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Effective price-matching: a comment

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Abstract

Corts [Economic Lett. 47 (1995) 417] showed that when allowing for price-beating policies in addition to price-matching policies, the competitive outcome prevails in lieu of monopoly pricing. I show by expanding the strategy set further to include effective price strategies, the possibility of monopoly pricing is restored.

Keywords: Price-matching, Price-beating, Monopoly pricing

JEL classification: L10

1. Introduction

When a firm's strategy set is expanded from announcing a simple price to including a policy, the competitiveness of the environment may be disrupted. Doyle (1988) shows that allowing a policy of price-matching will allow a new possibility of monopoly pricing; however, Corts (1995) shows that further expansion of the set of possible policies to include price-beating will eliminate any equilibrium but the competitive one. In Corts (1997), he expands this research to show that similar properties hold when there are two types of consumers: sophisticated (consider effective price) and unsophisticated (consider nominal price). In particular, the sophisticated consumers again pay a price equal to marginal cost.

The Corts results stem from one firm's ability to nullify its rival's policy of

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matching announced prices by using price-beating. Edlin (1997) conjectures that this nullification may not be possible with a policy of matching final prices.[1] I show that Corts' assumptions are indeed essential for his results by showing that further expansion of the strategy set to include policies written on effective as well as announced prices will return the possibility of monopoly pricing.

2. Effective price-matching may lead to monopoly pricing

There are $N \geq 2$ firms selling a homogeneous product that costs c to produce. Each firm chooses simultaneously an initial price p_i and a price-improving policy $g_i(p, p^e)$. This policy is a function of all initial prices $p = \{p_i\}$ and another set of prices called effective prices p^e.[2] The effective price represents the price the consumer gets after all discounts and adjustments. We restrict g_i to be a price-improving policy where the range is between 0 and p_i. Furthermore, we assume that g_i is continuous in effective prices $\{p_j^e\}$. Purchases by consumers are evenly split among the firms with the lowest effective price (possibly one firm). As with Corts, assume there is an aggregate demand function $d(p)$ with a finite, well defined monopolist price $p^m = \text{argmax}_p(p - c)d(p)$.

An equilibrium is a set of prices, policies and effective prices $\{\hat{p}_i, \hat{g}_i, \hat{p}_i^e\}$ such that they are consistent, $\hat{p}_i^e = \hat{g}_i(\hat{p}, \hat{p}^e)$, and no individual has incentive to deviate.

Proposition 1. *Given a set of prices p_i' and policy functions g_i'. A consistent set of effective prices p_i^e exists.*

Proof. Define $g(p) = \{g_i'(p', p)\}$. This is a continuous function from $[0, p_1'] \times \cdots \times [0, p_n']$ to $[0, p_1'] \times \cdots \times [0, p_n']$ and thus by Brouwer's Fixed Point Theorem has a fixed point.[3] This fixed point is a set of consistent effective prices $\{p^e\}$. □

Notice that firm i is able to choose a policy of effective price-matching where $g_i(p_i, p_{-i}, p^e) = \max\{\min\{p_{-i}^e, p_i\}, 0\}$. This guarantees that any consistent set of effective prices (which is shown to exist by Proposition 1) must have the effective price of firm i be (weakly) the lowest. For example, if firm j chooses a policy of effective price beating $g_j(p_j, p_{-j}, p^e) = \max\{\min\{p_j, p_j - \lambda(p_j - \min\{p_{-j}^e\})\}, 0\}$ where $\lambda > 0$, then their effective prices when consistent are the same. If $p_i < p_j$,

[1] Doyle (1988) mentions that his results still hold with a policy of matching the selling price instead of the announced price, but did not analyze this in conjunction with price-beating policies.

[2] A firm's policy is a function of all effective prices rather than all other effective prices for notational simplicity.

[3] See Border (1985) note 6.6 on page 29.

then the consistent effective prices must be $p_i^e = p_j^e = 0$. If $p_i \geqslant p_j$ then a set of consistent effective prices could also include $p_i^e = p_j^e = p_j$.

This realization about effective price-matching leads to the following Proposition.

Proposition 2. *There is an equilibrium where prices are monopoly prices.*

Proof. Suppose all firms choose $p_i = p^m$ with effective price-matching. The effective prices of $p_i^e = p^m$ is consistent with these choices. We see that these constitute an equilibrium, since no firm has an incentive to deviate. First, raising his price would not change his effective price. Second, lowering his price will lower the effective price and lower his profits. Finally, changing his policy from effective price-matching to some other policy can at most lower the final effective price without increasing his share, since everyone else has an effective price-matching policy. □

3. Discussion

Solving for the fixed point of effective policy functions may require a great deal of rationality. Whether consumers or salesclerks can compute such calculations for every policy is doubtful. However, there is still a possibility of arriving at matching effective prices by ''solving'' effective price policies through repeated interactions. For instance, let us say there are two stores, *A* and *B*, each having the policy of beat any standing offer from another store by 10% of the difference. A consumer could travel between both stores seeking a lower price from the salesclerk. If store *A* charges $1090 for a good while store *B* charges $1000, the consumer could then obtain a standing offer of $991 from store *A*. The competition would quickly converge to the matching effective price of $990. If this price is the monopoly price, neither store would have incentive to deviate in either announced price or policy.

Such an example shows that such effective policies may not be so difficult to implement. This leads one to wonder why overall there is a lack of explicit effective-price policies while standard price-matching and price-beating policies are ubiquitous, particularly when these policies may be no simpler than effective-price policies. For instance, currently in the online market for office supplies, Staples offers a price-matching policy while both Office Max and Office Depot offer price-beating policies of 55%. Moreover, the aforementioned policies vary somewhat in terms and applicability, but are based upon advertised price with varying clauses that consider shipping and sales tax. A policy that considers other store policies should not be more difficult to codify or explain. Furthermore, although not studied in depth, prices (advertised and effective) in this market are

both to an extent matching and above marginal costs. This absence of explicit effective-price-matching policies does not negate the existence of implicit policies. It is quite possible that a store may have an implicit effective-price-matching policy instead of an explicit policy in order to avoid the sometimes high verification costs of an effective price.

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