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# Economic Letter

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## Inflation Measurement Gives Us Food for Thought

by Jim Dolmas

**G**lobal food prices are soaring. Since February 2009, the United Nations Food and Agriculture Organization world food price index has risen roughly 67 percent, surpassing the previous peak in June 2008 (*Chart 1*). The last food price surge, from early 2007 to mid-2008, prompted riots in many countries; the latest rise has also fueled riots and may have been a factor in political unrest sweeping through North Africa and the Middle East.<sup>1</sup>

To the extent that the increases have contributed to accelerating inflation rates, they also challenge a number of central banks attempting to balance the goal of stable prices with the desire to support economic recovery.

U.S. consumers have—until very recently—been sheltered from this price jump. From February 2009 to December 2010, growth in the personal consumption expenditures (PCE) price index for food was essentially zero. That may be changing. In January and February, the PCE food index increased 1.4 percent, an annualized rate of roughly 9 percent.

While the behavior of food prices—with implications for world poverty, geopolitics and monetary policy—is interesting in its own right, food prices are also a useful context in which to think about inflation measurement.

Economists and central bankers often refer to “core” measures of inflation that exclude the frequently volatile prices of food and energy items. When the prices of food or energy are rising rapidly, policymakers’ reliance on such core figures can become controversial.<sup>2</sup>

More generally, the idea that one can learn more about inflation by ignoring some of its components is certainly counterintuitive. We can illustrate this principle at work, though, even among the components of the often-excluded food category.<sup>3</sup>

*If excluding some components from the calculation of the inflation rate produces a measure that, historically, tracks well the trend in the all-items inflation rate, such a measure would be useful.*



First, though, the recent surge in food prices is useful for illustrating the way in which increased scarcity makes less-abundant commodities relatively more expensive, something that, in general, monetary policy can't undo.

### Scarcity, Relative Price Movements, Monetary Policy

Among the causes of the recent world food price surge are weather-related poor harvests of staple crops such as wheat and some coarse grains. Affected heavily by drought in Russia and excessive rains in Canada and Australia, world wheat production for the 2010–11 marketing period is on track for a decrease of 5 percent compared with the 2009–10 period. World production of coarse grains (corn, sorghum, barley, rye and oats) is on pace to fall 2.5 percent.<sup>4</sup> Export bans by some countries, increased stockpiling by others and higher input costs—especially for energy in the production of fertilizer—likely also contributed to diminished supplies of many agricultural commodities.<sup>5</sup>

A basic principle of economics is that decreased supply increases a good's relative price—that is, its price in

terms of the other enjoyable things one must sacrifice to acquire the good. The number of theater tickets or MP3 downloads or haircuts one must sacrifice in order to enjoy a steak dinner increase when the relative price of steak increases. So too, does the number of hours one must work—and forgo leisure—to obtain a given amount of steak.

This is true in a world where money is used to facilitate the exchange of goods and services and would be true in a world without money (and thus without monetary policy).

Over periods of a few years (and, of course, over longer horizons), central banks can exercise considerable control over the rate at which the prices of an economy's goods and services rise or fall, in units of money. An important point, though, is that—with a few qualifications—monetary policy affects money prices for goods and services in general, not the terms at which goods and services exchange for one another.<sup>6</sup>

Monetary policy can slow the rate at which food prices (together with all other money prices) rise; it cannot make food—or any other particular good or service—more affordable in terms of other goods and services.

### Finding a Core for Food

The components excluded from core inflation measures—often, though not always, food and energy—typically have volatile price changes, and volatility is sometimes given as the rationale for their exclusion.<sup>7</sup> The point of constructing any core measure of inflation, though, is not simply to reduce volatility. A core measure ideally helps us gauge, in real time, the underlying trend of a more comprehensive inflation measure.

Chart 2 shows annualized month-to-month percentage changes in the PCE price index for food, along with a measure of the trend in those month-to-month changes. Note that the trend line does not reach to the ends of the sample. It cannot: To know with confidence the trend in a series at any point in time requires knowing the series' behavior both well before and well after that date.

In real time, where policymaking necessarily operates, we can only know past inflation, and not, obviously, future inflation. If excluding some components from the calculation of the inflation rate produces a measure that, historically, tracks well the trend in the all-items inflation rate, such a measure would be useful. Core inflation measures, to greater or lesser degrees, have this trend-tracking property.<sup>8</sup>

