**CHAIN-STORE PRICING**
**FOR STRATEGIC ACCOMMODATION**

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# Chain-Store Pricing for Strategic Accommodation

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**ABSTRACT**

Chain-stores now dominate most areas of retailing. While retailers may operate nationally or even internationally, the markets they compete in are largely local. How should they best operate pricing policy in respect of the different markets served - price uniformly across the local markets or on a local basis according to market conditions? We model this by allowing local market differences, with entry being inevitable in certain markets while being naturally or institutionally blockaded in others. We show that practising price discrimination is not always best for the chain-store. Competitive conditions exist under which uniform pricing can raise profits.

**Key Words:** Chain-store, Pricing Policy, Price Discrimination, Local Markets
***JEL* Codes:** L10, L11, L40, L66, L81

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# 1. Introduction

Our analytic focus in this paper is the *geographic scope* of pricing. Specifically, is it better for a chain-store retailer to set prices according to local market conditions (reflecting differences in cost, demand and competition) or set common prices that apply across all its stores, i.e. adopt a uniform pricing policy? Are likely firm decisions on this in line with consumer preferences? In contrast to the entry deterrence issue considered by Selten (1978), Milgrom and Roberts (1982) and Kreps and Wilson (1982), we look to see whether pricing policy, rather than deterring entry, might instead be employed strategically to accommodate entry when it is inevitable.[1]

The geographic scope for pricing is a very real issue for multiple retailers. It is evident that in practice some chain-store groups adopt uniform pricing while others do not. In some sectors, all multiple retailers price identically across their stores, e.g. UK electrical goods retailers (MMC, 1997a,b). While in other sectors, *local pricing* is practised to the extent that product prices might vary considerably from one store to another, e.g. the FTC found that for office supply superstores average prices varied by as much 16% depending on the extent of local competition in the US.[2] Moreover, this pricing policy distinction applies not just to different sectors but can apply within the same sector, e.g. amongst UK supermarkets where, of the leading fifteen groups, eight priced uniformly while seven priced according to local conditions (Competition Commission, 2000).[3]

Yet, in these days of computer-based pricing systems, it can hardly be said that ticketing costs are high[4], or that local demand and cost conditions cannot be effectively gauged. Hence, choosing a uniform price must be seen as a conscious act. Of course, uniform pricing might not be practicable when retailing costs are substantially different from one area to another.[5] Nevertheless, for many multiple retailers both local and uniform pricing might be feasible but a choice has to be made on which to adopt. This leads to two questions, first why it might ever be preferable for the incumbent to impose a constraint on its own behaviour, and second the circumstances under which the constraint is desirable. Our key insight on the first question is as follows: A firm will find itself more under competition in some markets than others. By practising

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[1] In regard to pricing strategies, there are obviously a number of widely discussed means of softening competition through contractual obligations with customers. The most widely discussed aspects are price-matching promises and *retroactive* most-favoured customer (MFC) clauses (e.g. Salop (1986) and Cooper (1986)). The former is clearly feasible in the present setting but, as several papers have pointed out, in practice it is not obvious that it will be a profitable strategy (e.g. Logan and Lutter (1989), Corts (1997), Hviid and Shaffer (1999) and Chen *et al.* (2001)). The latter we avoid considering here on grounds that it involves consideration of multiple (at the very least two) rounds of price competition. Here we restrict our attention to a single-shot pricing game.

[2] *Federal Trade Commission v. Staples, Inc. and Office Depot, Inc.*, Civ. no.97-701 (TFH), 1997. The FTC used evidence on local pricing to argue that a merger between Staples and Office Depot would raise prices by reducing local market competition. See Dalkir and Warren-Boulton (1999) for a summary.

[3] The Competition Commission uses the term "price flexing" whereby supermarkets adapt prices on a number of goods depending on local conditions. Individual product prices were found in some retailers to vary considerably (by as much as 100%), but average prices only differed across each chain by up to 3%. Nevertheless, the Commission concluded that the practice was anti-competitive and could be expected to operate against the public interest. However, no action was taken and the practice continues.

[4] For some estimates, see Levy *et al*. (1997).

[5] Interestingly, pricing is often consistent across locations for many retailers even when retailing costs vary considerably. An example would be the substantially higher salaries and property costs of operating in central London compared to operating in other cities in the UK.

uniform pricing, it softens competition between itself and rival players. This entails setting a higher price in those markets subject to (more) competition, at the expense of lower prices in markets where it is not subject (or is less subject) to competition, compared with a practice of market-specific pricing. The higher price in turn makes the action one which rivals find attractive, so it does not require agreement. Thus if the markets under competition are important enough to the firm, its net gain is positive. Hence our paper's prime focus is on the parameters associated with the nature and intensity of competition that might influence this choice.

