

## Using a Different Measure of Inflation for Indexing Federal Programs and the Tax Code

Federal laws try to protect taxpayers and recipients of government benefits from the effects of rising prices by specifying that dollar amounts in many parts of the tax code and in some programs be automatically adjusted—or indexed—for inflation. Without such indexing, a rise in the general level of prices would alter the effects of federal policies even in the absence of action by lawmakers. For example, if the dollar amounts that delineate the different tax brackets in the individual income tax were not indexed, inflation would push many people's income into higher brackets and boost average tax rates over time, even if income did not grow faster than prices.

Many federal programs and parts of the tax code are currently indexed to increases in the consumer price index (CPI), a measure of inflation calculated by the Bureau of Labor Statistics (BLS).<sup>1</sup> According to many analysts, however, the CPI overstates increases in the cost of living because it does not fully account for the fact that consumers generally adjust their spending patterns as some prices change relative to other prices. One option for lawmakers would be to link federal benefit programs and tax provisions to another measure of inflation—the chained CPI—that is designed to account fully for changes in spending patterns. The chained CPI grows more slowly than the traditional CPI does: by an average of 0.3 percentage points per year over the past decade. As a result, using that measure to index benefit programs and tax provisions would reduce federal spending (especially

on Social Security and federal pensions) and increase revenues.

Although many analysts consider the chained CPI a more accurate measure of the cost of living, using it for indexing could have disadvantages. Because the values of the chained CPI are revised over a period of several years, the tax code and affected programs would have to be indexed to a preliminary estimate of the chained CPI that is subject to estimation error. Also, the chained CPI may understate growth in the cost of living for some groups, such as older people.

### Inflation and Changes in the Cost of Living

Inflation—a general increase in the prices of goods and services—can be measured in various ways. Traditionally, the rate of inflation has been computed by multiplying the percentage price change for each item that people purchase by that item's share of consumer spending in a period before the prices changed and then summing those changes for all items. In a simplified example, imagine that people bought only two things last year, cars and cauliflower, and that they divided their spending evenly between the two. If the price of cars rose by 4 percent this year and the price of cauliflower rose by 7 percent, annual inflation would be measured as  $(0.04 \times 0.50) + (0.07 \times 0.50) = 0.055$ , or 5.5 percent. Such increases would reduce consumers' purchasing power (unless their income and wealth rose accordingly).

In reality, however, inflation as measured that way is generally higher than the annual growth in the cost of living—that is, than the amount of additional resources someone would need to maintain the same standard of living this year as last year in the face of rising prices. The reason for the difference is that many people can soften

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1. For more information about the CPI, see Congressional Budget Office, *Explaining the Consumer Price Index*, Issue Brief (June 20, 2007); and Bureau of Labor Statistics, "Consumer Price Index: Frequently Asked Questions" (January 14, 2010), available at [www.bls.gov/cpi/cpifaq.htm](http://www.bls.gov/cpi/cpifaq.htm). For technical details about how the CPI is calculated, see Bureau of Labor Statistics, *BLS Handbook of Methods*, Chapter 17 (June 2007), available at [www.bls.gov/opub/hom/pdf/homch17.pdf](http://www.bls.gov/opub/hom/pdf/homch17.pdf).

the impact of inflation on their standard of living by shifting some of their purchases away from goods or services that have risen in price toward ones that have not risen or have risen less. Even with such economic substitution, an increase in the price of a good lowers consumers' standard of living (unless they value the old good and the new good equally). But the resulting decline in their standard of living is usually smaller than it would be if substitution were not possible. Thus, measures of inflation that do not account for such substitution overstate growth in the cost of living, a phenomenon known as substitution bias.

