Ju Choi, Chang; Scarpa, Carlo

Working Paper

Brand Extensions and Entry Deterrence

Quaderni - Working Paper DSE, No. 66

Provided in Cooperation with:
University of Bologna, Department of Economics

Suggested Citation: Ju Choi, Chang; Scarpa, Carlo (1988) : Brand Extensions and Entry Deterrence, Quaderni - Working Paper DSE, No. 66, Alma Mater Studiorum - Università di Bologna, Dipartimento di Scienze Economiche (DSE), Bologna, https://doi.org/10.6092/unibo/amsacta/5344

This Version is available at:
https://hdl.handle.net/10419/158909

BRAND EXTENSIONS AND ENTRY DETERRENCE

Chong Ju Choi
and
Carlo Scarpa

Dicembre 1988

N. 66

1. INTRODUCTION

In many industries, we observe various "groups" of products linked by a common brand name. Coke and Diet Coke; Marlboro and Marlboro Lights are both examples of this phenomenon. This approach to launching products extends the existing reputation, in this case the brand name, also to achieve certain economies of scope (Willig, 1979) in areas such as advertising costs. This phenomenon is especially prevalent in "convenience" goods industries (Porter, 1976), industries where products are of a low price, and frequently purchased. In such markets, there is little price competition, and competition is more often through new product introductions. Brand extensions are indeed new products but are products that build upon the reputation of an existing brand.

The phenomenon that we will refer to as "brand extension" seems to combine features of models concerning reputation such as Shapiro (1983) and Farrell (1986) with those of the brand proliferation and pre-emption models of Schmalensee (1978), Eaton and Lipsey (1979), Judd (1985). Farrell (1986) in his model of moral hazard as an entry barrier analyzes the importance of being the first firm in the industry, and how subsequent firms may face a moral hazard barrier relative to the incumbent's product; the idea is related to Schmalensee's (1982) analysis of the advantages of pioneering brands. Shapiro's (1983) model shows how a firm may initially invest in creating a reputation in order to receive premium prices for its products at a later stage. The idea of brand extension is related to all these models; the major difference is that brand extensions are a way to "extend" an existing reputation and in turn prolong an incumbent's advantage.

Brand extensions are in turn related to the literature on brand proliferation. Brand proliferation[1] as applied by Schmalensee (1978)

to the ready-to-eat breakfast cereal industry was about incumbent firms filling up economic space with related products to deter potential entry. Although the actual process of producing these new brands was easily done with minimal capital adjustments,[2] the importance is that their new brand names suggested a differentiated product. With brand extensions, the original brand name is combined with other words: the original name (i.e. Coke) legitimizes, and the new product name (i.e. Diet Coke) individualizes the brand extension. Schmalensee argued that brand proliferation (new brands) of similar products reduces the market share a potential entrant can hope to capture. With brand extensions, because of economies of scope, the market share sizes are reduced even further.

Judd (1985) has shown that these earlier brand proliferation models must assume high exit costs and that without them the results of the models are substantially weakened. This is because a potential entrant does enter, the incumbent may withdraw (exit) the product it used for preemption in order to avoid postentry competition which would reduce profits on all of the incumbent's products. Brand extensions may create the type of exit barrier described by Judd. For example, if there are several variants of a brand in the market (i.e. Coke, Diet Coke, Cherry Coke), withdrawing one brand extension can have a negative reputational effect on the remaining products. In this sense, the link among the products (i.e. through brand name) has created an exit barrier,[3] and this solves the problem of the credibility of the commitment to keep the brand extension in the market even if a new firm enters.

To the best of our knowledge, the phenomenon of extending products through an existing product's reputation has not been studied in the economic literature. We focus on the case of extending the reputation of brand names. Although brand extensions are related to the two areas

of reputation and brand proliferation, our analysis shows that the results in terms of entry deterrence are significantly different.

With reference to the existing literature (Salop, 1979), we could say that brand extensions can be used as both "innocent" and strategic" entry barriers. This will be determined by the features of market dynamics and the degree of the market's segmentation. We discuss three particular types of markets: a growing market, a stagnating market and a declining market. This paper is organized in the following way. In section 2 we describe the general features of our model. In section 3, we describe the use of brand extensions as an innocent and strategic entry barrier depending on the three market structures described above. In section 4, we describe a general framework of when both cases will occur. In section 5, we provide a summary and conclusions.

2. GENERAL FEATURES OF THE MODEL

The starting point is the existence of brand name loyalty. One easy way to represent this feature can be the following. Assume for example that consumers have a utility function such as:

$$U = (1 + \beta) \int g(x)dx;$$

where $\beta \geq 0,\ldots,$ x is the quantity consumed and $g' \leq 0$. The marginal utility is thus:

$$U' = (1 + \beta)g(x);$$

Denoting the price as p, it is standard to assume:

$$p = U' \text{ so that,}$$

$$p(\beta , x) = (1 + \beta)g(x) \qquad (1)$$

The parameter β, is interpreted as an index of brand name loyalty. When consumers choose a new brand, $\beta = 0$, while $\beta > 0$ when they purchase the old (and known) brand. Changing brands implies a loss in utility, i.e. a switching cost as defined by Klemperer (1987). Of

course, we do not necessarily need this specific formulation and more general functions could equally back our analysis.

