



# Quality competition in retailing: A structural analysis

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## Abstract

This paper presents empirical evidence that endogenous fixed costs play a central role in determining the equilibrium structure of the retail food industry. Using the framework developed in Sutton [Sutton, J. (1991). *Sunk Cost and Market Structure: Price Competition, Advertising, and the Evolution of Concentration* (MIT Press, Cambridge).], I construct a structural model of retail competition in which escalating investment in firm level distribution systems yields a natural oligopoly of high quality supermarkets, while a low quality fringe of grocery stores serves consumers who do not value quality. Using a full census of the retail food industry to evaluate the model, I construct a structural prediction for the limiting number of supermarket firms and identify the quality escalation mechanism that sustains this oligopoly. Apart from the specific setting analyzed here, this model can help explain why certain retail industries remain highly concentrated as markets grow, while others quickly fragment.

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## 1. Introduction

In many retail industries, the most successful firms are the ones that offer the widest selection. For example, Wal-Mart rose to the top of the Fortune 500 by offering consumers a vast array of products at very competitive prices. The emphasis on product variety is particularly strong in the supermarket industry, where the introduction of computerized logistical and inventory management systems in the 1980s allowed firms to stock an ever expanding array of products. The explosion in both product variety and store size in the supermarket industry is striking.

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According to the Food Marketing Institute, the number of products offered per store increased from about 14,000 in 1980 to over 30,000 by 2004. To accommodate the greater selection, store size has increased an average of 1000 ft<sup>2</sup> per year for the past three decades. Maintaining this variety requires substantial firm level investments. Every major supermarket firm invests in proprietary information technology and logistical systems aimed at increasing variety while minimizing storage and transportation costs. The emphasis on variety and the requisite fixed investments yield tightly contested markets among a handful of rival chains, a pattern that is repeated throughout much of retail.

This is the second of two complementary papers that explain the industrial structure of the supermarket industry using an endogenous fixed cost (EFC) model of vertical product differentiation (VPD). The unifying theme of both papers is that escalating investments in variety enhancing distribution systems yield a natural oligopoly of high quality firms. The explanation for why we observe a natural oligopoly among supermarkets is based on [Shaked and Sutton's \(1987\)](#) claim that “entry in certain industries is limited to a small number of firms, not because fixed costs are so high relative to the size of the market, but rather because the possibility exists, primarily through incurring additional fixed costs, of shifting the technological frontier constantly forward towards more sophisticated products”. The tendency for larger markets to have better products instead of more firms reflects the dominance of vertical over horizontal differentiation; failure to match a rival's quality carries a severe penalty.

To establish the relevance of the EFC mechanism to the market for groceries, my earlier paper adapted [Sutton's \(1991\)](#) model of advertising to account for some specific features of supermarket competition. In my version of Sutton's model, supermarkets compete for customers by offering a greater variety of products in every store, requiring a fixed investment in distribution. Serving a larger share of the market requires building more stores. Expanding variety requires building larger stores and more advanced distribution systems. Because variety is a purely vertical form of product differentiation, firms that fail to match the quality increases of their rivals cannot survive. Therefore, as markets grow, existing firms must incur higher costs if they are to remain in the industry, and this escalation in costs discourages entry by additional firms. Consequently, markets both large and small are served by roughly the same small number of high quality chains.

As I demonstrate in [Ellickson \(2002\)](#), this simple model does not match what is observed in the data exactly: larger markets do have more firms. However, the expansion of firms is limited to a fringe of low quality stores that do not vertically integrate into distribution. In particular, there are two distinct tiers of firms in the food industry, supermarkets and grocery stores, but only one (supermarkets) is subject to endogenous investment. The current paper extends my earlier analysis by proposing and estimating a structural model of retailing in which each firm serves only one of these two submarkets, operating either supermarkets or grocery stores.

This framework easily generalizes beyond the specific setting analyzed here. In particular, several retail industries such as book stores, video rental outlets, and pharmacies feature two distinct tiers of firms: large regional (or national) chains and local “mom and pop” stores. While the dominant chains build large stores (or exploit the advantages of the internet), stock a vast array of products, and invest heavily in distribution and advertising, firms in the fringe offer a narrower, more specialized selection and build smaller stores that require little or no investment in distribution or advertising. The central claim of this paper is that retail industries can be viewed as containing two distinct submarkets, only one of which (the chain store segment) is subject to endogenous investment. Moreover, the equilibrium market structures that characterize

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