Order Code RL30074

CRS Report for Congress

The Consumer Price Index: A Brief Overview

Updated February 26, 2007

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Prepared for Members and
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Summary

The Consumer Price Index (CPI) is perhaps the most widely reported measure of inflation. A number of federal government programs are regularly adjusted to account for changes in the CPI, such as Social Security benefits and the personal income tax rate schedule. Thus, the behavior of the CPI has important consequences for a large number of people. Many, however, may be unfamiliar with how the CPI is estimated.

For Congress, the CPI is of particular interest because of its significant effect on the federal budget. Changes in the CPI can have substantial effects on both revenues and outlays, and those changes may either reflect underlying economic conditions or result from methodological changes in the way the CPI is calculated.

The CPI is based on a number of sample surveys. One of these surveys estimates the purchasing patterns of the "typical" household to determine how that household spends its money. Another survey determines where those households shop, and a third survey collects prices on the goods and services purchased by those households.

The CPI measures the price level relative to a particular period. Currently, the CPI number for each month is a measure of the price level relative to what it was between 1982 and 1984. The CPI is available for a number of metropolitan areas but it does not allow comparisons of the cost of living in different cities.

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The Consumer Price Index (CPI) is probably the most widely used measure of inflation. A number of federal government programs, such as Social Security benefits and civil service retirement, are tied to increases in the CPI.[1] In addition, the personal income tax rate schedule is indexed to the CPI.[2] Economists use the CPI to calculate constant-dollar estimates of other economic indicators, such as retail sales and hourly earnings, which allow analysis of changes in these variables excluding the effect of changes in the price level. Each year, the CPI is used to update the income levels that determine the poverty rate. Periodic increases in many union wage and other contracts are also tied to increases in the CPI. Thus, the behavior of the CPI has major consequences for a significant portion of the population. But, many may be unfamiliar with the details of how it is derived.

Background

The CPI is published by the Department of Labor's Bureau of Labor Statistics (BLS).[3] There is no specific legislation authorizing or requiring BLS to calculate and publish the CPI. Neither has legislation ever been enacted to require BLS to adopt any particular methodology in calculating the CPI. When the Bureau of Labor was first created in 1888, its task was, among other duties, to "acquire and diffuse among the people of the United States useful information on subjects connected with labor, in the most general and comprehensive sense of the word...."[4]

In 1913, the Bureau of Labor was transferred to the newly created Department of Labor and renamed the Bureau of Labor Statistics. BLS was given slightly more specific instructions:

> The Bureau of Labor Statistics, under the direction of the Secretary of Labor, shall collect, collate, and report at least once each year, or oftener if necessary,

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[1] U.S. Congress, Senate Committee on the Budget, *Indexation of Federal Programs*, committee print, prepared by the Congressional Research Service, 97th Cong., 1st sess., May 1981.

[2] See CRS Report RL30007, *Individual Income Tax Rates: 1989 through 2007*, by Gregg A. Esenwein.

[3] BLS began periodic publication of a National CPI in 1921. At first, the CPI was only released semi-annually. Quarterly releases were begun in 1935, and monthly releases began in 1940.

[4] 29 U.S.C. 1.

> full and complete statistics of the conditions of labor and the products and distribution of the products of the same ... and said Secretary of Labor may collate, arrange, and publish such statistical information so obtained in such manner as to him may seem wise.[5]

Two CPIs are published by the BLS, the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W), and the Consumer Price Index for All Urban Consumers (CPI-U). The CPI-W is based on the purchasing patterns of only those in the population who earn more than half of their income from clerical or wage occupations, and were employed at least 37 weeks in the previous year.[6] The CPI-W population makes up about 32% of the total non-institutional population. Prior to 1978, the CPI-W was the only CPI published. Beginning in 1978, the CPI-U was introduced so that a broader share of the population would be included in estimates of changes in the price level. The CPI-U is based on the expenditure patterns of all urban consumers and covers about 87% of the population. The CPI-U is usually the more publicized of the two price indexes.

Although the CPI-U and CPI-W are slightly different indexes, the numerical difference between the two measures is typically small. Between 1986 and 2006, the CPI-U increased, overall, by 83.9% compared with an increase of 81.5% for the CPI-W. Over the same period, that translates into an average annual rate of change of 3.1% for the CPI-U, and 3.0% for the CPI-W.

