



# The Determinants of Bulk Truck Rates (Summary)

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This is a summary of *The Determinants of Bulk Truck Rates* by Hanouf Alhunayshil, Jake Wagner, Wisnu Sugiarto, and Eric Jessup.<sup>1</sup> This research and analysis received funding from USDA's Agricultural Marketing Service (AMS) through cooperative agreement number 22-TMTSD-WA-0004. 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://wpcdn.web.wsu.edu/cahnrs/uploads/sites/5/The-Determinants-of-Bulk-Truck-Rates.pdf>.

## WHAT IS THE ISSUE?

To access domestic and international markets, agricultural producers depend on efficient transportation, including trucking. Trucks are the primary mode for transporting agricultural products from the farm to grain elevators, processing plants, intermodal terminals, and other modes of transportation (e.g., barge and rail loaders). However, a general lack of agricultural truck rate data, particularly on hopper, tanker, and other agricultural trailers, prevents agricultural producers and policy makers from better understanding this important market segment.

Given producers' heavy reliance on trucking—as well as the significance of trucking costs for agricultural bulk products—this research provides a detailed nationwide analysis of the key trends in agricultural trucking activities and the factors affecting agricultural bulk truck rates in a first-of-its-kind study. Such information is useful in making operating decisions (including truck ownership and mode choice tradeoffs); negotiating rates; and understanding where and when to ship. Such information can also be helpful in forecasting rates and understanding relevant policy implications (e.g., the impact of increased fuel taxes).

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## HOW WAS THE STUDY CONDUCTED?

The determinants of bulk truck rates were identified using a set of panel data models. Each model was estimated on truck rate data collected from Bulkloads.com, an online truck service loadboard specializing in bulk freight shipments. These data provide historical information on weekly bulk load shipment transactions from January 2017 through December 2023. The data include trailer type, commodity type, truck rate per mile, and truck rate per ton for origin-destination city pairs throughout the United States. Bulk commodities in the data include feed ingredients, fertilizer, grain, industrial, aggregates, metal/recycling, liquid, and other. Truck rates from each origin State to each destination State were assumed to be a function of fuel prices, wages, unemployment, and gross domestic product (GDP).<sup>2</sup>

## WHAT DID THE STUDY FIND?

**Midwest Has Most Trucking Activity.** Most trucking activity within the Bulkloads data originates from and is destined to the Midwest region.<sup>3</sup> The top three origin States are Iowa, Missouri, and Kansas, while the top three destination States are Texas, Missouri, and Iowa.

Notably, intra-State trips are among the most frequent truck routes—e.g., the most frequent trips to Alabama also originate from Alabama, and the same intra-State pattern is observed in Arkansas, California, and Texas. New England States—such as Maine, New Hampshire, and Rhode Island—have the least overall agricultural trucking activity (including intra- and interstate activity).

**Hoppers—Most Popular Trailer Type.** Hoppers are the most popular trailer type in the data, almost twice as popular as end dumps—the next most frequent trailer type. In comparison, belt, tanker, and walking floor trailers represent only a small fraction of uses by trailer type.

**Regional Rate per Ton: Gulf Coast Has Highest, and Midwest Has Lowest.** On a regional level, bulk trucking activity originating and ending in the Gulf Coast region has the highest average rate per ton at \$54.66/ton, while Midwest activity has the lowest at \$41.64/ton.

The New England region has the highest average rate per mile at \$13.98, and the Rocky Mountain region has the lowest at \$3.89. The West Coast region (excluding California) and the Midwest also have low average rates per mile at \$4.20 and \$4.60, respectively. The Midwest and Rocky Mountain regions generally have lower per ton and per mile rates than other regions.

**Current Truck Rates Are Influenced by Prior Truck Rates.** Higher (lower) truck rates per mile in the current period are influenced by higher (lower) truck rates from the previous period. That is, truck rates are persistent. Specifically, a 1-percent increase in the previous period's truck rate corresponds to a 0.24-percent increase in the current period's truck rate. At the mean truck rate, this finding indicates a 2.97-cent increase in truck rates in the previous period causes a 0.7-cent increase in the current truck rate. The persistent influence of recent historical truck rates underscores the need for accurate historical data to understand current market truck rates and predict short-term future rates.

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<sup>2</sup> The persistence of past conditions (truck rates, wages, etc.) on “current” rates are controlled by using lagged variables. A lagged variable represents a value from a past (or “previous”) time period, which is used to account for the effect of a past value on the “current” value of the target variable. In this study, truck rates are lagged 1 month for each origin to destination. For example, for each origin-destination pair, truck rates in January 2017 (referred to as “previous” period) are expected to impact rates in February 2017 (referred to as “current” period). This observation process is repeated for every month from January 2017 to December 2023 (the duration of the study period).

<sup>3</sup> Bulkloads has the most comprehensive database of bulk trucking activity across North America. While it is not representative of all trucking activity, the finding that most trucking activity is concentrated in the Midwest is unsurprisingly reflective of the nature of agricultural trucking activity, which occurs predominantly in the Midwest—the epicenter of U.S. grain production and shipping.

**Fuel Prices—Another Key Determinant of Truck Rates.** Fuel prices also determine truck rates: fuel prices and truck rates move in the same direction, such that higher fuel prices are associated with higher truck rates. Specifically, a 1-percent increase in fuel price causes a 0.49-percent increase in per mile truck rates. This finding indicates a \$0.005-increase in the mean per-mile fuel prices causes a \$0.014-increase in truck rate. That is, for every 10-cent increase in per mile fuel prices, per mile truck rates are expected to increase by approximately 30 cents. Likewise, for every 10-cent increase in per gallon fuel prices, per mile truck rates are expected to rise by approximately 4.2 cents. This finding highlights the critical impact of fuel costs on trucking rates. The authors note that government policy interventions targeting fuel prices can affect transportation costs.

**Drivers' Wages Do Not Affect Truck Rates per Mile.** Drivers' current wages and their wages from the previous period do not have a statistically significant effect on truck rates per mile. The fact that farmers alternate between for-hire and farm-operated trucks may have dampened a potentially significant effect of wages on bulk rates.

## **PREFERRED CITATION**

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