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Reputation and Firm Acquisition

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Abstract

Why do some firm acquisitions give rise to a single brand name, and why, following others, all brands involved subsist? How do the demand cross effects, the brand equity of the rivals and the strategic variable of competition influence this decision? The current paper addresses these issues. It is shown that keeping all names involved is always profitable, but adopting a common one may not be. However, the latter is the best choice whenever the new brand's expected value is higher than the average reputation of the pre-acquisition ones. When the rival's reputation is strong, this brand dilemma becomes less accute.

Introduction

Choosing the appropriate name for the acquired firm is an important aspect in any acquisition process. It involves the reputation and the image of the company, may affect customer loyalty and influence the profitability of the operation.

Following acquisition the acquirer may either decide to keep the two names in the market -his own and the one of the acquired firm, or he may choose a common brand. If a common name is chosen, this new single brand may be i) a combination of the former two -like in the case of ExxonMobil, ii) one of the pre-existing -as in the decision of DaimlerChrysler to end the Plymouth brand-, or, finally, iii) a newly-created brand -an example of which is Aventis, the name that resulted from the merger of Rhone-Poulenc and Hoechst.

The purpose of this paper is to show what determines the acquirer's decision and the consequences of the different solutions for this "brand dilemma" on the profitability of the acquisition. The roles of the strategic variable of competition (price or quantity), of the degree of technical differentiation between brands, and of the value of the rival(s)' brand(s) are addressed.

For those aims, the paper considers an industry with both technical and brand differentiation, where brand names play a role in the level of demand. Following what is called, for the purpose of the work, a *concentration* movement, both brands subsist and the new owner maximizes a profit function corresponding to the sum of the profits before acquisition. Brand differentiation is preserved.

However, if the firms *merge*, there will be a new common name.[1] As in the cases above, the new common name may be one of the pre-existing (the one with the highest value), a combination of the former two, or a completely new one. Optimization is performed on the sum of profits using the new brand equity. Brand differentiation between the two products is lost and only technical differentiation subsists.

The main results of the paper show that keeping both names is always profitable, but adopting a common one may not be. However, if the new name's value is expected to be higher than the average of the two pre-acquisition ones, then adopting the new name is always the best option. Moreover, for very high levels of the rival's brand equity, this brand dilemma becomes less relevant, because joining firms' profits under both scenarios approach.

[1] The distinction between concentrating and merging has been introduced to make the exposition clear.

Keeping both names may be seen as a means of preserving differentiation and filling in the product space. In this sense, the current paper is related with the literature on mergers with product differentiation, but also with the literature on brand names (e.g. Wiggins and Raboy, 1996; Tadelis, 1999, 2003; Pinkse and Slade, 2004), and with the literature on the welfare effects of variety (e.g. Spence, 1976; Dixit and Stiglitz, 1977; Mankiw and Whinston, 1986; Klemperer and Padilla, 1997; Cellini, Lambertini and Ottaviano, 2004; Mukherjee, 2005). As is well known, product differentiation reverses the private non profitability result of horizontal mergers under Cournot competition (Salant, Switzer and Reynolds, 1983) and makes it more attractive for firms to join. Under price competition horizontal mergers are always profitable in a differentiated product market (Deneckere and Davidson, 1985).

The paper by Lommerud and Sφrgard (1997) is the closest to the model considered, but with an important difference: besides technical differentiation, the current paper also introduces brand differentiation, through the value of the name for consumers.[2] Adding more parameters forces us to exclude marketing costs and the possibility of savings in this variable following a merger. This choice has also been made by Lommerud and Sφrgard while considering the case in which marketing costs are sunk.

The remainder of the paper is organized as follows. The model is presented in section 2. Section 3 explores the brand dilemma of joining firms. The profitability analysis for price-competing and quantity-competing firms is presented. The two brand management options are compared as to their effects on the profits of participants. Section 4 presents some concluding remarks.