Both the CPI-W and the CPI-U are used for inflation indexing by the federal government.[7] One advantage to using the CPI in indexing is that the CPI is rarely revised.[8] Definitions, the index base year, the goods and services accounted for, and the methodology used to calculate the CPI may change from time to time, but, once published, the actual index number is final.[9] Using other measures of the price level, such as one of the price indexes associated with Gross Domestic Product, for indexing purposes poses the problem of which number to use, the preliminary estimate or one of many subsequent revisions.[10]

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[5] 29 U.S.C. 2.

[6] Specifically, clerical workers, craft workers, operatives, service workers, or laborers.

[7] The CPI-U is the index used to adjust various provisions of the personal income tax code. The CPI-W is the index used to adjust Social Security benefits.

[8] Historically, BLS has published monthly changes in the CPI on both a seasonally adjusted and not seasonally adjusted basis. The seasonally adjusted changes are subject to revision because seasonal adjustment factors may change over time. BLS also makes available a seasonally adjusted index number that is subject to revision. Seasonal adjustment does not affect yearly changes because the adjustment factors cancel each other out over any given 12-month period.

[9] An exception to this occurred in 2000. A mathematical error was found in the way the CPI was calculated. As a result, numbers that had already been published were revised.

[10] See U.S. Department of Labor, Bureau of Labor Statistics, *Using the Consumer Price Index for Escalation*, available at [http://www.bls.gov/cpi/cpi1998d.htm].

New in 2007

Beginning with release of January data, the CPI and all of its component indexes will be published rounded to three decimal places rather than one. The change is not meant to imply any increase in the accuracy of the CPI. Instead it is being done to maintain precision in published estimates of percentage changes. Previously, when BLS published the CPI rounded to only one decimal place, it based published figures of percentage change in the CPI on those rounded numbers so that they could be replicated by users of published CPI data. But doing that meant that some precision in the published percent change data was lost. The effect of the change is likely to be small.[11]

Estimating the CPI

Both CPIs are based on retail market prices. These prices, for more than 80,000 separate items, are collected in 87 urban areas across the country from thousands of outlets, such as grocery and department stores, gasoline service stations, and hospitals, among others.[12] BLS selects these retail establishments based on a survey showing where people do their shopping. Actual prices (except those for food) are not published because they are collected on a confidential basis. Price indexes are available in considerable detail. Examples of items for which CPI data are available include white bread, men's shirts, automobile tires, haircuts, funerals, automobile repair, and bedroom furniture.

The "all-items" CPI is the index most often referred to and it is a composite index, a weighted average, based on the indexes for all of the goods and services whose prices are collected.

The all-items CPI measures the price change of a fixed market basket of goods and services over time. The mix of goods and services making up the market basket is based on spending patterns established by the Consumer Expenditure Survey (CES).[13] Based on the CES, weights are assigned to each of the goods and services that make up the market basket. These weights determine how much the price change for a given good will affect the all-items measure. For any given interval, the total price change, as measured by the all-items CPI, is the weighted average of the price changes of all of the components. With the release of data for January 2006, the CPI marketbasket was based on purchasing patterns described by the CES in 2003 and 2004. BLS intends to update the expenditure weights every two years.

Table 1 shows the major expenditure categories included in the CPI and their relative importance in the CPI-U as of December 2006. Relative importance reflects both the expenditure weights and changes in relative prices. Either a larger

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[11] See additional info at the BLS website, at [http://www.bls.gov/cpi/cpithreedec.htm].

[12] See "In the Field With the Price Indexers," *New York Time*s, June 20, 1995, p. D2.

[13] Detailed information on the CES is available on the Internet at [http://www.bls.gov/cex/].

expenditure weight, or an increase in the price of a good relative to prices for other goods may cause the relative importance to increase.

Table 1. Expenditure Categories and Relative Importance in the CPI-U

Expenditure Category	Relative Importance, December 2006
All items	100.000
Food and beverages	14.992
Housing - Shelter	32.776
Housing - fuels and utilities	5.264
Housing - household furnishings and operation	4.651
Apparel	3.726
Transportation	17.249
Medical care	6.281
Recreation	5.552
Education and Communication	6.034
Other goods and services	3.476

Source: Department of Labor, Bureau of Labor Statistics.

Medical Care

Based on the measures of relative importance shown here, some might be concerned that medical care costs have too small a weight in the all-items index. In particular, the elderly typically spend a relatively larger share of their outlays on medical care. In calculating the CPI, however, the share of the marketbasket accounted for by medical care is based on "out-of-pocket" costs. This includes direct out-of pocket costs for medical care as well as indirect out-of-pocket costs for health insurance.[14] An increasing share of medical costs are paid for by employers and government, so that out-of-pocket expenses on medical care are not as great as total outlays on medical care.

