

Fed Challenge Brief:

Price Indexes

Overview

Macroeconomic Price Indexes are frequently cited as measures of inflation. They are worth studying for the following reasons:

One of the Fed's primary goals in price stability.

Price indexes are used to adjust salaries and benefits payments

Elements of the federal income tax system, including brackets and exemptions, are adjusted using the Consumer Price Index (CPI).

Both Social Security benefit payments and federal and state assistance payments are adjusted for inflation using price indexes.

Price indexes are used to deflate economic statistics, including Gross Domestic Product (GDP) and other national income data.

Considering Quality Changes

What are quality changes?

Advances in technology and practice allow for better services and goods. At the same time, they complicate the development and use of price indices because quality changes are often difficult to observe and quantify.

Indexing quality change:

Taking account of quality change means that indices measure the price of goods holding their quality constant. That is, if the quality of a good increases, the change in quality should be considered in calculating the index. Prices may go up because of higher quality goods rather than due to inflation.

Why quality change may be understated in current measures such as the CPI:

The CPI uses constant weights over long periods of time. This means that too much weight is placed on older products and not enough may be placed on modern products.

The introduction of new items into the CPI is a slow process; typically occurring long after their true economic impact has become significant.

New products are treated the same as older products and ignores performance increases.

Quality changes are even more difficult to measure for the services component of the economy than for manufacturing. This is because it is harder to quantify quality improvements in the service sector. Increased disparity has been introduced as the services sector has grown relative to the manufacturing sector.

Quality reversals:

Although less common or visible, there are counter examples where quality declines. Example: Overcrowding on the subway, which tends to worsen as a city's population grows and decreases quality of the service.

Definitions

Consumption bundle – an average basket of goods; e.g., a typical consumer's purchases.

Aggregate price index – used to compare the average price of a basket of goods in two different time periods.

Cost of living index – an aggregate price index that accurately measures changes in the cost of a basket of goods providing a constant level of satisfaction.

Deflators

Price deflators are used to distinguish real and nominal variables. They are commonly applied to estimates of output such as US Gross Domestic Product.

Deflators are typically calculated as a ratio of the current-dollar value corresponding to the chained-dollar value multiplied by 100.

The Implicit Price Deflator is used as a measure of inflation in the US economy and is released quarterly with the NIPA.

Additional Resources

Current data:

<http://www.bls.gov> - provides time series data

<http://www.stlouisfed.org/fred/> - provides time series data

<http://www.dismal.com> - offers release analysis

<http://www.yardeni.com> - offers graphing and analysis

Other resources:

Consumer Price Index: Frequently Asked Questions

<http://www.bls.gov/cpi/cpifaq.htm>

Producer Price Index: Frequently Asked Questions

<http://www.bls.gov/ppi/ppifaq.htm>

Consumer Price Index (CPI)

Description: The Consumer Price Index (CPI) is the most frequently cited figure for measuring changes in the aggregate price level. It reflects changes in the price of a fixed basket of more than 80,000 items that a typical urban consumer might purchase. It is often used to measure the cost of living, though it was not designed for that purpose.

Data Collection: Each month, the Bureau of Labor Statistics (BLS) sends its workers calling and visiting thousands of service establishments and retail stores across the country to obtain price information on the various items tracked by the CPI. The recorded information is collected and aggregated at the national center, where the data are reviewed and adjustments are made.

Producer Price Index (PPI)

Description: The Producer Price Index (PPI) is a family of indexes that measure the prices of various goods that producers purchase to make goods or provide services. The PPI aggregates the changes in the prices paid for over 10,000 individual products in nearly every sector of the U.S. economy.

Data Collection: Each month, economists at the Bureau of Labor Statistics (BLS) survey selected establishments and inquire into the prices and composition of the specific goods and services that are reported by the PPI.

Personal Consumption Expenditures Chain-Type Price Index

Description: The Personal Consumption Expenditures Chain-Type Price Index (PCE) **is becoming an increasingly popular measurement for changes in the aggregate price level.** It measures the changes in prices of all goods purchased by consumers for a given quarter.

Market Basket: because the PCE index is derived from the National Income and Product Accounts data, it tracks the prices of all of the goods and services purchased by U.S. consumers in a given quarter.

Data Collection: Information on personal consumption expenditures is tabulated by the Bureau of Economic Analysis and released on a quarterly basis.

Problems and Limitations of the PCE:

This index requires many more resources to construct than do other indexes, such as the CPI. Also, the PCE is an aggregate measure and can be misleading if separate portions of the economy are experiencing differing shifts in the price level.

Considering Substitution Bias and Changing Tastes

Substitution bias can occur at two levels:

Basic level – consumers can be induced to substitute between goods within an individual category such as computers. This is known as price-induced substitution.

Substitution can also occur as consumers substitute apples for oranges so to speak, shifting consumption patterns to lower cost goods in different categories to achieve a higher level of satisfaction with a limited budget.

Substitution implies that different baskets of goods can represent equivalent standards of living.

Changes in Consumer Preferences or Tastes:

With any fixed basket of goods where the weights attached to each commodity is fixed, even for a period of time, the index is susceptible to inaccuracy when consumption preferences shift demand into a new basket. Current price indices which are not chain weighted are particularly susceptible to this form of bias.