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THE MOST-FAVOURED-CUSTOMER PRICING POLICY AND COMPETITIVE ADVANTAGE*

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ABSTRACT

The paper investigates the effects on competition of the unilateral most-favoured-customer pricing policy. A model is considered in which a multimarket incumbent firm faces a threat of entry in one of its two markets. It is shown that contemporaneous most-favoured-customer clauses may change competition to the advantage of the incumbent both under strategic substitutes and strategic complements. If the duopolistic market is strong, the most-favoured-customer policy makes the incumbent 'tough' and may be used for entry deterrence purposes.

I. INTRODUCTION

A most-favoured-customer (MFC) clause guarantees a rebate on the original price if the seller offers lower prices to other customers. MFC clauses may be either retroactive or contemporaneous. Under a retroactive MFC policy, the seller agrees to give rebates to buyers if the seller lowers its price in the future. Contemporaneous MFC clauses insure buyers against contemporaneous price discrimination in favour of other buyers. This paper analyses the effects of the *contemporaneous*

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MFC pricing policy on competition and concentrates on the role of this policy as an entry deterrence device.

Some authors have asserted that adopting unilaterally a retroactive MFC policy gives a competitive advantage to rivals and that the MFC pricing policy is a method of softening price competition (e.g. Salop, 1986; Cooper, 1986; Tirole, 1988). Two implications are: first, that MFC clauses can facilitate collusion (Hay, 1982; Salop, 1986; Cooper, 1986); and secondly, that the MFC pricing policy is not a good strategy for entry deterrence purposes because a 'puppy dog' strategy encourages entry (Tirole, 1988).[1]

I shall show that the MFC policy can make a firm a tougher or a softer competitor, depending on the circumstances. This result, which differs from the conventional wisdom that the MFC policy makes a firm softer, is based on the consideration of a contemporaneous MFC policy instead of the retroactive policy.[2] DeGraba (1987) also considers a contemporaneous MFC policy and assumes that there is a national firm which faces a local competitor in each of two geographically separated markets. He shows that when the national firm includes MFC clauses in its contracts, all firms charge lower prices than they would if no such clauses existed. The MFC policy makes the national firm behave less aggressively and, perceiving this fact, the local firms have an incentive to be more aggressive in nonprice competition (in particular, by reducing product differentiation).[3]

I consider a multimarket incumbent firm that sells a product in two separated markets: in one it is a monopolist, and in the other it faces the competition of a rival firm. When the incumbent adopts an MFC pricing policy, it then commits itself to price uniformly and its strategy space is therefore restricted.[4] The incumbent firm sacrifices the profit from its monopolized market and pays the incumbent firm to engage in this policy if its strategic position in the duopolistic market is improved. Following Robinson's (1933) terminology, let us call one market the 'strong' market and the other the 'weak' market.[5] Under

[1] See the taxonomy in Fudenberg and Tirole (1984).

[2] As I show, a contemporaneous policy can pull price in a market either up or down, while the retroactive version can only pull it up.

[3] On the contrary, I find that the MFC policy can make the firm that offers it become a more aggressive competitor.

[4] But we know from Schelling (1960)'s work that a constraint in the strategy space of a player may work in his favour. Schelling states: 'The essence of these tactics is some voluntary but irreversible sacrifice of freedom of choice. They rest on the paradox that the power to constrain an adversary may depend on the power to bind oneself' (p. 22).

[5] Under monopoly, a strong (weak) market is defined as a market in which, at the profit-maximizing uniform price, the market elasticity indicates that the profit in that market could be increased by increasing (decreasing) the price in that market. That is, in a strong (weak) market the discriminatory price is at least as great as (not greater than) the uniform price. In the present case, what determines if the market is strong or weak is the elasticity of the multimarket seller's residual demand, not the market demand. Many works in the literature on price discrimination have used Robinson's terminology (e.g. Holmes, 1989).

price competition (in this case, prices are strategic complements), if the duopolistic market is strong, then the MFC policy makes the incumbent 'tough'. Therefore, the MFC policy is optimal under entry deterrence and the price discrimination policy is optimal under accommodation.[6] That is, the MFC policy is used by the incumbent only when the policy successfully deters entry, and this requires that the entry cost be large enough. If the duopolistic market is weak, the MFC policy makes the incumbent 'soft', and this may be a good strategy for accommodation but not for entry deterrence. Under quantity competition (strategic substitutes), if the duopolistic market is strong, then the MFC policy also makes the incumbent tough. Thus, the MFC policy is optimal under entry deterrence and may be optimal for accommodation. If the duopolistic market is weak, the MFC policy makes the incumbent soft and, therefore, the established firm will never use it (either to accommodate or to deter entry).

