

The Art and Science of Measuring Inflation

At a time when many Americans worry about rising prices, Dallas Fed Senior Economist Jim Dolmas discusses the numbers we use to track inflation in the U.S. economy.

Q. How do recent inflation readings compare with historical trends?

A. The Consumer Price Index—what we call headline CPI inflation—was about 5.5 percent for the 12 months ending in July. To put it in perspective, a 5.5 percent rate, if sustained, would be something we haven't seen since the early 1990s.

The great inflation of the 1970s was brought down in two steps—a sharp deceleration in the early 1980s from double-digit levels to 4 to 5 percent, and a second step in the early 1990s to the 2 to 3 percent range. Current rates, if sustained, would put us back on that first step.

Of course, headline inflation is quite volatile. We also had 12-month rates around 4 percent from autumn 2005 to autumn 2006, followed by a period where the 12-month rate was mostly in the 2 to 3 percent range.

One of the distinctive features of our recent inflation experience has been the stability of the core rate, which excludes such volatile items as food and energy. In that regard, today differs from what we saw in the 1970s, when the core rate basically tracked the headline rate, with a lag of a few months.

Q. Haven't we seen particularly big increases in food and energy this time?

A. Yes, but food and energy prices were also big factors behind the headline inflation surges in the 1970s. We usually think of 1970s inflation as primarily driven by energy, but food also played a big role. The 12-month inflation rate in the food component of the CPI, for example, had already reached 20 percent in August of 1973, two months before the October oil embargo that caused energy prices to jump.

The sharp increases in food and energy prices only tell us why the headline rate initially accelerated. They don't explain why



core inflation increased so dramatically in the 1970s. To explain that—and, conversely, to explain why core inflation has been so stable over the past decade or so—we need to look to monetary policy.

In recent years, monetary policy has done a much better job of anchoring inflation expectations, so shocks to food or energy prices haven't had as big an impact on the pricing decisions of businesses outside those sectors.

Q. What about the perception that inflation statistics don't match consumers' experiences when they shop?

A. The components experiencing the most rapid price increases today are the ones people buy on a regular basis—the weekly trip to the grocery store or gas station. The components holding the overall index in check are in large part things people buy less frequently.

Over the past 12 months, the CPI's food and energy component is up about 16 percent. The price index for core goods—that is, goods excluding food and energy—has risen only 0.5 percent. These are items such as apparel, autos, televisions, computers, toys and the like.

The inflation rate for core services—that is, services excluding things such as electricity and other utilities—is running at 3.3 percent on a 12-month basis. The big player is shelter costs, up 2.5 percent over the past two months. It's something people consume every day, but a big chunk of it, called "owners' equivalent rent," is an implicit cost, not something people pay out of pocket.

Q. Shouldn't the cost of shelter be going down with housing prices?

A. The cost of a home and the cost of living in a home are different concepts. We want to measure the latter—the cost of consuming housing services over a given time period. The idea is to estimate what you would have paid to rent your home, and that's going to be influenced by factors beyond the price of the house itself, such as interest rates and expected house price appreciation.

The Bureau of Labor Statistics computes owners' equivalent rent by looking at actual rents paid, then making adjustments to account for differences between its sample of renters and a representative sample of homeowners.

Over long stretches of time, we'd expect rents and owners' equivalent rent to move together with house prices, but that needn't hold over shorter periods, especially when interest rates are changing or expected home price appreciation is speeding up or slowing down.

Rising costs for being an owner-occupant push people into the rental market, which drives up rents and the measure of the cost of owner-occupancy. That's what's been happening lately. I should note, though, that rent growth has slowed over the past several months, which suggests the flow of households into the rental market may be stabilizing.

“One of the distinctive features of our recent inflation experience has been the stability of the core rate, which excludes such volatile items as food and energy.”



Q. Why exclude food and energy?

A. When properly understood—that is, as an underlying trend missed by headline inflation—any core measure addresses the problem of how to distinguish transitory blips from more persistent movements in real time.

Those last few words are important. Think about a three-month period in which headline inflation went up a bit each month. Is that a blip or the start of a persistent movement? If the three months are in the distant past—so we have a bunch of observations before and after—then we can say with some certainty whether the acceleration was transitory or persistent. What do we do when those three months are the most recent, so we only know what came before, not what will come after?

Measures like “ex food and energy” try to solve this problem by excluding items that have traditionally shown high volatility. What’s left—the ex food and energy index—is going to be a lot smoother than the headline rate, and movements in it are more likely to represent persistent swings rather than transitory blips.

Q. Are there other measures that help reveal inflation trends?

A. I’ve been using “ex food and energy” and “core” interchangeably, but we have other measures of core inflation. The Trimmed Mean PCE we produce here at the Dallas

Fed or the Cleveland Fed’s trimmed mean CPI try to do something similar to the ex food and energy measure but without automatically excluding a predetermined list of items.

Some non-food, non-energy items are at least as volatile as a lot of food and energy items. Conversely, parts of food and energy—food away from home (at restaurants, for example)—are quite stable and probably very informative about underlying inflation trends.

Trimmed means exclude the items with the biggest price changes up or down in any month, regardless of the type of goods. I think this approach is superior to routinely excluding food and energy, but I look at all the measures each month and don’t entirely discount any of them.

Q. What’s the difference between the PCE and CPI?

A. The CPI tracks the cost of acquiring a particular basket of consumer goods, which represents what a typical urban household buys. The basket’s composition is adjusted every two years to reflect changes in spending patterns.

Unlike the CPI, the price index for personal consumption expenditures, or PCE, isn’t produced as an end in itself. Rather, it emerges from the solution to the problem

of separating the portion of changes in consumption due to varying prices from the portion due to real quantities. The PCE basket’s composition changes from month to month.

People tend to think the CPI and PCE are two ways of measuring the same thing, but each has its own logic. The CPI aims to be

a cost-of-living index—a measure of how price changes affect the real well-being of a household with a given money income. This leads to an emphasis on expenses people pay out of their pockets.

The PCE, on the other hand, focuses on what we consume, leading to some important differences from the CPI. Medical care, for example, has a much larger weight in the PCE than the CPI. Why? Well, the CPI just cares about what people spend directly on medical care, while the PCE also factors what employers pay into the weight assigned to medical care. A change in the identity of the party who pays for something shouldn’t affect our measure of the amount of consumption that takes place.

Q. Where do you see research on inflation measurement going in coming years?

A. The most interesting work is going to focus on refining our notions of what inflation measures central banks should watch. How much weight should these policymakers put on the various components of any price index?

I think of the situation as analogous to the early history of price indexes. In the early 1920s, Irving Fisher wrote a 500-page book called *The Making of Index Numbers*, which ranked more than 100 different price indexes that were in use or had been proposed.

Almost none of those indexes survives today. Why? Mainly because advances in consumer theory finally settled the question of what an ideal cost-of-living index should look like, killing off many of the competing indexes. Eventually, I think we’ll see something similar with regard to indexes for the purpose of conducting monetary policy.

