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Federal Reserve Bank of Cleveland

Is It More Expensive, or Does It Just Cost More Money?

by Michael F. Bryan

Most of us, from the general public to professional economists, use the term *inflation* pretty loosely. It's increasingly applied to any rise in prices, and even economists use it interchangeably with a *rise in the cost of living*. This *Commentary* explains what inflation is, why it should be kept distinct from a rise in the cost of living, and how some statistical measures attempt to distinguish between the two.

My grandmother used to say, all too repeatedly, "I remember when a hamburger only cost a nickel!" There are two ways to interpret what she was saying. The first is that getting a hamburger requires a greater sacrifice since they now cost about a dollar. And I wouldn't be surprised if grandmother was reminiscing about an earlier, seemingly happier time. But as an economist, I understand that grandmother might have intended to say nothing at all about the value of a hamburger, only that the value of *money* had changed. Indeed, she might very well have understood that hamburgers are easier to come by at a dollar than when they "only" cost a nickel. It is just that nickels are even easier to come by!

Here we see illustrated the distinction between two economic concepts. A rise in the cost of living means that one's ability to maintain a certain level of well-being has diminished. Prices may or may not have risen, but people's income relative to prices has fallen. The other concept, inflation, refers to the deterioration in the purchasing power of money—a rise in prices that comes when the central bank has created too much money, leaving people's income relative to prices unchanged. Inflation does not mean it is more difficult to maintain a particular lifestyle, only that its cost in terms of money is "inflated."[1]

This *Commentary* discusses the definition and measurement of the cost of living and inflation—concepts that are distinct, but are commonly talked about as if they were the same. When one hears about a rise in the "cost of living," it is impossible to know whether the term refers to a change in only the *money* cost of life, or to the difficulty in maintaining a certain level of welfare. But it is useful to appreciate the distinction between these two ideas. The causes of inflation and a rising cost of living are fundamentally different, as are their remedies. Furthermore, keeping the difference in mind helps one see how price statistics such as the consumer price index (CPI) combine cost-of-living changes (which the central bank cannot control) with inflation (which the central bank can control). In other words, if the central bank's objective is to eliminate inflation, it might not always find measures like the CPI the most useful statistics for monitoring inflation—especially in the short run.

The Cost of Living versus Inflation: A Descriptive Example

The boss wants to move you to New York City from Cleveland, Ohio. As you consider the move, you will no doubt reflect on the fact that New York is an expensive place to live. To buy in New York the same things you buy in Cleveland, you'd better be prepared to pay considerably more for them. In fact, according to recent estimates by the American Chamber of Commerce Research Association, it costs approximately 31 percent more to live in New York City than in Cleveland. So unless the boss agrees to a 31 percent "cost-of-living" adjustment to your income, you will find it more difficult to maintain your current lifestyle in the more expensive New York marketplace.

Just as one's cost of living may vary from one place to another, the cost of living can vary across time. Many events can reduce our well-being, which is to say, cause our cost of living to rise. Droughts make food more precious, oil shortages make it harder to stay warm, and import taxes can make acquiring foreign goods more difficult. These are all *real* changes in our economic situation and are reflected in higher costs to us. So, too, many events improve our well-being—cause the cost of living to fall—including new technologies that improve crop yields or the fuel-efficiency of furnaces, or medical breakthroughs that enhance life in ways that previously were not possible at any cost.

Consider figure 1, which shows the cost of buying the same bundle of goods (or market basket) for every year between 1960 and today. Again, there are two ways to think about how the cost of acquiring this basket has changed over time. In terms of dollars, the basket continually gets more costly. Specifically, what cost $6,000 in 1960 would cost roughly $36,000 today—a sixfold increase. But does that mean it is six times more difficult to buy things today compared with 1960? Of course not. It only costs six times as many "dollars." The sacrifice required to buy this bundle of goods has not increased. In fact, it has fallen, and substantially so. One way to see this is by answering the following question: "How many hours would you

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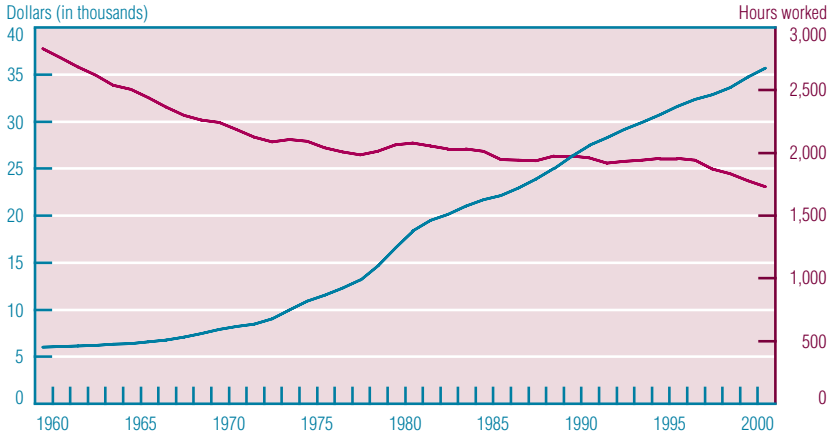
FIGURE 1 COST OF A 1960 BASKET OF GOODS AND SERVICES, MONEY PRICE AND HOURS WORKED



SOURCE: Federal Reserve Bank of Cleveland.

need to work to buy the basket of goods?" In 1960, this $6,000 market basket would have cost you about 2,800 hours of work. In 2000, it would have cost 1,700, or 39 percent fewer, hours (figured using average hourly compensation, which was only about $2 in 1960 but is approximately $19.50 today). What accounts for the fact that the cost of this market basket in terms of dollars is continually rising even though it is easier to acquire? The answer, simply enough, is that dollars are getting easier to come by because the central bank is creating more of them relative to the amount of things there are to buy. This is inflation.

