(\$3 \text{ per hot dog} \times 4 \text{ hot dogs}) + (\$4 \text{ per hamburger} \times 2 \text{ hamburgers}) = \20 per basket

•This table shows how to calculate the consumer price index and the inflation rate for

Table 1

•Calculating the Consumer Price Index and the Inflation Rate: An Example

Step 4: Choose One Year as a Base Year (2013) and Compute the Consumer Price Index in Each Year

2013	$(\$8 / \$8) \times 100 = 100$
2014	$(\$14 / \$8) \times 100 = 175$
2015	$(\$20 / \$8) \times 100 = 250$

Step 5: Use the Consumer Price Index to Compute the Inflation Rate from Previous Year

2014	$(175 - 100) / 100 \times 100 = 75\%$
2015	$(250 - 175) / 175 \times 100 = 43\%$

•This table shows how to calculate the consumer price index and the inflation rate for a hypothetical economy in which consumers buy only hot dogs and hamburgers.



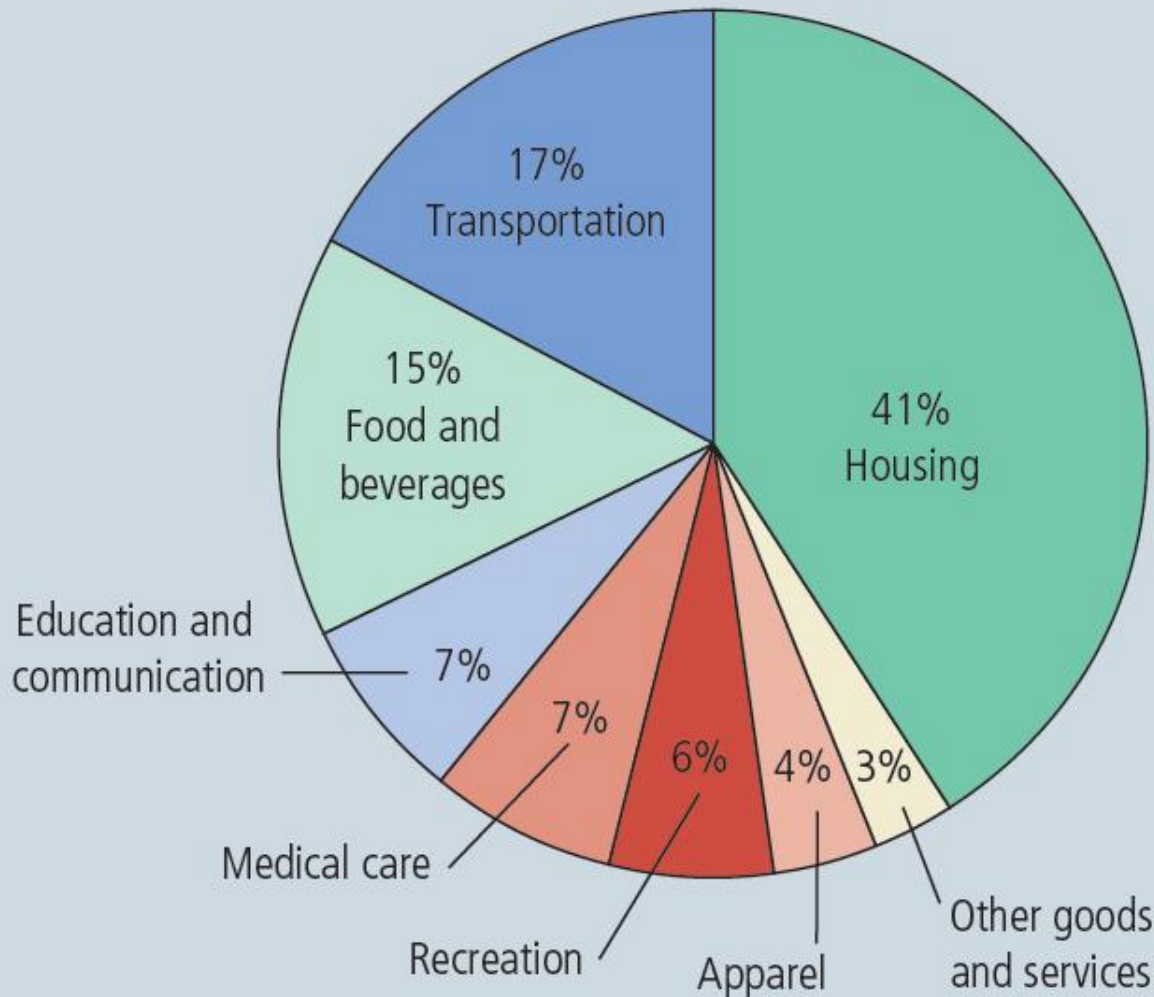
The Consumer Price Index

- Inflation rate
 - Percentage change in the price index
 - From the preceding period
- Producer price index, PPI
 - Measure of the cost of a basket of goods and services bought by firms
 - Changes in PPI are often thought to be useful in predicting changes in CPI

Figure 1

•The Typical Basket of Goods and Services

Source: Bureau of Labor Statistics.



