

THE CONSUMER PRICE INDEX: AN OVERVIEW

By John Boucher

The Consumer Price Index (CPI) is the most frequently used statistic among the thousands generated by the federal government. It is the most common indicator of changes in the "cost of living", and is used as an escalator in numerous contracts, leases and government entitlement programs. In a world where economic statistics do not generally attract much attention, the CPI is a media darling, regularly garnering front page headlines when it is released. The CPI's high profile has made it fair game for critics. Perhaps worst of all, the rather superficial treatment the CPI can receive in the media leads to misconceptions and misuses of it on the part of the public. This article will attempt to explain the CPI in greater detail and deal with some of the common misconceptions.

First of all, there are two types of CPI's available. The CPI-U is for the urban consumers, and approximates the buying habits of 80% of the population. The CPI-W is for wage and clerical workers and approximates the buying habits of 40% of the population. These CPI's are based on different "market baskets" of goods and services which were arrived at by a survey of consumer buying habits last conducted in 1972. The CPI-U and CPI-W are available for both the nation and the areas which make up the national sample.

The Anchorage urban area is the only local community or area in Alaska for which a CPI is calculated. Two common misconceptions are that the CPI is calculated for just about every community and that the CPI represents a statewide sample. The Bureau of Labor Statistics, who is ultimately responsible for which areas have a CPI and which do not, only selects large metropolitan areas in which to take regular CPI samples. In general, the Bureau's policy is that the sample must be large in order for the data to be accurate. Metropolitan areas offer the size necessary to create a good sample of prices while also allowing the data to be collected relatively inexpensively. The Alaskan CPI user should be aware that the Anchorage CPI only gives information about price changes in the Anchorage area and it is not intended to be a measure of statewide or other local price changes. It is a common practice to assume that a change in the Anchorage CPI would indicate a similar change for other communities. Given the sparseness of comprehensive cost of living data for other communities throughout the state, this is an acceptable practice if one knows the limitations of the data.

Another common mistake made in regards to the CPI is that a dollar value is attached to the index. The CPI has never been a measure of how much it costs to live in one area of the country as opposed to another. The CPI is a measure of prices and how they have changed over a given period of time.

For example, take the Anchorage and Seattle CPI-U for March and May of 1984:

	March 1984	May 1984	2 Month Percentage Change
Anchorage	274.4	275.3	0.3
Seattle	310.2	313.0	0.9

It is commonly assumed that the CPI's above connote some dollar value; i.e., what cost \$310.20 in Seattle in March of 1984 cost only \$274.40 in Anchorage during that same month. This is not correct, no dollar values are implied in the CPI. What the CPI measures is the change in prices in a certain location. What the above data says is that prices in the Seattle area rose at a faster rate than prices rose in the Anchorage area from March to May. Inflation therefore was more predominant in the Seattle area during this period.

It should also be noted that the Bureau of Labor Statistics official recommendation is that "because local area indexes are based on smaller samples they are subject to substantially more sampling and other error than national indexes, BLS strongly urges users to consider the use of the national indexes in escalator agreements". Perhaps in an effort to encourage the use of the national index, BLS is planning on publishing some local area CPI's less often beginning in 1987. The Anchorage area index will be published only semi-annually beginning in that year.

Using the CPI to Measure Inflation's Impact

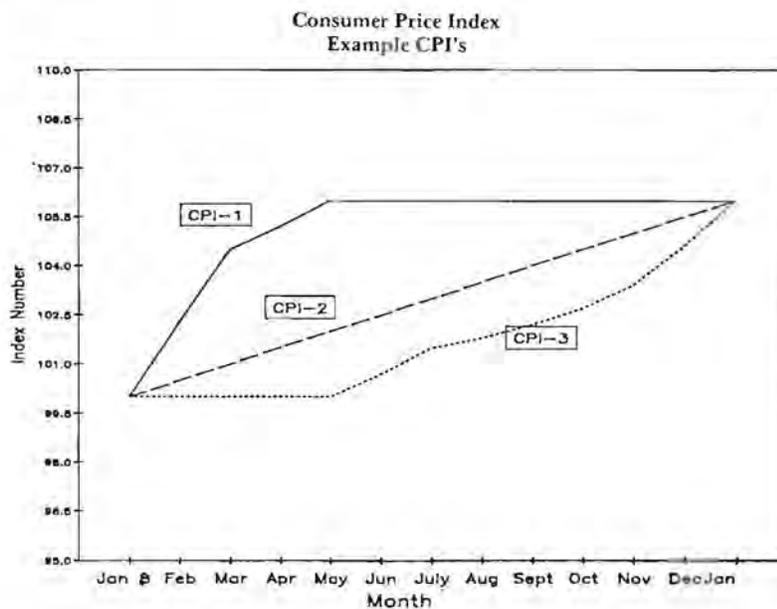
The CPI can be a valuable tool in measuring the impact changing prices have on the average consumer's income. Proper use of the CPI is a necessity in these instances because improper uses of the index numbers produce less accurate measurements of the impact prices have on a consumer. Some very simple rules apply for the proper uses of the CPI.

