Price and quality competition

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Abstract This study considers an oligopoly model with simultaneous price and quality choice. Ex-ante homogeneous sellers compete by offering products at one of two quality levels. The consumers have heterogeneous tastes for quality: for some consumers it is efficient to buy a high quality product, while for others it is efficient to buy a low quality product. In the symmetric equilibrium firms use mixed strategies that randomize both price and quality, and obtain strictly positive profits. This framework highlights trade-offs which determine the impact of consumer protection policy in the form of quality standards.

Keywords Oligopoly · Price and quality competition · Quality standards

JEL Classification L13 · L15 · L50

1 Introduction

In some professional service markets, the providers (e.g., consultants, lawyers, architects) set quality levels simultaneously with their price quotations when competing for clients’ custom. The firms have potential to provide the same service at different quality levels. However, often a firm’s offer is not preceded by a negotiation process and there is little transparency regarding the alternative qualities that could have been provided (and could have been closer to a client’s actual needs). The rivals’ quality
and price choices are at best disclosed after the submission of the bids.\footnote{There is typically no renegotiation process and the firms cannot subsequently alter their prices. Also, for a given project, there are rarely dynamic considerations involved in the bidding so that firms essentially play a one-shot game.} Similarly, in markets where the products are bundled with service terms such as business software, the firms’ offers can be regarded as simultaneous price-quality bids. In these examples clients’ preferences for the services are likely to be different. Building on these observations, this study proposes an oligopoly model where sellers simultaneously compete in quality and price for buyers with heterogeneous tastes for quality and analyzes the equilibrium outcome.

More specifically, the analysis shows that in the symmetric equilibrium of the proposed price-quality competition model, the firms randomize on both prices and qualities. Price and quality dispersion emerges from competition of ex-ante identical sellers in the provision of a homogeneous product. Some features of the proposed model are the following. Sellers can choose between two levels of quality. All consumers value both qualities, but it is efficient for some consumers to buy a high-quality product, and for others to buy a low-quality product.\footnote{That is, high-end consumers’ marginal valuation of the high-quality product exceeds its cost, while the remaining (low-end) consumers’ marginal valuation of the high-quality product is below its cost.} The sellers know the valuations for either quality and their distribution in the population, but they cannot distinguish among buyers and, therefore, cannot price discriminate. The sellers offer their products at only one of two quality levels.\footnote{The equilibrium characterized in this research is consistent with a market in which the sellers first decide whether to offer only one or both qualities, but to put up a menu of qualities they incur a positive cost.}

In consumer product markets (e.g., groceries, household supplies), some observed quality differences stem from packaging, labelling, availability of information, add-ons, or expert/celebrity endorsements. For example, some products indicate an improved recipe, added vitamin C, or are labelled as healthy living options. Such quality improvements most often do not call for a long-term decision. Firms can relatively easily change the packaging, slightly improve a recipe, or arrange for an endorsement and rivals are unlikely to observe the internal price-quality decision before making their own choices. Anecdotal evidence suggests that in these markets there is much variation in firms’ price-quality offers. Also, consumers are likely to differ in their willingness to pay for quality. The price-quality competition model predicts both price and quality dispersion in the symmetric equilibrium and seems consistent with the patterns observed in these markets.\footnote{Note that since the seminal work of \textit{Varian} (1980), mixed strategy equilibria have been linked to both intertemporal and cross-sectional variation. For a review of the literature on price dispersion, see \textit{Baye et al.} (2006).}

In the symmetric equilibrium, there is a monotonic relationship between prices and qualities. Low-quality is always associated with lower prices, and high-quality with higher prices. At equilibrium, there is a positive probability that any one firm is the sole provider of a given quality and, even though it faces some competition from the other quality, it can charge a price in excess of marginal cost. In effect, the symmetric equilibrium leads to positive expected profits for the firms. The difference between the highest (lowest) price for a high-quality product and lowest (highest) price for a...