There is some commonality in this issue with related questions on third-degree price discrimination in oligopoly (e.g. Holmes, 1989). More specifically, the issues raised here tie in with why oligopolistic firms would wish to limit or even entirely avoid price discrimination, e.g. Winter (1997) [6] and Corts (1998), or adopt practices which provide the same outcome, notably *contemporaneous* MFC clauses, e.g. DeGraba (1987) and Besanko and Lyon (1993)[7].

There are obvious links between our paper and Corts (1998) which also considers the question of uniform versus discriminatory pricing under duopoly (within a rather different framework). However, in Corts' model, it turns out that it is usually not in a firm's unilateral interest to practise uniform pricing. Therefore, where uniform pricing is profitable, strategic commitments not to price discriminate are normally involved and hence discussion focuses on the form these might take. By contrast, within our framework, and for a specified range of parameters, we find that it is in the firm's own interest not to discriminate and that uniform pricing arises as *an equilibrium strategy*. This is important, and provides a new insight, because it means that uniform pricing need not be accompanied by evidence of strategic commitment to that policy in order for it to be worthwhile and practised.

Our result that firms can commonly be better off under a uniform pricing regime casts an interesting light on some other previous models. The result is not new - it was first encountered in Holmes' (1989) "weak market-strong market" model of price discrimination in oligopoly. However, in their investigation of a model similar to Holmes', Armstrong and Vickers (2001) find that if a market is sufficiently competitive, profits always increase with discrimination. This leads them to conclude that "Holmes' result that profits may fall with discrimination requires markets to be reasonably uncompetitive." (p. 597). Our model shows this is not completely true. In our framework, which in effect has a weak and a strong market, profits may fall with discrimination *whatever the degree of competition*. That is, however uncompetitive

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[6] Winter (1997), for instance, focuses on the joint incentive for firms to agree on limiting price discrimination. He shows conditions under which such moves can be jointly profitable and also welfare increasing. His illustration is of retailers agreeing to limit the value of coupon discounts in the context of consumers being distinguished by their degree of price sensitivity.

[7] Again, there are different emphases here. For instance, DeGraba (1987) focuses on government-imposed MFC clauses that make a national firm a weak price competitor against local firms by preventing the national firm from setting prices independently in different local markets. The result is that non-price competition is intensified, prices and profits fall but welfare increases by virtue of decreased product differentiation. In contrast, the model developed by Besanko and Lyon (1993) illustrates that private preference for contemporaneous MFC clauses can exist. They show a "bandwagon effect" in which adoption of an MFC clause is more attractive the more firms that have already adopted them in *n*-firm oligopoly. So that *n* matters in terms of numbers of adopters.

the market, uniform pricing can be profitable. What is required for this is each individual monopoly market, in our context, to be sufficiently large.

To consider how different competitive conditions affect the scope-of-pricing decision, the model developed here has an incumbent monopoly chain-store operating across a finite number of local markets, analogous to Selten's well-known chain-store paradox analysis. However, in contrast to Selten's framework, these local markets are assumed to differ in respect of the scale of consumer demand and this in turn affects entry conditions. There are two market types. In each of the larger, "affluent" markets, entry barriers are insufficient to prevent entry by a new, independent rival. Yet, in smaller, less affluent markets the chain-store is taken to have a protected monopoly position (arising from natural or institutional barriers).[8] In this setting, we show that a chain-store would not necessarily prefer to use local pricing as a profit-enhancing price discrimination tool. Competitive conditions exist in the form of a region trading off the degree of substitutability between entrant and incumbent's products and the degree to which duopoly markets are larger than monopoly markets. Under these conditions, the chain-store would prefer to commit to a policy of uniform pricing since this allows for softer competition in contested local markets and hence raises its aggregate profits.

While the prospect of strategic accommodation through dampening price competition influences the preference between local or national pricing, a chain-store's choice is not inevitably at variance with that preferred by society.[9] In particular, a store's willingness to commit to national pricing can in certain circumstances not only enhance its profits but also raise social welfare if not consumer surplus. Yet market conditions commonly exist under which welfare would be adversely affected by the chain-store following its preferred choice.

