



# Impact of Rising Diesel Prices and Truck-Driver Availability on Food Transportation and Distribution (Summary)

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This is a summary of "Impact of Rising Diesel Prices and Truck-Driver Availability on Food Transportation and Distribution" by Jim Shi and Jasmine (Aichih) Chang.<sup>1</sup> This research and analysis received funding from USDA's Agricultural Marketing Service (AMS) through cooperative agreement number 22-TMTSD-NJ-0003. The opinions and conclusions expressed are the authors' and do not necessarily reflect the views of USDA or the Agricultural Marketing Service. The full report is available online at: <https://web.njit.edu/~jshi/USDA%20Report-2025-Shi%20and%20Chang.pdf>.

## WHAT IS THE ISSUE?

In recent years, rising transportation costs have played a role in food price increases, and trucking representing a majority of those transportation costs domestically. In the United States, trucks ship 83 percent of agricultural products and 92 percent of dairy, fruit, vegetables, and nuts. Because rising food prices reduce consumers' ability to afford food, this study explores how truck transportation costs affect food prices.

According to Cass Information Systems, trucking costs rose 6.5 percent from February to March 2022, almost double the increase in freight demand (3.4 percent). The American Transportation Research Institute, in its *2023 Operational Cost of Trucking Report*, noted that 2022 was the costliest year on record to operate in the trucking industry—whether or not fuel costs were included. The average operational cost of trucking surpassed \$2.25 per mile in 2022. The cost increases were largely driven by changes spawned by the COVID-19 pandemic. In recent years, especially during the pandemic, the two main sources of trucking costs—surging fuel prices and a lack of available drivers—became more pronounced. As a result, truck rates rose, and these higher costs trickled down to restaurants, grocery stores, and ultimately, consumers.

Of the two major trucking factors (fuel prices and driver availability) contributing to rising food prices, driver availability has received less attention. Despite the incentive of relatively high wages, recruitment and retention have been decades-long challenges for the industry, especially in the for-hire long-distance truckload sector. Driver wages and benefits account

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for more than 40 percent of the marginal expense—the single-largest trucking operational cost. The average annual turnover rate of long-haul truckers was reported at 94 percent before the pandemic and was estimated to reach 150 percent after the pandemic.

Little empirical research has examined the influence of fuel prices in conjunction with driver availability on food transportation and distribution costs. However, the most relevant historical study, Volpe et al. (2013), provided insights into the ways fuel prices are transmitted to wholesale-produce prices through transportation costs.

Building on the research of Volpe et al., which used only fuel price to represent transportation costs, the current study broke down truck-shipping costs into two major components: fuel price and truck-driver availability, which accounted for almost 70 percent of marginal shipping costs.<sup>2</sup> Also, in contrast to the Volpe study, which focused only on California-sourced produce, the current study analyzed data that included food sourced from 16 States and shipped to 9 terminal markets, from 2017 to 2022. With these data, the current study analyzed the impact of surging fuel prices and truck-driver availability on food transportation costs and, in turn, on the retail price of four of the most popularly consumed produce items: onions, potatoes, apples, and tomatoes.

## **HOW WAS THE STUDY CONDUCTED?**

To examine the transportation impacts on food prices, the researchers compiled and analyzed Panel data from January 2017 to December 2022. By controlling attributes of food type, origin, and destination, the Fixed Effects Regression approach was used to isolate the transportation effect on food prices. Food types were controlled to account for the price differences between qualities and varieties (e.g., Gala, Fuji, Golden Crispy apples, etc.). Food sources and shipping destinations were also fixed to account for the cost differences among States (e.g., labor, diesel, shipping distance, etc.).

Based on data availability and the most purchased fresh food commodities, the researchers selected four food items as the study's focal commodities—apples, onions, tomatoes, and potatoes. Potatoes, onions, and tomatoes ranked as the three most purchased vegetables in U.S. markets in 2022; apples were the most consumed fruit, followed closely by oranges.