Always use the annual average CPI percentage change when measuring the impact inflation has on a consumer's expenditures. The common error made is to take a measurement at two points in time, calculate a percentage change and assume that this was the inflation rate for that period. The following example will help to illustrate why the annual average should be used. Let's assume that the January 1983 CPI was 100.0 and the January 1984 CPI was 106.0 with these two observations many users would arrive at an inflation rate in the following manner.

$$(106.0 - 100.0)/100 = 6/100 = .06 \text{ or } 6\% \text{ inflation}$$

The user's error is not one of mathematics, the formula used is correct, but the error is one of omission. Consider the example graphs of three CPI's and their different interim observations.

All of the CPI's have 100.0 for the January 1982 observation and 106.0 for the January 1984 observation, yet inflation in each case was much different. In CPI-3 price increases did not occur until June leaving the first five months of the year inflation free. CPI-1 shows price increases occurring until May and staying at that level for the remainder of the year. In CPI-2 prices increased at a steady rate throughout the year. Since the consumer is spending his income continuously during the year each universe would have a different cumulative impact upon the consumer's income. Assuming the consumer has a fixed income, the prices indicated by CPI-1 would take the largest amount of the consumer's income because prices reached their higher level sooner in the year. CPI-2 would indicate the next highest inflation rate and CPI-3 would be the lowest rate of inflation.



By using the BLS method of calculating the annual average CPI, the impact on the consumer of each CPI can be quantified. First of all, one might notice that there are 12 observations graphed in the above graph yet the Anchorage CPI is only published every other month. The other 6 observations used in calculating the annual averages are estimated in the following manner:

$$I = \sqrt{M_p * M_f}$$

Where I is equal to the index, M_p equals the index for the month prior to the month being estimated and M_f equals the index for the month following the month being estimated.

When the six index numbers have been imputed for the missing observations, the annual average index number is calculated as follows:

$$12 \sqrt{X_1 * X_2 * X_3 * \dots * X_{12}}$$

Where X_1 = the index number for the first month, X_2 the index for the second month and so forth. Using the above method, the following annual average CPI's are calculated from the monthly measurement of price levels or monthly CPI's.

CPI - 1	105.0
CPI - 2	102.7
CPI - 3	101.4

This number is the annual average CPI for the example period from January 1983 to December 1983. To calculate the "inflation rate" one would then use the following formula:

$$(A - B)/B$$

Where A = the most recent periods annual average CPI and B is equal to the previous periods annual average CPI. For simplicities sake if we assume that the 1982 annual average was 97.5, the following inflation rates would be found:

$$\text{CPI-1: } (105.0-97.5)/97.5 = 7.5/97.5 = .077 \text{ or } 7.7\% \text{ inflation}$$

$$\text{CPI-2: } (102.7-97.5)/97.5 = 5.2/97.5 = .053 \text{ or } 5.3\% \text{ inflation}$$

$$\text{CPI-3: } (101.4-97.5)/97.5 = 3.9/97.5 = .040 \text{ or } 4\% \text{ inflation}$$

Graphic presentation of the CPI is a tool that can better illustrate the impact of price changes. Oftentimes the CPI is used as a measure to predict future inflation. Frequently future inflation is predicted based on last year's rate. If we extrapolate the three lines on the graph into 1984 you can see the weakness of this argument. In CPI-1 for example you have the highest inflation rate in 1983 but prices were stable during the last 7 months indicating that a lower inflation rate might be expected during 1984. CPI-3 on the other hand had dramatic increases in prices during the last several months of the year indicating that prices could increase at a much faster rate during the next 12 months. Only with CPI-2 would you expect inflation to remain constant during the next 12 month period.

Developing a thorough knowledge of what the CPI measures and how to properly use it is the most important rule in regards to the CPI. When you are involved in bargaining or negotiating a contract the CPI will undoubtedly be useful in arriving at a fair settlement. If the other party has a more thorough knowledge of the index you may find yourself negotiating from a weaker position simply because you have to accept their numbers at face value.

Remember also that the Department of Labor, Research & Analysis Section exists to assist you in matters such as these. If you want to know what the CPI has been doing for a certain period, or you need an explanation of what a CPI number means, don't hesitate to call upon us to answer your questions.

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