Although our model is undoubtedly specific, the results are considerably more general. Our general results are (1) that under a range of conditions including very competitive markets, uniform pricing is privately optimal both for incumbent and entrant without co-ordination and (2) that enforcing uniform pricing where firms would prefer local pricing by no means necessarily advances social welfare. The significance of the first is that existing papers have concentrated heavily on co-ordinated action on uniform pricing. By contrast, policy has often focused on whether firms practice uniform pricing, viewing this with approval, something in conflict with our second point.

The remainder of the paper is organised as follows. Section 2 discusses the analytical framework whereby an incumbent chain-store retailer faces certain entry in a (fixed) number of its local monopoly markets. As with the original Selten story, entry into such "contested" markets is, in each case, by an independent, non-affiliated local retailer. Section 3 then examines and compares the outcomes where the chain-store uses local pricing against where it adopts a uniform (national) pricing approach. Section 4 addresses consumer welfare considerations. Section 5 concludes the paper.

[8] The distinction, for example, may be between large cosmopolitan cities and small rural towns.

[9] Our prime concern here is not with strategies that place rivals at a competitive disadvantage (e.g. tactics to raise rivals' costs – Salop and Scheffman (1983)). Rather the focus is on self-inflicted tactics which affect the firm's own ability to compete aggressively (i.e. normally from raising its own costs or reducing the competitive sensitivity of demand in the market).

## 2. The Framework

Following Selten and others, we consider the situation of a chain-store retailer holding a monopoly position in a finite number of independent, local markets. In each market there is one potential entrant; should that firm enter, post-entry competition would be characterised by the Bertrand-Nash outcome in a duopoly pricing game. Complete information applies and it is assumed that the incumbent has no cost or demand advantage over the entrant, or vice versa. In this situation entry is inevitable in each local market when entry costs are low (at least when there is some minimal differentiation between the firms allowing for positive returns for the entrant) and when there are no institutional impediments such as planning restrictions that prevent new stores being opened. However, if entry costs are substantial or there are no available sites then the local market is blockaded and entry does not occur.[10]

Our key departure from the previous literature is that we allow entry not be viable in all local markets. That is for the $N$ markets originally held by the chain-store we assume that $M$ ($<N$) are blockaded or otherwise provide insufficient demand for two firms, but that the remainder $C$ ($= N - M$) can become "contested" by virtue of becoming local duopolies. The relevance of this assumption will become apparent from the analysis.[11]

We have a two-stage game, depicted in Figure 1. In the first stage, each entrant simultaneously decides whether or not to enter; we illustrate with only two markets and potential entrants. Then in the second stage, the incumbent decides pricing policy-whether to practice local ($L$) or uniform ($U$) pricing. There is no commitment stage. The equilibrium concept is subgame perfection. Hence, in determining its move, the entrant (e.g. $E_1$) knows the payoffs facing the incumbent ($I$), as its aggregated profits ($\Pi_I$); knows that the incumbent will choose the path that is the more profitable.[12] However, because an entrant does not know how many other entrants will enter for certain (given simultaneous entry moves), it will not necessarily know whether the incumbent will practise local or uniform pricing.

[Figure 1 about here]

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[10] In a practical sense, we could think of the markets where entry does not occur due to the impossibility of finding a suitable site for a store or where logistical support cannot be made because the local markets are out of reach of the remainder of the supplied network. In such circumstances an entrant may be at a significant cost and demand disadvantage to the incumbent. Yet, even where such disadvantages are not a feature, the extent of sunk and fixed costs associated with entry may be sufficient as to allow only one firm to operate profitably in the market, principally when demand is limited.

[11] For technical simplicity it will be assumed that the demand, cost and competition structure in all contested local markets are identical. In this case if all markets became duopolies there would be no differences between the markets and the chain-store's position across them, and so local pricing would be identical to national pricing. Thus the assumption that some markets remain monopolies allows for some asymmetry in the set up which then allows us to consider any tensions in this pricing decision. In addition, though, this does appear to be a very real element to this as we discuss below where retailers have been granted "islands of monopoly" through restrictive planning laws preventing new entry.

[12] Thus the entrant is assumed to know that the incumbent chooses only between these two pricing strategies. Notice that if both the entrant and incumbent are better off with a particular strategy in place, this will clearly constitute an equilibrium. If however the entrant and the incumbent would want different pricing strategies, the outcome of the game is rather more sensitive to our precise framework holding.