•This figure shows how the typical consumer divides spending among various categories



The Consumer Price Index

- Problems in measuring the cost of living
 - Substitution bias
 - Prices do not change proportionately
 - Consumers substitute toward goods that have become relatively less expensive
 - Introduction of new goods
 - More variety of goods
 - Unmeasured quality change
 - Changes in quality



GDP deflator versus CPI

- GDP deflator

- Ratio of nominal GDP to real GDP
- Reflects prices of all goods & services produced domestically

- CPI

- Reflects prices of goods & services bought by consumers



“The price may seem a little high, but you have to remember that’s in today’s dollars.”



GDP deflator versus CPI

- GDP deflator

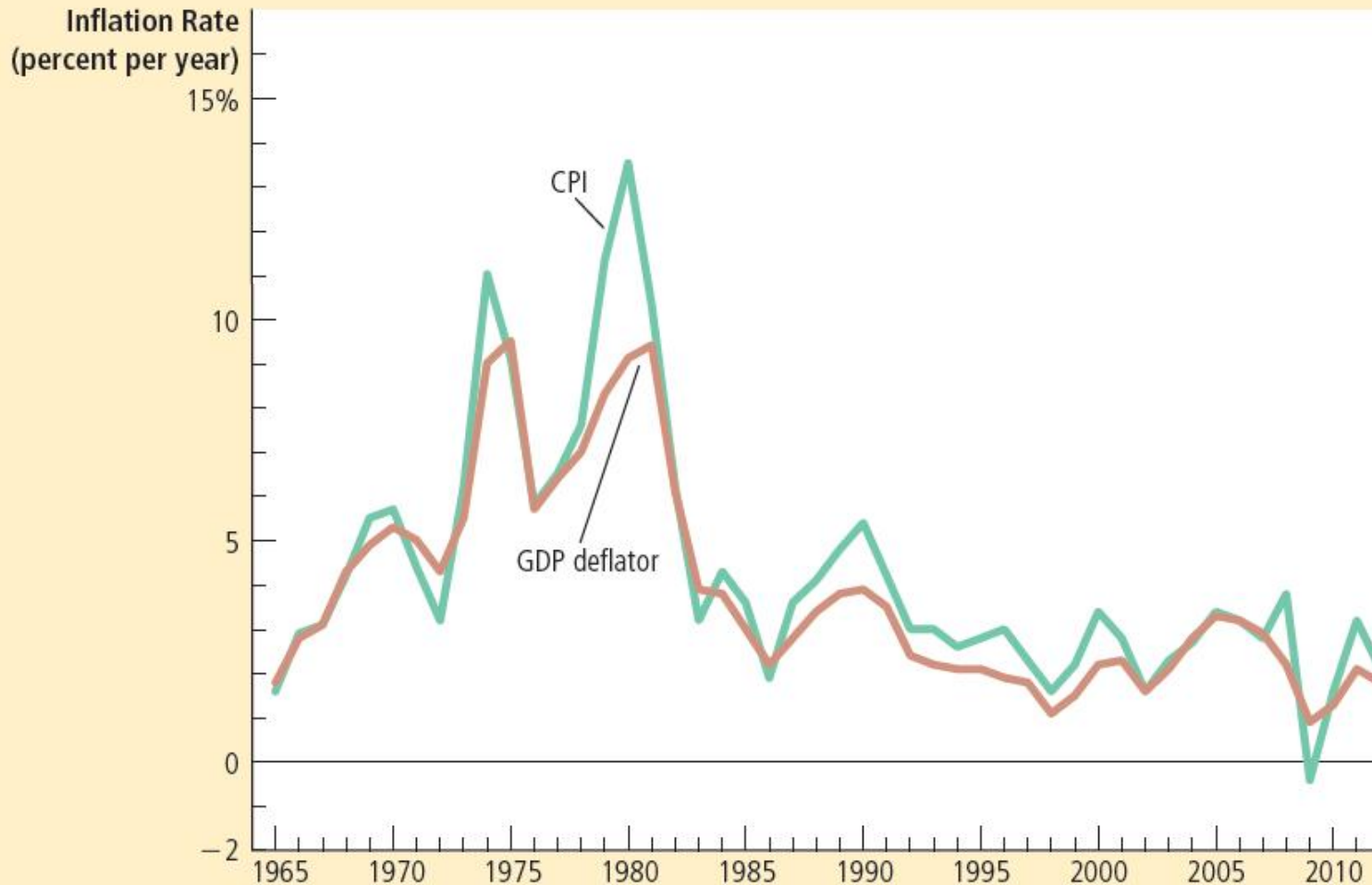
- Compares the price of currently produced goods and services
 - To the price of the same goods and services in the base year

- CPI

- Compares price of a fixed basket of goods and services
 - To the price of the basket in the base year

Figure 2

- Two Measures of Inflation



- This figure shows the inflation rate—the percentage change in the level of prices—as measured by the GDP deflator and the consumer price index using annual data since 1965. Notice that the two measures of inflation generally move together.