The dependent variable in the model was the price spread from shipping, which was calculated as the incremental price from the shipping point to the terminal market. The shipping price spread was used instead of the terminal market price to focus on transportation effects. To study the transportation impact on food prices, the researchers focused on two key independent variables—diesel price and truck-driver availability. In addition, three controlled variables (consumer price index, seasonality, and the presence of COVID) were also used in the model.

## **WHAT DID THE STUDY FIND?**

In nearly all hypothetical scenarios for all four commodities, the researchers found that food prices increased when truck drivers were in short supply and/or diesel prices rose. (The effect of truck-driver availability on onions was the one exception.) The magnitude of these impacts varied by food type: prices of three of the four items (apples, potatoes, and tomatoes) rose during the post-pandemic period (2020-22) study period, with increases ranging from 1.8¢ per pound (for apples) to 4.3¢ per pound (for potatoes). Detailed results are discussed below.

**Of all studied commodities, onion and potato prices were the most sensitive to transportation costs.** When both diesel price and truck-driver availability were considered, potato prices were the most sensitive to transportation costs, among the four studied commodities. Because potatoes were (and are) mostly grown in Idaho—far from major transport hubs like California, New York, and Texas—potatoes' supply chain relies heavily on truck transportation. Without other transport options, potato prices unavoidably absorbed fluctuations in truck-driver availability and diesel prices. Onions—grown in Washington (far from major markets)—showed similar sensitivity to truck-driver availability and diesel prices.

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<sup>2</sup> Fuel costs and driver wages and benefits accounted for 28.5 percent and 40.3 percent of marginal cost per mile, respectively, in 2022 (Leslie and Murray, 2023).

**Apple prices were less sensitive to transportation costs than onion and potato prices.** Like onions and potatoes, Washington-grown apples were (and are) also far from major markets. Yet, despite that similarity, apples were less sensitive to transportation costs, but more sensitive to other costs, such as storage, because of apples' stringent storage requirements and shorter shelf life. For example, apples in Washington are harvested from August to early November and later placed in cold storage to supply the national market year-round.

**Tomato prices were the least sensitive to transportation costs.** Mainly imported from Mexico through Texas and Arizona, tomatoes have a shipping window of only 5 days—part of which is already spent by the time the tomatoes reach the U.S. border by truck. Because of the product's perishability and its very brief shipping window from the U.S. border, shippers have few options for tomatoes apart from shipping them immediately. (Storage options for tomatoes are more limited than for other commodities.)

**Food prices are more sensitive to changes in fuel prices than to truck driver availability.** During the study period (2017-22), the average effect of an increase in diesel price was a rise of 1.8¢ per pound across the four selected commodities. Meanwhile, the average effect of a decrease in truck-driver availability was a rise of 0.6¢ per pound. From January 2020 (just before the COVID-19 pandemic) to December 2022, the price increases for the four commodities ranged from 2.05 percent (for apples) to 8.78 percent (for potatoes).<sup>3</sup>

Broken down by commodity, post-pandemic price increases have been statistically significant for potatoes, apples, and tomatoes, but statistically insignificant for onions. Specifically, diesel price increases precipitated estimated per pound price increases of 10.3¢ for potatoes, 7.2¢ for apples, and 3.3¢ for tomatoes.

More than apple prices, potato and tomato prices were sensitive to COVID-19-related changes—possibly, because of production differences between vegetables and fruits. For example, vegetable production often requires more intensive labor for planting, harvesting, and processing. During the COVID-19 lockdown, disruptions in labor availability led to reduced production, higher production costs, and, later, higher food prices.

## **PREFERRED CITATION**

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<sup>3</sup> The percent increase in price is calculated by dividing the coefficient by its unit price, which allows us to compare the relative impact of transportation. For example, the apple's coefficient of the COVID-19 variable is 1.8¢, divided by its unit price, \$0.88 per pound, and the relative effect of COVID is a 2.05 percent increase. After COVID-19, the average apple price increased 2.05 percent.