## The Consumer Price Index and Its Limitations

Although the CPI is not a true cost-of-living index, BLS's goal in computing it is to estimate the growth in the cost of living by measuring the change in the cost of a "market basket" of goods and services that represents average consumer spending.<sup>2</sup> The market basket is based on data from BLS's Consumer Expenditure Survey, in which thousands of families report what they actually bought. BLS divides those purchases into 211 categories—such as breakfast cereal, rent on a primary residence, women's dresses, and wireless telephone services—and assigns a percentage weight to each category based on its share of consumer spending in a base period. To measure price changes, BLS chooses about 80,000 specific items (several hundred for each category) and checks their prices every month at selected stores and other establishments in 87 urban areas.

BLS uses those price data to compute various versions of the CPI, two of which are currently used to index federal programs. The consumer price index for all urban consumers (CPI-U) is based on the average spending of almost all residents of urban or metropolitan areas—about 87 percent of U.S. residents. The consumer price index for urban wage earners and clerical workers (CPI-W) focuses on a subset of the CPI-U population: households that include clerical workers, sales workers, laborers, or certain other types of nonprofessional employees. The CPI-W population represents about 32 percent of U.S. residents.

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2. Bureau of Labor Statistics, *BLS Handbook of Methods*, Chapter 17, p. 2.

The two versions of the CPI produce similar estimates of inflation. Over the past 20 years, CPI-W inflation has averaged 2.65 percent a year, and CPI-U inflation has averaged 2.69 percent. The Congressional Budget Office (CBO) expects that the two measures will grow at about the same rate in the future.

Every two years, BLS uses new survey data to update the share of consumer spending devoted to each of the 211 categories in the market basket. As a result, at any given time, the CPI is based on spending patterns from two to four years earlier. For example, the monthly values of the CPI computed in 2008 and 2009 were based on spending data reported in the Consumer Expenditure Survey in 2005 and 2006. For the monthly values beginning in January 2010, BLS used new data to update the market basket to reflect purchases made in 2007 and 2008.

Because the CPI is based on spending patterns from a point in the past, it does not fully incorporate the effects of economic substitution. Therefore, the CPI grows faster than the cost of living does. That substitution bias would exist whether the market basket was from one month ago or five years ago. However, greater periods of time between updates to the basket tend to magnify substitution bias and to cause an even larger gap between the increase in the CPI and growth in the cost of living.

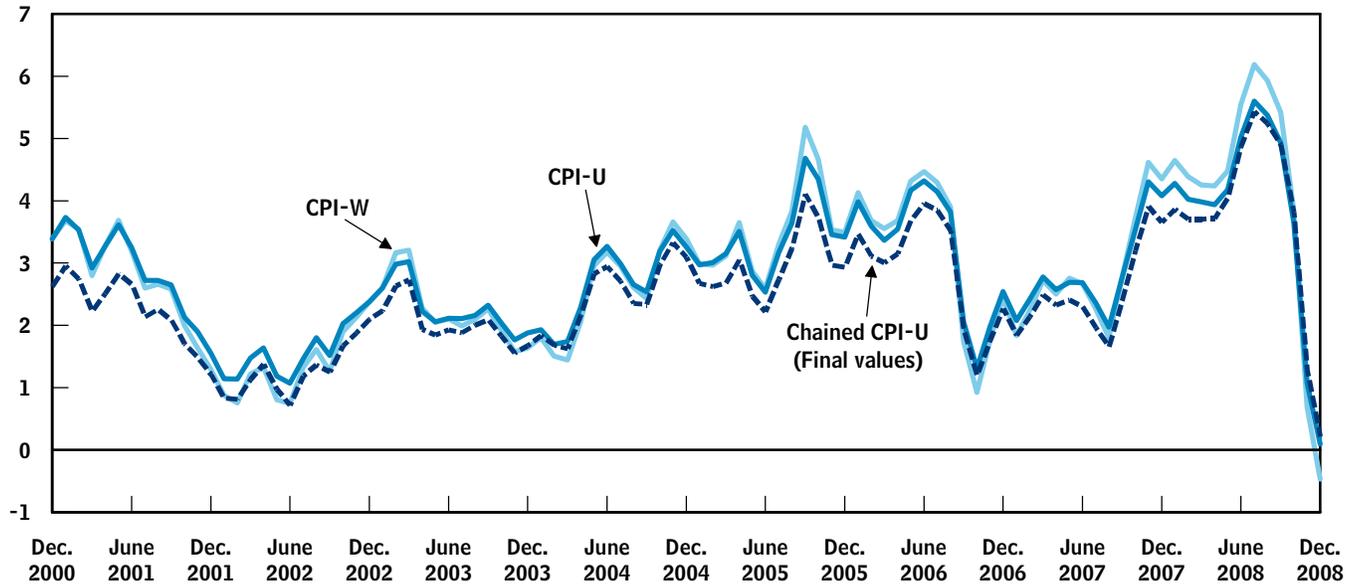
BLS's procedures account for the effects of substitution *within* most basic categories of goods and services in the market basket—such as when some consumers who previously bought large grade-A eggs switch to medium-sized eggs when the latter go on sale.<sup>3</sup> However, the index does not take into account shifts that occur *between* one category and another. For instance, if the price of apples rises by 50 percent and the price of bananas goes up by only 10 percent, consumers will tend to buy fewer apples and more bananas. Because apples and bananas are separate categories in the CPI market basket, the index does not account for the effects of such substitution. As a result, it overstates the amount by which consumers' well-being declines when prices rise and understates the benefit of price reductions.