To ease the exposition we assume that all markets where entry is possible are identical in respect of market demand and operating costs for retailers and that all remaining markets where entry is not possible are similarly identical to each other. However, we allow the two market types to differ in the extent of consumer demand. This is captured in the model by allowing the demand intercept term to be less in the monopoly markets than the contested markets.[13] Then by assumption, in some markets (the small markets) the entrant's payoff ($\pi_E$) is negative whatever happens, so the incumbent chooses local pricing. But this is not true for all markets. In those markets where entry is potentially profitable (the large or potentially duopoly markets), the subgame perfect equilibrium outcome clearly depends upon the payoffs to the players. But it is important to note that, given our assumptions regarding the market, an individual entrant's decision does not depend on it knowing whether the incumbent will practise local or uniform pricing.[14] Thus the entry assumption in the contested markets is that both the payoffs (net of sunk entry costs) to the entrant available on entry is non-negative.

It is further assumed that there is no demand or cost connection between the markets (so that profits are separable across markets).[15] We also assume that operating costs are identical for all retailers and, in addition, that the retailers operate under constant unit and marginal costs which, without further loss of generality, are taken to be zero.

In setting out the demand specification for each market, we will denote each of the *contested* markets by $h = 1, \ldots, C$ and the *M monopoly* markets by $k = 1+C, \ldots, N$. Consumer preferences in each of the two market types are represented by a standard quadratic utility function. In the case of contested markets, the utility function for the representative consumer takes the form

$$V_h(q_{Ih}, q_{Eh}) = q_{Ih} + q_{Eh} - (q_{Ih}^2 + 2\gamma q_{Ih} q_{Eh} + q_{Eh}^2)/2 + z_h \qquad \forall_h$$

where $q_I$ and $q_E$ respectively represent the quantity supplied by the incumbent retailer and the new entrant for market $h$, $\gamma \in [0,1)$ captures the consumer's perception of the substitutability between the retailers' services and product offering (becoming closer substitutes as $\gamma \to 1$), and $z_h$ represents all other goods and has a price normalised to unity. The consumer's budget constraint is taken as $m_h = p_{Ih}q_{Ih} + p_{Eh}q_{Eh} + z_h$.

In monopoly markets, with the absence of variety, the utility function takes the form for market $k$:

$$V_k(q_{Ik}) = \alpha q_{Ik} - (q_{Ik}^2)/2 + z_k \qquad \alpha \in (0,1] \qquad \forall_k$$

Here, the consumer's budget constraint is $m_k = p_{Ik}q_{Ik} + z_k$.

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[13] The assumed link between the extent of consumer demand and entry conditions might be justified in the context of smaller markets either not encouraging new entry or planners being reluctant to extend retail space when they perceive market demand is already satisfactorily covered by an existing operator. This aspect lies at the heart of criticism in the UK of supermarkets being granted "islands of monopoly", protected from incursion by restrictive planning policy (see Competition Commission (2000, Ch.12). See also Bresnahan and Reiss (1987) for some general empirical support for the assumption.

[14] That is, by assumption either *both* payoffs for the entrant are negative, if it enters, or positive.

[15] While it might be reasonable to consider demand not to be linked in the context of distinct local markets the same may not be generally true of costs. Local costs may be independent in regard to hiring labour and renting/purchasing sites but there is likely to be other elements where the chain-store might have economies of scope across its local markets. Notably, this might apply in procurement where the more markets it operates in the more likely it will be able to negotiate greater discounts from suppliers. Additionally, there might be economies from centralising administration. We do not discuss these considerations further in this paper.

Constrained optimisation of the utility functions reveals indirect demand in each market as

$$p_{Ih}(q_{Ih},q_{Eh}) = 1 - q_{Ih} + \gamma q_{Eh} \qquad \forall_h \tag{1a}$$

$$p_{Eh}(q_{Eh},q_{Ih}) = 1 - q_{Eh} + \gamma q_{Ih} \qquad \forall_h \tag{1b}$$

$$p_{Ik}(q_{Ik}) = \alpha - q_{Ih} \qquad \forall_k \tag{1c}$$

Solving for the direct demand functions reveals

$$q_{Ih}(p_{Ih},p_{Eh}) = (1 - \gamma - p_{Ih} + \gamma p_{Eh})/(1 - \gamma^2) \qquad \forall_h \tag{2a}$$

$$q_{Eh}(p_{Ih},p_{Eh}) = (1 - \gamma - p_{Eh} + \gamma p_{Ih})/(1 - \gamma^2) \qquad \forall_h \tag{2b}$$

$$q_{Ik}(p_{Ik}) = \alpha - p_{Ik} \qquad \forall_k \tag{2c}$$

The linear demand specification, represented by (1) and (2), allows for profit functions to be continuous, bounded, twice-differentiable and strictly concave, enabling us to determine pure-strategy equilibrium outcomes based on profit maximisation. In the case of demand in the monopoly markets, $\alpha$ represents the demand intercept term, where as $\alpha$ declines the consumer's willingness to buy falls for all price levels (given that the slope of the demand curve is constant at -1) and thus the market size declines. In essence, $\alpha < 1$ allows for the possibility of viewing monopoly markets as being both smaller and less affluent, and therefore less able to support new entry or for planners to allow new entry, than in larger/richer markets.

