The Cost of Living

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CPI

- GDP measures the quantity of goods and services that an economy produces.
- This section looks at the overall *cost of living*. How far does a dollar get you in terms of purchasing power?
- **CPI:** A measure of the overall price level measured by the cost of goods and services bought by a typical consumer (e.g., housing, gasoline, food, etc.)

Calculating the CPI

1. Fix the basket
2. Find the prices at each point in time
3. Compute the basket's cost: $P_t = \sum_i p_{it} \times q_i$, where i represents each good in the index. The quantity refers to the number of each good contained in the basket. Remember that it stays fixed!
4. Choose a base year and compute the index

Calculating the CPI

- The CPI in year t is computed as

$$CPI_t = P_t / P_{baseyr} \times 100$$

- **Inflation Rate:** The percentage change in the price index from the preceding period.
- Just like with the GDP deflator, we can use the CPI to find the inflation rate:

$$\pi_{t+1} = (CPI_{t+1} - CPI_t)/CPI_t \times 100\%$$

Calculating the CPI

Example

Table 1 shows the prices of textbooks and movie tickets in an economy. Suppose that a basket contains 20 movie tickets and 10 textbooks. 2014 is the base year.

Table: Production in a Simple Economy

Year	Movie Tickets	Textbooks
2013	$10.00	$120.00
2014	$11.50	$130.00
2015	$12.00	$135.00

How much did the basket cost in 2015? What was the CPI in each year? What is the inflation rate in 2014?

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$P_{2013} = 10 \times 20 + 120 \times 10 = \$1,400.$
$P_{2014} = 11.50 \times 20 + 130 \times 10 = \$1,530$
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$\pi_{2014} = (100 - 91.5)/91.5 \times 100\% = 9.3\%.$

Issues with the CPI

1. Substitution bias: Buyers move towards goods that become relatively less expensive. Basket remains constant, so it ignores substitution towards these goods and overstates increases in the cost of living.
2. New goods: As new goods are introduced, consumers have more choices and each dollar is worth more. Fixed baskets ignore this increase in value.
3. Quality change: Hard to measure changes in quality.

Correcting for Inflation

- Due to inflation, a dollar in one year is not the same as a dollar the next. In order to compare the purchasing power of money between two different years, we need to perform a unit conversion.
- Since the CPI gives a measure of the price level each year, we can use a ratio of the CPI to convert from year X dollars to year Y dollars as such:

  $$\text{Amount in yr. } Y \text{ dollars} = \text{Amount in yr. } X \text{ dollar} \times (CPI_Y / CPI_X)$$

- **Indexation:** The automatic correction by law or contract of a dollar amount for the effects of inflation.

Correcting for Inflation

Example

The average price of gas in 1981 was \$1.42 a gallon. Meanwhile, the average price of gas in 2005 was \$2.50. If the CPI in 1981 was 88.5 and the CPI in 2005 was 196.4, was gas more expensive in 1981 or 2005 after correcting for inflation?

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1981 gas price in 2005 dollars $= 1.42 \times (196.4/88.5) =$ \$3.15/gallon.

Gas was more expensive in 1981.

Correcting for Inflation

Example

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1980 salary in 2000 dollars $= 24{,}000 \times (200/90) = \$53{,}333.$
Better off today.

Readings and Assignments

- Today: Mankiw Ch. 24
- Next time: Mankiw 25
- Problem Set 4, section 3