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3. BLS does not use those procedures for some types of goods and services included in the CPI—such as rents, certain utilities, and medical services—because consumers cannot easily substitute one good for another within those categories.

**Figure 1.****Inflation as Measured by the CPI-W, CPI-U, and Chained CPI-U**

(Percentage change from one year earlier)



Source: Congressional Budget Office based on data from the Bureau of Labor Statistics.

Note: CPI-W = consumer price index for urban wage earners and clerical workers; CPI-U = consumer price index for all urban consumers.

**An Alternative Measure:  
The Chained CPI-U**

One way to account for the effects of economic substitution would be to use a market basket of purchases from a period after the price changes being measured. However, the resulting measure of inflation would be biased downward, just as the current CPI is biased upward. Another approach would avoid both types of bias. Since August 2002, BLS has published an alternative index, the chained CPI-U, that attempts to fully account for the effects of economic substitution on changes in the cost of living.<sup>4</sup> The chained CPI-U provides an unbiased

estimate of changes in the cost of living from one month to the next by using market baskets from both months, thus “chaining” the two months together.<sup>5</sup>

The chained CPI-U produces lower estimates of inflation than the traditional CPI does. Since December 2000, when such comparisons became possible, the annual increase in the chained CPI-U has been 0.3 percentage points lower, on average, than the increases in the traditional CPI-U and CPI-W (see Figure 1).

A drawback of the chained CPI-U is that it requires data on changes in consumers’ spending patterns. Those data do not become available for several years, so BLS releases preliminary estimates of the chained CPI-U and revises them over the following two years. The preliminary values are based on estimates of monthly changes in the percentage weights of different categories of goods in the market basket (rather than on a biennially updated

4. Although BLS began publishing the chained CPI-U in 2002, it has produced monthly values for the index starting in December 1999. For more information about the chained CPI-U, see Bureau of Labor Statistics, “Frequently Asked Questions About the Chained Consumer Price Index for All Urban Consumers” (April 6, 2005), available at [www.bls.gov/cpi/cpisupqa.htm](http://www.bls.gov/cpi/cpisupqa.htm); and Brian W. Cashell, *The Chained Consumer Price Index: How Is It Different, and Would It Be Appropriate for Cost-of-Living Adjustments?* Report RL32293 (Congressional Research Service, March 23, 2009).

