Umbrella Branding Can Leverage Reputation, but only with Market Power

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Umbrella Branding

First question: Why do brand names matter anyway?

The main and easy answer is that some firms simply have committed to a technology that produces high-quality products. Adverse selection models.

Another answer is reputation. Moral hazard models. Klein-Leffler (1981). Anderssen (2002).

Market Structure

This has received much less attention. How would umbrella branding work in competitive markets? Reputation works in competitive markets. How about umbrella branding based on reputation?

Could umbrella branding be used as a tool to leverage monopoly power in one market into another?

The Model

One or more firms produce a single good, which has either low or high quality. Each firm chooses its own quality anew each period. All firms have a marginal cost of c for the low-quality version of the product and $(1+\gamma)c$ for the high quality version, with $\gamma > 0$.

We will look at both monopoly and competition. In the monopoly case, the monopolist chooses the price. In the competitive case, a unit interval continuum of firms engage in Bertrand price competition.

Consumers lie on a continuum of length x. Consumers are identical. Each wishes to buy one unit of the good and is willing to pay up to v for low quality or $(1+\theta)v$ for high quality, with $\theta > \gamma$.

A firm's quality in a given period is unobservable before purchase, but becomes common knowledge after purchase. The discount rate is r, and there are an infinite number of periods.

Timing

At the start of a period, firms choose prices and qualities.

Consumers then decide whether and where to buy.

An interval of time passes, and at the end of the period firms pay the cost of production, consumers pay the firms, receive the product, and everyone learns the quality the products that were purchased.

The next period then begins with new decisions by firms about prices and qualities.

Viability

Assume

$$(1+\theta)v - (1+\gamma)c > 0, \tag{1}$$

which says that purchasing a high-quality product at cost is better for the consumer than not buying at all.

If $v > c$ we will say that low quality is viable: it is more efficient for consumers to buy low quality than not to buy at all.

If $v < c$ we will say that low quality is unviable.

The assumptions imply that high quality is efficient.

The High-Quality Equilibrium.

Firms produce high quality unless they have ever produced low quality, in which case they produce low quality.

In a competitive market the equilibrium price is $p = c + (1 + r)\gamma c$, and in a monopolized market it is $p = (1 + \theta)v$.

If consumers believe the quality is high, they purchase at the lowest available price if it is less than $(1+\theta)v$ and do not purchase at all otherwise.

If consumers believe the quality is low, they purchase at the lowest available price if it is less than v and do not purchase at all otherwise. Out-of-equilibrium, if consumers observe a firm charging less than the equilibrium price, they believe it has chosen low quality; otherwise, they believe it has chosen high quality.

The Klein-Leffler Price

The price exceeds marginal cost, because sellers require an inducement to forgo earning short-term profits by producing low quality.

Let us call the minimum necessary price that makes high quality a possible equilibrium outcome the "Klein-Leffler price" and denote it by $p^*(comp)$. This price will equal

$$p^*(comp) = c(1+\gamma) + r\gamma c = c + (1+r)\gamma c.$$

Deviations

Any firm that deviated to a higher price would sell nothing in that period, and so would reduce its payoff.

Any firm that deviated to a lower price would be believed to have low quality in that period and thereafter.

This is dominated by charging $p^*(comp)$ and deviating to low quality. In subsequent periods, when the firm is believed to produce low quality, it is clear no consumer will buy if $v < c$. If $v > c$, a consumer could earn surplus buy buying low quality, but the viability condition tells us that buying high quality at $p^*(comp)$ is preferable. Thus, no firm will deviate.

Profits

Even though firms are competitive they earn positive profit.

Existence

For this equilibrium to exist requires that consumer prefer buying a product believed to be high quality at price $p^*(comp)$ instead of a product believed to be low quality at price c.

Consumers all prefer high quality to low quality if both are priced at marginal cost; high quality is efficient.

But in equilibrium, the Klein-Leffler price is ABOVE marginal cost. If it is too much higher than MC, then the consumers will prefer low quality at P=MC (or not buying at all).

The Equilibrium for a Monopoly

If $v < c$ then the "monopoly Klein-Leffler price," $p^*(monopoly)$, will equal the competitive Klein-Leffler price $p^*(comp)$, because deviation profits are the same as for a competitive industry.

