Chapter 15
Transformative Analytics and Logistics Pricing: How Business Intelligence Can Inform Logistics

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ABSTRACT

Raw materials and products are moved and created globally through complex supply chains. Within those supply chains, logistics is what enables the goods to move through distribution and reach the end consumer. Being such a widely used process, this is what motivates the researchers to examine the logistics portion of the supply chain from an analytical perspective and attempt to determine the relationship between various market forces and their impact on the cost of logistics. This will be accomplished with transformative analytics techniques, such as multivariate regression modeling focusing on areas such as directionality and precipitation. That should enable logistics managers, researchers, and others to better understand the factors that go into the cost of logistics services, and thus impact pricing of goods dependent on those services. In a world where logistics managers rely heavily on “gut feel,” utilizing business intelligence and analytics can better enable decision making.

INTRODUCTION

Raw materials and products are moved and created globally through complex supply chains. Within those supply chains, logistics is the engine that enables raw materials and finished goods to move from the various suppliers to the manufacturer, through distribution and to the end consumer. This phenomenon drives pricing of goods and is what motivates the researchers to examine the logistics portion of the
supply chain. This research determines the relationship between various market forces and their impact on logistics cost. This area is ripe for transformative analytic techniques that will enable logistics managers, researchers and others to better understand the cost of logistics services and thus impact pricing of goods dependent on those services.

Based on the survey conducted by Accenture in 2014, more than one-third of the respondents reported being engaged in serious conversations to deploy analytics in supply chain management; and three out of ten already have an initiative in place to implement analytics. (Wang, Gunasekaran, Ngai, & Papadopoulos, 2016) The direct result of understanding external forces is to reduce transaction costs in logistics and procurement, one of a company’s main activities in any industry (Nechaeva, Andrianova, & Sandriev, 2016). In this paper, the researchers will set forward the current and future research of the Central Connecticut State University School of Business Supply Chain and Logistics Research Forum (SCLF). The SCLF will extend the understanding of logistics pricing analytics and create techniques to enable managers within this industry to better innovate.

The current study explained in this paper looks at full truck load (FTL) pricing using a dataset provided by a US-based supply chain business intelligence company North American Supply Chain Analytics Company (NASCA)¹. The goal is to create more accurate pricing and to determine the significance of various external factors. Logistics managers often operate by “gut feel” rather than data to support their decisions (NASCA, 2016) (Kersten, 2008). While decisions supported by business intelligence (BI) may not be able to replace the seasoned logistics manager, BI should be able to support managers in their quest to reduce costs and improve services within their company, all of which benefit the end-consumer.

A major milestone that must be considered in all logistics research is the signing of the US Motor Carrier Act (MCA) of 1980. MCA opened the door for the trucking industry to “become the responsive and innovative transportation mode it is today—capturing more than 70 percent of total freight revenue.” (Schulz, 2015) Now the industry faces constant regulatory challenges covering everything from emissions pollution to the number of hours of sleep for drivers. Due to the “hub-and-spoke” networks, hours of service regulations have not had a direct effect on the industry. Rather there has been a “trickle down” effect as it forces the sector to hire additional drivers further contributing to the driver shortage and resulting in increases in pay, and resultant costs across the entire industry. Also, contributing to the industry’s driver shortage is the increased scrutiny of drivers in terms of safety, environments, security regulations, economics, changing demographics, and difficulty marketing jobs to younger people and minorities. Some in the industry feel that the Federal Motor Carrier Safety Administration (FMCSA) focuses “almost exclusively on safety without regard for cost or adverse effects for trucking companies or their shipper customers.” (Schulz, 2015). All of these factors have influenced the researchers at the SCLF desire to better understand logistics pricing.

Before continuing on to the current research, it is important that the researchers’ perspective on supply chain and logistics management is understood as this impacts their perspective and motivation. As business analysts and information systems specialists, the staff at SCLF take an information flow perspective on the interaction and transaction costs with in the supply chain. This perspective is in line with the Global Supply Chain Forum as the researchers look at the supply chain as a set of information flows as given in Figure 1 – Information Flow View of Supply Chain Processes. (Supply Chain Management Institute, 2008)

Taken together these cross-functional and cross-organizational processes depend on correct, timely, and cost-effective logistics. The researchers believe that taking this approach sets the stage for a large and transformative foundation for the work by SCLF staff.