

Pricing strategy, quality signaling, and entry deterrence[☆]

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Abstract

I investigate a pricing strategy that is aimed at deterring entry by applying a two-period model of a durable-goods monopolist. There exists an incumbent that is of two types, that is, high and low quality types. They differ in terms of their R&D capabilities, and the incumbent's type is assumed to be unknown to an entrant. If the entrant decided to enter the market, Nash–Bertrand price competition ensues between the incumbent and the entrant. I show that not only limit pricing but also prestige pricing signals the incumbent's quality type, which serves to discourage entry. In the prestige pricing, the high-quality type sells the products at an intentionally higher price. I also show that although limit pricing is more desirable than prestige pricing from a social welfare viewpoint, the incumbent can still choose prestige pricing.

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1. Introduction

I investigate a pricing strategy that is aimed at deterring entry when there is asymmetric information. The focus is on the signaling role of prestige pricing, where the incumbent sells its products at an intentionally high price. In reality, firms that deal in high-quality goods, such as exclusive bags, watches, and electrical appliances, use prestige pricing. The common belief is that consumers tend to see a high price as an indication of high quality. Therefore, by charging an intentionally

high price, these firms seek to emphasize the high-quality and high class of their products. In this paper, I use a durable-goods model in order to examine the role of prestige pricing in discouraging entry. The results suggest that prestige pricing actually affects rival (potential) firms rather than consumers. The high price shows not only the high-quality of present products but also that of future products. In particular, this pricing indicates a company's strong confidence in the future innovation and future development of its products and thus discourages potential entrants.

Many papers have investigated the relationship between pricing strategy and entry.¹ Milgrom and Roberts (1982a) allowed for the existence of asymmetric

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¹ Bain (1949) originally pointed out the role of limit pricing in discouraging entry.

information when considering the cost structure of the incumbent and showed that a low-cost type incumbent can use limit pricing as a signal of its cost structure. Harrington (1987) and Bagwell and Ramey (1991) analyzed an oligopoly case where many incumbent firms and a potential entrant exist.² LeBranc (1992) investigated the role of limit pricing and predatory pricing in deterring entry.³ All of these papers assumed the existence of asymmetric information about the cost structure of the incumbent.⁴ Linnemer (1998) considered a case where the cost structure and product quality are unknown, and showed that price and advertising play the signaling role in the entry deterrence problem.⁵ On the other hand, this paper analyzes the effect of pricing strategy on entry behavior when the product's quality is uncertain. I analyze the case where the R&D capability of an incumbent is uncertain, namely, the level of quality of the new products is private information. I demonstrate that pricing can signal the incumbent's quality type and thereby serves to deter entry. It is shown that not only limit pricing but also prestige pricing plays a signaling role in deterring entry.

Economic analyses of a durable-goods monopolist originated from Coase (1972).⁶ He conjectured that durable goods monopolist faces time inconsistency. (See Stokey (1981) for the discussion on the Coase's conjecture.) Bulow (1982) constructed a two-period model of durable goods monopolist and theoretically proved that time inconsistency problem occurs.⁷ Waldman (1993) and Choi (1994) investigated the decision by a durable-goods monopolist on new product introduction.⁸ Waldman (1996a,b) and Hendel and Lizzeri (1999a) strictly investigated the interaction between the old and new products by considering a secondhand market. Especially,

² Bagwell and Ramey (1988) showed that in addition to price, advertising can signal the cost type of the incumbent.

³ Milgrom and Roberts (1982b) and Kreps and Wilson (1982) also analyzed the effect of predatory pricing on the entry deterrence problem.

⁴ Concerning the quality signaling of pricing, see Chan and Leland (1982), Cooper and Ross (1984), Bagwell and Riordan (1991), and Daughety and Reinganum (1995), although they did not consider the possibility of entry.

⁵ See also Kihlstrom and Riordan (1984), Milgrom and Roberts (1986), Hertzendorf (1993), Fluet and Garella (2002), and Linnemer (2002) for the signaling effect of advertising.

⁶ See Waldman (2003) for the survey of durable-goods market analysis.

⁷ Bulow (1986) assumed that the durable-goods monopolist can control the durability level of the product, and showed that the monopolist chooses inefficiently short lives for first-period products.

⁸ For the monopolist's decision on new product introductions, see also Fudenberg and Tirole (1998), Lee and Lee (1998), Ellison and Fudenberg (2000), Kumar (2002), and Nahm (2004).

Waldman (1996a) proved that the time inconsistency problem concerning R&D decision rather improves social welfare.⁹ Using durable-goods monopolist models, Hendel and Lizzeri (2002) and Johnson and Waldman (2003) considered situations where asymmetric information exists about the level of product quality and analyzed the role that leasing plays on the adverse selection problem.¹⁰ Utaka (2006b) also assumed the existence of asymmetric information about product quality and investigated the role of durable-goods warranties in the moral hazard problem. This paper investigates the signaling effect of pricing strategy in deterring entry.¹¹

I use a two-period model of a durable-goods monopolist in which there is an incumbent that is of two types, that is, high and low quality types. They differ in terms of their R&D capabilities that determine the quality levels of new products released in the second period. The incumbent's type is unknown to the entrant in the first period. The entrant has to decide whether to enter the market during the first period without knowing the incumbent's R&D capabilities. Accordingly, it guesses the incumbent's type on the basis of the price of the first-period products. If the entrant decided to enter the market, Nash–Bertrand price competition ensues between the incumbent and the entrant. In the second period, the first-period products are traded in a second-hand market. Under these settings, I explore the incumbent's pricing strategy that is aimed at discouraging entry.

It is shown that in cases where the probability of the incumbent being of a high-quality type is not so high, two kinds of signaling equilibria occur: limit pricing and prestige pricing equilibria. In the prestige pricing strategy, the high-quality type sells products to fewer customers at a higher price in the first period. I show that these pricing strategies can signal that the products are of high quality, and that this deters entry. Although these strategies reduce the first-period profits of the incumbent, deterring entry brings the high-quality incumbent larger second-period profits. With prestige pricing, the

⁹ Utaka (2006a) extends Waldman's (1996a) analysis by considering the fact that the introduction of a higher quality model lowers the utility of consumers who use an older model.

¹⁰ For the model of adverse selection in the durable-goods markets, see also Hendel and Lizzeri (1999b).

¹¹ By using a durable-goods monopolist model, Hoppe and Lee (2003) analyze the monopolist's innovation decision in cases where a potential entrant exists. In the complete information setting, they showed that limit pricing can deter entry by focusing on the interaction between "Coasian pricing dynamics" and the incentive for innovation. Fudenberg and Tirole (2000) proved that the incumbent firm of a network good can set low prices with the existence of a potential entrant.

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