Definitions, Past and Present

In a 1997 *Commentary*, "On the Origins and Evolution of the Word *Inflation*," I argued that the term "inflation" originally appeared during the latter half of the nineteenth century to describe a condition of money, not prices. An inflated money was a paper money with a diminished claim to gold; because so much of the paper had been printed in proportion to the amount of gold it represented, the purchasing power of the paper was actually much less than it appeared.

Today, our money is fiat (essentially costless for the government to produce) and not limited by our stock of gold. So how does the issuer of money, the central bank, know when it has produced too much money? The answer to this question is relatively straightforward: If the central bank oversupplies money, the purchasing power of money falls, or in other words, the money price of things rises. That is, inflated money will reveal itself when the prices of things in terms of money rise. So the central bank must monitor the behavior of prices as a way of detecting inflation. But over time, people have blurred the distinction between how inflation is measured with what inflation is. Indeed, today one often hears the word "inflation" used when what is meant is simply "price increase."

Even in economics, the meaning of inflation can be perplexing. A survey of 34 college textbooks I found in the library reveals that about half define inflation as a "*general* rise in prices." A general (or aggregate, or overall) rise suggests that to be "inflation" the price increases must be broadly diffused across the market basket. This characteristic distinguishes inflation from merely *any* price increase. But the other half of the textbooks define inflation as a "sustained" (or "continual") rise in the general price level. By adding persistence to the phenomenon, these definitions imply that a process underlies the upward movement in prices. While the nature of that process is usually left unsaid, it certainly hints at a monetary origin.

Consider an energy shortage that causes gasoline and heating bills to rise and national output to shrink as firms scale back production. Clearly, this general rise in prices reflects an increase in the cost of living. After all, our lives have become more difficult. As we now must pay more for energy, we can afford fewer of the other things we used to buy. Note also that the drop in available energy does not cause continual rises in the average level of prices. Once prices rise to their new, higher level, the process stops.

It is hard to imagine that anything other than a *continual* increase in the quantity of money relative to the number of things there are to buy could cause all prices to persistently rise. As long as the central bank continues to create money at a faster rate than the rate at which additional goods and services are being produced, prices will rise. But remember, this sort of rise does not mean that the cost of living has changed. Indeed, our incomes will increase right along with prices, and unlike the price increases caused by the energy shortage, these increases do not reflect a direct reduction in our well-being.

Only a handful of college economics textbooks make the monetary nature of this process explicit by emphasizing that inflation is something that occurs only to the *money* price of goods. Paul Heyne, in *The Economic Way of Thinking*, however, goes to great length to draw a distinction between cost-of-living changes and inflation:

"Inflation is not a rise in the cost of living. Inflation is basically a fall in the value or purchasing power of money. *Looking at it another way, we can say that inflation is a rise in the money price of goods. You may even, if you wish, speak of inflation as a rise in the money cost of living. But the key word is* money."

The Measurement of the Cost of Living and (Core) Inflation

In theory, cost-of-living changes are measured by envisioning the cost of attaining a certain level of welfare and comparing that cost in different places or different periods of time. Unfortunately, "welfare" is impossible to quantify and a more practical approach is to calculate the cost of a representative market basket of goods and services and compare that cost between two places (like Cleveland and New York) or two periods of time (like 1960 and today). This is the basic idea behind the consumer price index, the dollar cost of a fixed basket of goods and services purchased by the average urban consumer. Produced by the U.S. Department of Labor's Bureau of Labor Statistics, this popular statistic has suffered some unfortunate criticism in recent years, so much so that Congress created a special advisory committee to investigate the construction of the index and make recommendations for improving the measure.

TABLE 1 A COMPARISON OF CPI COST-OF-LIVING WEIGHTS TO SELECTED CORE INFLATION MEASURE WEIGHTS (AS OF JANUARY 2001)

CPI components	CPI (percent)	CPI excluding food and energy (percent)	Variance weights[a] (percent)
Food at home	8.5	0.0	2.6
Food away from home	6.2	0.0	36.3
Beverages	1.0	0.0	2.1
Shelter	31.5	40.3	20.3
Fuel and utilities	4.5	1.1	0.6
Furnishings/operations	4.8	6.6	8.5
Apparel	4.4	5.6	1.6
Transportation	17.1	18.6	0.7
Medical care	5.8	7.4	11.9
Recreation	6.0	7.7	8.4
Education/communication	5.8	7.4	6.0
Other goods and services	4.3	5.5	1.0

a. Variance weights are computed as the inverse of the individual (i) components' time-series variance relative to the sum of the inverse of component variances, or $w_i = (1/\sigma_i^2)/(\sum 1/\sigma_i^2)$ (computed over the January 1993 to December 2001 period).