II. THE MODEL

Consider a multimarket incumbent, firm I, which sells one product in two separate markets. It faces a threat of entry in market 1; firm E is the potential entrant. Consider two kinds of post-entry competition: Bertrand competition with differentiated products and Cournot competition with a homogeneous product. For the Bertrand game we consider a demand system for a differentiated product $x_i = D_i(p_I, p_E)$, $i = I, E$. Assume that demands are downward-sloping ($\partial D_i/\partial p_i < 0$), firms sell substitutes ($\partial D_i/\partial p_j > 0$), and $|\partial D_i/\partial p_i| > |\partial D_i/\partial p_j|$, $i = I, E, j \neq i$. For the case of Cournot competition we consider an inverse demand $P_1(x_1)$, where x_1 is the total output, which is assumed to be downward-sloping ($P_1'(x_1) < 0$). Let us denote by $P_2(x_2)$ the inverse demand and by $x_2 = D_2(p_2)$ the demand in market 2, with $P_2'(x_2) < 0$ and $D_2'(p_2) < 0$. Marginal production costs are constant and identical for both firms: $c_I = c_E = c$. Firm i's profits in market 1 in terms of prices are $\Pi^i(p_I, p_E) = (p_i - c)D_i(p_I, p_E)$, $i = I, E$, and in terms of quantities, $\Pi^i(x_I, x_E) = [P_1(x_I + x_E) - c]x_i$, $i = I, E$. The incumbent's profit function in market 2 is $\Pi_2(x_2) = [P_2(x_2) - c]x_2$. We assume that $\Pi^i_{ii} < 0$, $\Pi^i_{ij} > 0$, $\Pi^i_{ii} + |\Pi^i_{ij}| < 0$, $i = I, E, j \neq i$, and $\Pi_2'' < 0$. These assumptions ensure that Bertrand and Cournot reaction functions are well behaved and that there exist unique Bertrand and Cournot equilibria. Furthermore, the incumbent's profit function in market 2 is concave and the monopoly output (and price) is well defined.

[6] Following the taxonomy of Fudenberg and Tirole (1984), the MFC policy would be the 'top dog' strategy and the price discrimination policy would be the 'puppy dog' strategy.

The timing is as follows. (1) The incumbent firm decides whether to include MFC clauses in its sales agreements with buyers. (2) The potential entrant, firm E, observes the incumbent's pricing policy and decides to enter or stay out. The cost of entry is f_E. (3) If entry occurs, the incumbent and entrant decide on price (or quantity) levels simultaneously and independently.

III. EFFECTS ON COMPETITION OF THE MOST-FAVOURED-CUSTOMER POLICY

Let us assume that the incumbent adopts an MFC policy before entry. Then, in equilibrium, the incumbent firm must charge the same price in both its markets. Consider the Bertrand game and suppose that $p_I > p_2$ so that the incumbent must rebate $(p_I - p_2)D_I(p_I, p_E)$ to market-1 customers. The incumbent's profit is $(p_2 - c)[D_I(p_I, p_E) + D_2(p_2)]$. The incumbent could increase its profits by charging p_2 in both markets and thus obtaining $(p_2 - c)[D_I(p_2, p_E) + D_2(p_2)]$. Hence, under the MFC pricing policy the incumbent commits itself to uniform pricing. The incumbent's total profit function is $\Pi(p, p_E) = (p - c)[D_I(p, p_E) + D_2(p)]$. The first-order condition (FOC) is given by:

$$\frac{\partial \Pi}{\partial p} = D_I(p, p_E) + D_2(p) + (p - c)\left[\frac{\partial D_I(p, p_E)}{\partial p} + \frac{dD_2(p)}{dp}\right] = 0. \quad (1)$$

Firm E's profit function is $\Pi_E(p_E, p_I) = (p_E - c)D_E(p_E, p_I) - f_E$. The FOC is:

$$\frac{\partial \Pi_E}{\partial p_E} = D_E(p_E, p_I) + (p_E - c)\frac{\partial D_E(p_E, p_I)}{\partial p_E} = 0. \quad (2)$$