[14] See U.S. Department of Labor, Bureau of Labor Statistics, "Measuring Price Change for Medical Care in the CPI," at [http://www.bls.gov/cpi/cpifact4.htm].

It is also important to appreciate that there is considerable variation among consumers (and among elderly consumers as well) in the demand for medical care, and the relative importance of medical care in the CPI is based on an average. No single price index can accurately describe the inflation experience of every single person. Different population groups (e.g., the elderly) tend to have different purchasing patterns, and individuals' purchases vary significantly within those groups. Although many elderly may spend more on medical care than is taken into account in the CPI, there are also likely some elderly who spend less. For those who spend less, if medical care costs rise more rapidly than do the prices of other goods and services, the CPI will tend to overstate increases in the cost of living, other things being equal. BLS is currently investigating the behavior of an experimental CPI for the elderly population.[15] This experimental CPI for Americans aged 62 and older rose by an average of 3.3% per year between December 1986 and December 2006. During the same period, the CPI-U rose at a rate of 3.2%, and CPI-W rose at an average annual rate of 3.0[16]

Considerable effort is made to ensure that the CPI is a meaningful, reliable measure of changes in the price level. But it does not necessarily reflect the inflation experience of each individual consumer. To the extent that individuals spend relatively more on those goods and services whose prices are rising faster than average, they may experience a higher inflation rate than that measured by the CPI. Similarly, those who spend relatively less on goods and services whose prices are rising faster than average, may experience a lower inflation rate than that measured by the CPI.

If purchasing patterns change significantly, then in the short run the CPI may tend to overstate the inflation rate. The CPI is a fixed-weight index and does not immediately take into account changes in spending patterns due to changes in relative prices. There may also be a tendency for the CPI to overstate the inflation rate because some price increases reflect improvements in the quality of goods and services. Taking quality changes into account in a price index is difficult, but BLS does attempt to make some adjustments to the CPI for quality improvements in a number of areas, including automobiles, apparel, and a number of consumer electronic goods, personal computers in particular.[17]

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[15] See U.S. Department of Labor, Bureau of Labor Statistics, "Experimental Consumer Price Index for Americans 62 Years of Age and Older, 1998-2003," [http://www.bls.gov/cpi/cpiexpcpie2004.pdf].

[16] See CRS Report RS20060, *A Separate Consumer Price Index for the Elderly?*, by Brian W. Cashell.

[17] See U.S. Department of Labor, Bureau of Labor Statistics, "How BLS Measures Price Change for Personal Computers and Peripheral Equipment in the Consumer Price Index," [http://www.bls.gov/cpi/cpifaccomp.htm].

Home Ownership

Home ownership costs in the CPI are treated in a special way.[18] Prior to 1983, the home ownership component of the CPI measured changes in the cost of purchasing a new home. Since 1983 for the CPI-U and 1985 for the CPI-W, changes in the cost of home ownership have been based on the concept of "rental equivalence." Rather than measuring changes in the cost of buying a house in each period, which would include finance charges, the CPI attempts to estimate the rental value of owner-occupied housing. Thus, the CPI measures changes in the consumption aspect of housing costs and not changes in the investment value of owner-occupied housing.[19]

Improving the CPI

In December 1996, a special commission chaired by economist Michael Boskin reported to the Senate Finance Committee that the CPI tended to overstate the actual rate of inflation by about 1.1% per year.[20] Although a number of specific recommendations were made in the report, Congress took no legislative steps to require any changes in the way BLS calculates the CPI.[21]

But the methodology of calculating the CPI has changed much since it was first published and is likely to continue to do so. BLS continues to look at methods that might lead to a more accurate measure of the cost of living. As part of that process, with the release of data for July 2002, BLS introduced an alternative CPI that makes use of "chain-weights." This index is referred to as the C-CPI-U. The expenditure weights for the C-CPI-U will be updated more frequently than either the CPI-U or the CPI-W, and the index itself will be subject to revision. The C-CPI-U has not replaced either the CPI-U or the CPI-W, and they will continue to be used for indexing.[22]

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[18] See U.S. Department of Labor, Bureau of Labor Statistics, "Consumer Price Indexes for Rent and Rental Equivalence," at [http://www.bls.gov/cpi/cpifact6.htm].