Correcting Economic Variables

- Dollar figures from different times

Amount in today's dollars =

$$= \text{Amount in year T dollars} \times \frac{\text{Price level today}}{\text{Price level in year T}}$$

- Indexation

- Automatic correction by law or contract
- Of a dollar amount
- For the effects of inflation
- COLA: Cost of living allowance



Real and Nominal Interest Rates

- Nominal interest rate
 - Interest rate as usually reported
 - Without a correction for the effects of inflation
- Real interest rate
 - Interest rate corrected for the effects of inflation

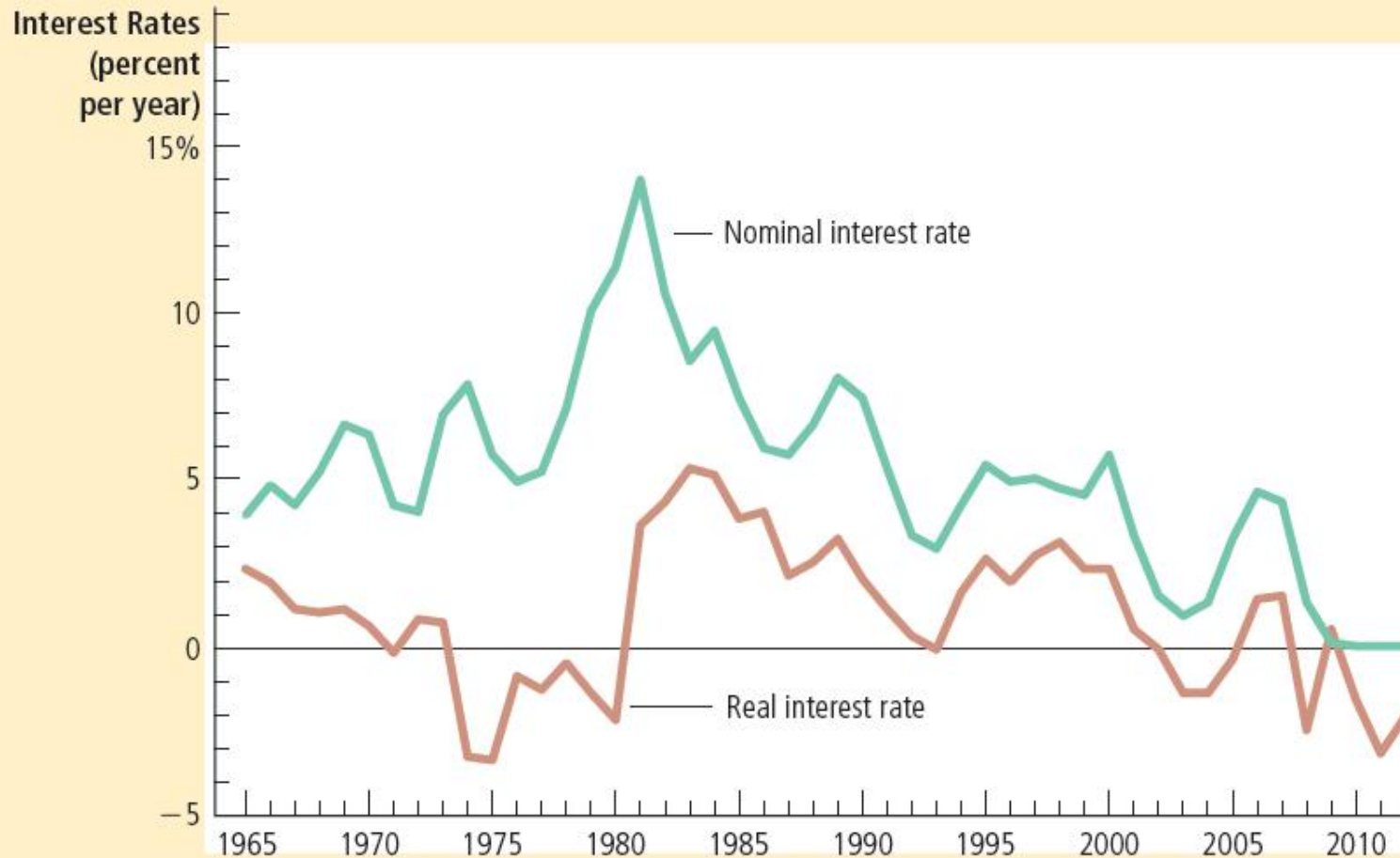
= Nominal interest rate – Inflation rate

Interest rates in the U.S. Economy

- **Nominal interest rate**
 - Always exceeds the real interest rate
 - U.S. economy has experienced rising consumer prices in every year
- **Inflation is variable**
 - Real and nominal interest rates do not always move together
- **Periods of deflation**
 - Real interest rate exceeds the nominal interest rate

Figure 3

•Real and Nominal Interest Rates



•This figure shows nominal and real interest rates using annual data since 1965. The nominal interest rate is the rate on a 3-month Treasury bill. The real interest rate is the nominal interest rate minus the inflation rate as measured by the consumer price index. Notice that nominal and real interest rates often do not move together.