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Hedonic Price Methods and the Structure of High-Technology Industrial Markets

An Empirical Analysis

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This article develops a hedonic price model to investigate empirically the structure of a rapidly evolving industrial market. The model postulates price distortions that arise out of intersegment and interfirm heterogeneity. The application of the model supplies evidence in support of the hypotheses. Empirical results are consistent with existing work on the role of technical performance and technological change in hedonic evaluations of high-technology industrial products. Particular emphasis is placed on policy implications for industrial marketing management.

INTRODUCTION

This paper examines the implications of intersegment and interfirm differences for the price structure of a high-technology market and shows how differences both

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Segment and firm heterogeneity have a significant impact on price.

among segments and among vendors can lead to price discrimination strategies.

In industrial markets, competition often is based on differences in product performance. In high-technology markets, the rate at which product performance changes is often rapid, making it vital for firms to keep abreast of technological change. Observed differences in product prices therefore might be explained solely by differences in product performance, at any one moment in time or by changes in quality over time. However, our study illustrates that these are not the only determinants of price structure. More specifically, we argue that differences in price sensitivities among customer segments can lead to price discrimination schemes in which firms can charge significant price premiums. Such premiums are charged over and above any allowance made for differences in product performance.

Furthermore, despite an emphasis on competition based on technological performance in such markets, manufacturer names and differences in reputations also affect their ability to charge price premiums. Our study indicates that price premiums are charged over performance-corrected prices, which we hypothesize arise from unobserved marketing capabilities that differ among firms.

For the empirical identification of the above relationships, we apply hedonic price methods to data describing the computer hard disk drive market. As shown below, the application of the hedonic framework provides evidence in support of the hypotheses along with useful empirically determined insights.

The organization of the article is as follows. The next section provides a brief overview of the computer disk drive industry considered here and lays the principles of the hedonic approach to the analysis of differentiated markets. The third section develops an empirical framework and derives a hedonic model that describes our hypotheses. Empirical results are presented in the fourth section. Subsequently, we discuss the empirical findings and their implications for industrial marketing management. A concluding section summarizes the study.

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BACKGROUND

The Disk Drive Industry

Hard disk drives (henceforth HDDs) are electromechanical devices, used widely in computers to store data. The basic architecture of a HDD consists of a stack of rotating disks made from a rigid material coated with magnetically charged particles. Data are written to and read from the disks by respectively altering or recognizing the charge on the particles coating the disks, and this is done using movable, magnetically sensitive heads. The data are stored in concentric rings, termed tracks, on the disk. Glossbrenner and Anis [1] describe the goal of all personal computer HDD subsystems as: "To provide mass storage that is quickly accessible, compact, and affordable." Buyers have valued greater storage capacity, speed, smaller physical size, and lower prices, and over the years various ingenious technologies have been developed to improve the product performance along these dimensions. These have included: (a) methods that allow more particles to be placed on a disk surface, (b) designs that utilize both sides of the disk, (c) more advanced heads that can be located more closely to the disk surface, (d) more sensitive heads and coatings that allow data to be recorded more densely in a given surface area, (e) more accurate head positioning systems that allow data to be packed more densely, and (f) improved input/output methods for greater speed. In addition, speed also was improved by combinations of the above methods; see Christensen [2], Bower and Christensen [3], Campbell-Kelly and Aspray [4] for further details.