If $v > c$, on the other hand, consumers will continue to buy even if they expect low quality.

The monopolist's profit from deviating to low quality then has two parts, the one-time large gain from when consumers are fooled into paying the high-quality price and a steady stream thereafter of positive though lower profits from charging v for low quality. The monopoly's payoff is

$$\pi(low\ quality, monopoly) = \frac{(p-c)x}{1+r} + \frac{(v-c)x}{(1+r)r}.$$

When $v > c$ the monopoly Klein-Leffler price is greater than the competitive Klein-Leffler price.

One might think that this means that there exist parameter values for the quality premium θ high enough for high quality to be viable for a competitive industry but not for a monopoly. That is false, as Proposition 1 tells us.

Proposition 1: Whenever parameter values make high quality viable under competition they also make it viable under monopoly.

A Puzzle

The quality-guaranteeing price is higher for the monopolist.

Yet the viability problem of that price being so high that no equilibrium with high quality exists is no more severe than for a competitive industry.

The most tempting deviation has a different character for the monopoly. What matters is whether it is tempted to deviate to low quality to obtain a one-time gain and then begin selling low quality at a low but profitable price.

For the competitive industry, what matters is whether *consumers* would switch from a firm selling high quality at $p^*(comp)$ to a firm selling low quality at c. Thus, we cannot simply compare the quality-guaranteeing prices in the two industry structures.

Observation 1. Suppose a competitive market is viable for low quality but not for high quality.

If the the low-quality product becomes worse (v falls) while the high-quality product does not ($(1+\theta)v$ stays the same) social welfare can rise because high quality may become viable.

Observation 2. If the monopolized market is unviable for high quality, the monopolist may be able to profitably make it viable by allowing free entry into production of the low-quality good.

Why Observation 2 Is True

Both a competitive and a monopolistic industry would increase profits by making high quality viable in this way, and social surplus would rise.

In the competitive industry, consumers would have positive payoffs even in the pessimistic equilibrium if low quality is viable. Worsening the low-quality product could eliminate any surplus from it while reducing $p^*(comp)$ to just slightly below $(1+\theta)v$, the consumer's value. [incomplete]

In the monopoly case, consumers earn zero surplus in either the pessimistic or the optimistic equilibrium, so the product-worsening strategy would affect only the firm.

Umbrella Branding: Monopoly

We will now let there be two products, subscripted i, with possibly differing parameters v_i, γ_i, θ_i, c_i, and x_i, $i = 1, 2$. Firms choose the quality of each product separately. We will use K_i as an indicator variable, where $K_i = 1$ if $v_i \geq c_i$ so that low quality for product i is viable, and $K_i = 0$ if $v_i < c_i$.

If both products are viable, a monopoly will sell them at prices $(1+\theta_1)v_1$ and $(1 + \theta_2)v_2$ for high quality. It cannot do better by using cross-subsidization. If neither is viable, the firm would sell either nothing or low quality.

Suppose next that high quality for product 1 is strictly viable but for product 2 it is unviable. This means that

$$(1+\theta_1)v_1 > p_1^*(monopoly) = c_1 + (1+r)\gamma c_1 + K_1(v_1 - c_1) \qquad (2)$$

and

$$(1+\theta_2)v_2 < p_2^*(monopoly) = c_2 + (1+r)\gamma c_2 + K_2(v_2 - c_2) \qquad (3)$$

Note that if $K_i = 0$ then the monopoly Klein-Leffler price is $c_i + (1 + r)\gamma c_i$,while if $K_i = 1$ it is $v_i + (1 + r)\gamma c_i$, as we found earlier in the single-product model.

Proposition 2: A monopoly selling two products can for some parameter values maintain high quality for each when two monopolies each selling one product cannot.

Intuition

What makes umbrella branding helpful is first the lack of viability of high quality for product 2. If high quality is already viable in market 2, then the price immediately rises to the reservation price of high quality and nothing further can be done by umbrella branding. If high quality is not viable for product 2, then umbrella branding can help. It is particularly likely to help if θ_1, and x_1 are high relative to the other parameter values, and if r and γ_1 are low.

Product 1's profit can be used as a hostage to ensure that the two-product monopolist does not cheat and sell low quality for product 2.