Given this basic structure we can now state in a more precise way how brand extensions can affect the entrant's profit. In the markets we analyse, there are no substantial product innovations, i.e. new products can be "emulated" by competitors and the issue of patents doesn't arise. Thus, the new brand and the brand extension can produce the "same" good (from a functional viewpoint), but the brand extension has two advantages: it has lower fixed costs, especially lower introductory advertising costs, and it can also exploit the parent brand's reputation. This latter feature is more interesting and can be clearly seen from equation (1), where consumers attach a higher value to the product which uses the known brand name, so that the demand function for the brand extension will be higher. The consequence is that if the brand extension is launched this will completely displace the new brand with regard to the old consumers, defining old consumers as people who have already experienced (Nelson, 1970) the incumbent's original brand. In a sense, our model shows how Schmalensee's (1982) pioneering brand advantage can be extended.

It can be useful to look at these features with more precision. Using I and N to denote, respectively the incumbent firm and the new brand (potential entrant), the profit functions(Π) of the two competitors are the following:

$$\Pi^I = R^I[x, \beta; e] - C^I[x; e] \qquad (2)$$

$$\Pi^N = R^N[x, \beta; e] - C^N[x] \qquad (3)$$

where R is revenue, C denotes costs and e refers to the possible existence of a brand extension. Given equation (1) we have,

$$R^I_\beta > 0, \; R^N_\beta \leq 0$$

A brand extension can be either launched or not launched, thus we have $e = 0, 1$. The effects of a brand extension on the competitors revenues

can be seen as follows:

$$R^I[\bullet;\ 0] \leq R^I[\bullet;\ 1] \tag{4}$$

$$R^N[\bullet;\ 0] \geq R^N[\bullet;\ 1] \tag{5}$$

If the market consists only of old consumers, in general we will have:

$$R^N[\bullet;\ 1] = 0 \tag{6}$$

This means that all old consumers, if they change products at all, would prefer to stay within the old brand name, i.e. at the same price, they prefer the brand extension.

3. THREE MARKET ENVIRONMENTS

In this section, we analyze the three different market environments of growing markets, stagnating markets and declining markets and see the role of brand extensions in these three settings. In our models, there is an existing incumbent firm with one product (i.e. Marlboro cigarettes). The interaction is between the incumbent launching a brand extension (i.e. Marlboro Lights) and a potential entrant launching a new brand. This points out the obvious asymmetry created by the possibility of extending the brand name: only the incumbent can do so, while a new firm cannot exploit any such reputation. The consumers that demand a new product are comprised of two groups: completely new consumers entering the market for the first time; and old consumers who want to shift to a new product. We will first provide an illustration of the competition in these three markets using reaction functions as done by Dixit (1979); a more formal analysis will be offered in the next section.

A brand extension achieves economies of scope from the reputation of the existing (parent) brand. For example, a brand extension (i.e. Diet Coke) may not require as much introductory advertising because of the existing reputation of the parent brand (i.e. Coke). A brand extension can also depend on the existing distribution channels that

the parent brand has already used. The result being that a brand extension has acquired certain economies of scope in costs relative to a potential entrant's new brand. We will use the following abbreviations:

E: brand extension;

RF^I: incumbent brand's reaction function;

RF^N: new brand's (potential entrant) reaction function;

A: new (potential) consumers;

F_j: fixed costs of j, where $j = I,E,N$.

i) Growing markets:

This means that the number of new consumers entering the market is relatively large and that the demand for a new product is coming from consumers first entering the market, and not from old consumers shifting from the incumbent's product. We define, δ as the share of sales a new product captures from the existing brand. In this first case of growing markets, in order to make the analysis more clear, we will simply consider the case where all demand is coming from new consumers; thus we assume $\delta = 0$, which amounts to considering a situation where the brand loyalty of consumers of the existing parent brand is absolute. Therefore, the demand for a new product, either an incumbent's brand extension or a potential entrant's new brand, is coming from new consumers entering the market for the first time.

Referring to figure 1, when fixed costs are included, the reaction functions are not continuous, because below certain output levels the firms would get negative profits.

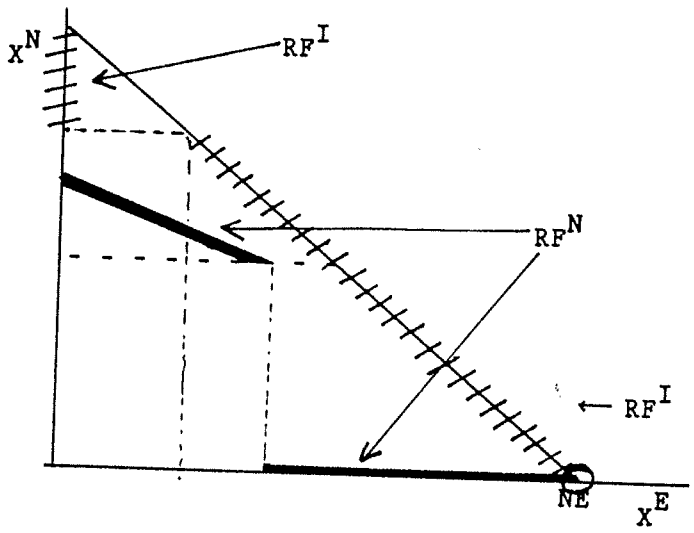

Figure 1

In the case considered in figure 1, the new brand's fixed cost is so large relative to F_E that the new brand will never enter: the equilbrium is at NE.

