

Your "Inflationary Dollar," how much is it worth today?

Imagine that on the day you were born, your parents placed a dollar bill in a magic box. The magical properties of this box change the contents to match the changes in the Consumer Price Index. When the CPI increases, the amount of money in the box decreases because inflation erodes its value. Likewise when the CPI decreases, the amount in the box increases as deflation increases its value. Given the changes in the CPI since your birth, how much money do you think you'd find in your magic box if you opened it today?

You can calculate a manual solution as follows.

The solution results from this equation.

$$\frac{\text{birth year CPI}}{\text{current year CPI}} = \frac{X}{\$1}$$

Solving for X tells us what the purchasing power of today's dollar would be in the year of the person's birth. For example, I was born in 1947. The CPI (1982-84=100) stood at 22.3. The CPI for 1998 is 163. Therefore, $X = 22.3/163$ or .1368. Rounded off that is 14 cents.

Reversing the equation (finding what \$1 from the person's birth year would purchase today), you see

$$\frac{\text{birth year CPI}}{\text{current year CPI}} = \frac{\$1}{X}$$

For easier reading, we can express the equation as

$$\frac{\text{current year CPI}}{\text{birth year CPI}} = X$$

Solving this for my birth year we find that a 1947 dollar would purchase \$7.31 worth of goods (rounded off to the nearest penny) at the end of 1998. In other words, its value is 1/7.31 of what it was. This (rounded) divides out to same 14 cents we calculated with the first equation.

Consumer Price Index, 1941-98 (1982-84=100)

YEAR	CPI	YEAR	CPI
1941	14.7	1976	56.9
1942	16.3	1977	60.6
1943	17.3	1978	65.2
1944	17.6	1979	72.6
1945	18	1980	82.4
1946	19.5	1981	90.9
1947	22.3	1982	96.5
1948	24.1	1983	99.6
1949	23.8	1984	103.9
1950	24.1	1985	107.6
1951	26	1986	109.6
1952	26.5	1987	113.6
1953	26.7	1988	118.3
1954	26.9	1989	124
1955	26.8	1990	130.7
1956	27.2	1991	136.2
1957	28.1	1992	140.3
1958	28.9	1993	144.5
1959	29.1	1994	148.2
1960	29.6	1995	152.4
1961	29.9	1996	156.9
1962	30.2	1997	160.5
1963	30.6	1998	163
1964	31		
1965	31.5		
1966	32.4		
1967	33.4		
1968	34.8		
1969	36.7		
1970	38.8		
1971	40.5		
1972	41.8		
1973	44.4		
1974	49.3		
1975	53.8		

Calculating Inflation in Individual Prices

If you know the prices for the same product at two different times, you can calculate the inflation rate in that price. To do so, you divide the recent price by the older price, subtract one and convert the result to a percent by moving the decimal point two places to the right and adding a percent sign (%).

For example, when I was born in 1947, the average price for a quart of whole milk was \$.19. On February 17, 1999 I found it selling at Andronico's in Berkeley for \$1.15. 1.15 divided by $.19$ equals 6.05263 . Subtracting 1 leaves 5.05263 . Converting that to a percent shows a 505.263% price inflation.

Once we know the inflation rate for a given item, we can compare it to the general inflation rate as measured by the Consumer Price Index (CPI). The federal government calculates the CPI from a monthly survey of prices it conducts for a given "market basket" of goods. The result is a number that shows the change in the value of that market basket from month to month and year to year. It is this number that we use to calculate the overall value of the dollar from year to year.

The CPI for 1947 was 22.3. For 1998, it was 163. 163 divided by 22.3 is 7.30941 . Subtracting 1 leaves 6.30941 . Converting that to a percent shows a 630.941% change in the CPI. Since this is larger than the price inflation in milk, we can assume that other items that make up the CPI were inflating at a faster rate.

We can also determine what the price of that quart of milk should have been if it had inflated at the same rate as the CPI. To do that, we multiply the starting price by the CPI inflation rate converted back to a decimal with the 1 we subtracted added back. 7.30941 times $.19$ equals 1.3887879 . Rounding off to the nearest penny gives us \$1.39. Since I would pay \$1.15 at Andronico's, that probably means that milk producers have lost money to inflation over the past 51 years. They have to buy the same things as the rest of us, but the price they get for their product has not quite kept up. Therefore, they have a bit less to spend in real (constant) dollars than they did 51 years ago.

In the interest of accuracy, I must say that there is one problem with what I have done above. I started by comparing an actual price (Andronico's) with a national average. I did so because the national averages for today will not be available for another year or two. It takes awhile for the government to collect, tabulate and publish all of those numbers. The national average for today's milk price might be higher, lower or about the same as Andronico's actual price.