Conditions (1) and (2) implicitly define the reaction functions of firm I and E, $R_I^c(p_E)$ and $R_E(p_I)$. A Bertrand equilibrium is defined by $p^c = R_I^c(p_E^c)$ and $p_E^c = R_E(p^c)$. Condition (1) can be expressed as:

$$\frac{(p^c - c)}{p^c} = \frac{D_I(p^c, p_E^c) + D_2(p^c)}{D_I(p^c, p_E^c)\varepsilon_I(p^c, p_E^c) + D_2(p^c)\varepsilon_2(p^c)} \quad (3)$$

where $\varepsilon_I(p_I, p_E) = -(\partial D_I(.,.)/\partial p_I)(p_I/D_I(.,.))$ and $\varepsilon_2(p_2) = -(dD_2(.)/dp_2)(p_2/D_2(.))$ are the elasticity of the multimarket seller's residual demand in market 1 and the demand elasticity of market 2, respectively.

The marginal profits of the multimarket seller in markets 1 and 2 at the equilibrium prices under the MFC pricing policy (p^c, p_E^c) can be expressed, by substituting the price-cost margin from (3), as:

$$\frac{\partial \Pi_i(p^c, p_E^c)}{\partial p_I} = D_I(p^c, p_E^c)\left[1 - \frac{(p^c - c)}{p^c}\varepsilon_I(p^c, p_E^c)\right]$$

$$= D_I\left[\frac{D_2(\varepsilon_2 - \varepsilon_I)}{D_I\varepsilon_I + D_2\varepsilon_2}\right] \tag{4}$$

$$\frac{d\Pi_2(p^c)}{dp_2} = D_2(p^c)\left[1 - \frac{(p^c - c)}{p^c}\varepsilon_2(p^c)\right]$$

$$= D_2\left[\frac{D_I(\varepsilon_I - \varepsilon_2)}{D_I\varepsilon_I + D_2\varepsilon_2}\right]. \tag{5}$$

The signs of (4) and (5) depend on the relation between elasticities. When the duopolistic market is *strong* $(\varepsilon_I(p^c, p_E^c) < \varepsilon_2(p^c))$, then $\partial\Pi_I(p^c, p_E^c)/\partial p_I > 0$ and $d\Pi_2(p^c)/dp_2 < 0$. Thus (given that profit functions are concave), $p_I^* > p^c > p_2^m$, where p_I^* and p_2^m are the equilibrium prices of the incumbent firm under price discrimination. Notice that the MFC pricing policy makes the incumbent firm become *more aggressive* in market 1. With strategic complements, the entrant's optimal response to a more aggressive play by the multimarket firm is to become more aggressive; that is, firm E also reacts by decreasing its price, $p_E^* > p_E^c$.[7] Given that $d\Pi_I(p_I^*, R_E(p_I^*))/dp_I > 0$ and $d\Pi_E(R_E(p_I^*), p_I^*)/dp_I > 0$, both firms' profits fall. Thus, owing to the MFC policy the incumbent becomes a tough competitor and entry is made more difficult than under price discrimination.[8] When the duopolistic market is *weak* $(\varepsilon_I(p^c, p_E^c) > \varepsilon_2(p^c))$, then $\partial\Pi_I(p^c, p_E^c)/\partial p_I < 0$ and $d\Pi_2(p^c)/dp_2 > 0$ and, thus, $p_2^m > p^c > p_I^*$. In this case, the MFC pricing makes the multimarket seller *less aggressive* (by raising its price) in market 1 than under price discrimination. With strategic complements, the rival's optimal response to a less aggressive play by firm I is to be less aggressive; that is, firm E reacts also by increasing its price, $p_E^* < p_E^c$. As a consequence, the entrant's profits increase and the

[7] I assume that $\partial D_i/\partial p_j > p_i(\partial^2 D_i/\partial p_i \partial p_j)$, $j \neq i$ and, therefore, the actions of the two firms are strategic complements as defined by Bulow *et al.* (1985).