[19] Because of the timing of this change in the way the CPI is calculated, a permanent upward bias in the *level* of the CPI was introduced. BLS has published estimates of the CPI-U using the rental equivalence approach for the years 1967 to 1982. This series is known as the CPI-U-X1. The Census Bureau now publishes historical estimates of real money income based on the CPI-U-X1 measure. See U.S. Bureau of the Census, *Money Income of Households, Families, and Persons in the United States*, Current Population Reports, Series P-60, no.174, 1991, pp. 8-9.

[20] U.S. Congress, Senate Committee on Finance, *Final Report of the Advisory Commission to Study the Consumer Price Index*, committee print, 104th Cong., 2nd sess., Dec. 1996.

[21] Because of the CPI's budget implications, Congress has, from time to time, taken some interest in how it is calculated. To date, however, no legislation has been enacted that would directly affect BLS' methodology.

[22] See CRS Report RL32293, *The Chained Consumer Price Index: How Is It Different?*, by Brian W. Cashell.

Availability of the CPI

The CPI is currently published for 26 metropolitan areas. For most of these cities, however, indexes are not published on a monthly basis. These metropolitan area indexes are only intended to compare inflation *rates* between cities. The metropolitan area CPIs may *not* be used to compare the actual cost of living between cities.[23] **Table 2** shows the metropolitan areas for which the CPI is published as well as the publication frequency.

BLS has published estimates of the CPI going back as far as 1800, which makes it the longest, continuous price index series available. These data are shown in **Table 3**. Data for 1800 through 1912 were derived by splicing price indexes collected in three separate, nongovernmental, studies. Prior to 1978, there was only one CPI available. For 1978 and after, the data in **Table 3** correspond to the CPI-U.

[23] The CPI expresses the price level relative to a particular period of time. Currently, the CPI reflects the level of prices relative to the 1982-1984 period. Thus, the average index value during that period for each metropolitan area will be 100, no matter how expensive any area may be in which to live. That does not mean that each of these metropolitan areas is equally expensive. See CRS Report RS20942, *Adjusting Federal Benefits for Geographic Differences in the Cost of Living*, by Brian W. Cashell.

Table 2. Availability of Local Area CPIs

Northeast Region	monthly
Boston-Brockton-Nashua, MA-NH-ME-CT	bimonthly (odd)
New York-Northern New Jersey-Long Island, NY-NJ-CT-PA	monthly
Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD	bimonthly (even)
Pittsburgh, PA	semiannually
Midwest Region	monthly
Chicago-Gary-Kenosha, IL-IN-WI	monthly
Cincinnati-Hamilton, OH-KY-IN	semiannually
Cleveland-Akron, OH	bimonthly (odd)
Detroit-Ann Arbor-Flint, MI	bimonthly (even)
Kansas City, MO-KS	semiannually
Minneapolis-St. Paul, MN-WI	semiannually
Milwaukee-Racine, WI	semiannually
St. Louis, MO-IL	semiannually
Southern Region	monthly
Atlanta, GA	bimonthly (even)
Dallas-Fort Worth, TX	bimonthly (odd)
Houston-Galveston-Brazoria, TX	bimonthly (even)
Miami-Fort Lauderdale, FL	bimonthly (even)
Tampa-St. Petersburg-Clearwater, FL	semiannually
Washington-Baltimore, DC-MD-VA-WV	bimonthly (odd)
Western Region	monthly
Anchorage, AK	semiannually
Denver-Boulder-Greeley, CO	semiannually
Honolulu, HI	semiannually
Los Angeles-Riverside-Orange County, CA	monthly
Portland-Salem, OR-WA	semiannually
San Diego, CA	semiannually
San Francisco-Oakland-San Jose, CA	bimonthly (even)
Seattle-Tacoma-Bremerton, WA	bimonthly (even)

Source: Department of Labor, Bureau of Labor Statistics.

Table 3. Consumer Price Index for All Urban Consumers, 1800 - 2006

(1982 - 1984 = 100)

