Inviting entrants may help incumbent firms*

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Abstract

This paper provides an example that incumbent firms might allow potential entrants to enter a market. The market consists of two sub-markets: a high-end market and a low-end market. (i) If low-quality products are of no value to consumers in the high-end market, (ii) consumers in the low-end market will not be concerned about product quality; and (iii) if the low-end market is relatively small, then the entries of firms into the low-end market would be beneficial to the incumbent firms. To be more specific, entry into a certain market represents a commitment to prevent incumbent firms from fierce competition within the high-end market and guarantees higher profits to the incumbent firms.

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1 Introduction

Standard microeconomics textbooks explain that, in an oligopoly market (e.g., Cournot oligopoly), the equilibrium price decreases as the number of firms increases, and the profits of the firms then decrease. In many real-world markets, the characteristics concerning reductions in profits and prices actually hold.[1] In markets which have those characteristics, it is natural for incumbent firms to be apprehensive about the possibility of other firms entering the market. Protests by incumbent firms against the entry deregulation are typical examples of such apprehension. In fact, market prices have frequently been observed to drop dramatically, and the profits of incumbent firms to decline, after a government allows potential entrants to enter a market (e.g., the deregulation of the Japanese taxi industry). Therefore, many economists do not speculate very much whether potential rivals are beneficial for incumbent firms; however, they have often studied the conditions under which incumbent firms try to prevent and deter potential entrants into the market and the welfare implication of entry deterrence by incumbent firms.[2]

On the contrary, we sometimes observed counter examples about the relation between market prices and the number of firms. Established Japanese firms share their knowledge of the electricity industry with Chinese firms that are potential competitors of the Japanese.[3] Intuitively, it appears that such technological transfers would lead to reductions in the profits of the incumbent firms; nevertheless, such transfers take place. In the food industry, the invasion of private-label food products sometimes causes increases in prices and profits of name-brand products. For example, Ward *et al.* (2002) empirically show that increases

[1] In several papers, it has been reported that the total profits of an industry may result in an increase in the number of firms. Using a bilateral oligopoly model, Naylor (2002a) shows that for a small number of firms, the increment in the number of firms enhances the overall profits of an industry.

[2] See, for instance, Bernheim (1984), Dixit (1980), Eaton and Ware (1987), Gelman and Salop (1983), McLean and Riordan (1989), Sørgard (1997), and Waldman (1987, 1991). Geroski (1995) provides an excellent survey on the literature of entry problems. In the literature of spatial competition with entry deterrence, see Bonanno (1987), Ishibashi (2003), Judd (1985), and Schmalensee (1978).

[3] Evidence of this has been provided by engineers of the Sanyo Electric Co., Ltd.

in the share of private-label goods are correlated with a rise in the price of name-brand goods. Pauwels and Srinivasan (2004) empirically show that the invasion of private-label food products produces increases in the *profits* of name-brand goods.

Speculation on this subject raises several questions. Some of these questions focus on issues such as the reason that there are technology transfers that invite potential entrants into the market; whether such an invitation is profitable for incumbent firms; in such a case, why it is profitable; and the reason that the invasion of private-label food products induces an increment in the *profits* of name-brand goods.

In the examples reported above, a common market characteristic exists. Established products and non-established products exist in the same markets, and they are recognized as differentiated products. For instance, in the food industry, name-brand products are produced by established firms, and private-label food products are produced by non-established and established firms.[4] These private-label food products are priced lower than name-brand products and, they frequently offer equivalent quality. As summarized in Soberman and Parker (2004), some empirical studies show that some consumers are willing to pay more for advertised (name-brand) products. In other words, some consumers believe that private-label products are the same as store-brands in regards to overall quality, taste, availability, freshness, guarantee of satisfaction, clarity of labeling, and quality of packaging, among other attributes.

The questions listed above are answered below. In addition, we show, with the use of a simple framework, how entries into the market can be profitable for incumbent firms and the circumstances under which prices can be increased. In other words, the profits of the incumbent firms could *increase* as new firms enter the market.

We consider the following market structure. The market consists of two sub-markets: a high-end market and a low-end one. Consumers in the high-end market require products of higher quality. Low-quality products are of no value to those consumers. On the other hand, consumers in the low-end market are less concerned with quality.[5] The low-end market is

[4] See Hinloopen and Martin (1997) and Connor and Peterson (1992, 1997).