5. Another chained measure of prices is the personal consumption expenditures price index, which the Bureau of Economic Analysis constructs as part of the national income and product accounts.

basket, as is the case with the traditional CPI). BLS bases those estimated changes in spending patterns on measured price changes and any available updated data on consumers' expenditures.

For each month, BLS releases estimates of the chained CPI-U at three points in time. The *initial* estimate is published a few weeks after the end of the month for which price changes are being measured, at the same time as the traditional CPI. *Interim* estimates are published each February for all months in the previous year, and *final* values for that year are released the following February. For example, an initial estimate of the chained CPI-U for January 2008 was released in February 2008. Interim estimates for January 2008 through December 2008 were released in February 2009, and final values for 2008 were published in February 2010. By contrast, the values of the traditional CPI that are currently used to index federal programs are not revised.<sup>6</sup>

## Using the Chained CPI-U to Index Federal Programs and the Tax Code

Indexing federal programs and tax provisions for inflation is designed to maintain purchasing power for recipients of federal benefits over time and to tax similar amounts of real (inflation-adjusted) income at roughly the same rates over time.<sup>7</sup> The parameters of various federal programs are indexed to changes in the traditional CPI. For instance, the annual cost-of-living adjustments (COLAs) made to Social Security benefits and federal pension benefits are based on the CPI-W. The federal poverty guidelines—income thresholds that are used to determine eligibility for many support programs aimed at lower-income people—are indexed to the CPI-U. Programs that use the poverty guidelines include Head Start, the Supplemental Nutrition Assistance Program, the National School Lunch Program, the Low-Income

Home Energy Assistance Program, the Children's Health Insurance Program, and parts of Medicaid.<sup>8</sup>

Parameters of the tax code that are indexed for inflation include the amounts of the personal and dependent exemptions; the size of the standard deductions; the income thresholds that divide the rate brackets for the individual income tax; the size of tax-deductible contributions to retirement accounts, such as 401(k) plans; the amount of annual gifts exempt from the gift tax; and the thresholds and phaseout boundaries for the earned income tax credit and several other credits. If those values were not indexed, average tax rates would gradually rise because of inflation.<sup>9</sup> All of those parameters are indexed by adjusting them for the growth in the average monthly CPI-U between a base year (which runs from September through August) and the most recent September-to-August period.<sup>10</sup>

An alternative to current law would be to index federal programs and the tax system to the chained CPI-U rather than the traditional CPI-U or the CPI-W. Because the chained CPI-U generally grows more slowly than the traditional CPI does, such a change would reduce federal outlays and increase revenues. For example, in its most recent *Budget Options* volume, CBO estimated the budgetary effects of using the chained CPI-U for indexing in three instances.<sup>11</sup> Switching from the traditional CPI-U to the chained CPI-U to index parts of the tax code would reduce budget deficits by a total of about \$90 billion over 10 years.<sup>12</sup> Using the chained CPI-U to set

6. BLS also releases values of the CPI that are adjusted to remove the effects of seasonal influences (such as the fact that although oranges are available year-round, they are much more expensive in the summer when they are out of season). The seasonally adjusted values of the CPI are revised, but those values are not used to index federal programs.

7. For more information, see Brian W. Cashell, *Automatic Cost-of-Living Adjustments: Some Economic and Practical Considerations*, Report RL34168 (Congressional Research Service, January 11, 2010).

8. For a more detailed list of programs, see Department of Health and Human Services, "Frequently Asked Questions Related to the Poverty Guidelines and Poverty" (January 25, 2010), available at [www.aspe.hhs.gov/poverty/faq.shtml#programs](http://www.aspe.hhs.gov/poverty/faq.shtml#programs).

9. Even with indexing, average tax rates tend to increase over time as the real growth of income (growth above and beyond the effects of inflation) pushes taxpayers into higher tax brackets.

10. September-to-August averages are used instead of calendar year averages because they allow enough time to incorporate the new dollar amounts for indexed parameters into tax forms for the coming year.

