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Owner-Operator versus Company-Driver Safety Performance Analysis

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Owner-Operator versus Company-Driver Safety Performance Analysis

Abstract

The safety performance of motor carriers is a serious concern in the trucking industry and is a top priority for the U.S. Department of Transportation. This study explored the extent to which a carrier's use of owner-operators and/or company drivers affects safety performance. Two primary research questions were addressed: how does motor carrier firm size relate to organizational flexibility, or the use of owner-operators versus company drivers, and does organizational flexibility affect safety performance? The study also examined whether safety performance varies by industry segment. A dataset based on data obtained for a previous study was created that includes equipment ownership profile information for approximately 108,780 motor carriers. An analysis of the data indicated that the larger the firm, the lower the use of company drivers; contrary to expectations, the use of company drivers results in poorer safety performance; and safety performance varies by industry segment.

Keywords

Commercial drivers, motor carriers, owner operators, safety, trucking safety, truck lines, company drivers, safety performance

Disciplines

Civil Engineering

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tech transfer summary

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RESEARCH PROJECT TITLE

Owner-Operator versus Company-Driver Safety Performance Analysis

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The Midwest Transportation Center (MTC) is a regional University Transportation Center (UTC). Iowa State University, through its Institute for Transportation (InTrans), is the MTC lead institution.

MTC's research focus area is State of Good Repair, a key program under the 2012 federal transportation bill, the Moving Ahead for Progress in the 21st Century Act (MAP-21). MTC research focuses on data-driven performance measures of transportation infrastructure, traffic safety, and project construction.

The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the project sponsors.

Safety is a serious concern in the trucking industry and it is of paramount importance that industry and government find ways to make progress on the safety performance of motor carriers.

Background and Problem Statement

The Federal Motor Carrier Safety Administration (FMCSA) reported that, in 2013, more than 3,800 fatal crashes and 385,000 non-fatal crashes across the US involved at least one large truck or bus. While the FMCSA has implemented safety practices to reduce the number and severity of accidents, additional work needs to be pursued to improve the safety performance of US motor carriers.

Further research is needed to understand how motor carriers are affected by their use of owner-operators versus company drivers. This is a timely issue because carriers often remain competitive by outsourcing their driver and commercial motor vehicle equipment needs to third-party logistics providers to meet customer demands.

Meanwhile, previous research has found that the type of driver directly affects a firm's safety performance. While company drivers have been found to have better safety performance than owner-operators, company drivers are actually involved in more crashes.

An owner-operator versus company-driver safety model is needed to enhance our understanding of how the FMCSA can continue to improve the safety performance of commercial motor carriers by exploring the extent to which a carrier's use of owner-operators and/or company drivers affects safety performance (e.g., state-reportable crashes).



Screenshot from a video camera used on I-35 during a previous research study (Image: Institute for Transportation)

Objectives

The primary objective of this research was to help improve the safety performance of commercial motor carriers. A related objective was to assess the extent to which firm size relates to organizational flexibility (i.e., the adoption of owner-operators or company drivers).

Research Methodology

Three hypotheses were evaluated:

- The larger the firm, the lower the use of company drivers.
- A higher level of use of company drivers is positively related to firm safety performance.
- The effect of use of company drivers on firm safety performance varies across industry commodity segments.

The data used in this study were obtained from the Volpe National Transportation Systems Center, which provided data for approximately 108,780 motor carriers from the Motor Carrier Management Information System (MCMIS). A dataset was created containing equipment ownership profile information. The researchers used the equipment profile data as a proxy for owner-operator usage.

Most carriers in the sample participate in the general freight, building materials, large machinery, refrigerated produce, and fresh produce industries and have, on average, 28 tractors (power units).

Dependent variables included driver out-of-service (OOS) rate, the number of driver OOS inspections divided by the number of total driver inspections; vehicle out-of-service rate, the number of vehicle OOS inspections divided by the number of total vehicle inspections; and crash rate, the total number of crashes the firm was involved in divided by the size of the firm in terms of total number of power units.

The key independent variable was the use of company drivers, which was operationalized as the ratio of owned tractors to total tractors in a carrier's fleet. Firm size was operationalized as the firm's total number of power units. The carrier's operating segment/commodity segment was also controlled for.

Ordinary least squares (OLS) regression models were used to test the hypothesized relationships.

Key Findings

- Statistical support was found for the hypothesis that as firm size increases, firms pursue organizational flexibility in terms of increased use of owner-operators. Anecdotal support in the trade press literature confirmed that some larger firms prefer outsourcing as a way to avoid vehicle maintenance responsibilities and gain access to modern equipment that can improve service quality and mitigate safety concerns.

- The use of company drivers was found to negatively affect safety performance, which disproved the second hypothesis.
- The effect of using company drivers on firm safety performance was found to vary across industry commodity segments.

Implementation Readiness and Benefits

This study provides important theoretical and empirical contributions to the motor carrier safety literature, conceptually links use of company drivers or owner-operators to the concept of organizational flexibility, and offers important managerial and public policy implications.

- An owner-operator versus company-driver safety model can demonstrate the need to provide additional safety resources to motor carriers that rely heavily on company drivers.
- Motor carrier firms that are best positioned to respond to capacity changes are those that have the resources to invest in technology solutions to monitor the outsourced partners' behavior.
- Company drivers may have poorer safety performance because profit margins in the industry are small, and thus motor carriers may not allocate adequate funds to equipment maintenance. Carriers also may not be able to rapidly adapt to the proper equipment configurations necessary to safely haul freight. Moreover, firms may lack control over their drivers and equipment due to a lack of effective monitoring.
- Regulatory changes may be needed to encourage modernization of motor carrier fleets and provide more resources to monitor the behavior of a carrier's drivers and owner-operators.
- The variety of commodity segments in the US motor carrier industry requires flexible operating strategies and equipment in order to safely haul freight. More work needs to be done to enforce proper equipment configurations and training so that motor carriers operate more safely.

Future Research

- Future research should attempt to address issues of causation by collecting longitudinal data to supplement the cross-sectional archival data set used in this study.
- A case study approach can be used to explore some of the behavioral and environmental uncertainties associated with the decision to use company drivers or owner-operators.
- Future studies should seek to understand the nature and extent of information technology use among company drivers and owner-operators.