

## Hard “Core” Inflation

One of the more popularly cited indicators of economic welfare is the so-called core inflation rate. It is often considered a better measure of trend movements in aggregate prices than the overall inflation rate because it tries to eliminate high-frequency fluctuations. Low-frequency price changes are those that largely stem from sustained monetary policy actions and, hence, are more relevant to policymakers trying to gauge trend inflation. While news reports might lead one to believe that there exists a precise measure of the core inflation rate, there is, in fact, no universally accepted definition. In particular, two measures, shown in the accompanying figure with consumer price index (CPI) inflation, are widely used: inflation excluding food and energy (XFE) and weighted median inflation (WMI).<sup>1</sup>

The most frequently reported measure of core inflation is CPI inflation XFE. The overall CPI is a measure of the total price that consumers pay for a given market basket of goods and services compared with the base year, and the inflation rate is the percentage change in the CPI from a year earlier.<sup>2</sup> CPI inflation XFE is calculated as the rate of change in the CPI after food and energy are eliminated from the market basket. Food and energy prices are excluded because they can be highly volatile and difficult to predict.

Popular in academic research, the WMI rate is a second common measure of core inflation. In determining the CPI, each component has an associated weight—the respective proportion of all expenditures that consumers spend on that particular item. The WMI rate is determined by computing the simple monthly rate of change in prices for each component, then ordering the items by their inflation rates, and pairing each with its appropriate weight. WMI is the inflation rate associated with an accumulated weight of 50 percent: In other words, for any month, half of the components have inflation rates higher than the weighted median, while the other half have lower inflation rates. This is an appealing measure of core inflation because it eliminates components with relatively large (and relatively small) changes in prices, which generally do not persist, while the weighted median more closely reflects the persistent trend in price movements.<sup>3</sup>

Smith (2004) analyzes various measures of core inflation—including the two described here—in an attempt to determine the optimal choice.<sup>4</sup> She defines core inflation as the best predictor of future inflation, and her tests provide evidence that, of the two, WMI does indeed do a superior job at predicting future inflation, which other economists have also shown. Inflation XFE excludes the same components in every period, even if their individual price fluctuations are not unusual relative to those of other components, whereas the WMI eliminates different components each month, depending on their price fluctuations at that time. Consequently, the latter appears to be a better method to capture the underlying price trend among all expenditures. Therefore, the core inflation rate that we typically read about in the newspaper might not be the one that best forecasts future inflation.

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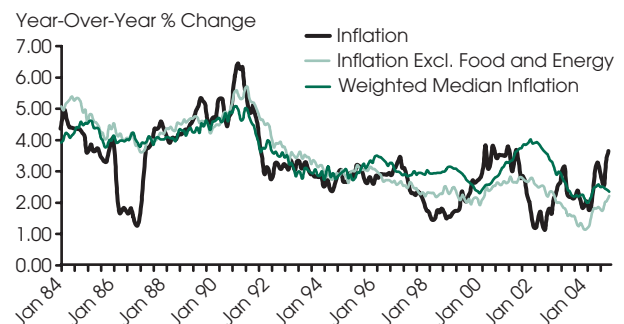
<sup>1</sup> Alternative measures of core inflation exist—e.g., the trimmed mean. The personal consumption expenditures price index is sometimes used instead of the CPI and is preferred by policymakers.

<sup>2</sup> The Bureau of Labor Statistics lists the following major groups in the CPI market basket: food and beverages; housing; apparel; transportation; medical care; recreation; education and communication; and other goods and services.

<sup>3</sup> Clark, Todd E. “Comparing Measures of Core Inflation.” Federal Reserve Bank of Kansas City *Economic Review*, Second Quarter 2001, 86(2), pp. 5-31.

<sup>4</sup> Smith, Julie K. “Weighted Median Inflation: Is This Core Inflation?” *Journal of Money, Credit, and Banking*, April 2004, 36(2), pp. 253-63.

### CPI Inflation Rates (Seasonally Adjusted)



SOURCE: Bureau of Labor Statistics and the Federal Reserve Bank of Cleveland.

Views expressed do not necessarily reflect official positions of the Federal Reserve System.