[5] In the personal computer (PC) industry, specific businesses may require more sophisticated hardware to

relatively small compared to the high-end market. In this study, there are two incumbent firms and a potential entrant. Some entry barriers may prevent a potential entrant from joining the market without the cooperation of an incumbent firm.[6]

In this setting, we show a subgame perfect equilibrium that enables an incumbent firm to support a new entrant as a *local* monopolist in the low-end market. Without the entry of a new firm, the incumbents will need to produce more because the low-end market remains empty and sufficiently profitable. However, once incumbent firms sell their products to consumers in the low-end market, the price in the high-end market collapses, and then the profits of the incumbent firms drastically decrease. The entry is a credible commitment not to sell their high-quality products to consumers in the low-end market. As a result, the incumbent firms can secure high profits from the high-end market.

We now report the theoretical contribution of our results. As stated above, we show that entries might raise both the incumbent's profits and the equilibrium price.[7] To our knowledge, no previous study has shown that the profits of incumbent firms *increase* as a result of the entries of new firms into the market and then the prices of the incumbent

satisfy the demands of their business than household users, who may need a computer for personal reasons such as writing letters and listening to music. Those business users do not need PCs with low level equipments. However, typical computer users are generally satisfied with word-processing software and programs that will enable them to use the Internet.

[6] The setting discussed here is related to that in Rosenthal (1980). He also discusses a market structure in which two classes of consumers exist: those who view labels of companies as artifacts and purchase only from the low-price company; and those who perceive significant differences among the brands and purchase only from their respective favorite brands (see, Rosenthal (1980, p. 1575)). He shows that the equilibrium price increases as the number of firms increases. In his model, however, pure-strategy equilibria do not exist and the increment of the equilibrium price is evaluated on the concept of stochastic dominance. Rosenthal (1980) and most of the subsequent researches (e.g. Narasimhan (1988) and Baye *et al.* (2004)) discuss the topic of price dispersion but do not consider the relation between the profitability of incumbent firms and the existence of entrants.

[7] Naylor (2002b) derives a similar result in the context of wage bargaining in unionized bilateral oligopoly. He considers a simple Cournot oligopoly model in which wages are determined by bargaining in unionized bilateral oligopoly. In his model, the equilibrium price of the final product, however, always decreases as the number of firms increases. This is quite different from the price change by the entries in our model.

firms' products increase. However, several studies have indicated that market entries produce increases in the price of the incumbent firm's product. Inderst (2002) considers how prices react to an increase in competition. In his model, an incumbent enjoys the advantage of having a locked-in fraction of buyers. He shows that the price of a product produced by the incumbent firm may increase. He does not show that the profit of the incumbent firm increases as a result of the entry of new firms into the market. Davis *el al.* (2004) consider a duopoly model in which an incumbent firm and an entrant exist. When the entrant enters the market, the incumbent firm sets its price higher than that in the monopoly situation because serving consumers with lower willingness to pay is not beneficial. They also consider the product positioning of the firms, but they do not show the profit of the incumbent relative to that of the new entrant.

The organization of the remainder of the paper is as follows. In the next section, we describe a two-stage game model. In Section 3, we derive the subgame perfect equilibrium of the game constructed in the previous section. The last section is the conclusion.

2 Model

We consider an industry with two vertically differentiated products (h and l). h and l are high- and low-quality products, respectively. There are two major firms (1 and 2) and one minor firm (3). The major firms can produce h at a constant marginal cost normalized to zero. We assume that neither major firm produces l. A minor firm cannot produce any good at first. However, with a major firm's support, a minor firm can produce l at a constant marginal cost normalized to zero.[8] No fixed cost is assumed for the production of h or l.

We assume two groups of consumers, H (the high-end market) and L (the low-end market). Consumers in H demand only h. That is, the quality of l is not at all sufficient for

[8] The support might be some lectures on the basic technology, cheap license fees for the major firm's important patents, or the major firm's cooperation for the outsourcing of the minor firm's product. The main result of the paper (inviting entrants may help incumbent firms) does not depend on the number of entrants. In our model, even though the number of entrants is n (for instance, because of the technical support by the incumbent, the technological know-how about product l is diffused and adopted by the other minor firms), the property of the main result does not change. We discuss the matter in Section 5.

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