Chapter 8
Exploring Decision Rules for Sellers in Business-to-Consumer (B2C) Internet Auctions

Jeff Baker
Texas Tech University, USA

Jaeki Song
Texas Tech University, USA

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 mer-
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 discuss our findings and note the implications of our study. Finally, we conclude by briefly noting