When the growth of the market is faster (i.e. larger gap, A) figure 2 becomes relevant and strategic behavior matters. This means that it is crucial to decide whether anybody has a move advantage and can credibly pre-commit himself to a certain output level.[4] Typically, in fact, we have a multiplicity of equilibria, and the exact outcome will depend on the possibility of these precommitments. If the incumbent can precommit to introduce the brand extension and to produce H, monopoly output, then the equilibrium is NE^2, and this pre-commitment generates a barrier to entry.

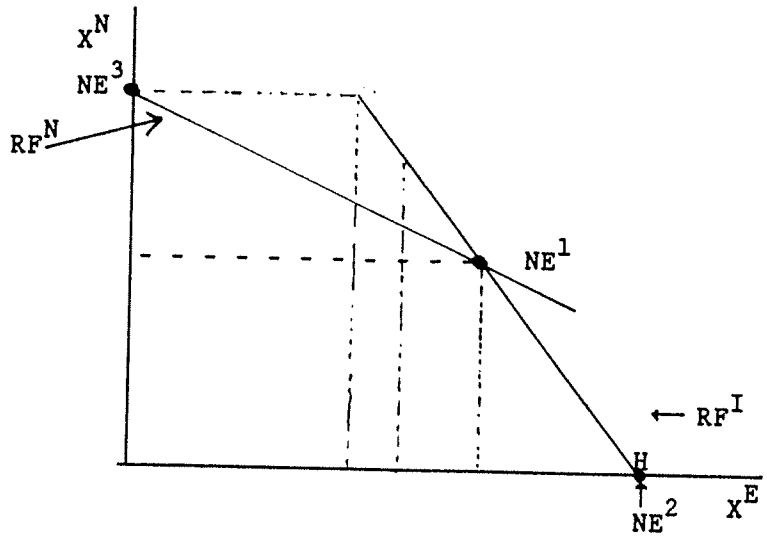

Figure 2

In general, however, we will disregard these possibilities, showing however that they are not necessary for a brand extension to constitute a purely strategic entry deterrent. In this case the equilibrium will thus be the more usual Nash equilibrium (NE^1) where both the brand extension and the new brand are launched and produce positive output levels.

In the case we have described, we can have strategic entry preemption only if we allow one firm to precommit itself to a particular output level, but this raises serious problems of credibility. However, the strategic variable would be output, not product innovation. In other words, the launch of a brand extension is not in discussion, only its output level is. Thus, the brand extension is launched in an "innocent" way; it would be launched in any case, unless the potential entrant can precommit itself to NE^3.

ii) **Stagnating markets:**

We define stagnating markets as those industries where there is no increase in the number of consumers. Competing products can be launched in the attempt to steal a share of a given market. In this type of market, the economic gap, A, is equal to zero. If there is no

brand extension or a potential entrant's new brand, then consumers continue consuming the incumbent's original (parent) brand. If there is a choice of both brand extension and a potential entrant's new brand, the consumers choose the brand extension because of lower total switching costs. Relative to the previous situation, now we drop the assumption that $\delta = 0$. Market segmentation is not absolute, and a new brand can steal a share of the incumbent's market. Therefore now we have to consider together the sales in the "old" market and in the "new" one (if a new product is launched).

The incumbent firm's additional profits are nonpositive: if there is no brand extension, people will either stay ($\Delta\Pi = 0$) or go to the new brand ($\Delta\Pi < 0$); if there is a brand extension, the total number of customers of the incumbent does not change because of brand loyalty, but there is an additional fixed cost $F_E > 0$. Π_o^I is defined as the profit level the incumbent firm(monopolist) reaches launching the brand extension, i.e. paying a cost for the launch.

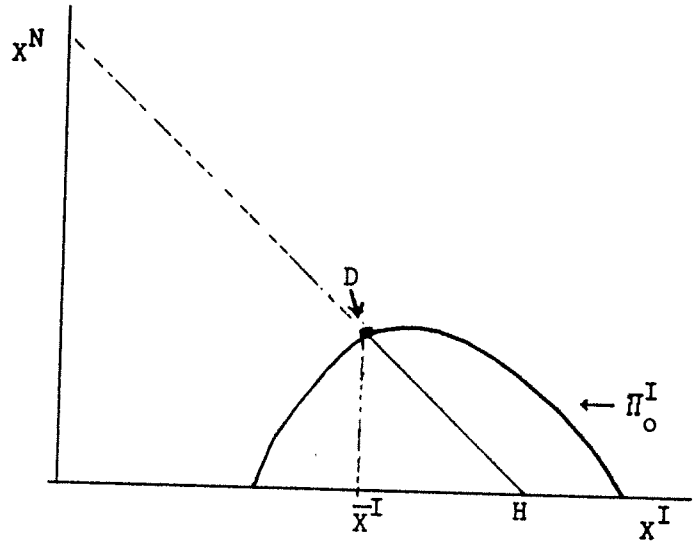

Figure 4

The relevant reaction function for the incumbent is DH in figure 4. The incumbent will have to compare the profits of two situations:
1) with brand extension, i.e. larger market, which however, implies larger fixed costs;

2) with no brand extension (i.e. with a duopoly and product differentiation), with unchanged fixed costs.
The profit level Π_o^I is defined as the total profit the firm would get launching a brand extension(F_E).

The competition in the new segment will have the features of models with vertical product differentiation,[5] since old consumers will prefer to remain loyal to their old brand name. The equilibrium outcome will essentially depend on whether the given perceived quality differential (i.e. the switching cost) can be compensated by a price cut or not. Klemperer (1987) has modeled the idea of switching costs and their role in entry deterrence.