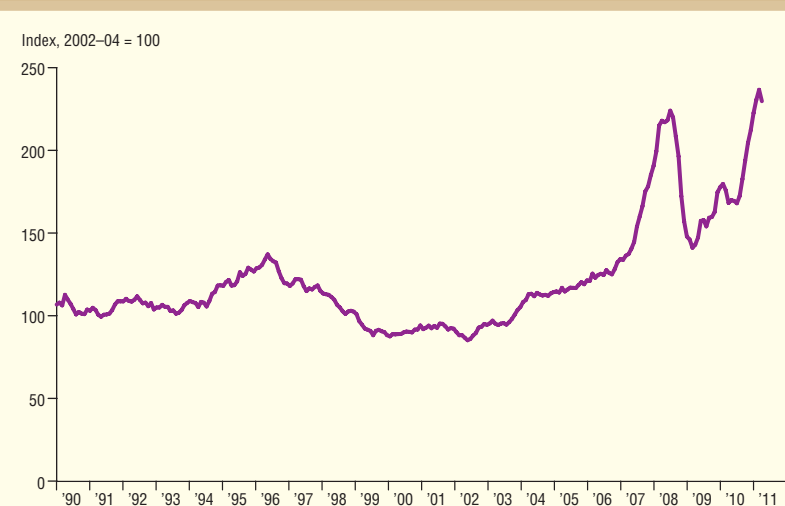
We can illustrate this principle simply by looking within food itself.

There are 22 food-related components—not including meals purchased at restaurants and similar establishments—that go into the all-items PCE price index but are absent from PCE excluding food and energy.

Those 22 components are listed in Table 1, divided in a way I find useful: those that are less processed and those that are more processed. The categorization involves some judgment—while “processed fruits and vegetables,” for example, obviously belongs in the “more-processed” category, the assignment of a component like “other meats” is less clear-cut.<sup>9</sup>

Chart 1

### U.N. Food Price Index Climbs to New Highs



SOURCE: United Nations Food and Agriculture Organization.



Why is the division a useful one? Consider the more-processed components. For our purposes, their most important characteristic is that, by and large, they consist of items with brand identities. Lay's potato chips. Campbell's soup. Kellogg's Frosted Flakes. These items differ from the steak at the butcher's counter in more than just the steps involved in their production. Their producers typically possess market power, and thus face nontrivial pricing decisions.

Producers of such items also tend to change their prices infrequently, even though their production costs are fluctuating, perhaps on a daily basis. Knowing that their next price adjustment may be weeks or months away, producers must be forward-looking when setting prices. If they perceive a jump in the price of some input—such as an unprocessed food item—to be temporary, they may choose not to fully incorporate the higher input cost into their current price. A faster or slower expected rate of general inflation should also be reflected in larger or smaller price increases.<sup>10</sup>

Movements in prices for these sorts of items are thus apt to be more informative about future price developments and the underlying trend in food price inflation.<sup>11</sup> This is, in fact, the case. We can aggregate the two sets of components into two different price indexes—"more processed" and "less processed"—and compare their abilities to track the trend in all-items food price inflation (the trend line shown in Chart 2).

Monthly changes in the more-processed price index are, on average, closer to the trend rate of food price inflation than are the monthly changes in either the less-processed index or even the all-food-items index itself, by nearly a full percentage point in that case (*Table 2*). The more-processed-food price index would make a useful core for food inflation.

Such a core food index would exclude about 30 percent of food expenditure but would give us, as a

Chart 2

## Monthly Food Price Changes and Their Trend

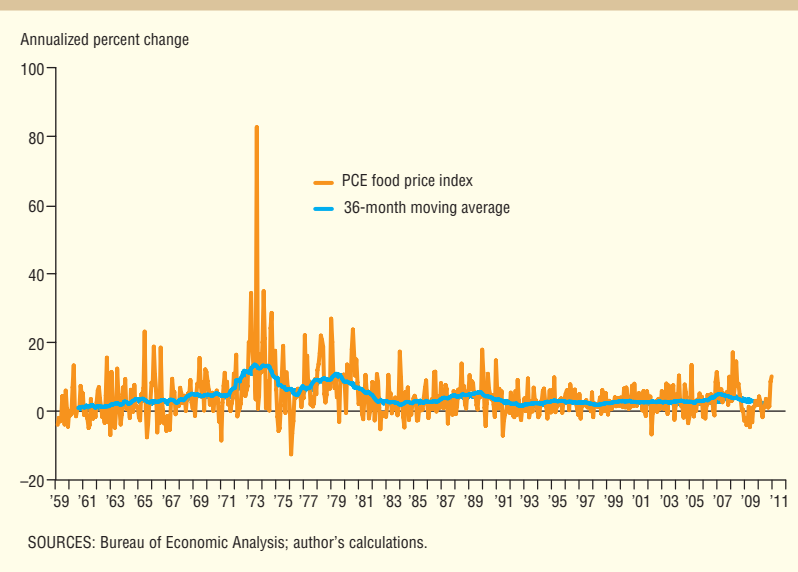


Table 1

## Separating Components of PCE Food Prices

Less-processed items	More-processed items
Beef and veal	Bakery products
Eggs	Beer
Fish and seafood	Cereals
Food produced and consumed on farms	Coffee, tea and other beverage materials
Fresh fruit	Fats and oils
Fresh milk	Food products, not elsewhere classified
Fresh vegetables	Mineral waters, soft drinks, vegetable juices
Pork	Other meats
Poultry	Processed dairy products
	Processed fruits and vegetables
	Spirits
	Sugar and sweets
	Wine

SOURCES: Bureau of Economic Analysis and author's judgment.

result, a better gauge of the trend in overall food price inflation.

