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What is Behind the Inflation Numbers?

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Inflation is often on the minds of U.S. consumers, especially when there are noticeable price changes for food, gasoline or housing. Over the past year, a nationwide drought pushed up the price of food. And energy costs, while volatile, have continued to trend upward with the economic recovery. Additionally, home and rental prices are rising in most areas across the United States after several years of a struggling housing sector. While food, energy and home prices have risen recently, broader inflationary pressures remain subdued and well below the 2-percent inflation rate targeted by the Federal Reserve. This issue of *The Rocky Mountain Economist* describes common measures of inflation and explores how recent inflation trends compare to the policy objectives of the Federal Reserve.

MONETARY POLICY AND INFLATION

In 1977, Congress amended The Federal Reserve Act, and in doing so, established the current monetary policy objectives of the Federal Reserve as follows:

“The Board of Governors of the Federal

Reserve System and the Federal Open Market Committee shall maintain long run growth of the monetary and credit aggregates commensurate with the economy’s long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices and moderate long-term interest rates.”¹

These objectives are commonly referred to as the “dual mandate,” where the Federal Reserve is charged with keeping inflationary pressures subdued while also encouraging full employment in the interest of economic growth and stability. Since January 2012, the Federal



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Open Market Committee (FOMC) has maintained a long-run target for the inflation rate of 2 percent.² This means that the FOMC is pursuing monetary policy aimed at meeting 2 percent annual inflation.

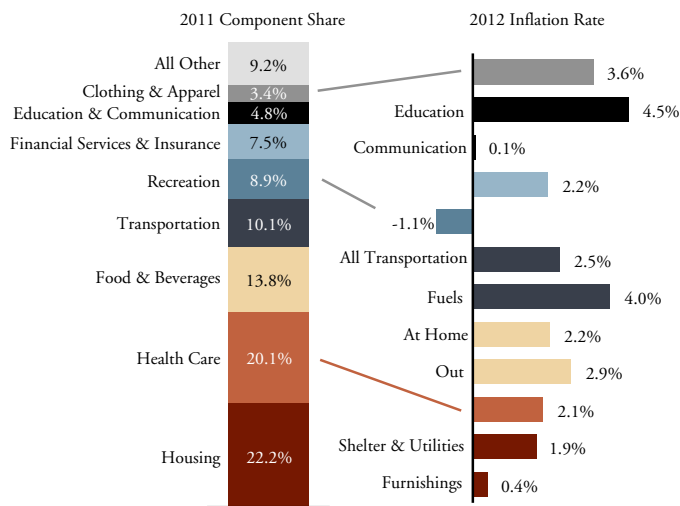
MEASURING INFLATION

Inflation can generally be defined as the change in prices over a given period (typically one year). Although a single commodity price, such as the price of oil or corn, can serve as an inflation indicator, economists typically use price indexes that account for a myriad of prices for goods and services to measure broad-based inflation. The personal consumption expenditure (PCE) price index is one broad-based and frequently cited measure. It is the measure of inflation used as a monetary policy target by the Federal Reserve and is forecasted throughout the year by the FOMC.

The PCE price index measures the prices of goods and services purchased by households or by nonprofits on behalf of households; estimates of the PCE price index are released by the Bureau of Economic Analysis each month. In March, the PCE price index estimated that consumer prices had increased 1 percent in the past year.

To calculate the PCE price index, each good and service that is purchased for household consumption is given a weight that changes quarterly to reflect its changing share of total spending (Chart 1). For example, in 2011, clothing purchases constituted 3.4 percent of consumer spending, food and beverage purchases made up 13.8 percent of spending, and recreation contributed 8.9 percent. The largest components of consumer expenditures are healthcare (20.1 percent) and housing (22.2 percent). Healthcare purchases include out-of-pocket costs for consumers, medical spending by businesses on behalf of consumers and healthcare spending by government

CHART 1
PCE Price Index



Source: Bureau of Economic Analysis.

agencies on behalf of consumers. The housing component of consumer expenditures includes rents, imputed rents for owner occupied housing, housing utilities and furnishings.³

Although prices of the complete bundle of consumer goods and services increased a moderate 1.8 percent in 2012, inflation rates varied across different goods and services (Chart 1). Natural gas prices decreased 9.8 percent providing some relief to consumers who heat their homes using gas. Telephone and computer prices also declined, following a long trend of declining prices for these types of products. Several categories saw significant price increases, including a 4.5 percent increase in education prices, a 4 percent increase in fuel prices and a 2.9 percent increase in food prices for consumption outside of the home.

Because food and energy prices tend to be the most volatile components of inflation, core inflation, a measure of inflation that excludes these purchases, is often used to examine underlying inflation trends. Core PCE inflation excludes energy purchases, such as gasoline and electricity and

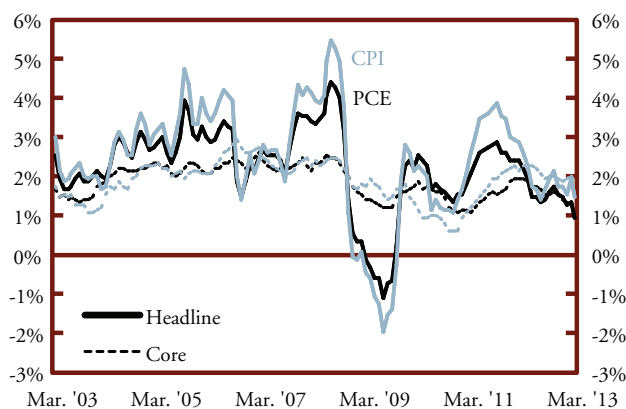


food purchases for home consumption. Core PCE inflation has increased 1.1 percent in the past year as of March, similar to overall headline inflation of 1 percent. Headline inflation, however, has a much larger variance because of large swings in food and energy prices (Chart 2).