If the quality differential and the introductory cost of a new brand are not too large (and if the market is large enough), we will observe a new entry, and the two firms will produce at different prices, sharing the market. If only a few consumers want to change their product, their brand loyalty is low and because a new brand needs very high set up costs, no new entry will occur. In this case, by launching a brand extension, the incumbent firm will maintain its monopoly position. Therefore the profit level Π_o^I is non-decreasing in β and F_N, and is non-increasing in F_E and in δ.

The relevant reaction function is DH because if the equilibrium output level of the differentiated duopoly game is lower than $\bar{X}^I$, the incumbent will prefer to pay F_E in order to compete with a new brand not only with a different product, as the parent brand, but just with a strictly "better" product, the brand extension.

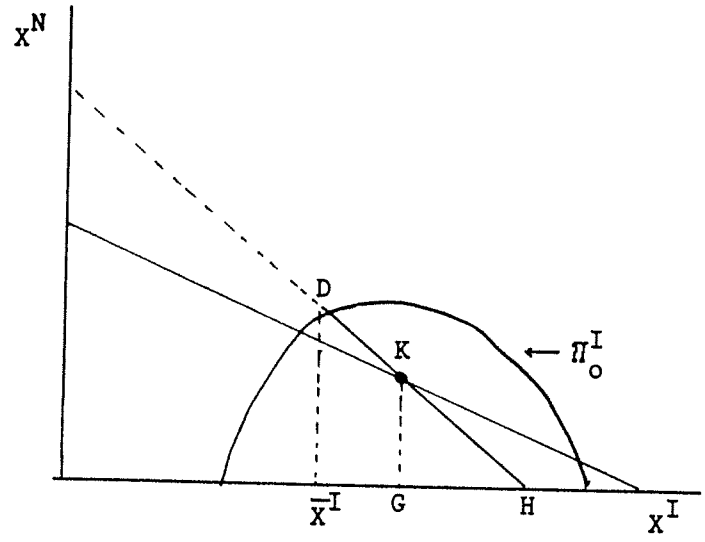

Figure 5

On the contrary, if the equilibrium with no brand extension is at point K as in figure 5, then the incumbent will allow the new brand to enter the market, because his loss of market GH is small enough and would not justify the launch of a brand extension (i.e. the fixed cost F_E). However, suppose the duopoly equilibrium is along the DH reaction function, but that the situation is like in figure 6 below, where the entrant has to pay a fixed cost such that his reaction function is discontinuous for $X^N = \bar{X}^N$ (break even level).

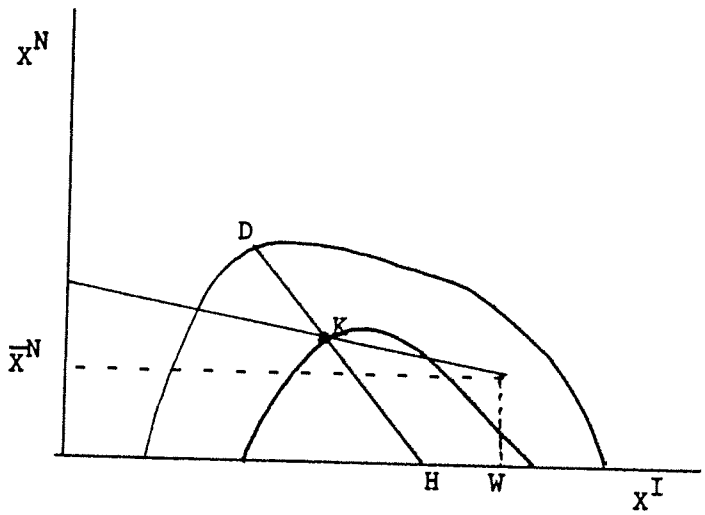

Figure 6

In this case, if the incumbent is able to pre-commit himself to output level W, he will do so; in this case, he will drive the rival firm's price down, so that output will be chosen as a strategic variable to establish a strategic entry barrier (the reason is that $\Pi^I(W) > \Pi^I(K)$).

This points out that in general the incumbent may have (at least) two strategic variables to prevent entry. First of all, a brand extension which will be used if the duopoly equilibrium is at $X < \tilde{X}^I$, this could lead output level to H, but with the incumbent paying F_E. Second of all, output is as Dixit (1979), producing at W, but this raises the issue of credibility.

iii) **Declining markets:**[6]

A declining market is defined as a situation where the number of potential consumers decreases. Competing products can be launched, which can also steal part of the residual parent brand's market. With no brand extension or potential entrant's new brand, some consumers will leave the market, leading to a lower demand curve. With no brand extension, $\Delta\Pi^I < 0$. With brand extension, exiting consumers will not leave the market, but will turn to the new product. A new brand will get some consumers only if no brand extension is launched. In all cases, the incumbent firm's profits drop. Figure 7 below represents schematically the separation of the market between residual (non-changing) consumers and the consumers who will exit the market unless there is a brand extension or new brand alternative (i.e. bored consumers). An example of this phenomenon could be a health trend that affects soft drink consumers; if there is no new product that satisfies the new health demand (i.e. a soft drink with no caffeine) the consumers may exit the market to an alternative such as fruit juices or milk.