[8] It must be pointed out that the MFC policy would be optimal only if it successfully deterred entry (or induced exit), given that the incumbent's profits come down.

incumbent's profit in market 1 can increase or decrease.[9] The effect of the MFC pricing on the multimarket seller's total profits is ambiguous: even if its profits were to increase in market 1, they would decrease in market 2. Thus, the MFC policy makes the incumbent a soft competitor, so that this policy could be optimal to accommodate entry but never to deter entry.

Under quantity competition the MFC pricing policy also commits the incumbent to uniform pricing;[10] therefore, it must choose the output levels so that the prices be the same in both markets. The profit maximization problem of the incumbent is:

$$\max_{\{x_I,\, x_2\}} [P_1(x_I + x_E) - c]x_I + [P_2(x_2) - c]x_2$$

$$\text{s.t. } P_1(x_I + x_E) = P_2(x_2). \tag{6}$$

FOCs, with λ being the Lagrange multiplier and $\overline{\Pi}$ the Lagrangian function, are:

$$\frac{\partial \overline{\Pi}}{\partial x_I} = [P_1(x_I + x_E) - c] + x_I P_1'(x_I + x_E) - \lambda P_1'(x_I + x_E) = 0 \tag{7}$$

$$\frac{\partial \overline{\Pi}}{\partial x_2} = [P_2(x_2) - c] + x_2 P_2'(x_2) + \lambda P_2'(x_2) = 0 \tag{8}$$

$$\frac{\partial \overline{\Pi}}{\partial \lambda} = P_1(x_I + x_E) - P_2(x_2) = 0. \tag{9}$$

Condition (7) implicitly defines the incumbent's reaction function, $R_I^c(x_E)$. Firm E's profits are $\Pi_E(x_E, x_I) = [P_1(x_I + x_E) - c]x_E - f_E$, and let $R_E(x_I)$ be its reaction function. Denote by x_I^c, x_E^c, $x_1^c = x_I^c + x_E^c$, and x_2^c the equilibrium outputs under the MFC policy. By replacing λ from (8) and using (9), we can obtain from condition (7) the price/cost

[9] Note that in this case $d\Pi_I(p_I^*, R_E(p_I^*))/dp_I > 0$ does not imply that the MFC policy increases profits in the duopolistic market given that the increase in the incumbent's price is not a marginal one. A sufficient condition for the MFC policy to increase the incumbent's profit in the duopolistic market is $d\Pi_I(p^c, R_E(p^c))/dp_I > 0$, which would imply that the uniform price is lower than the Stackelberg price. On the other hand, note that the uniform price (under the MFC policy) might be so high that the weak market is not served by the multimarket seller.

[10] Assume that before entry the incumbent adopts an MFC policy in market 1 and that this market is strong. If the incumbent chooses x_I and x_2 so that $P_I(x_I, x_E) > P_2(x_2)$, then it must rebate $[P_I(x_I, x_E) - P_2(x_2)]x_I$ to customers. The incumbent's profit is $[P_2(x_2) - c][x_I + x_2]$. The incumbent can increase its profits by choosing an output, $x_I' > x_I$, such that, given x_E, $P_2(x_2)$ is the price of both markets, obtaining $[P_2(x_2) - c][x_I' + x_2]$.

markup under MFC pricing:

$$\frac{p^c - c}{p^c} = \frac{x_I^c + x_2^c}{x_1^c \varepsilon_1 + x_2^c \varepsilon_2}. \tag{10}$$

The marginal profits of the multimarket seller in markets 1 and 2 at the equilibrium outputs under the MFC pricing (x_I^c, x_2^c, x_E^c) can be expressed, respectively, as:

$$\frac{\partial \Pi_I(x_I^c, x_E^c)}{\partial x_I} = \frac{p^c x_2^c}{(x_1^c \varepsilon_1 + x_2^c \varepsilon_2)\varepsilon_1} (\varepsilon_1 - s_I^c \varepsilon_2) \tag{11}$$

$$\frac{\partial \Pi_2(x_2^c)}{\partial x_2} = \frac{p^c x_1^c}{(x_1^c \varepsilon_1 + x_2^c \varepsilon_2)\varepsilon_2} (s_I^c \varepsilon_2 - \varepsilon_1) \tag{12}$$