11. See Congressional Budget Office, *Budget Options, Volume 2* (August 2009), pp. 132–133, 147–148, and 186.

12. The \$90 billion estimate, which was produced by the staff of the Joint Committee on Taxation, represents the change in the overall budget balance that would result from changes in both revenues and outlays.

COLAs for Social Security would lower outlays by \$108 billion over a decade, and using that index to set COLAs for federal civilian and military pensions and veterans' benefits would reduce outlays by \$23 billion over 10 years.

Switching to the chained CPI-U would be complicated, however, by the delay in releasing the final value of the index. One way around that problem would be to base adjustments on the initial release of the chained CPI-U, which generally differs only slightly from the final value. That approach would be equivalent to applying the initial estimate of inflation in the past year, adjusted for revisions to previous estimates. (Details of those calculations for tax provisions, Social Security, and pensions are presented in a [technical appendix](#) available on CBO's Web site.)

As an illustration of the issues involved, consider the tax code. In the base year of 1987, the standard deduction for a single tax filer was \$3,000. Between that time and the year ending in August 2009, the CPI-U rose by 91.1 percent. Correspondingly, the standard deduction (rounded down to the nearest \$50 increment) increased to \$5,700 in 2010.

To switch from the traditional CPI-U to the chained CPI-U, tax law could be amended to use a new base year for which the final value of the chained CPI-U was known. The amount of the deduction (or other relevant tax parameter) would then equal the amount in the base year adjusted for the initially estimated growth in the chained CPI-U since then. In subsequent years, the amount of the deduction would change not only to reflect estimates of inflation for the most recent year but also to reflect updates in the estimates of the chained CPI-U for previous years. For instance, the base year for the standard deduction could be moved from 1987 to 2005, with a base value for the deduction of \$5,000 in 2005 and a base value for the chained CPI-U of 100 in the year ending in August 2005.<sup>13</sup> If the initial chained CPI-U for, say, the year ending in August 2014 was 120, then the standard deduction in 2015 would be \$6,000  $[(120/100) \times \$5,000]$ .

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13. For clarity, the index is rebased in this example. The current base period for the chained CPI-U, in which the index equals 100, is December 1999, and the average of the final values of the chained CPI-U for the 12 months ending in August 2005 was 112.43.

Suppose that the following year, the initial release of the chained CPI-U for the year ending in August 2015 was 125, and the value for 2014 was revised from an initial estimate of 120 to an interim estimate of 121. (In reality, the revisions between initial and interim estimates tend to be much smaller than the 0.8 percent used in this simplified example.) That revision indicates that the \$6,000 standard deduction used in 2015 should have been \$6,050  $[(121/100) \times \$5,000]$ .

In 2016, the standard deduction would be \$6,250  $[(125/100) \times \$5,000]$ . That would represent a 4.2 percent increase from the previous year's deduction of \$6,000, even though the estimate of inflation would be 3.3 percent (the growth from 121 to 125). Effectively, the revision of the chained CPI-U for 2014 indicated that the initial estimate used to set the 2015 value of the standard deduction was too low. Therefore, the growth in the deduction the following year (from \$6,000 to \$6,250) would be higher than the new estimate of the most recent year's inflation in order to make up for the understatement in the previous year. In that way, that error would affect only the value of the 2015 deduction and would not persist in 2016 or later years.<sup>14</sup> Errors in initial and interim estimates of the chained CPI-U for later years would affect the value of the standard deduction in each subsequent year but would not cumulate.