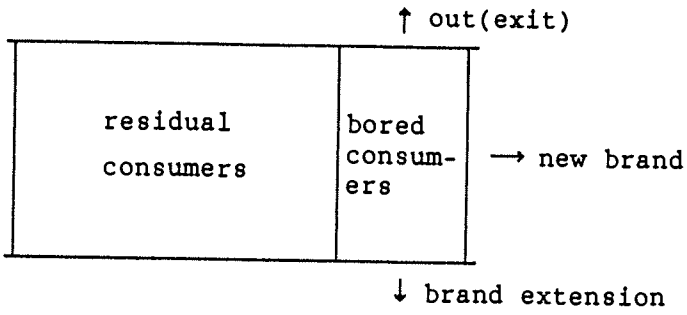

Figure 7

The parent brand and the new brand will in any case compete, because there is substitutability between the two products, in other words we still have $\delta > 0$.

If there is a brand extension and the market is still monopolised, the output level is H_E but fixed costs of the incumbent are higher (see figure 8). If there is no brand extension (and no new brand) the market is smaller, but still monopolized and the equilibrium is H. If there is only a new brand, it will certainly acquire the potentially exiting consumers, and will also compete for the residual parent brand's market. So the brand extension has at the same time a defensive purpose (countering the attack of the new brand on the residual market) and an offensive purpose (i.e. to capture the exiting consumers).[7] In figure 8, we have a sort of combination of the two previous cases described in growing and stagnating markets.

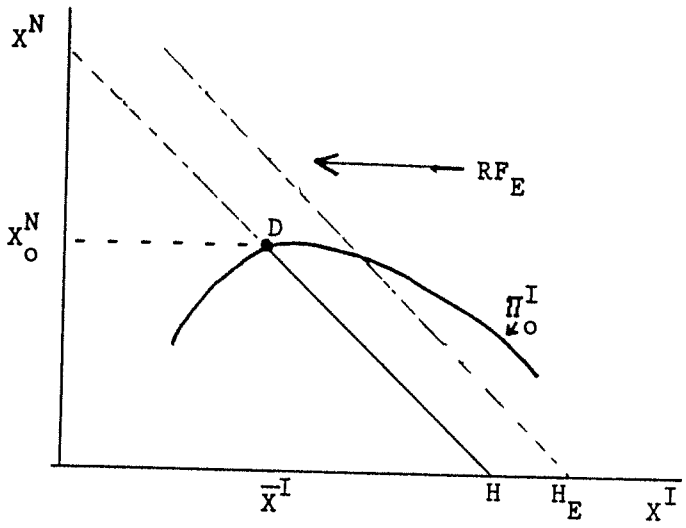

Figure 8

If the profit level Π^I_o is larger than the one in H, then a brand extension will be launched in any case, regardless of the existence of a competitor.

It is thus more interesting to analyse the case where $\Pi^I_o < \Pi(H)$, so that, in the absence of a new brand (potential entrant) no brand extension would occur. If the equilibrium point of the duopoly game between the parent brand and the new brand is along DH, so that the output for the incumbent is $X > \bar{X}^I$, then we will observe no brand extension: the loss in the market share due to the new entrant is not enough to justify the cost of launching a brand extension. On the contrary, if the duopoly equilibrium was at $X < \bar{X}^I$, we will have a brand extension and the incumbent's reaction function shifts to RF_E. Thus, here we have two reaction functions for the incumbent firm. If the equilibrium point with no brand extension is not along DH, then a brand extension will be launched, shifting the reaction function to RF_E. Analogously to the previous situation, if β and F_N are large relative to δ and F_E, then by launching a brand extension, the incumbent will deter entry.

Conclusion:

What we have tried to do in this section is to introduce the idea of brand extension, and how it can be used as a strategic variable to create strategic entry barriers. We analyzed this by using reaction functions and studying the three cases of growing, stagnating and declining markets. We saw that in the cases of stagnating and declining markets, the use of brand extensions would acquire a more strategic role in deterring potential entry. In the next section, we will introduce a more precise framework to show just what type of variables and the sizes of parameters determine whether brand extensions lead to innocent or strategic entry barriers. One important result was that brand extensions could be used to create strategic entry barriers even without the usual type of strategic commitment by the incumbent.

In this section, we have used reaction functions to analyze brand extensions in three types of market settings. Using reaction functions, we have been able to vary price and output. But in the next section, we prefer to hold price fixed in order to focus on the brand extensions themselves and their potential role in strategic entry deterrence.

4. A FORMAL TREATMENT

In the more formal framework of this section, we will be holding price fixed. On one hand, this is convenient in order to emphasize the role of brand extensions in entry deterrence; as we have already noted, the use of price (or output) as strategic variables in these situations has been the object of several other studies. On the other hand, we believe that price is not the crucial dimension of oligopolistic competition, at least in many industries where product differentiation plays an important role. In the case of convenience goods industries,

Porter (1976) has shown that new products rather than price is the strategic variable used in competition.[8] Furthermore, Schmalensee (1982) has also noted that non-price competition is the main feature of the competition between a pioneering brand and a potential entrant in the presence of product differentiation. Because our emphasis is in these kinds of industries, holding price fixed entails a very small loss of generality.

Brand extensions have important cost advantages relative to a new brand: because of the reputation effects of the parent brand, the brand extension requires lower levels of advertising (especially introductory advertising) and can also build upon the existing networks such as distribution which the parent brand has already established. In this way, brand extensions have important economies of scope relative to new brands.

