Chapter 6.15
Exploring Decision Rules for Sellers in Business-to-Consumer (B2C) Internet Auctions

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ABSTRACT

The recent growth of business-to-consumer (B2C) Internet auctions challenges researchers to develop empirically-sound explanations of critical factors that allow merchants to earn price premiums in these auctions. The absence of a comprehensive model of Internet auctions leads us to conduct an exploratory study to elucidate and rank critical factors that lead to price premiums in Internet auctions. We employ Classification and Regression Trees (CART), a decision-tree induction technique, to analyze data collected in a field study of eBay auctions. Our analysis yields decision trees that visually depict noteworthy factors that may lead to price premiums and that indicate the relative importance of these factors. We find shipping cost, reputation, initial bid price, and auction ending time as the factors most predictive of price premiums in B2C Internet auctions.

INTRODUCTION

Over the past decade, Internet auctions have grown from a mere curiosity to a major focus of both researchers and businesses. In their early days, Internet auctions were dominated by individuals selling collectibles such as antiques, celebrity memorabilia, stamps, toys, coins, and trading cards; the vast majority of transactions were consumer-to-consumer (C2C) (Lucking-Reiley, 2000a). More recently, researchers have noted the growth of business-to-business (B2B) and business-to-consumer (B2C) auctions (Bapna, Goes, & Gupta, 2001). In B2C auctions, large merchants such as Dell, Disney, Home Depot, IBM, Motorola, Sears, Sun Microsystems, and Sharper Image have been able to use Internet auctions to sell excess inventory for greater profit than they would receive from using a liquidator (Dholakia, 2005b; Gentry, 2003; Grow, 2002; Vogelstein, Boyle, Lewis, & Kirkpatrick, 2004). As further evidence of the growth of B2C Internet auctions, by the first quarter of 2006, Internet auctioneer eBay alone hosted approximately 383,000 eBay stores worldwide, including 171,000 on Web sites other than their U.S. Web site (eBay, 2006). As firms continue to make extensive use of Internet auctions, the interest in developing sound guidelines for businesses as well as developing theory to advance research will likely continue to grow as well.

While many studies have examined the factors that determine an auction item's final bid price, the number of bids an item receives, whether a sale is completed, or the revenue earned by a seller, the examination of price premiums (above-average final bid prices) is relatively understudied. In economics, price premiums are defined as prices that yield above-average profits (Klein & Leffler, 1981; Shapiro, 1983). Price premiums within the Internet auction context have been defined as *"the monetary amount above the average price received by multiple sellers for a certain matching product"* (Ba & Pavlou, 2002, pp. 247-248). Restated, a number of auctions exist where sellers have earned above-average prices, or price premiums, on the items they have auctioned. In this study, we compare the group of auctions that have achieved above-average prices with those that have not, to observe significant differences. To our knowledge, only two studies have previously examined price premiums (Ba & Pavlou, 2002; Pavlou, 2002). Since it is only by maximizing revenue and profit that a firm can remain viable in the marketplace (Seth & Thomas, 1994), an increased focus on how businesses that rely upon Internet auctions can earn price premiums may prove beneficial. The focus on price premiums is the first contribution of this study. As we investigate price premiums, we examine many of the independent variables that have been considered in previous studies to determine if they are also predictive of price premiums. The second contribution is the application of CART analysis to Internet auctions as a tool to generate decision rules. CART analysis is a tree-based method of recursive partitioning for explaining or predicting a response to order variables by significance (Brieman, Friedman, Olshen, & Stone, 1984). It generates decision trees and decision rules that may be used as guidelines (by sellers in Internet auctions, in this case). While electronic commerce research has demonstrated that CART analysis can be used to improve one-to-one Internet marketing (Kim, Lee, Shaw, Chang, & Nelson, 2001), CART has not yet been applied to Internet auctions. Thus, our study is, to our knowledge, the first to use a statistically-based decision making technique to demonstrate how sellers can use quantitative data to decide how to sell products in B2C Internet auctions. The third and final contribution of this study is the examination (by CART analysis) of variables that have been found (generally by multiple-regression analysis) to be determinants of auction outcome in previous studies. This confirmation of variables identified as critical factors in other types of analysis is the third contribution of this study.

The article will be organized as follows. We begin by reviewing literature on auctions, including relevant research on both traditional auctions as well as Internet auctions. Next, we present literature on machine-learning techniques that enable the induction of decision trees. Following the literature review, we discuss our methods, including our dataset, variables, and our research design. Specifically, we describe the collection and analysis of field data from Internet auctioneer eBay. We then present the results of our analysis. Following the presentation of our results, we