The model

The notation employed and respective meaning is summarized below:

p_i	price of the good sold by firm i
q_i	quantity produced by firm i
α_i	proxy of firm i's brand value
γ	technical differentiation parameter
π_i^p	firm i's profit under price competition
π_i^q	firm i's profit under quantity competition
$\pi_{ij}^{c,p}$	joint profit of firms i and j when they *concentrate*, under price competition
$\pi_{ij}^{c,q}$	joint profit of firms i and j when they *concentrate*, under quantity competition
$\pi_{ij}^{m,p}$	joint profit of firms i and j when they *merge*, under price competition
$\pi_{ij}^{m,q}$	joint profit of firms i and j when they *merge*, under quantity competition
α	proxy of the brand value of the firm resulting from *merger*

Following Dixit (1979) and Singh and Vives (1984), consider the inverse demand structure

$$p_i = \alpha_i - q_i - \gamma \sum q_j \qquad i, j = 1, ...n,\ j \neq i, \text{ with } \alpha_i > 0 \text{ and } 0 < \gamma < 1 \tag{1}$$

Each of the n products is produced at the outset by a different firm with own brand name. Products are technical substitutes. Different intercepts are intended to capture different brand values, connected with distinct levels of firm reputation. The higher the value of the brand, the more consumers are willing to pay, so the higher α_i. This is an absolute demand advantage for firm i.[3]

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[2] As Dixit (1979: 32) states after proving the different impacts of the two types of product differentiation, "industrial organization economists should keep these two aspects distinct". Katz (1984) is another example of the use of a model with product-specific and brand-specific differentiation, as well as Gilbert and Matutes (1993), who study firms' product line choices and the use of brand proliferation as an entry deterring strategy.

[3] The exogenous demand parameter may include more aspects other than just brand value. However, these factors are normalized to zero for simplicity. Firm reputation is especially

Goods are thus differentiated through their technical characteristics (0< γ <1) and through their names ($\alpha_i \neq \alpha_j$, j≠i). Without loss of generality, it is assumed that $\alpha_1 < \alpha_2$.[4] The fact that $\gamma < 1$ implies that the homogeneous case is ruled out. The lower γ, the higher the degree of technical differentiation.

As Lommerud and Sφrgard (1997), let us take n=3. Firms 1 and 2, chosen without loss of generality, have the option to *concentrate* or to *merge*. In the concentration case the two brands are kept and so the parameters α_1 and α_2 subsist. In the merger case a new common brand is chosen, with value α. This new common name may be i) one of the pre-existing, in which case the firm chooses the one with the best image and thus reputation may reach α_2, ii) a combination of the former two, or iii) a completely new one. In the last two cases the firm will choose a name with a better image than the average of the two pre-acquisition, otherwise concentration would be a better option. Hence, $\alpha \in (\frac{\alpha_1+\alpha_2}{2}, \alpha_2]$.

The system of inverse demands

$$\begin{aligned} p_1 &= \alpha_1 - q_1 - \gamma q_2 - \gamma q_3 \\ p_2 &= \alpha_2 - q_2 - \gamma q_1 - \gamma q_3 \\ p_3 &= \alpha_3 - q_3 - \gamma q_1 - \gamma q_2 \end{aligned} \qquad (2)$$

gives rise to the following direct demand functions:

$$q_i = \frac{\alpha_i(1+\gamma) - (\alpha_j + \alpha_k)\gamma - (1+\gamma)p_i + \gamma(p_j + p_k)}{(1-\gamma)(1+2\gamma)} \qquad i = 1,2,3 \qquad i \neq j \neq k \qquad (3)$$

This linear demand structure obtains from a quadratic and strictly concave utility function

$$U(q_1, q_2, q_3) = const + \alpha_1 q_1 + \alpha_2 q_2 + \alpha_3 q_3 - \frac{q_1^2+q_2^2+q_3^2}{2} - \gamma(q_1 q_2 + q_1 q_3 + q_2 q_3).$$

In what follows production costs are normalized to zero. Note that variable costs are irrelevant for the sake of comparing merging and concentration, because they do not change with the type of acquisition. On the contrary, fixed costs may vary when firms choose a new name. For instance some marketing effort may be needed so that consumers become aware of the new brand as resulting from the former two. However, suppressing a brand may also imply fixed cost savings because there is now a single brand to manage. For simplicity, and to avoid including an additional parameter, we assume that both effects cancel. In the concentration case there is no reason for fixed costs to vary, since both brands are kept.