Since it can exploit the parent brand's reputation (it uses the same brand name), a brand extension needs a lower advertising level to achieve a given market size. Therefore we may assume that the fixed costs of a brand extension are lower than those of a new brand, i.e. $F_E < F_N$ (cost advantage).

The situation we want to analyze is the following. An incumbent firm initially monopolisesthe market, producing output X_p. The market evolves over time both on the demand and on the supply side. In the former one, the market grows and a new segment of size A appears, which can be served only by a variation of the existing product. This calls for a "product innovation" which can come either from a new brand or from a brand extension. The monopolist is assumed to have a move advantage, so that he can launch the brand extension eventually pre-empting the potential entrant. This move advantage arises because the incumbent, in launching a brand extension, can utilize the various existing networks (such as distribution) which the original brand has

already established. Evidently, this corresponds to the formal structure of a two stage game, and we want to study its subgame perfect equilibrium in order to analyse what factors make entry deterrence, more likely, and what kind of entry deterrence we can observe under different conditions. The incumbent monopolist has the following initial cost function, corresponding identically to the cost function of the incumbent's parent brand (P).

$$C_I \equiv C_P = F + cX_P \tag{7}$$

Production of the quantity X_P requires a fixed cost $F > 0$ and a constant marginal cost $c > 0$. Therefore, initially we have only the parent brand, which requires a fixed overhead cost in advertising, which has all the features of a sunk cost. For simplicity, we assume that $F = F_N$, i.e. the parent brand has no cost advantage on the new entrant. The brand extension (E) has a similiar cost function:

$$C_E = F_E + cX_E \tag{8}$$

but now $F_E < F$, since the extension can exploit the advertising already made to the brand name by the parent brand. This implies the existence of economies of scope for the incumbent firm, and this is the main source of asymmetry between firms in the present model. However, notice that within the very simple framework we have set up, brand extension rather than brand proliferation seems to be a viable strategy for entry deterrence.

In general, we may think that the introduction of a product innovation will affect negatively the sales of the incumbent parent brand. More precisely, we can assume that a brand extension will reach a level of sales X_E defined by:

$$X_E = \lambda A + \alpha X_P, \qquad 0 < \lambda \leq 1 \tag{9}$$

where $\lambda = 1$ if there is no other entry and $\lambda \in (0,1)$ otherwise. However, remember that in the new market the position of the brand extension is symmetric to that of the new brand, so that we could set λ

= 1/2. The coefficient α is non-negative and this is related to the phenomenon of cannibalization,[9] i.e. to the fact that the brand extension will steal part of the parent brand's market share. Notice, however, that the existence of cannibalization is "irrelevant" in this context, since it represents a mere transfer of sales, and given that p and c are constant, of profit from the parent brand to the brand extension. The firm as a whole is indifferent to the extent of this cannibalization, as it aims at maximizing total profit, without constraining in any way the single products it launches. Therefore, without any loss of generality, we may put $\alpha = 0$ (no cannibalization).

The previous arguments can be summarized in the following model. With no loss of generality, we get,

$$p - c = 1 \tag{10}$$

so that each firm's profit becomes:

$$\pi = X - F \tag{11}$$

The interaction between a potential entrant's new brand (N) and an incumbent's brand extension (E) can be shown in the following four relations where Π_N is the profit of the potential entrant (new brand), Π_E is the profit of the incumbent (brand extension), and for both we consider the case where the competitor also launches a new product (E and N, respectively) and the case where he does not (denoted by a 0). The profit of the potential entrant is:

$$\Pi_{N,E} = X_N - F_N = (1-\lambda)A - F_N \tag{12a}$$

$$\Pi_{N,0} = A + \delta X_p - F_N \tag{12b}$$

The profit of the brand extension is:

$$\Pi_{E,N} = \lambda A + \alpha X_p - F_E \tag{13a}$$

$$\Pi_{E,0} = A + \alpha X_p - F \tag{13b}$$

The change in the incumbent's parent brand's profits in the various cases is:

$$\Delta\Pi_{P,E,0} = -\alpha X_p \tag{14a}$$

$$\Delta\Pi_{P,E,N} = -\alpha X_P \tag{14b}$$

$$\Delta\Pi_{P,O,N} = -\delta X_P \tag{14c}$$

Given that:

$$\Delta\Pi_I \equiv \Delta\Pi_P + \Pi_E \tag{15}$$

the change in total profit for the incumbent firm is for the different cases the following:

$$\Delta\Pi_{I,E,O} = A - F_E \tag{16a}$$

$$\Delta\Pi_{I,E,N} = \lambda A - F_E \tag{16b}$$

$$\Delta\Pi_{I,O,N} = -\delta X_P < 0 \tag{16c}$$

We want to study the subgame perfect equilibrium of this game, where the relevant payoffs are given by equations (12 a - b) for the entrant and by (16 a - c) for the incumbent. Of course, we will observe different equilibria depending on the value of the parameters.

The following three situations help to show the variables which help to determine whether brand extensions lead to innocent or strategic entry barriers.

Situation 1:

$$\lambda A > F_E \ (\rightarrow A > F_E) \tag{17}$$

In this case the market is growing fast relative to the cost of launching the brand extension so that, whatever happens, we have a brand extension: in fact,

$$\Delta\Pi_{I,E,O} > 0$$

$$\Delta\Pi_{I,E,N} > 0$$

Thus the launching of a brand extension does not depend on the existence of a potential entrant. If we have entry deterrence in this case, it will be only an innocent entry barrier.

