

Bias in the US Consumer Price Index: Why It Could Be Important

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The US consumer price index may be overstating the inflation rate, thereby distorting calculations of inflation adjustments in both government expenditures and income tax brackets and swelling the federal deficit.

CHANGES IN the consumer price index (CPI) provide the most commonly used measure of inflation in all countries (see box). In a recent study, the US Advisory Commission to Study the Consumer Price Index (more commonly known as the Boskin Commission, whose chairman was Michael Boskin, former chief of the US Council of Economic Advisers) estimated that the US CPI overstated inflation by 1.1 percentage point in 1996 and by slightly more in each of the previous 20 years. Thus, although the official rate of inflation for 1996 was 2.9 percent, the true rate may have been in the neighborhood of 1.8 percent. This upward bias arises because the CPI methodology does not adequately capture shifts in consumer purchases when relative prices move, the effects of changes in the quality of goods and services, the introduction of

new products, or the growing number of discount stores. While some experts have disputed that the upward bias is as large as has been suggested by the Commission, there is a growing consensus that there may indeed be significant bias.

Upward bias in the official inflation rate has important implications. First, real wages—which were widely thought, on the basis of official data, to have stagnated over the last two decades—may, in fact, have increased considerably. Second, in regard to fiscal policy, upward bias has considerable budgetary costs: expenditures indexed to the CPI rise by more than is needed to offset inflation, and inflation adjustments made to tax brackets are overstated, resulting in

reduced tax revenues. Recent estimates indicate that if the current inflation bias continues for the next 10 years, the federal government deficit will increase on this account alone by \$140 billion, and \$650 billion will be added to the national debt by the end of the period (see chart).

The Boskin Commission's report identified and quantified three sources of bias, all of which arise because of limitations in the methodology used to calculate the CPI (see table):

- *Quality change and new product bias*, the largest source of bias, arises because the CPI does not immediately take into account either improvements in the quality of goods and services or the introduction of

How the US CPI is computed

In the United States, the consumer price index (CPI) is used to estimate the overall price level in the consumer sector of the economy each month. The US Department of Labor's Bureau of Labor Statistics (BLS) is responsible for calculating the CPI, which is based on individual prices for a fixed market basket of goods and services, which includes food, clothing, shelter, fuel, transportation, medical services, and other items.

Using statistical sampling techniques to select specific items, the BLS collects prices each month for about 71,000 goods and services from about 22,000 outlets in 44 geographic areas. For example, the cost of housing is included in the data collection by surveying about 5,000 renters and 1,000 homeowners each month. The price quotations the BLS obtains are then combined to form the consumer price index. Some simplifying assumptions have to be made to make this complex calculation practicable. The formula the BLS uses to aggregate all of these prices assumes that consumers purchase fixed quantities of goods—that is, that their spending patterns remain the same—over time. The CPI, then, is designed to reveal how much it costs consumers to purchase the same market basket of goods and services today compared with what it cost in a previous month or year.

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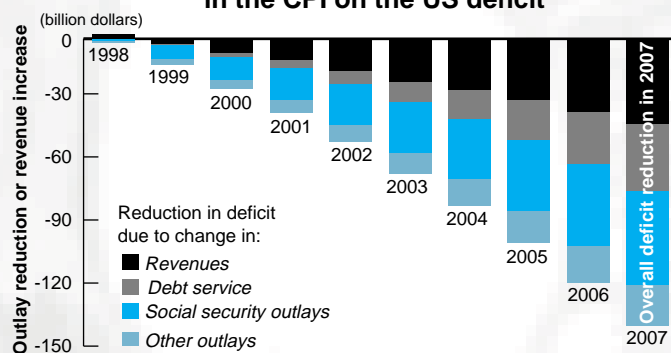
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Sources of bias in US consumer price index, 1996

Sources of bias	Percent per year
Quality change/new product bias	0.6
Substitution bias	0.4
Outlet substitution bias	0.1
Total	1.1
(Plausible range)	(0.8–1.6)

Source: United States, Advisory Commission to Study the Consumer Price Index, 1996, *Toward a More Accurate Measure of the Cost of Living*, Final Report to the Senate Finance Committee (Washington).

Impact of correcting a 1 percentage point overstatement in the CPI on the US deficit



Source: United States, Congressional Budget Office, 1997, *The Economic and Budget Outlook* (Washington).

new products. To the extent that the CPI fails to account for changes in quality, the index will not reflect “true” changes in prices. And new products need to be incorporated into the CPI on a timely basis, so that the early declines in price that are a normal part of the product life cycle are captured.

- *Substitution bias* occurs because the formula used for CPI calculations assumes that consumers purchase a constant mix of various goods and services despite changes in their relative prices. In actuality, if the price of one good rises relative to that of another good, consumers will tend to substitute cheaper goods for higher-priced ones. Because the weights of goods in the CPI are adjusted infrequently (about once every 10 years), substitution is not taken into account.

- *Outlet substitution bias* occurs because the CPI does not adequately take into account the extent to which new discount stores have offered lower prices and enticed consumers away from the traditional outlets that tend to be more fully represented in the CPI market basket.

To eliminate the various biases, the Commission recommends replacing the

method used in calculating the CPI with one that more accurately takes into account changing spending patterns. Other changes recommended include adopting new procedures for annual updates of weights and revisions to historical data, changing the price data and methods of collection, and establishing a committee of outside experts to review and advise the US Department of Labor’s Bureau of Labor Statistics on statistical issues.

The Commission’s conclusions have been criticized by some commentators. Most of the criticism has been directed at the large estimates of quality and new product bias. Measuring quality improvements is particularly difficult because direct quantitative evidence is scarce, and no new substantive information on this issue was provided in the Commission’s report. Some critics have noted that the report does not take into account the fact that the quality of some goods and services included in the CPI market basket has deteriorated.

Although the debate about upward bias in the CPI has been most active in the United States, the findings of the Commission’s study are relevant more generally, since many countries use methodologies

that have much in common with that used in the United States. Analyses of the Canadian CPI suggest that there may be an upward bias of 0.5–1 percent, somewhat lower than in the United States, reflecting in part the more frequent updating in Canada of the weights of the goods and services in the CPI market basket. A study of the United Kingdom’s retail price index suggests a plausible range of bias of 0.35–0.8 percent, although further work is under way to assess whether the bias may actually be larger.

More generally, the magnitude of bias in other countries depends on, among other factors, the frequency with which the CPI weights and the items sampled are updated; the extent to which new and improved products are brought to market; the formula used in estimation; and the extent to which quality adjustments are made. For example, indexes of consumer prices in countries where the weights used are updated annually—such as Norway, Sweden, and the United Kingdom—are likely to be less susceptible to substitution bias. Although most industrial countries—including the United States—make some attempt to allow for quality changes, they are not entirely successful in eliminating this form of bias. In most of the developing and transition countries, however, no quality adjustments are made, suggesting that this form of bias may have an important impact on their consumer price indexes—and, thus, on the inflation rates they indicate—particularly when newly opened markets increase the variety and quality of goods and services available to consumers. [F&D]

For a more detailed discussion of the data collection procedures and methodology used to prepare the US consumer price index, see Paul A. Armknecht, 1996, “Improving the Efficiency of the U.S. CPI,” IMF Working Paper No. 96/103 (Washington: International Monetary Fund).

This article is derived from a box entitled “United States: Sources and Implications of Bias in the Consumer Price Index” published in the Spring 1997 edition of the IMF’s World Economic Outlook (Washington).

Reference:

United States, Advisory Commission to Study the Consumer Price Index, 1996, Toward a More Accurate Measure of the Cost of Living (Washington).