## 3. Pricing Outcomes

### *3.1. Local Pricing*

We begin by outlining the outcomes when the chain-store adopts local pricing before considering the situation where it adopts uniform pricing.

For each entrant, operating under zero unit cost, its profit function is:

$$\pi_{Eh} = p_{Eh}q_{Eh}(p_{Eh}, p_{Ih}) = p_{Eh}(1-\gamma - p_{Eh} + \gamma p_{Ih})/(1-\gamma^2) \qquad \forall_h \tag{3}$$

Optimising with respect to its price, $p_{Eh}$, allows us to determine its best-response function as

$$p_{Eh}(p_{Ih}) = (1 - \gamma + \gamma p_{Ih})/2 \qquad \forall_h \tag{4}$$

For the chain-store, it sets a price for each local market to maximise profit in that local market. In the case of each monopoly market where $\pi_{Ik} = p_{Ik}q_{Ik}$, substituting in the expression for demand, (2b), optimising with respect to $p_{Ik}$ and solving yields the monopoly price as $p^L_{Ik} = \alpha/2$, quantity as $q^L_{Ik} = \alpha/2$ and local market profit as $\pi^L_{Ik} = \alpha^2/4$. For each contested market its profit function is

$$\pi_{Ih} = p_{Ih}q_{Ih}(p_{Ih}, p_{Eh}) = p_{Ih}(1-\gamma - p_{Ih} + \gamma p_{Eh})/(1-\gamma^2) \qquad \forall_h \tag{5}$$

On optimising with respect to $p_{Ih}$, the chain-store's best-response function in each contested market is

$$p_{Ih}(p_{Eh}) = (1 - \gamma + \gamma p_{Eh})/2 \qquad \forall_h \tag{6}$$

Using (4) and (6) we can solve for the pair of local pricing equilibrium prices

$$p^L_{Ih} = p^L_{Eh} = (1-\gamma)/(2-\gamma) \qquad \forall_h \tag{7}$$

Then, from (2a), (2b), (3) and (5), the quantity sold by the chain-store and the entrant and their respective profit levels in each contested market are:

$$q^L_{Ih} = q^L_{Eh} = 1/[(1+\gamma)(2-\gamma)]\,; \;\; \pi^L_{Ih} = \pi^L_{Eh} = (1-\gamma)/[(1+\gamma)(2-\gamma)^2] \qquad \forall_h \tag{8}$$

Accordingly, combined profits for the chain-store across all its markets under local pricing are

$$\Pi_I^L \equiv \sum_{h=1}^{C} \pi_{Ih}^L + \sum_{k=C+1}^{N} \pi_{Ik}^L = C(1-\gamma)/[(1+\gamma)(2-\gamma)^2] + (M\alpha^2)/4 \qquad (9)$$

*3.2. Uniform Pricing*

With uniform pricing, the incumbent chain-store sets a single price to maximise its combined profits:

$$\Pi_I(p_I, \mathbf{p_{Eh}}) = p_I\left(\sum_{h=1}^{C} q_{Ih} + \sum_{k=C+1}^{N} q_{Ik}\right) = p_I\left(\frac{C(1-\gamma-p_I)+\gamma\Sigma_h(p_{Eh})}{1-\gamma^2} + M(\alpha-p_I)\right) \qquad (10)$$

Rearrangement of the first order condition shows that the best-response function for the incumbent in this case is

$$p_I(\mathbf{p_{Eh}}) = \tfrac{1}{2}\left(\frac{(1-\gamma)(C+\alpha M(1+\gamma))+\gamma\Sigma_h(p_{Eh})}{C+M-M\gamma^2}\right) \qquad (11)$$

Using (11) along with each entrant’s best response function from (6), we can solve for the equilibrium prices when the incumbent adopts uniform pricing:

$$p_I^U = \frac{(1-\gamma)[(C(2+\gamma)+2\alpha M(1+\gamma)]}{C(4-\gamma^2)+4M(1-\gamma^2)} \qquad (12a)$$

$$p_{Eh}^U = \frac{(1-\gamma)[(C(2+\gamma)+M(1+\gamma)(2(1-\gamma)+\alpha\gamma)]}{C(4-\gamma^2)+4M(1-\gamma^2)} \quad \forall_h \qquad (12b)$$