Situation 2:

$$\lambda A < F_E < A \tag{18}$$

Now the market growth is slower, so that the new segment cannot accomodate for both new products. Thus, if the brand extension is

launched, the potential entrant will not enter. If he does not enter, (16a) is the relevant condition. Given (18), $\Delta\Pi_I > 0$ and thus a brand extension will indeed be launched.

If there is a new entry, then the incumbent's decision depends on which of the following two magnitudes is bigger:

1) $\Delta\Pi_{I,E,N} = \lambda A - F_E < 0$

2) $\Delta\Pi_{I,0,N} = -\delta X_P < 0$

Suppose:

$$(\lambda A - F_E) < -\delta X_P < 0 \qquad (19)$$

In this case, launching no brand extension is the dominant strategy for the incumbent; we have thus an equilibrium with new entry and no brand extension. But on the contrary, if

$$0 > (\lambda A - F_E) > -\delta X_P \qquad (20)$$

launching a brand extension (even without avoiding entry) entails a smaller loss than allowing entry. Therefore, we will have a brand extension; however in this case, $\Pi_N < 0$, and thus there will be no entry so that $\Delta\Pi_I > 0$. Summarising, in situation 2 we can have two equilibria:

i) brand extension - no new brand;

ii) (if $(\lambda A - F_E) < -\delta X_P < 0$), new brand - no brand extension, (if $\Pi_N = A + \delta X_p - F_N > 0$).

Notice that under (i) the brand extension is launched with $\Delta\Pi_I > 0$ and there is thus no purely strategic behavior. The incumbent would launch the brand extension even if he ignored the existence of a potential entrant.

Situation 3:

In this case, the cost of launching a brand extension is large compared to the growth of the market, like in the situation of a stagnating market. More precisely:

$$F_E > A(\text{small gap}). \qquad (21)$$

For the same reasons as before, $\Pi_{N,E} < 0$ (if we have a brand extension, the entrant does not enter), but now, $\Delta\Pi_{I,E,0} < 0$; if a brand extension is launched, there is a loss for the firm. Nonetheless, this could occur in equilibrium if:

$$-\delta X_p < \Delta\Pi_{I,E,0} < 0 \qquad (22)$$

In this case, a brand extension may create negative profits, but this is preferable to launching no brand extension and accepting the entry of a new brand. This is the case when condition (22) is met and

$$\Pi_{N,0} = A + \delta X_p - F_N > 0 \qquad (23)$$

so that a new brand is launched if no brand extension is launched. So, under situation 3 we can have, unlike in the previous cases, a brand extension that is launched just because of the potential entrant. As Judd (1985) has shown, the credibility of such a preemption depends on the existence of high exit costs. Choi and Scarpa (1988) analyze the way brand extensions help create such exit costs and in turn make the spatial preemption credible. Conditions (22) and (23) require δ to be large (a low brand name loyalty relative to the functional switch, i.e. to drink a diet product is more important than to continue drinking a Coke product). Of course, if $\delta = 0$, we cannot have a purely strategic brand extension.

The result we have proved and that we want to emphasize can be summarised in the following proposition.

PROPOSITION: $\delta > 0$ is necessary for a brand extension to represent a purely strategic move (entry barrier). This can occur when δ is large; A is small; economies of scope are small; the cost advantage is small. More precisely, necessary and sufficient conditions are:

i) $-\delta X_p < A - F_E < 0$

ii) $\delta X_p > F_N - A > 0$ ($F_N - A > 0$ is a consequence of $A - F_E < 0$,

given $F_E \leq F_N$).

The purpose of this general framework was to describe the phenomena of brand extensions and to show how they could be modelled in terms of strategic entry deterrence. As mentioned before, the idea of brand extensions holds certain elements of reputation models such as Shapiro (1983), Farrell (1986) and that of brand proliferation models such as Hay (1976), Schmalensee (1978), Eaton and Lipsey (1979). However, as we have shown, the results and the way in which brand extensions can create a strategic entry barrier is different from these other related models in the economics literature.

We analyzed brand extensions as defensive and offensive strategies. But only in the case of defensive purposes (i.e. maintaining original market share), did brand extensions lead to strategic entry barriers: indeed, $\delta > 0$ is necessary for this result, and this implies that there must be the need to protect the original market from the entry of a new brand. Furthermore, it is interesting to note that brand extensions assume this strategic aspect only in relatively stagnating markets (i.e. when A is small). Given that brand extensions are more common in declining and stagnating markets, we can presume that brand extensions are created to essentially maintain market share, through erecting strategic entry barriers.

5. CONCLUSION

The purpose of this paper has been to introduce the idea of brand extension because as far as we know, it has not been studied in the economics literature. We wanted to show the role of brand extensions as "innocent" and "strategic" entry barriers. As mentioned before, brand extension is a related but different strategy to, brand proliferation as first discussed by Hay (1976), Schmalensee (1978); brand proliferation referred to the launching of numerous, new brands.

Brand extension on the other hand refers to the "extension" of an existing brand name; incumbent's acquire an asymmetric advantage because potential entrants do not have a brand name to extend.

After describing some general features of our model in section 2, we tried in section 3 to analyze exactly when a brand extension would be launched to counter a potential entrant's new brand. Using reaction functions, we studied three cases of market structure: growing markets, stagnating markets and declining markets. We saw that in the case of growing markets, brand extensions would be used as an innocent entry barrier, or a strategy that even a protected monopolist would follow. In the case of stagnating and declining markets, brand extensions could be used strategically, in turn creating a strategic entry barrier.

