



Find the full report at www.ers.usda.gov/publications/err-economic-research-report/err-160.aspx

How Transportation Costs Affect Fresh Fruit and Vegetable Prices

Richard Volpe, Edward Roeger, and Ephraim Leibtag

What Is the Issue?

Fuel prices, understood to be a major driver of food prices in the United States, can have significant impacts on food price levels and volatility. Since consumer demand for fruits and vegetables has been proven to be price-sensitive, fuel price surges could significantly reduce U.S. consumption of fresh produce, at least in the short term. There has been little empirical research to calculate the magnitude of fuel price changes on food prices and how this effect might vary across markets, based on transportation distance or commodity attributes. This study analyzes the relationship between fuel prices and wholesale produce prices using data for 2000-2009. Fresh produce provides particularly clear insight into the effects of transportation costs on food prices, because fruits and vegetables typically have few processing or other non-transport expenses and they have clear geographic origins.

What Did the Study Find?

The study affirmed that, in general, as the distance from the produce source increases, the impact on wholesale prices of higher fuel prices also increases. However, the extent of that impact depends on the transportation method, importation and seasonality issues, and perishability.

- Fuel prices are a statistically significant factor in determining the difference between domestic wholesale and farm-level produce prices. For produce shipped by truck, these price margins are increasingly sensitive to fuel prices as the distance traveled from the growing source lengthens.
- Fuel price volatility can lead to substantial geographic variation in produce prices within the United States.
- Truck transport rates, which increase with fuel prices, are the most likely conduit of fuel price effects on produce prices. In general, the sensitivity of truck rates to fuel prices increases linearly with distance traveled. For example, an increase in national fuel prices widens the margin for California-grown produce considerably more in Boston than in Los Angeles. This distance/price relationship has been taken for granted, and there has been little attempt to establish it empirically.
- However, truck transportation rates do not necessarily vary only with route length. For example, the distance from the San Joaquin Valley to Dallas is less than half that to Boston, but the average truck rate is more than half.

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.

- A 100-percent increase in diesel prices would lead to a short-term wholesale produce price increase of 20 to 28 percent, on average. However, this could differ across shipping routes and commodities. The impacts on imported produce would likely be much smaller.
- The effect of fuel price increases on wholesale produce prices varies by commodity characteristics:
 - * For commodities with multiple growing sources, robust imports, and weak seasonality (e.g., grapes and asparagus), fuel price effects are significant but vary across geographic markets and seasons.
 - * For commodities with clear growing seasons and few major import sources (e.g., cantaloupes and oranges), fuel price effects are more constant, with a discernible relationship between price increases, seasonality, and transportation distance.
- The prices of commodities with larger import shares generally exhibit less fuel price sensitivity. This is likely because air and ship transport are considerably less energy-intensive per mile than truck transport.

How Was the Study Conducted?

This report uses wholesale fresh fruit and vegetable prices collected by the USDA Agricultural Marketing Service (AMS) for 13 wholesale (terminal) market locations. These large markets were selected to span the United States, providing transportation routes of varying lengths for both domestic and imported produce. Fuel prices and truck transportation rates were also available from AMS. The data cover 2000-2009. The study relies on regression analysis to identify the impact of fuel prices on transportation costs, margins, and wholesale prices.