CHART 2

PCE and CPI Inflation

Year-Over-Year Price Change, Seasonally Adjusted



Source: Bureau of Labor Statistics and Bureau of Economic Analysis.

THE PCE PRICE INDEX VS. THE CPI

In addition to the PCE price index, the consumer price index (CPI) also is a frequently used measure of consumer inflation.⁴ In particular, the CPI is used by the federal government to adjust Social Security payments and federal retirement benefits each year and by the Internal Revenue Service (IRS) to adjust income tax brackets. In 2000, the FOMC switched from using the CPI to measure inflation to the PCE price index because of several of its advantages.⁵

The PCE index and the CPI are closely related, and in fact the PCE index uses CPI data as part of its calculation. There are several key differences, however, between the two indexes (Table 1). The PCE index measures the prices of goods and services purchased by households or by nonprofits on behalf of households. Whereas, the

TABLE 1

Comparison of PCE & CPI Price Indexes

	PCE Price Index	CPI
Scope	Spending by and on behalf of households and nonprofits.	Cost of out-of-pocket expenditures made by consumers.
Source	The Bureau of Economic Analysis publishes indexes based on CPI and producer price index data, among other sources.	The Bureau of Labor Statistics publishes indexes based on surveys of consumer prices and other data sources.
Calculation	Chained Fisher chain-weighting formula.	Laspeyres-type index formula.
Component Weights	Derived from business surveys; changes quarterly with the expenditure composition.	Derived from household surveys; calculated as a fixed basket of goods updated every two years.

Source: Bureau of Labor Statistics and Bureau of Economic Analysis.

CPI measures only the cost of out-of-pocket spending by consumers. As a result, items like healthcare spending make up a much larger share of the PCE index than in the CPI because many healthcare purchases are made by businesses or government on behalf of the consumer.

Another difference between the two surveys is that the PCE index accounts for substitution between goods and services as prices change by updating the weight of each expenditure component quarterly. Therefore, the PCE index more comprehensively reflects the current spending patterns of U.S. consumers. By contrast, the CPI uses weights that are updated every two years for a fixed basket of goods and services. As a result, the CPI tends to have an upward bias relative to the PCE index because many consumers may substitute items with lower price increases.

Finally, historical data used in the PCE price index can be revised to account for newly available information and improved measurement techniques. This allows the measure to be more consistent over time.

Despite the differences, the two inflation indicators have trended closely over the years, though CPI inflation has been consistently higher and more volatile than PCE inflation (Chart 2). For example, in March, PCE inflation rose 1 percent annually, while CPI inflation rose 1.5 percent. Both measures were well below the 2 percent FOMC target.



REGIONAL INFLATION VARIATION

CPI indexes are available for four regions of the United States and for selected metropolitan areas. While inflation can vary regionally, it has tracked closely with nationwide trends (Chart 3). In March, the Northeast, South, and West regions of the U.S. had inflation rates consistent with the nation at 1.5 percent. The Midwest region was slightly lower, at 1.4 percent. Across metropolitan areas where data is available, Chicago had the lowest inflation rate in March, at 0.9 percent, while New Jersey was the highest at 1.9 percent.

Within the Rocky Mountain region, a CPI price index is available for the Denver-Boulder-Greeley metropolitan area. This data is published semi-annually. Inflation in the area increased 2.1 percent in the second half of 2012 over the same period in the prior year, relative to 1.8 percent for the nation.

ENDNOTES

¹Federal Reserve Act, Section 2A.

²FOMC. Press Release: Federal Reserve issues FOMC statement of longer-run goals and policy strategy, January 25, 2012. <http://www.federalreserve.gov/newsevents/press/monetary/20120125c.htm>

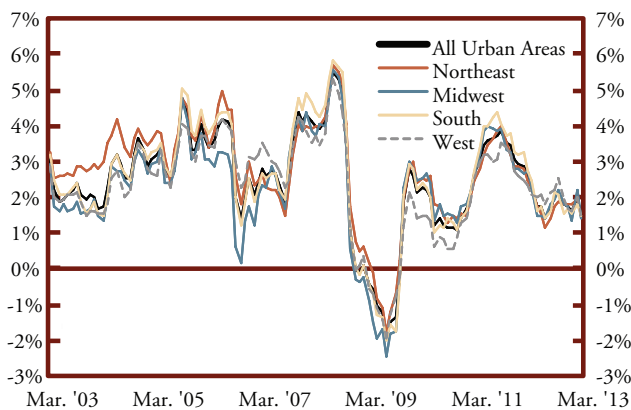
³Imputed rent is the amount of money that owner occupiers would have spent had they been renting. Estimates are based on the rents charged for similar tenant-occupied housing.

⁴Specifically, the consumer price index for all U.S. urban consumers is the measure used most commonly.

⁵Board of Governors. Monetary Policy Report to Congress. February 17, 2000. <http://www.federalreserve.gov/boarddocs/hh/2000/february/fullreport.htm>

CHART 3

*Regional CPI Inflation
Seasonally Adjusted*



Source: Bureau of Labor Statistics.



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