In the next section, we proved that whether a brand extension is used as an innocent rather than a strategic entry barrier depended on the variables involved. For example, we showed that $\delta > 0$ was necessary for a brand extension to represent a purely strategic move; this implies incomplete, or imperfect market segmentation. Obviously, our models were very simple in form, done to best illustrate the idea of brand extension, its difference with brand proliferation, and its strategic role.

Two possible areas warrant further research. The first would be varying advertising levels and making them additional strategic variables combined with the decision to launch a brand extension; the incumbent's choice between a brand extension versus a new brand could also be further studied. The second possible extension would be to include dynamics. By this we mean that if a new brand knows it will soon launch brand extensions after becoming established, it may locate differently in product space than in markets with no brand extensions. This is left for future research.

FOOTNOTES:

[1] In a sense, a brand extension is a type (subset) of product extension that extends the reputation of the brand name. But in this paper, brand extension (proliferation) is synonymous to product extension (proliferation) and the two phrases will be used interchangeably.

[2] At one extreme, products such as Sugar Frosted Flakes merely required adding sugar equipment to standard wheat or corn flakes lines (Scherer, 1979); nevertheless, the new brand name suggested a new product.

[3] The role of exit barriers in spatial preemption is analyzed in a paper by Choi (1988).

[4] The use of the concept of commitment and its strategic effects is due to the seminal works of Schelling (1956, 1960), and was introduced to models of entry deterrence by Dixit (1979).

[5] See Shaked, A and Sutton, J. (1983) for a model of vertical product differentiation.

[6] Although models of growing markets are numerous, analyses of stagnating or declining markets have been relatively neglected by economists. Nalebuff and Ghemawat (1985) discuss the issues concerning declining markets.

[7] A similar phenomenon exists in the idea of sleeping patents as analyzed by Gilbert and Newberry (1982).

[8] Porter (1976a, 1976b) made the important distinction between convenience goods and shopping goods. Convenience goods, the focus of our paper, are of relatively low price, frequently purchased, and the retailer does not play a major role in providing information. Schmalensee (1982) has noted that the advantages of pioneering brands are greater for convenience goods. Examples of convenience goods

industries include cigarettes, soft drinks, pet foods, soap, beer.

[9] The issue of cannibalization, i.e. a firm's new product taking market share from a firm's own existing product (Scherer, 1979) exists for many multiproduct firms. However, we are interested in the firm's overall profits, regardless of whether the profits are coming from the original brand or from a brand extension.

BIBLIOGRAPHY

Choi, C.J. and Scarpa, C. "Product Extensions, Exit Barriers and Credible Spatial Preemption." Oxford University mimeo, 1988.

Dixit, A. "A Model of Duopoly Suggesting a Theory of Entry Barriers". The Bell Journal of Economics (Spring 1979), pp. 20-32.

Eaton, C. and Lipsey, R. "The Theory of Market Preemption: the Persistence of Excess Capacity and Monopoly in Growing Spatial Markets". Economica, vol 46(May 1979), pp. 149-158.

Farrell, J. "Moral Hazard as Entry Barrier." The Rand Journal of Economics(1986), pp.

Ghemawat, P. and Nalebuff, B. "Exit". The Rand Journal of Economics(1985), pp. 184-194.

Gilbert, R. and Newberry, D. "Preemptive Patenting and the Persistence of Monopoly." American Economic Review(1982), pp. 514-526.

Hay, D.A. "Sequential Entry and Entry-Deterring Strategies in Spatial Competition." Oxford Economic Papers, vol. 28, no. 2(July 1976), pp. 240-257.

Judd, K. "Credible Spatial Preemption." The Rand Journal of Economics, vol. 16(1985), pp. 153-167.

Klemperer, P. "Entry Deterrence with Switching Costs". Economic Journal, (1987 supplement), pp. 99-117.

Nelson, P. "Information and Consumer Behavior." Journal of Political Economy(March/April 1970), pp. 311-329.

Porter, M. "Interbrand Choice, Media Mix and Market Performance." American Economic Review(1976a), pp. 398-406.

——— Interbrand Choice, Strategy and Bilateral Market Power. Harvard University Press, Cambridge: 1976b.

Salop, S. "Strategic Entry Deterrence." American Economic Review(1979), pp. 335-338.

Schelling, T.C. "An Essay on Bargaining." American Economic Review(June 1956), pp. 557-583.

———— The Strategy of Conflict. Harvard University Press: 1960.

Scherer, F. "The Welfare Economics of Product Variety." The Journal of Industrial Economics(Dec. 1979), pp. 113-134.

Schmalensee, R. "Entry Deterrence in the Ready-to-Eat Breakfast Cereal Industry." The Bell Journal of Economics, vol. 8(Autumn 1978), pp. 378-393.

--------- "Product Differentiation Advantages of Pioneering Brands". American Economic Review(June 1982), pp. 349-365.

Shaked, A. and Sutton, J. "Natural Oligopolies." Econometrica (1983), pp. 1469-1484.

Shapiro, C. "Premiums for High Quality Products as Returns to Reputation." Quarterly Journal of Economics(November 1983), pp. 659-679.

Willig, R. "Economies of Scope." The American Economic Review(1979 Papers and Proceedings), pp. 346-351.