Year	Index	Percent Change	Year	Index	Percent Change	Year	Index	Percent Change
1800	17.0		1825	11.3	3.0	1850	8.3	0.0
1801	16.7	-2.0	1826	11.3	0.0	1851	8.3	0.0
1802	14.3	-14.0	1827	11.3	0.0	1852	8.3	0.0
1803	15.0	4.7	1828	11.0	-2.9	1853	8.3	0.0
1804	15.0	0.0	1829	10.7	-3.0	1854	9.0	8.0
1805	15.0	0.0	1830	10.7	0.0	1855	9.3	3.7
1806	15.7	4.4	1831	10.7	0.0	1856	9.0	-3.6
1807	14.7	-6.4	1832	10.0	-6.3	1857	9.3	3.7
1808	16.0	9.1	1833	9.7	-3.3	1858	8.7	-7.1
1809	15.7	-2.1	1834	10.0	3.4	1859	9.0	3.8
1810	15.7	0.0	1835	10.3	3.3	1860	9.0	0.0
1811	16.7	6.4	1836	11.0	6.5	1861	9.0	0.0
1812	17.0	2.0	1837	11.3	3.0	1862	10.0	11.1
1813	19.3	13.7	1838	10.7	-5.9	1863	12.3	23.3
1814	21.0	8.6	1839	10.7	0.0	1864	15.7	27.0
1815	18.3	-12.7	1840	10.0	-6.3	1865	15.3	-2.1
1816	17.0	-7.3	1841	10.3	3.3	1866	14.7	-4.3
1817	16.0	-5.9	1842	9.7	-6.5	1867	14.0	-4.5
1818	15.3	-4.2	1843	9.3	-3.4	1868	13.3	-4.8
1819	15.3	0.0	1844	9.3	0.0	1869	13.3	0.0
1820	14.0	-8.7	1845	9.3	0.0	1870	12.7	-5.0
1821	13.3	-4.8	1846	9.0	-3.6	1871	12.0	-5.3
1822	13.3	0.0	1847	9.3	3.7	1872	12.0	0.0
1823	12.0	-10.0	1848	8.7	-7.1	1873	12.0	0.0
1824	11.0	-8.3	1849	8.3	-3.8	1874	11.3	-5.6

Year	Index	Percent Change	Year	Index	Percent Change	Year	Index	Percent Change
1875	11.0	-2.7	1900	8.3	0.0	1925	17.5	2.3
1876	10.7	-3.0	1901	8.3	0.0	1926	17.7	1.1
1877	10.7	0.0	1902	8.7	4.0	1927	17.4	-1.7
1878	9.7	-9.4	1903	9.0	3.8	1928	17.1	-1.7
1879	9.3	-3.4	1904	9.0	0.0	1929	17.1	0.0
1880	9.7	3.6	1905	9.0	0.0	1930	16.7	-2.3
1881	9.7	0.0	1906	9.0	0.0	1931	15.2	-9.0
1882	9.7	0.0	1907	9.3	3.7	1932	13.7	-9.9
1883	9.3	-3.4	1908	9.0	-3.6	1933	13.0	-5.1
1884	9.0	-3.6	1909	9.0	0.0	1934	13.4	3.1
1885	9.0	0.0	1910	9.3	3.7	1935	13.7	2.2
1886	9.0	0.0	1911	9.3	0.0	1936	13.9	1.5
1887	9.0	0.0	1912	9.7	3.6	1937	14.4	3.6
1888	9.0	0.0	1913	9.9	2.4	1938	14.1	-2.1
1889	9.0	0.0	1914	10.0	1.0	1939	13.9	-1.4
1890	9.0	0.0	1915	10.1	1.0	1940	14.0	0.7
1891	9.0	0.0	1916	10.9	7.9	1941	14.7	5.0
1892	9.0	0.0	1917	12.8	17.4	1942	16.3	10.9
1893	9.0	0.0	1918	15.1	18.0	1943	17.3	6.1
1894	8.7	-3.7	1919	17.3	14.6	1944	17.6	1.7
1895	8.3	-3.8	1920	20.0	15.6	1945	18.0	2.3
1896	8.3	0.0	1921	17.9	-10.5	1946	19.5	8.3
1897	8.3	0.0	1922	16.8	-6.1	1947	22.3	14.4
1898	8.3	0.0	1923	17.1	1.8	1948	24.1	8.1
1899	8.3	0.0	1924	17.1	0.0	1949	23.8	-1.2