From (2), the individual quantities sold by each firm in each market are

$$q_{Ih}^U = \frac{C(2+\gamma)+M(1+\gamma)[2(1-\gamma)(2+\gamma)-\alpha(2-\gamma^2)]}{(1+\gamma)[C(4-\gamma^2)+4M(1-\gamma^2)]} \quad \forall_h \qquad (13a)$$

$$q_{Eh}^U = \frac{C(2+\gamma)+M(1+\gamma)(2(1-\gamma)+\alpha\gamma)}{(1+\gamma)[C(4-\gamma^2)+4M(1-\gamma^2)]} \quad \forall_h \qquad (13b)$$

$$q_{Ik}^U = \frac{2\alpha M(1-\gamma^2)-C(2+\gamma)(1-\gamma-\alpha(2-\gamma))}{C(4-\gamma^2)+4M(1-\gamma^2)} \quad \forall_k \qquad (13c)$$

The combined quantity sold by the incumbent and its total profits are

$$Q_I^U \equiv \sum_{h=1}^{C} q_{Ih}^U + \sum_{k=C+1}^{N} q_{Ik}^U = \frac{[C(2+\gamma)+2\alpha M(1+\gamma)][C+M(1-\gamma^2)]}{(1+\gamma)[C(4-\gamma^2)+4M(1-\gamma^2)]} \qquad (14)$$

$$\Pi_I^U \equiv \sum_{h=1}^{C} \pi_{Ih}^U + \sum_{k=C+1}^{N} \pi_{Ik}^U = \frac{(1-\gamma)(C+M(1-\gamma^2))[(2+\gamma)C+2\alpha M(1+\gamma)]^2}{(1+\gamma)[C(4-\gamma^2)+4M(1-\gamma^2)]^2} \qquad (15)$$

Finally, the profit earned by each entrant is

$$\pi^U_{Eh} = \frac{(1-\gamma)[C(2+\gamma)+M(1+\gamma)(2(1+\gamma)+\alpha\gamma)]^2}{(1+\gamma)[C(4-\gamma^2)+4M(1-\gamma^2)]^2} \quad \forall_h \tag{16}$$

*3.3. Profit Comparison for the Incumbent Chain-store*

We are now in a position to compare the profits for the chain-store under local pricing and uniform pricing. To facilitate this comparison it will prove convenient to make use of the parameter $\mu = M/N$ (where $\mu \in (0,1)$) to indicate the proportion of the markets for the chain-store that are monopoly markets and equivalently 1-$\mu$ as the proportion of markets that are contested. It will also prove convenient to refer to the local pricing equilibrium price in monopoly markets as $p^m$ ($\equiv p^L_{Ik} = \alpha/2$) and the corresponding price in contested markets as $p^c$ ($\equiv p^L_{Ih} = (1-\gamma)/(2-\gamma)$). In addition, two identities labelled as $Z_I$ and $Z_S$ (each defined below) will prove important in establishing propositions here and in the next section relating respectively to comparisons over the incumbent's profits and consumer welfare levels.

Subtracting the chain-store's uniform pricing profits (15) from those generated under local pricing (9) and rearranging yields

$$\Pi^L_I - \Pi^U_I = \frac{CM[2(1-\gamma)-\alpha(2-\gamma)]}{4(2-\gamma)^2[C(4-\gamma^2)+4M(1-\gamma^2)]^2} \tag{17}$$
$$\times [2(1-\gamma)(C(16-\gamma^4)+16M(1-\gamma^2))-\alpha(2-\gamma)(C(4-\gamma^2)^2+8M(1-\gamma^2)(2-\gamma^2))]$$

The denominator in the first part of (17) is clearly positive, as is the term *CM* on the numerator. The sign of the expression thus hinges on the sign of the other two terms in square brackets, which can be positive or negative.

Note first that by substituting $\gamma = 0$ into (17), the whole expression reduces to $4CM(1-\alpha)^2/(C+M)$ which is clearly positive if $\alpha \neq 1$ and equal to zero when $\alpha = 1$. If the competing retailers are viewed as being demand independent, i.e. $\gamma = 0$, then the chain-store will only be indifferent between using local pricing and national pricing when the demand functions are identical across all markets, i.e. when $\alpha = 1$. Otherwise it strictly prefers to use local pricing (i.e. for $\alpha \neq 1$).

