

# The CPI and the Cost of Living

Economics 152

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## 1 Introduction

In this chapter we will look at the Consumer Price Index (CPI), its computation and how it differs from the GDP deflator.

## 2 The Consumer Price Index

The Consumer Price Index (CPI) is a measure of the average of prices paid by urban consumers for a *fixed* market basket or bundle of goods and services. The CPI is computed by the Bureau of Labor Statistics (BLS) once every month. In computing the CPI, the BLS takes into account a *reference base year*. At present, the reference base year is 1982–1984. This means that from January 1982 through December 19, i.e. over this 36 month period, the CPI is 100.

### 2.1 The CPI Basket

In computing the CPI, the BLS takes into account approximately 80,000 goods and services assumed to be representative of an average urban household. The BLS uses two baskets to calculate two CPIs - CPI-U measures the average price paid by all urban households and CPI-W measures the average price paid by urban wage earners and clerical workers. We will focus on the CPI-U.

### 2.2 Computing the CPI

To compute the CPI we make the following assumptions:

- Two Commodities - Apples and Oranges
- The reference base period is 2000

The CPI is computed using the following formula:

$$\begin{aligned} \text{CPI}^{2002} &= \frac{\text{Cost of CPI basket at current period prices}}{\text{Cost of CPI basket at base period prices}} \times 100 \\ &= \frac{P_{apples}^{2002} * Q_{apples}^{2000} + P_{oranges}^{2002} * Q_{oranges}^{2000}}{P_{apples}^{2000} * Q_{apples}^{2000} + P_{oranges}^{2000} * Q_{oranges}^{2000}} \times 100 \end{aligned} \tag{1}$$

### 2.3 Measuring Inflation

Despite the fact that the CPI overstates inflation, it is often used as a measure of inflation. To compute the inflation rate we use the following formula:

$$\text{Inflation rate} = \frac{(\text{CPI in current year} - \text{CPI in previous year})}{\text{CPI in previous year}} \times 100 \quad (2)$$

### 3 The GDP Deflator

The GDP deflator is a much broader bundle of goods and services. The GDP deflator for 2002 can be computed in the following way:

$$\begin{aligned} \text{GDP deflator}^{2002} &= \frac{\text{NGDP}^{2002}}{\text{RGDP}^{2002}} \times 100 \\ &= \frac{P_{apples}^{2002} * Q_{apples}^{2002} + P_{oranges}^{2002} * Q_{oranges}^{2002}}{P_{apples}^{2000} * Q_{apples}^{2002} + P_{oranges}^{2000} * Q_{oranges}^{2002}} \times 100 \end{aligned} \quad (3)$$

### 4 The CPI Vs. The GDP Deflator

Given below are some differences between the CPI and the GDP deflator.

1. The CPI measures expenditures by consumers only, while the GDP deflator incorporates expenditures by firms, the government and the foreign sector.
2. The CPI includes imported goods, while the deflator does not.
3. The CPI is a fixed weight basket but the deflator is not.

### 5 Criticisms of the CPI

All the criticisms of the CPI arise from the fact that it is a *fixed weight basket*. The three main criticisms are given below:

1. The CPI suffers from a *substitution bias*.
2. The CPI does not include new products.
3. The CPI does not include quality changes.