Year	Index	Percent Change	Year	Index	Percent Change	Year	Index	Percent Change
1950	24.1	1.3	1969	36.7	5.5	1988	118.3	4.1
1951	26.0	7.9	1970	38.8	5.7	1989	124.0	4.8
1952	26.5	1.9	1971	40.5	4.4	1990	130.7	5.4
1953	26.7	0.8	1972	41.8	3.2	1991	136.2	4.2
1954	26.9	0.7	1973	44.4	6.2	1992	140.3	3.0
1955	26.8	-0.4	1974	49.3	11.0	1993	144.5	3.0
1956	27.2	1.5	1975	53.8	9.1	1994	148.2	2.6
1957	28.1	3.3	1976	56.9	5.8	1995	152.4	2.8
1958	28.9	2.8	1977	60.6	6.5	1996	156.9	3.0
1959	29.1	0.7	1978	65.2	7.6	1997	160.5	2.3
1960	29.6	1.7	1979	72.6	11.4	1998	163.0	1.6
1961	29.9	1.0	1980	82.4	13.5	1999	166.6	2.2
1962	30.2	1.0	1981	90.9	10.3	2000	172.2	3.4
1963	30.6	1.3	1982	96.5	6.2	2001	177.1	2.8
1964	31.0	1.3	1983	99.6	3.2	2002	179.9	1.6
1965	31.5	1.6	1984	103.9	4.3	2003	184.0	2.3
1966	32.4	2.9	1985	107.6	3.6	2004	188.9	2.7
1967	33.4	3.1	1986	109.6	1.9	2005	195.3	3.4
1968	34.8	4.2	1987	113.6	3.7	2006	201.6	3.2

Source: Department of Labor, Bureau of Labor Statistics.

CPI Data Via the Internet

Detailed CPI data are now readily available to those with access to the Internet. BLS has set up a number of ways on their website, [http://www.bls.gov/cpi/#data], to obtain CPI data. By making selections from each of a succession of menus, users of BLS's website may specify the particular data they want. There is also a link to an "inflation calculator," allowing users to make their own inflation adjustments to dollar amounts.

BLS has also set up a separate home page for the CPI where visitors can get a copy of the most recent CPI press release, as well as up-to-date information regarding the CPI program. The Internet address for this page is [http://www.bls.gov/cpi/].

CPI Calculations

The CPI is an indicator of changes in the price level. At present, those changes are expressed relative to the average level of prices in the years 1982, 1983, and 1984. Thus, the average of all of the monthly CPI numbers for those years is equal to 100. Determining the change in consumer prices between any two years is a simple percent change calculation using the formula:

$$\text{percent change in the CPI} = ((\ CPI_2 \div CPI_1\ ) - 1\ ) \times 100.$$

For example, in 2006, the CPI-U was 201.6, and in 1986 the CPI-U was 109.7. The total percentage change in the CPI-U between 1986 and 2006 was:

$$((\ 201.6 \div 109.7\ ) - 1\ ) \times 100 = 83.8 \text{ percent.}$$

Calculating the percentage change between any two years at an *annual rate* is slightly more complicated, and requires the formula:

$$\text{annual rate of change in the CPI} = ((\ CPI_2 \div CPI_1\ )^{1/n} - 1\ ) \times 100,$$

where n is the number of years covered in the interval. To calculate the average annual rate of change in the CPI-U between 1986 and 2006, we use an n of 20 and the same CPI-U values as in the previous example. The average annual rate of change in the CPI-U between 1986 and 2006 was:

$$((\ 201.6 \div 109.7\ )^{1/20} - 1\ ) \times 100 = 3.1 \text{ percent}$$

Another common use of the CPI is to adjust dollar amounts for inflation, so that amounts from different years can be compared in terms of dollars of the same purchasing power. Suppose the question is how much money would have been required in 2006 to buy the same quantity of goods and services as $100 bought in 1986. To get such an estimate, the 1986 dollar value needs to be adjusted to account for the increase in consumer prices between 1986 and 2006. That requires the formula:

$$\text{equivalent purchasing power in period 2} = (\ CPI_2 \div CPI_1\ ) \times \text{dollar amount in period 1}$$

For example, using the same CPI values as in the above examples, the equivalent purchasing power in 2006 of $100 in 1986 is:

$$(\ 201.6 \div 109.7\ ) \times \$100 = \$183.77$$

This same calculation can be reversed to find the purchasing power in an earlier period of a dollar amount of a more recent vintage. To do this use the formula:

$$\text{equivalent purchasing power in period 1} = (\ CPI_1 \div CPI_2\ ) \times \text{dollar amount in period 2}$$

For example, using the same CPI values as in the above examples, the equivalent purchasing power in 1986 of $100 in 2006 is:

$$(109.7 \div 201.6) \times \$100 = \$54.41$$

Using these formulae, dollar values of constant purchasing power can be compared for any two periods for which CPI data are available. Constant dollar values are always compared in terms of the dollar's purchasing power in a particular year, known as the base year. When comparing dollars of constant purchasing power, it is important to specify the base year.