Umbrella branding is that it not only makes product 2 viable; it does so without requiring the firm to sacrifice any profits whatsoever from product 1.

A firm's post-entry profit from producing two products of high quality is

$$\frac{(p_1 - (1+\gamma_1)c_1)x_1}{r} + \frac{(p_2 - (1+\gamma_2))x_2}{r} \tag{4}$$

compared with a deviation payoff of

$$\frac{(p_2 - (1+\gamma_2)c_2)x_2}{1+r} + \frac{(p_2 - (1+\gamma_2)c_2)x_2}{1+r} \tag{5}$$

These are equated by the same values of p_1^* and p_2^* as when firms sell individual products. The two payoffs are also equated by many other price pairs. Would any of those support an equilibrium? No. Any other price pair would require not just umbrella beliefs but also that $p_1 > p_1^*$ and $p_2 < p_2^*$. Firms do not have "redundant" profits from product 1 that they can put at risk to give themselves an incentive for high quality from product 2.

Proposition 3: A competitive industry made up of firms selling two products cannot maintain high quality if an industry of firms selling one product each could not.

Proposition 4: Suppose one product can be produced by only one firm but a second product can be produced by many firms. If the monopoly is allowed to produce both products, it will capture both markets. If a firm with a monopoly on some third product also tries to sell in the competitive market, competition between the two monopolies will result in monopoly leveraging that helps consumers.

Leveraging Monopoly Power Using Umbrella Branding

Let there be 2 monopolies and 3 products, all strictly viable, with demand and cost parameters.

Monopoly 1 and monopoly 2 are the only possible producers of products 1 and 2, while product 3 can be produced at the same cost by both those two firms and by many other competitive firms.

We will assume, to reduce clutter, that $v_1 < c_1$ and $v_2 < c_2$), so low quality is not viable for products 1 and 2.

The quality-guaranteeing price for product 3 will be different for monopoly 1, monopoly 2, and the competitive firms.

Let us clarify the out-of-equilibrium beliefs being assumed. On observing an out-of-equilibrium price, onsumers believe a firm chose low quality if its price is below the quality-guaranteeing price $p^*(comp)$ *for that firm* and high quality otherwise.

If the monopolies are not allowed to sell product 3, the market prices are

$$p_1 = (1 + \theta_1)v_1$$

$$p_2 = (1 + \theta_2)v_2 \tag{6}$$

$$p_3 = p_3^*(competitive) = c_3 + (1 + r)\gamma_3 c_3$$

What if monopoly 1, but not monopoly 2 is allowed to sell product 3?

Monopoly 1 will charge epsilon less than the competitive firms)(equal, in a weak Bertrand equilibrium) , and grab the entire market for product 3.

Now open up product 3 to sales by monopoly 2.

Monopoly 2 will capture the entire market for product 3, at price $p_3^*(Mon.1)$, the price below which monopoly 1 cannot cut. The price has fallen strictly below the competitive price for good 3, so consumers are better off than originally in the competitive market.

How To Tell This Kind of Monopoly Leveraging

This kind of monopoly leveraging is distinguishable from improper leveraging in two ways.

First, it does not involve any kind of complex contract that ties the two markets together, unlike bundling or exclusive dealing.

Second, the monopoly does not charge less than the cost of the competitive firms.

Whinston (1990) Tying

Goods A and B each have consumer reservation prices of 8 and are monopolized by a firm that has marginal cost of 5 for each of them.

A new firm with a marginal cost of 3 and entry cost 1 appears for B. If the monopolist sells the two goods separately, the new firm will enter.

If the monopoly commits to tying sales of A and B and charges 16 for the bundle instead of 8 for each, it is safe from entry.

If the new firm enters, the monopolist would be willing to let the bundle's price drop to 10.9, leaving consumers with a surplus of 5.1, greater than the 5 they could get by buying only good B from the new firm.

The monopolist payoff is still .9. better than the 0 he would get by losing the sale.

The monopolist purposely puts its monopoly profits at risk to block competition in a second market.

In the Whinston model, however, the monopolist succeeds because it has increased potential price-cutting off the equilibrium path.

In the umbrella model, the monopolist succeeds because it has reduced potential quality-cheating off the equilibrium path in a way that competitive firms cannot match.

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The End

After the End