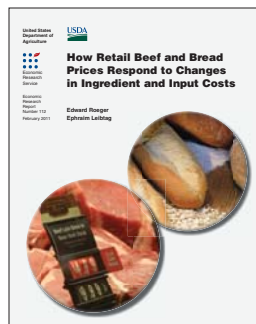


ERS *Report Summary*

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How Retail Beef and Bread Prices Respond to Changes in Ingredient and Input Costs

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What Is the Issue?

Periodic spikes in the prices of major field crops and related commodities such as those from 1971 to 1974, 1994 to 1996, and 2006 to 2008 have stimulated questions about how these shocks affect wholesale and retail food prices. To what extent do wholesale food prices respond to changes in the underlying costs of inputs? How much of a change in input costs is passed through to retail prices and how long does it take for such cost changes to pass through?

Retail and wholesale prices will generally follow upstream commodity prices directionally, but there are often factors that limit this responsiveness. The extent to which price changes are passed through depends on the value added by each producer in the production process and a number of other organizational and marketing factors at each stage of production, leading to input price changes that are only partially reflected in later stages of the supply chain, and, at times, a lack of measurable response in the downstream product's price.

In this study, we develop price pass-through models for farm-to-wholesale and wholesale-to-retail price changes using 36 years of monthly Bureau of Labor Statistics price indices data (1972-2008). We focus on the wheat to retail bread and the cattle to retail beef chains because they represent examples of supply chains with significantly different degrees of processing between stages.

What Were the Major Findings?

Pass-through rates and timing can vary dynamically between prices at different stages in the supply chain, across food categories, and for a given relationship over time.

- A more processed item (bread/wheat flour) showed less response to upstream price changes than did a less processed item (retail/wholesale beef).
 - Retail beef prices typically incorporated between 19 to 29 percent of a change in the wholesale beef price after 6 months, while wholesale beef prices incorporated 52 to 54 percent of the change cattle prices.
 - Retail bread prices typically incorporated 16 to 21 percent of wholesale wheat flour price changes, while wholesale prices of wheat flour incorporated 29 to 31 percent of changes in wheat commodity prices.

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- Wholesale prices for beef and wheat flour both responded in a generally symmetric manner to changes in farm prices regardless of the size and direction of change, while retail prices for both beef and bread for which prices adjusted asymmetrically (especially in more recent years), with the adjustment dependent upon the characteristics of the wholesale price change.
- For both beef and bread, most of the change at the farm level was passed on to the wholesale stage within the first month, with some additional adjustments to the long-term equilibrium price after that.
- Retail prices had a more complicated response to wholesale price changes, and for both bread and beef, the pass-through from wholesale to retail was weaker than the pass-through from farm to wholesale. Retail price responses were strongest when wholesale prices were relatively high. When prices were more stable or in times of price declines, significant pass-through often did not appear for several months.

How Was the Study Conducted?

We analyze the farm-to-wholesale and wholesale-to-retail price relationships using a two-stage error correction model that allows for the possibility of asymmetric price response. We also test for structural breaks in the long-term (cointegrating) relationships. Variations in the response of the downstream prices that are dependent on the magnitude and/or sign of changes in the upstream prices are modeled by considering a threshold-type response based on the downstream price's position relative to the expected long-term relationship.

This research extends the work of recent empirical studies that have investigated the complexity of commodity pass-through relationships using newly developed statistical tools. We characterize price-response behavior in a manner that is not overly influenced by any short-term market conditions that can dominate samples of fewer years by including a long time period and considering different possible types of asymmetric price adjustment. Our models also allow more freedom for the relationships between points in the supply chain to vary for a given food group and include energy and labor variables as short-term inputs.