The sequence of the game is as follows. In the first stage firms 1 and 2 decide whether to concentrate, to merge, or to continue operating individually. In the second stage market competition takes place in prices or in quantities.[5] The results are derived in the following section.

The brand dilemma

This section analyses the incentives underlying the choice to keep both brand names or to adopt a common one under the setting described above, and compares the profitability of these two brand management options after acquisition. This is done for two strategic variables of

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important when consumers make repeated purchases, and hence the current model is particularly suited to non-durable goods.

[4] Lommerud and Sφrgard (1997) consider $\alpha_i = \alpha_j = 1$ for all i,j.

[5] Under price-competition firms use price as strategic variable, i.e., price is the variable they all choose to maximize own profits. Quantity competition may be seen as a rivalry scenario in which firms decide their production capacities and then compete by placing that quantity in the market.

competition between firms: price and quantity. As is well known from the literature (Bulow, Geanakoplos and Klemperer, 1985), these two strategic variables involve distinct levels of rivalry.

Price competition

Consider an industry with price competing firms. If firms 1 and 2 concentrate, p_1 and p_2 are chosen to maximize

$$\pi_1 + \pi_2 = \left(\frac{\alpha_1(1+\gamma) - (\alpha_2 + \alpha_3)\gamma - (1+\gamma)p_1 + \gamma(p_2 + p_3)}{(1-\gamma)(1+2\gamma)} \right) p_1 + \left(\frac{\alpha_2(1+\gamma) - (\alpha_1 + \alpha_3)\gamma - (1+\gamma)p_2 + \gamma(p_1 + p_3)}{(1-\gamma)(1+2\gamma)} \right) p_2 \quad (4)$$

In turn firm 3 chooses p_3 to maximize

$$\pi_3 = \left(\frac{\alpha_3(1+\gamma) - (\alpha_1 + \alpha_2)\gamma - (1+\gamma)p_3 + \gamma(p_1 + p_2)}{(1-\gamma)(1+2\gamma)} \right) p_3 \quad (5)$$

If firms 1 and 2 merge, the new owner maximizes[6]

$$\pi_{12} = \left(\frac{\alpha - \gamma\alpha_3 - (1+\gamma)p_1 + \gamma(p_2 + p_3)}{(1-\gamma)(1+2\gamma)} \right) p_1 + \left(\frac{\alpha - \gamma\alpha_3 - (1+\gamma)p_2 + \gamma(p_1 + p_3)}{(1-\gamma)(1+2\gamma)} \right) p_2 \quad (6)$$

with $\alpha \in (\frac{\alpha_1+\alpha_2}{2}, \alpha_2]$. Firm 3, in turn, chooses p_3 to maximize

$$\pi_3 = \left(\frac{\alpha_3(1+\gamma) - 2\gamma\alpha - (1+\gamma)p_3 + \gamma(p_1 + p_2)}{(1-\gamma)(1+2\gamma)} \right) p_3 \quad (7)$$

Equilibrium prices and quantities for both types of equilibria are reported in Table 1, where the results for the pre-acquisition scenario are also shown.

Quantity competition

Consider now an industry with quantity competing firms. If firms 1 and 2 concentrate, q_1 and q_2 are chosen to maximize

$$\pi_1 + \pi_2 = \left(\alpha_1 - q_1 - \gamma(q_2 + q_3)\right) q_1 + \left(\alpha_2 - q_2 - \gamma(q_1 + q_3)\right) q_2 \quad (8)$$

while firm 3 chooses q_3 that maximizes

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[6] Indirect demand curves are now $p_1 = \alpha - q_1 - \gamma(q_2 + q_3)$ and $p_2 = \alpha - q_2 - \gamma(q_1 + q_3)$, with $\alpha \in [\alpha_2, \alpha_1]$, and $p_3 = \alpha_3 - q_3 - \gamma(q_1 + q_2)$. Thus, $q_1 = \frac{\alpha - \gamma\alpha_3 - (1+\gamma)p_1 + \gamma(p_2 + p_3)}{(1-\gamma)(1+2\gamma)}$, $q_2 = \frac{\alpha - \gamma\alpha_3 - (1+\gamma)p_2 + \gamma(p_1 + p_3)}{(1-\gamma)(1+2\gamma)}$, and $q_3 = \frac{\alpha_3(1+\gamma) - 2\gamma\alpha - (1+\gamma)p_3 + \gamma(p_1 + p_2)}{(1-\gamma)(1+2\gamma)}$.