## Effects of Revisions to the Chained CPI-U

Because the initial release of the chained CPI-U is based on incomplete data, using it to index federal programs would introduce some errors, as described above. When the chained CPI-U was first published in 2002, BLS had little data available on which to base the methodology it used to estimate the initial and interim values, so it began with a simple model. As a result, the initial values of the index have generally been lower than the final values (see Figure 2). For example, from 2002 through 2008, the difference between the initial and final values for the third quarter of the calendar year—the quarter whose values are used to index Social Security and pension benefits—ranged from 0.18 percent to 0.62 percent. On average, the difference was 0.35 percent. As a result, had the initial

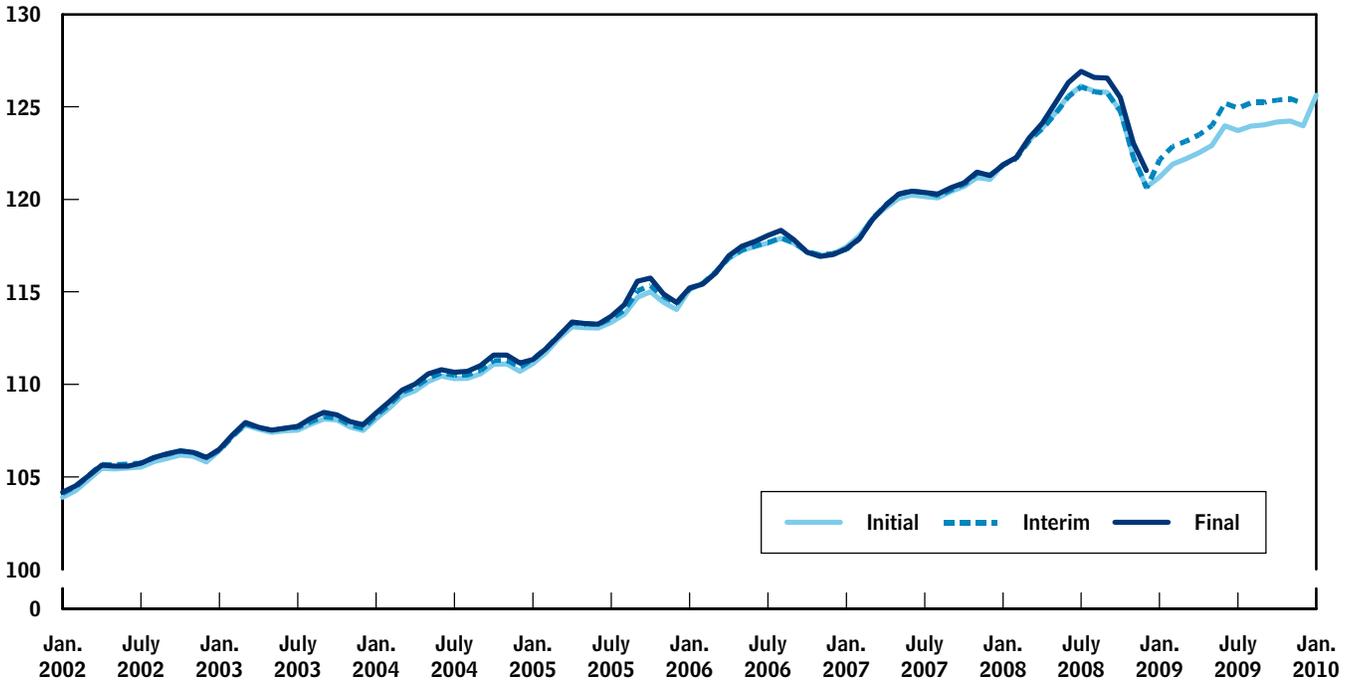
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14. If the final value of the chained CPI-U for 2014 differed from the interim estimate of 121, the 2016 deduction would be adjusted in a similar way.

**Figure 2.**

**Initial, Interim, and Final Values of the Chained CPI-U**

(Index value)



Source: Congressional Budget Office based on data from the Bureau of Labor Statistics.