The intuition behind this result is immediate. When $\gamma = 0$, the demand independency between the firms means that in essence the chain-store is free to behave as if it were a monopolist in all the markets. In such circumstances, and with no competition concerns to consider, it would always price discriminate given demand differences between local markets. The only exception is where the local demand across all markets is identical, i.e. $\alpha = 1$, as here there is no difference in the prices set, and the resulting profit, under uniform and local pricing.

In general, of course, $\gamma \neq 0$. Our key result is the following:

*Proposition 1.* For $\alpha \in (0,1)$ there exists a zone in $(\alpha,\gamma)$ space for which the chain-store retailer prefers national pricing. This zone has two boundaries. The first boundary is given by the condition that the contested market price is equal to the monopoly market price, i.e. $p^m = p^c$. The other boundary lies above (i.e. outside) the first in ($\alpha$,$\gamma$) space.

*Proof.* As noted above, the sign of the equation in (17) rests on two terms. These can be re-expressed to yield two conditions, relating $\alpha$ and $\gamma$, such that when either holds the value of (17) is zero. Specifically $\Pi_I^L = \Pi_I^U$ if $\alpha = 2(1-\gamma)/(2-\gamma)$ or $\alpha = [2(1-\gamma)/(2-\gamma)]Z_I$, where $Z_I \equiv [C(16-\gamma^4)+16M(1-\gamma^2)]/[C(4-\gamma^2)^2+8M(1-\gamma^2)(2-\gamma^2)]$. Note that the first condition then amounts to $p^m = p^c$ while the second is $p^m = p^cZ_I$. Next, observe that $Z_I$ takes a value strictly greater than unity as long as $\gamma \in (0,1)$. This follows since $(16-\gamma^4)C > (4-\gamma^2)^2C$ and $2(1-\gamma^2)M > (1-\gamma^2)(2-\gamma^2)M$. Thus these two loci divide the profit space in dimensions ($\alpha$, $\gamma$) into three segments. Expression (17) must take on either a positive or a negative value in each of these segments. Further, by simple substitution, of ($\alpha$, $\gamma$) values (0,0) and (1,1), we see that in the lowest and uppermost segments, the expression is positive. Hence in the middle section, it is negative. *Q.E.D.*

The immediate implication of Proposition 1 is that there are competitive conditions under which uniform pricing would be preferred by the chain-store.

The precise nature, shape and extent of the zones where uniform pricing or local pricing is preferred by the chain-store is informed by the following corollaries which build on Proposition 1:

*Corollary 1.* The lower, inner boundary, where $p^m = p^c$, is strictly downward sloping in ($\alpha$,$\gamma$) space and strictly concave to the origin ($\alpha = \gamma = 0$). The upper, outer boundary is also strictly downward sloping. Both boundaries converge at opposite extreme values of $\alpha$ and $\gamma$, i.e. in the limit where $\alpha \to 1, \gamma \to 0$ and $\alpha \to 0, \gamma \to 1$.

*Proof.* A sufficient condition for the downward slope and concavity of the inner boundary is that the first-order and second-order derivatives of $p^c$ with respect to $\gamma$ are negatively signed. This is satisfied as $\partial p^c/\partial\gamma = -2/(2 - \gamma)^2 < 0$ and $\partial^2 p^c/\partial\gamma^2 = -4/(2 - \gamma)^3 < 0$. For the upper boundary, partial differentiation with respect to $\gamma$ reveals that $\partial(p^cZ_I)/\partial\gamma = -2[C^2X_1+8CM(1-\gamma)X_2+128(1-\gamma)M^2X_3]/[(2-\gamma)(C(4-\gamma^2)+8M(1-\gamma^2)(2-\gamma^2))]^2$. With all other terms positive, aside from the front negative sign, the overall sign of the expression rests on the signs of $X_1$, $X_2$ and $X_3$. These in fact are all signed positively as $X_1 \equiv 256(1-\gamma)^2+384\gamma^2(1-\gamma^2)+ \gamma^5(96+56\gamma-16\gamma^2-\gamma^3) > 0$, $X_2 \equiv (2-\gamma)^2[16+4\gamma^2+36\gamma^3+15\gamma^4+\gamma^5] > 0$ and $X_3 \equiv (1-\gamma^2)^2[2(1-\gamma)^2+\gamma^2(3-2\gamma)] > 0$. Accordingly, $\partial(p^cZ_I)/\partial\gamma < 0$ and thus the second boundary is also strictly downward sloping. Finally, convergence of the boundaries at opposite extreme points is shown by evaluation at these extremes. *Q.E.D.*

*Corollary 2.* Irrespective of the value of $\mu$, if the monopoly price is lower than the contested market price then the chain-store strictly prefers local pricing.