where s_I^c is the incumbent's market share in market 1. The signs of (11) and (12) depend on the relationship between elasticities. When the duopolistic market is *strong* $(\varepsilon_1 < s_I^c \varepsilon_2)$, then $\partial \Pi_I(x_I^c, x_E^c)/\partial x_I < 0$ and $d\Pi_2(x_2^c)/dx_2 > 0$. Thus (given that profit functions are concave), $x_I^* < x_I^c$ and $x_2^m > x_2^c$, where x_I^* and x_2^m are the equilibrium outputs of the incumbent firm under price discrimination. Note that the MFC pricing policy makes the multimarket seller become *more aggressive* in market 1. With strategic substitutes, the entrant's optimal response to such an aggressive play by the incumbent firm is to become less aggressive, $x_E^* > x_E^c$.[11] As a consequence, the entrant's profits come down (note that $d\Pi_E(R_E(x_I^*), x_I^*)/dx_I < 0$) and the incumbent's profits in market 1 can increase or decrease. The effect on the incumbent's profits is ambiguous: although its profits in market 2 decrease, they can increase in market 1. When the duopolistic market is *weak* $(\varepsilon_1 > s_I^c \varepsilon_2)$, then $\partial \Pi_I(x_I^c, x_E^c)/\partial x_I > 0$ and $d\Pi_2(x_2^c)/dx_2 < 0$. Thus, $x_I^* > x_I^c$, $x_2^m < x_2^c$ and $x_E^* < x_E^c$. The entrant's profits are therefore increased and the incumbent's profits reduced.[12]

Let us denote by Π_E^* and Π_E^c the entrant's (variable) profits under the price discrimination policy and under the MFC policy, respectively. We can now state the equilibrium pricing policy choice by the incumbent firm depending on the entry cost. If the entry cost is high, $f_E > \max\{\Pi_E^*, \Pi_E^c\}$, entry into market 1 is blockaded and the incumbent will choose the price discrimination policy (as it would under pure monopoly). For intermediate values of the entry cost, $\max\{\Pi_E^*, \Pi_E^c\} > f_E > \min\{\Pi_E^*, \Pi_E^c\}$, if the duopolistic market is strong (weak) the MFC (price discrimination) pricing policy deters entry into market 1 under

[11] I assume that $\partial P_i/\partial x_j + x_i(\partial^2 P_i/\partial x_i \partial x_j) < 0, j \neq i$. See Bulow *et al.* (1985).

[12] Note that $d\Pi_I(x_I^*, R_E(x_I^*))/dx_I > 0$, and so the MFC policy results in a decrease in the incumbent's profits in market 1.

TABLE 1
Strategic choice of pricing policy

	Duopolistic market	*Entry deterrence*	*Accommodation*
Strategic complements	Strong	MFC	PD
	Weak	PD	?
Strategic substitutes	Strong	MFC	?
	Weak	PD	PD

both strategic substitutes and strategic complements.[13] If entry cost is low, $f_E < \min\{\Pi_E^*, \Pi_E^c\}$, the incumbent cannot deter entry. Under price competition (strategic complements), when entry is inevitable, the incumbent will choose the price discrimination policy if the duopolistic market is strong, but the MFC policy may be optimal if the duopolistic market is weak. Under quantity competition (strategic substitutes), if the duopolistic market is weak, the incumbent will choose to discriminate on price, but the MFC policy may be optimal if the duopolistic market is strong.

Table 1 summarizes the equilibrium pricing policy choice depending on whether the incumbent wants to deter or to accommodate entry (MFC denotes a most-favoured-customer pricing policy and PD denotes price discrimination).

IV. CONCLUDING REMARKS

This paper shows that the traditional presumption that the MFC pricing policy entails less aggressive competition is not necessarily true when the contemporaneous version of the policy is considered. The results therefore highlight some interesting differences between retroactive and contemporaneous MFC policies. The strategic choice of the pricing policy by a multimarket firm has been examined in a simple but quite general model. When the duopolistic market is strong, the MFC pricing policy conveys a more aggressive behaviour by the incumbent, and so this policy could be optimal to deter entry whether variables be strategic substitutes or strategic complements. If the duopolistic market is strong, price discrimination makes the incumbent 'soft' whereas the MFC policy makes the incumbent 'tough' and may be used for entry deterrence purposes. When the duopolistic market is weak, the best policy to deter

[13] The choice of pricing policy by the multimarket seller depends on whether it makes more profit by deterring or by allowing entry.

entry is price discrimination. The pricing policy choice in the entry-accommodation case has been discussed also.

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