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How USDA Forecasts Retail Food Price Inflation

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What Is the Issue?

Each month, USDA's Economic Research Service (ERS) publishes wholesale and retail price forecasts for various food categories and subcategories, and policymakers, food suppliers, and researchers rely on these numbers. In recent years, as commodity and food prices have become more volatile and less easily predicted, users of the forecasts have expressed a greater need for more accurate forecasts.

ERS continually explores ways to improve its forecasts as new data and methods become available. In 2011, ERS revised its food price forecast methodology to use more rigorous statistical techniques and capture the impacts of the multistage U.S. food supply system on wholesale and retail food price formation. This updated approach incorporates far richer data available for farm, wholesale, and input prices, which could lead to more accurate forecasts.

What Did the Study Find?

- The precision of ERS food price forecasts has observably improved with the revised methodology. As a result, ERS food price forecasts are, on average, closer to the realized inflation figures.
- ERS forecasts using the new methodology required fewer and smaller revisions. For a given year, forecasts are subject to revision during a 17-month period. An average of 3.2 changes were made per food category using the new, current forecasting methods compared with 3.7 revisions using the previous method, and the average size of the adjustments dropped from 2.6 to 2.1 percentage points.
- Another measure of forecast accuracy was the extent to which initial forecasts differed from the actual Consumer Price Index (CPI) values. Using revised forecast methodology, the average difference from CPI values was 2 percentage points, compared with 2.6 percentage points for the previous methods.
- Although forecast accuracy and precision have improved relative to less rigorous approaches used by ERS before 2011, more years of data are needed to fully assess forecast performance.

ERS is a primary source of economic research and analysis from the U.S. Department of Agriculture, providing timely information on economic and policy issues related to agriculture, food, the environment, and rural America.

How Was the Study Conducted?

For those food categories with a sufficiently lengthy time series of historical retail and input prices, as well as reliable measures of forecast input prices, four separate vertical price transmission models are used to predict farm, wholesale, and retail-level food prices. The vertical price transmission approach relies on price forecasts at earlier stages of the production process, which are then “passed through” to forecast the CPI for food. For those categories subject to data limitations that preclude use of the vertical price transmission method, the autoregressive moving-average approach is used, which relies on lagged and current values of the CPI being forecast, as well as a time trend.

The accuracy of the current forecasting method is compared with the forecasting method used by ERS before 2011. Performance of the current forecasting methods is evaluated over the 2011-2013 period and compared with the performance of the previously used univariate moving average approach, which is evaluated over the 2003-2010 period. Various measures of forecast accuracy and adjustments are used to evaluate forecast performance.

Finally, the forecasting accuracies of the four vertical price transmission models are compared with each other using various performance statistics over the 2012-2013 period. Several accuracy tests were conducted, including a directional analysis to examine the extent to which the forecast models anticipate changes in the direction of price movements.