Note: CPI-U = consumer price index for all urban consumers.

estimates of the chained CPI-U been used to set Social Security COLAs during that period, benefit payments would have been 0.35 percent lower, on average, than if the final values of the chained CPI-U been used. Likewise, the initial or interim values available for tax indexing—covering the 12-month period from September to August—were 0.05 percent to 0.27 percent lower than the final values from 2002 through 2008.<sup>15</sup>

Now that multiple years of data are available, BLS is investigating better methods for estimating the preliminary values of the chained CPI-U. If such a method was adopted, the initial and interim values of the index would still differ from the final value, but the differences should be notably smaller than in the past.

15. Those figures compare the final values with the average of the interim values for September through December of one calendar year and the initial values for January through August of the following calendar year.

With one of those better methods in place, the effects of revisions to the chained CPI-U would be small compared with the overall effect of switching from the traditional CPI-U to the chained CPI-U. The gap of about 0.3 percentage points between inflation as measured by the traditional and the chained indexes compounds over time, whereas the effect of any revisions between the initial and final values of the chained CPI-U would not compound.

In the case of Social Security and federal pensions, using a different index would not affect initial benefit levels, now or in the future. The effects would be felt with each COLA, when benefits would be slightly smaller than they would have been without the change in indexing. The impact would be greater the longer people received benefits (that is, the more COLAs they experienced). For example, after 10 years of COLAs, the Social Security retirement benefits paid to a 73-year-old who had claimed initial retirement benefits at age 62 would be about 3 percent lower, on average, if the chained CPI-U was used for indexing instead of the CPI-W.

## Measures of Inflation for Specific Populations

The consumer price index reflects prices paid for the goods and services purchased by an average household, not by any specific individuals or age groups. Therefore, most people experience price changes that are either higher or lower than reported in the CPI. Computing changes in the cost of living separately for each individual would not be feasible, but different indexes could be calculated for other subgroups of the population or for different policy purposes.

The possibility that the cost of living may grow at a different rate for the elderly than for the rest of the population is of particular concern because Social Security benefits are the main source of income for many older people. BLS computes an index that reflects the purchasing patterns of older people, called the experimental CPI for Americans 62 years of age and older (CPI-E). Since 1982 (the earliest date for which that index has been computed), annual inflation as measured by the CPI-E has been 0.2 percentage points higher, on average, than inflation as measured by the traditional CPI-U and 0.3 percentage points higher than inflation as measured by the CPI-W. If policymakers believed that the CPI-E was an appropriate measure of inflation for the elderly, they could use it to index programs that serve that population. A chained version of the CPI-E could also be developed to better account for economic substitution by older consumers.

It is unclear, however, whether the cost of living actually grows at a faster rate for the elderly than for younger people. The elderly tend to devote a larger-than-average portion of their out-of-pocket spending to health care, so changes in health care prices play a disproportionate role in their cost of living. But determining the impact of rising health care prices on the cost of someone's standard of

living is problematic because it is difficult to accurately account for changes in the quality of health care. Both treatment costs and the value of improved treatments often increase rapidly. Thus, more uncertainty exists about measures of price growth for health care than for other goods and services. Some research suggests that BLS underestimates the rate of improvement in the quality of health care and that such improvement may be reducing the true price of health care by more than 1 percent a year.<sup>16</sup> If that is the case, then all versions of the CPI overstate growth in the cost of living, with the overstatement especially large for the CPI-E.

The CPI-E differs from the CPI-U only by using different percentage weights for the 211 categories of goods and services in the CPI market basket. New indexes could be constructed that would also reflect the differences in different populations' purchasing patterns *within* those categories. Such indexes could be based, for example, on information from retail stores that showed the specific items being purchased by elderly people or other segments of the population.

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16. See Robert J. Gordon, *The Boskin Commission Report: A Retrospective One Decade Later*, Working Paper No. 12311 (Cambridge, Mass.: National Bureau of Economic Research, June 2006), pp. 24–25, available at <http://papers.nber.org/papers/w12311>.

This issue brief was prepared by Noah Meyerson of CBO's Health and Human Resources Division. It and other CBO publications are available at the agency's Web site: [www.cbo.gov](http://www.cbo.gov).



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