$$\pi_3 = \left(\alpha_3 - q_3 - \gamma(q_1 + q_2)\right) q_3 \tag{9}$$

If 1 and 2 merge the expressions to be maximized are

$$\pi_{12} = \left(\alpha - q_1 - \gamma(q_2 + q_3)\right) q_1 + \left(\alpha - q_2 - \gamma(q_1 + q_3)\right) q_2 \tag{10}$$

with $\alpha \in (\frac{\alpha_1+\alpha_2}{2}, \alpha_2]$, and, for firm 3,

$$\pi_3 = \left(\alpha_3 - q_3 - \gamma(q_1 + q_2)\right) q_3 \tag{11}$$

Equilibrium values are also reported in Table 1.

Table 1 - Equilibrium prices and quantities

		Price competition	Quantity competition
Pre-acquisition	q_i^*	$\frac{(1+\gamma)\left(\alpha_i(2+3\gamma-\gamma^2)-(\alpha_j+\alpha_k)\gamma(1+\gamma)\right)}{2(1-\gamma)(1+2\gamma)(2+3\gamma)}$	$\frac{\alpha_i(2+\gamma)-(\alpha_j+\alpha_k)\gamma}{2(2-\gamma)(1+\gamma)}$
$(i \neq j \neq k = 1,2,3)$	p_i^*	$\frac{\alpha_i(2+3\gamma-\gamma^2)-(\alpha_j+\alpha_k)\gamma(1+\gamma)}{4+6\gamma}$	$\frac{\alpha_i(2+\gamma)-(\alpha_j+\alpha_k)\gamma}{2(2-\gamma)(1+\gamma)}$
Concentration	$q_1^* = q_2^*$	$\frac{\alpha_i(4+8\gamma+\gamma^2-2\gamma^3)-\alpha_j\gamma(4+5\gamma-2\gamma^2)-2\alpha_3\gamma(1+\gamma)}{4(1-\gamma)(1+2\gamma)(2+2\gamma-\gamma^2)}$	$\frac{\alpha_i(4-\gamma^2)-\alpha_j\gamma(4-\gamma)-2\alpha_3\gamma(1-\gamma)}{4(1-\gamma)(2+2\gamma-\gamma^2)}$
	q_3^*	$\frac{(1+\gamma)(\alpha_3(1+\gamma-\gamma^2)-\frac{\alpha_1+\alpha_2}{2}\gamma)}{(1-\gamma)(1+2\gamma)(2+2\gamma-\gamma^2)}$	$\frac{\alpha_3(1+\gamma)-\frac{\alpha_1+\alpha_2}{2}\gamma}{2+2\gamma-\gamma^2}$
	$p_1^* = p_2^*$	$\frac{2\alpha_i(4+4\gamma-3\gamma^2)-\frac{\alpha_j}{2}\gamma^2-\alpha_3\gamma(1+\gamma)}{2(2+2\gamma-\gamma^2)}$	$\frac{2\alpha_i(4+4\gamma-\gamma^2)+\frac{\alpha_j}{2}\gamma^2-\alpha_3\gamma(1+\gamma)}{2(2+2\gamma-\gamma^2)}$
	p_3^*	$\frac{\alpha_3(1+\gamma-\gamma^2)-\frac{\alpha_1+\alpha_2}{2}\gamma}{2+2\gamma-\gamma^2}$	$\frac{\alpha_3(1+\gamma)-\frac{\alpha_1+\alpha_2}{2}\gamma}{2+2\gamma-\gamma^2}$
Merger	$q_1^* = q_2^*$	$\frac{2\alpha(1+\gamma-\gamma^2)-\alpha_3\gamma(1+\gamma)}{2(1-\gamma)(1+2\gamma)(2+2\gamma-\gamma^2)}$	$\frac{2\alpha-\alpha_3\gamma}{2(2+2\gamma-\gamma^2)}$
	q_3^*	$\frac{(1+\gamma)(\alpha_3(1+\gamma-\gamma^2)-\alpha\gamma)}{(1-\gamma)(1+2\gamma)(2+2\gamma-\gamma^2)}$	$\frac{\alpha_3(1+\gamma)-\alpha\gamma}{2+2\gamma-\gamma^2}$
	$p_1^* = p_2^*$	$\frac{2\alpha(1+\gamma-\gamma^2)-\alpha_3\gamma(1+\gamma)}{2(2+2\gamma-\gamma^2)}$	$\frac{2\alpha(1+\gamma)-\alpha_3\gamma(1+\gamma)}{2(2+2\gamma-\gamma^2)}$
	p_3^*	$\frac{\alpha_3(1+\gamma-\gamma^2)-\alpha\gamma}{2+2\gamma-\gamma^2}$	$\frac{\alpha_3(1+\gamma)-\alpha\gamma}{2+2\gamma-\gamma^2}$