SOURCES: U.S. Department of Labor, Bureau of Labor Statistics; and Federal Reserve Bank of Cleveland.

Many of the problems identified with the CPI (and other similar market basket approaches) have been well known to economists for nearly a century. Most arise because the basket of goods and services used to compute the cost-of-living statistic gradually becomes dissimilar to the basket of goods and services actually purchased by consumers. The lack of comparability between the statistical market basket and the true market basket creates a bias between the measured statistic and the actual cost increases being encountered by households. This bias is an important statistical puzzle that makes the market basket approach to measuring the cost of living difficult. But another problem is that market basket statistics also pick up inflation because they measure the money cost of the basket. That is, the CPI can rise even if the cost of living is constant if the Federal Reserve continues to oversupply money and makes the dollar an increasingly inflated measure of cost.

Price statistics that attempt to isolate the persistent rise in the general price level are commonly called *core* (or sometimes, *underlying*) inflation statistics. One gauge of core inflation is the long-run growth trend in the cost of the market basket. These time-series averages take the approach that we will see the persistent component of aggregate price movements only once it has revealed itself to be persistent. But this approach involves such long horizons that inflation-minded central bankers are left monitoring data of an economic situation that is long past.[2]

An alternative procedure for measuring core inflation is to reconstruct the market basket in a way that reduces the influence of transitory price fluctuations originating in various components of the index. The idea here is that although such price swings may reflect changes in the cost of living, they are not part of a persistent rise in the general price level that comes from a monetary source. The best-known core inflation statistic excludes food and energy goods from the consumer market basket, and virtually every major central bank in the world uses some variation of this technique to turn a market basket price statistic into an inflation measure.

This is a dramatic difference in measurement. By excluding some components of the market basket, the measure no longer reflects consumer spending patterns and therefore fails to qualify, in a meaningful sense, as a cost-of-living statistic; volatile or not, food and energy are important to our cost of living.

More statistically sophisticated approaches to the measurement of (core) inflation, called "stochastic" index numbers, weight price data purely on the basis of "signal-to-noise" criteria, disregarding completely the items' importance to consumers.[3] James Dow, for example, has suggested that the core inflation statistic assign weights to price changes on the basis of their observed historical persistence. (Mark Wynne describes Dow's technique in a working paper—see the recommended readings.) Goods that fluctuate widely from month to month would be assigned lower weights, and goods that show more stable growth patterns would get higher weights. This "variance-weighting" approach means that no item in the basket necessarily has a weight that bears any relation to what one would find in the typical household budget.[4] Table 1 compares the market basket weights used to construct the CPI, the CPI excluding food and energy, and a simple variance-weighting approach.

Although measures of core inflation vary by technique, most cast off the notion of cost of living (or any other welfare conception of cost), in an effort to identify the persistent part of the general price increase that the central bank can influence, inflation.

Conclusion

A major problem caused by inflation is that people are apt to confuse changes in the dollar cost of things with changes in the *real* cost of things. That is, they are likely to confuse changes in the cost of living with inflation. In this *Commentary*, I have stressed the difference between these economic concepts because they are often discussed as though they are the same phenomenon. They are not. The cost of living is a welfare concept. It is intended to describe how hard it is to achieve a certain level of well-being. Indeed, the cost of living is a relevant economic concept even in a world absent money—a barter economy.

Inflation, however, is a nominal concept, arising only when the money cost of things increases over time. Although central banks have no ability to systematically influence the cost of living, they can rid the world of inflation by carefully managing the money supply. How well they do so, however, at least partially depends on how well they can see the object they hope to keep in check.

Footnotes

1. Of course, inflation causes hardship because it makes using money to carry out market transactions more problematic and thereby lowers overall welfare. I will not dwell on this complication.

2. In related work, Cogley (2002) computes what he calls an adaptive measure of core inflation that averages past movements in the cost-of-living statistic such that the largest weights are given to the most recent data, which then geometrically decay as the vintage of the data increases. In this way, the core inflation measure is more timely than the cost of living's long-run growth trend.

3. The Federal Reserve Bank of Cleveland produces a statistic called the *median CPI*, an extreme variant of a class of statistics called trimmed-mean estimators. These statistics are similar to the core inflation measures as they, too, attempt to filter out high-variance movement in the individual price data. But unlike other core inflation statistics, the trimmed-mean estimators retain the exact weighting structure of the CPI and therefore gauge the cost change of the same basket of goods tracked by the CPI. In this way, the trimmed-mean estimators are more akin, statistically speaking, to the cost-of-living measure.

4. Similarly, Bryan and Cecchetti (1993) weight price changes on the basis of a statistical model that separates price movements unique to individual items from movements shared by all items in the basket.

Recommended Reading

Bryan, Michael F. 1997. "On the Origin and Evolution of the Word Inflation." Federal Reserve Bank of Cleveland, *Economic Commentary* (October 15).

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