### What We're Seeing Now

Over the first six months of 2010, as the global food price surge accelerated, the less-processed-food index

increased at an average annualized rate of 6.7 percent. Over the same six months, though, our core, more-processed-food price index actually fell at a 0.9 percent average annualized rate. Consistent with the greater informativeness of the more-processed index, over



the second half of the year, the rate of increase in the less-processed index abated to a 1.8 percent annualized rate. Overall food inflation, covering less-processed and more-processed items, ended up at 1.2 percent for the year.

The increases in January and February of this year are different. Not only has the less-processed index risen sharply—at a 19 percent annualized rate—but, in contrast to 2010, the more-processed index has also grown robustly, at a 5.2 percent annualized rate. A sustained period of higher food price inflation may be in store for U.S. consumers.

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## Notes

<sup>1</sup> Regarding the 2008 food riots, see “Across Globe, Empty Bellies Bring Rising Anger,” by Marc Lacey, *New York Times*, April 18, 2008, [www.nytimes.com/2008/04/18/world/americas/18food.html](http://www.nytimes.com/2008/04/18/world/americas/18food.html). For the more recent political unrest that began in North Africa, see, for example, “Durability of Mideast Leaders in Doubt,” by Michael Peel, Abeer Allam and Abigail Fielding-Smith, *Financial Times*, Jan. 16, 2011.

<sup>2</sup> See, for example, the *Wall Street Journal* editorial “Deja Deflation Fear,” Review and Outlook, Feb. 18, 2011, <http://online.wsj.com/article/SB10001424052748704657704576150501497853690.html>.

<sup>3</sup> Note that my intent is not to defend any particular core measure—there are a number of alternatives to “ex food and energy” produced at several Federal Reserve Banks, including the Dallas Fed’s trimmed mean PCE inflation rate, the Cleveland Fed’s median and trimmed mean CPI and the Atlanta Fed’s sticky price CPI.

<sup>4</sup> “World Agricultural Production,” Foreign Agriculture Service Circular Series WAP-03-11, U.S. Department of Agriculture, March 2011, [www.fas.usda.gov/wap/circular/2011/11-03/toc.asp](http://www.fas.usda.gov/wap/circular/2011/11-03/toc.asp).

<sup>5</sup> See “The Future of Food: Crisis Prevention,” *The Economist*, Feb. 24, 2011, [www.economist.com/node/18229412?story\\_id=18229412](http://www.economist.com/node/18229412?story_id=18229412).

<sup>6</sup> The key qualification is that to the extent some prices are “sticky,” or sluggish to adjust, a central bank’s actions may affect some relative prices.

<sup>7</sup> The Bank of Canada, for example, uses a core CPI measure described explicitly as one that excludes the eight most volatile components. See [www.bank-banque-canada.ca/en/press/2001/pr01-9.html](http://www.bank-banque-canada.ca/en/press/2001/pr01-9.html).

<sup>8</sup> See, for example, “Comparing Measures of Core Inflation,” by Todd E. Clark, Federal Reserve Bank of Kansas City *Economic Review*, Second Quarter, 2001, [www.kc.frb.org/publicat/econrev/pdf/2q01clar.pdf](http://www.kc.frb.org/publicat/econrev/pdf/2q01clar.pdf).

<sup>9</sup> The bulk of “other meats” consists of items such as hot dogs and lunch meats.

<sup>10</sup> This paragraph, in fact, describes in words the pricing behavior underlying the so-called New Keynesian Phillips curve. See, for example, “The New Neoclassical Synthesis and the Role of Monetary Policy,” by Marvin Goodfriend and Robert G. King, in *NBER Macroeconomics Annual 1997*, Ben S. Bernanke and Julio Rotemberg, ed., Cambridge, Mass.: MIT Press, 1997, pp. 231–96.

<sup>11</sup> This argument is presented in some detail in “Are Some Prices in the CPI More Forward Looking Than Others? We Think So,” by Michael F. Bryan and Brent Meyer, Federal Reserve Bank of Cleveland *Economic Commentary*, May 19, 2010, [www.clevelandfed.org/Research/commentary/2010/2010-2.cfm](http://www.clevelandfed.org/Research/commentary/2010/2010-2.cfm).

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Table 2

## Average Discrepancy Between Monthly Changes in Food Price Indexes and Trend Food

Index	Percentage points
All-food-items index	3.6
Less-processed index	9.2
More-processed index	2.7

NOTES: Average discrepancy is the average absolute deviation between annualized one-month rates of change in the three indexes and the annualized trend rate of increase or decrease in the all-items index. The trend is a centered 36-month moving average of annualized one-month changes. The sample period is January 1959 to December 2010.

SOURCES: Bureau of Economic Analysis; author’s calculations.