Before proceeding we make the following assumptions regarding the parameterization of the model:

$\alpha \in (\frac{\alpha_3\gamma(1+\gamma)}{1+\gamma-\gamma^2}, \frac{\alpha_3(1+\gamma-\gamma^2)}{\gamma})$ for $0 < \gamma \leq 0.83785$

$\alpha \in (\frac{\alpha_3(1+\gamma-\gamma^2)}{\gamma}, \frac{\alpha_3\gamma(1+\gamma)}{1+\gamma-\gamma^2})$ for $0.83785 < \gamma < 1$

$\alpha_3 < \min\{\frac{2\alpha_i(4+4\gamma-3\gamma^2)-\frac{\alpha_j}{2}\gamma^2}{\gamma(1+\gamma)}, \frac{\alpha_i(4+8\gamma+\gamma^2-2\gamma^3)-\alpha_j\gamma(4+5\gamma-2\gamma^2)}{2\gamma(1+\gamma)}, \frac{\alpha_i(4-\gamma^2)-\alpha_j\gamma(4-\gamma)}{2\gamma(1-\gamma)}\}$, $i, j = 1, 2$

These assumptions ensure that all prices and quantities reported in Table 1 are positive. Throughout the remainder of the paper we will assume that they are verified.

Profitability of two different brand management options after acquisition

In this section firms' incentives to concentrate or merge are analyzed. The results presented are obtainable from the expressions in Table 1, by computing profits under the various scenarios, comparing them and making the adequate comparative statics analysis.

Absolute profitability

First, let us compare profits after both types of acquisition with those in the pre-acquisition scenario. As expected, results for the merging case are less clear than those for concentration, because there is one additional variable involved (α).

Note first that concentration is always profitable as compared with a no-acquisition scenario, while merging may not be.

In fact, $\pi_{12}^{c,p} > \pi_1^p + \pi_2^p$ and $\pi_{12}^{c,q} > \pi_1^q + \pi_2^q$ for all $\alpha_1, \alpha_2, \alpha_3, \gamma$, where superscripts refer to the type of operation and to the type of competition (c - concentration and m - merger; p - price and q - quantity). This is true because the industry has kept the same structure, but the new firm has now the advantage of controlling two decision variables that were formerly chosen by different firms.

However, $\pi_{12}^{m,p}$ may be larger or smaller than $\pi_1^p + \pi_2^p$, the same being true for $\pi_{12}^{m,q}$ as compared with $\pi_1^q + \pi_2^q$. In the merger case the industry acquires a new configuration and so the result depends on the value of the new brand, α, and also on α_3 and γ, that is, the value of the surviving rival brand and the degree of technical differentiation between the products. Under the restrictions imposed on the parameters, the likelihood of merger profitability is always increasing in the new brand value α.

Price versus quantity competition

In what concerns the distinction between price and quantity competition, it can be proved that when technical differentiation, as given by the inverse of γ, is sufficiently high (namely for all $\gamma \leq 0.55496$), quantity-competing firms gain more with *concentration* than price-competing ones, independently of the values of the brands. This happens because a low γ softens price competition before acquisition, and thus reduces the gains from concentrating. When brands become more homogeneous as to their technical characteristics ($\gamma > 0.55496$), the result depends on relative brand values and several combinations may occur.

