Logistic Regression Approach to Predicting Truck Driver Turnover

S. Scott Nadler, Department of Marketing and Management, University of Central Arkansas, Conway, AR, USA

John F. Kros, Department of Marketing and Supply Chain Management, East Carolina University, Greenville, NC, USA

ABSTRACT

The purpose of this study is to identify those constructs that lead to driver turnover. The theory of reasoned action (TRA), originating in the social psychology literature is the theoretical approach in this study. Interviews with drivers were conducted using the intercept method to develop a survey instrument. The survey was then administered to drivers at large truck stops. This study makes contributions on two fronts. From a managerial perspective the study results indicate that companies can use a technique such as this model as part of their driver retention efforts in order to create competitive advantage by increasing efficiency and cutting costs. The resulting logistic regression model, based on four factors, accounts for eighty eight percent of the variance and accurately predicts which drivers or driver classes are most at risk of turning over.

Keywords: Driver Turnover, Logistics, Supply Chain Management, Theory of Reasoned Action (TRA), Truck Driver Retention

INTRODUCTION

One of the most important and complex problems facing both motor carriers and supply chains is the high rate of driver turnover (Patton, Park, & Lockridge, 2011) which currently exceeds 100 percent (McNally, 2013). The Advanced Center for Transportation Technologies at Clark College (2006) estimated that driver shortages and turnover costs the U.S. economy between $1.8 and $3 billion annually. Min and Lambert (2002) put these numbers in perspective and estimated that it costs between $3000 to $12,000 to replace a driver depending on the amount of time and money that the company must invest in the hiring, orientation, and training. During the course of this study we found that this figure now ranges from $7,000 to $10,000 to hire an experienced driver with no orientation or training costs to between $20,000 and $27,000 if these services are provided. This updated finding is generally supported by an industry report which placed the cost of replacing a driver at $25,000 (Refrigerated Transporter, 2007). High driver turnover rates have been found to increase carriers’ operating costs, reduce driver productivity and result in reductions in service quality and highway safety.

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High driver turnover rates have also been found to impact shippers when carriers are unable to meet pick-up and delivery schedules due to a lack of drivers or when frustrated or overworked drivers simply walk away and leave their trucks sitting on the side of the road (Keller & Ozment, 1999a; LeMay, Williams, & Garver, 2009).

Consequently, driver turnover and retention has been studied from many perspectives. These perspectives include but are not limited to driver recruitment and retention practices (LeMay, Taylor, & Turner, 1993; Gupta, Jenkins, & Delery, 1996; Stephenson & Fox, 1996; Keller & Ozment, 1999b; Keller, 2002; Min & Lambert, 2002; Suzuki, Crum, & Pautsch, 2009), driver training (Mejza & Corsi, 1999; Mejza, Barnard, Corsi, & Keane, 2003), work conditions (Rodriguez & Griffen, 1990; LeMay et al. 1993; Richard, LeMay, & Taylor, 1995; Stephenson & Fox, 1996; Keller & Ozment, 1999a; Keller, 2002; Min & Lambert, 2002; Suzuki et al. 2009), equipment (Garver, Williams, & Taylor, 2008), compensation (Rodriguez & Griffen, 1990; LeMay et al. 1993; Richard, LeMay, & Taylor, 1995; Gupta et al. 1996; Shaw, Delery, & Jenkins, 1998; Stephenson & Fox, 1996; Keller & Ozment, 1999b; Keller, 2002; Min & Lambert, 2002; Suzuki et al. 2009), demographic characteristics (Beilock & Capelle, 1990; Shaw et al. 1998; Min & Lambert, 2002; Suzuki et al. 2009), employment stability and past safety behavior (Cantor, Corsi, Grimm, & Ozpolat, 2010), driver needs (Williams, Garver, & Taylor, 2011), the role of dispatchers or driver managers (Richard et al. 1995; Gupta et al. 1996; Stephenson & Fox, 1996; Keller & Ozment, 1999ab; Keller, 2002; Suzuki et al. 2009), dispatching procedures (Taylor & Whicker, 2010), drivers’ relationship with top management (LeMay & Taylor, 1988), justice in the workplace (Cantor et al 2011), and driver satisfaction and frustration (Keller & Ozment, 1999b; Johnson, Bristow, McClure, & Schneider, 2010; LeMay et al. 2009). Other research in this area has looked at predicting which drivers are most at risk of turning over (Richard et al. 1995; Min & Emam, 2003; Garver et al. 2008; Suzuki et al. 2009). Readers may also gain useful insights from Crum & Morrow (2002).

Given the fact that driver turnover rates are increasing yet again due to the improving economy and regulatory mandates the purpose of this study is to determine why truck drivers turn over or churn. To accomplish the stated objective of this study the next section will address the research hypotheses which are based on the theory of reasoned action. The research hypotheses were tested using logistic regression. Logistic regression was chosen for this study due to its ability to analyze a combination of scale and categorical variables for the purpose of prediction and because it has been used for similar purposes in the job performance (e.g. Jackofsky, Ferris & Breckenridge, 1986), job turnover (e.g. Mano-Negrin & Kirschenbaum, 1999), and driver health (Dahla, Kaerlev, Jensen, Tuchsen, Hannerz, Nielsen, & Olsen, 2009; Valway, Jenison, Keller, Vega-Hernandez & McCree, 2009) literature. The authors then provide a discussion of the study results that were obtained from a survey of 154 Class 8 truck drivers that were employed by a diverse group of long haul truck load carriers across the United States. Discourse is then provided on study findings, managerial recommendations, implications for future research, and study conclusions.

This study contributes to the driver turnover and retention literature by presenting and empirically testing the influence of the four constructs identified in this study. This study contributes to the practice by speaking to the need for managers to develop programs in order to better manage the perceptions of their internal stakeholders (truck drivers) in order to reduce the costly negative impacts associated with high rates of driver turnover. The next section presents an overview of the theory of reasoned action which provides the theoretical support for our research hypotheses.
Coordination and Decision of Supply Chain Under: Price-Dependent Demand and Customer Balking Behavior
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