Mergers are more profitable under price than under quantity competition when goods are close substitutes (specifically for $\gamma > 0.76759$), a result in line with the literature (Salant, Switzer and Reynolds, 1983 and Deneckere and Davidson, 1985). For a larger degree of differentiation ($\gamma \leq 0.76759$) mergers are more profitable under price competition if the common name adopted lies at the extremes of the allowed range of variation (either very low or very high).

Proposition 1 Let concentration denote the case in which the joining firms keep their brand names and let merger denote the case in which they adopt a common name. Then,
(i) Concentration is always profitable. For sufficiently high levels of technical differentiation (for $\gamma < 0.55496$, with $0 < \gamma < 1$) concentration is more profitable for quantity-competing firms than for price-competing ones. The reason is that price competition is softened before acquisition when the goods are distant substitutes. For closer technical substitutes ($\gamma > 0.55496$) the result depends on brand differentiation.

(ii) Mergers may be unprofitable. The likelihood of profitability increases with the value of the adopted brand name. Merger profitability is higher when firms compete in prices than when they compete in quantities for low levels of technical differentiation ($\gamma > 0.83785$), or, for more technically differentiated brands, when the value of the new name lies at the extremes of the allowed interval.

Relative profitability

This subsection compares profits under the two brand options after acquisition.

The firm's decision on whether to keep both brands or choose a common one will be determined by the relative profitability of these alternatives. Although concentration is always profitable but mergers are not, there are cases in which mergers are profitable and even more than concentration operations.

By comparing joint profits under merger and under concentration, it is easy to conclude that the former are higher whenever the new name's equity is higher than the average of the pre-acquisition ones ($\alpha > \frac{\alpha_1+\alpha_2}{2}$). If $\alpha < \frac{\alpha_1+\alpha_2}{2}$, firms would prefer concentration and in the equality case they are indifferent. Combining with the results in the previous subsection, the likelihood of preferring merger rather than concentration is higher, the higher is $\alpha > \frac{\alpha_1+\alpha_2}{2}$.

Proposition 2 Joining firms prefer to adopt a common name rather than keeping the two pre-acquisition names in the market when the value of the new brand is higher than the average of the pre-acquisition brand values. This preference rises with the value of the common name and decreases with the equity of the rival's brand.

It is straightforward to show that $\pi_{12}^{c} - \pi_{12}^{m}$ declines with the brand equity of the surviving rival (α_3) if and only if $\alpha < \frac{\alpha_1+\alpha_2}{2}$. This result holds for price and for quantity competition and tells us that when firms choose concentration ($\alpha < \frac{\alpha_1+\alpha_2}{2}$), this preference becomes less marked as α_3 rises, and the same when they choose the merger solution ($\alpha > \frac{\alpha_1+\alpha_2}{2}$). Thus, although firms may prefer one type or the other of acquisition, depending on the expected value of the new brand name, such preference is less pronounced the higher is α_3 . In other words, when the surviving rival has a strong name in the market, the "brand dilemma" becomes less important.

Proposition 3 The higher the value of the rival's brand, the closer are joining firms' profits under the two brand management options, easing the "brand dilemma".

4. Concluding remarks

Firm acquisition may either give rise to a single brand, or the joining parties may choose to keep both their names in the market. This decision is an important one, because it involves the reputation of the joining firms, as an asset embedded in the names. It may be seen as a matter of strategic positioning in the brands' space. The solution for this "brand dilemma" depends on the degree of product-specific and brand-specific differentiation, and on the nature of competition - price or quantity, for instance. Although keeping both names is always a profitable choice but adopting a common one may not be, players prefer the latter option in some cases. This is more likely to occur when the new brand is expected to have a strong image and the rival's name has a weak one. If the firm that stays out of the agreement has a strong name in the market, the profit difference between merging and concentration is reduced, easing the "brand dilemma".

Beyond the results presented in the current paper, one can also show that the two possibilities explored are not indifferent in terms of the effects on the rival's profits and on consumer's welfare. These aspects must be taken into account by a regulatory authority when analyzing proposed acquisitions.

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