*Proof.* This follows directly from Proposition 1, where the condition $p^m < p^c$ is independent of the values of $C$ and $M$, and thus of $\mu$ as well. *Q.E.D.*

This result can be seen as arising from the averaging effect involved in uniform pricing. Here it serves to raise the price in the monopoly markets while lowering that in the contested markets. Both of these moves serve to lower the chain-store's profits irrespective of how many monopoly or contested markets there are. In the case of monopoly markets, the effect of raising the price is to restrict quantity sold below the monopoly level. In the case of contested markets, competition is intensified with chain-store's more aggressive pricing encouraging the local entrant to respond in kind, thereby damaging profits for the chain-store (as well as for the entrant).

*Corollary 3*. As the proportion of monopoly markets relative to contested markets increases (i.e. as $\mu$ increases) the outer boundary extends out in $(\alpha,\gamma)$ space, extending the zone for which uniform pricing is preferred.

*Proof*. Observe that $p^c$ and, therefore, the first boundary, are independent of $M$ and $C$, and thus $\mu$. The effect on the second boundary relates to the effect of $\mu$ on $Z_I$. Letting $M = \mu N$ and $C = (1-\mu)N$ and rearranging, we can re-express $Z_I$ as a function of $\mu$; specifically $Z_I \equiv [(16-\gamma^4) - \mu\gamma^2(16-\gamma^2)]/[(4-\gamma^2)^2 - \mu\gamma^2(16-7\gamma^2)]$. Partial differentiation of $Z_I$ with respect to $\mu$ reveals $\partial Z_I/\partial\mu = [8\gamma^4(1-\gamma^2)(4-\gamma^2)]/[(4-\gamma^2)^2 - \mu\gamma^2(16-7\gamma^2)]^2 > 0$. An increase in $\mu$ increases the value of $Z_I$, thereby extending out the upper boundary in $(\alpha,\gamma)$ space, and thus extending the zone for which uniform pricing is preferred. *Q.E.D.*

The intuition is that as the number of monopoly markets increases then to raise price in the contested markets it requires proportionately less of a decrease in price in the monopoly markets. Observe that in the limit as $\mu \to 1$, then $Z_I \to 2/(2-\gamma^2)$ which takes on a maximum value of 2 when $\gamma = 0$. Conversely, as the proportion of monopoly markets decreases, then to raise price in the contested markets means dropping monopoly market prices relatively more. In the limit as $\mu \to 0$ then $Z_I \to (4+\gamma^2)/(4-\gamma^2)$, which only has a maximum of $^5/_3$ when $\gamma = 0$.[16]

To get a better feel for the above results it may be perhaps instructive to consider them in a diagrammatic form, as in Figure 2. Here, represented in $(\alpha,\gamma)$ space, and showing the case where $\mu = ½$ (i.e. $M = C$), the two boundaries from Proposition 1 divide the area into three zones, L1, U and L2. In region L1, the incumbent practises local pricing, in area U uniform pricing and in area L2 local pricing again.

[Figure 2 about here]

Yet, as can be seen in Figure 2, the area for where uniform pricing is preferred is quite limited. For much of $(\alpha,\gamma)$ space, local pricing offers the chain-store higher aggregate profits. This applies first to the large area below the lower boundary, where $p^m < p^c$. This area is fixed in size since the lower boundary is unaffected by the number of monopoly or contested markets. The second area where local pricing is preferred is where $p^m > p^c Z_I$. In this region, uniform pricing, when compared to local pricing, has the effect of lowering the monopoly market price to the extent that the gain in profits from contested markets would not sufficiently outweigh the loss of profits from monopoly market profits. However, the size of this second zone is affected by the

16 Another way of looking at this is to consider the effect of $\mu$ on $p_I^U$. From (12a), we can re-express $p_I^U$ in terms of $\mu$ such that $p_I^U = [(1-\gamma^2)((2+\gamma)-\mu(2+\gamma-2\alpha(1+\gamma))]/[4-\gamma^2-3\mu\gamma^2]$. Partially differentiating reveals that $\partial p_I^U/\partial\mu = [2(1-\gamma^2)(2+\gamma)][2(1-\gamma)-\alpha(2-\gamma)]/[4-\gamma^2-3\mu\gamma^2]^2$ which is positively valued if $p^m > p^c$. In other words, the greater the proportion of monopoly markets, the higher will be the uniform price set by the chain-store, *ceteris paribus*, when the local monopoly price exceeds that of the local contested price.

relative composition of the different market types. From Corollary 3, the upper boundary extends out in ($\alpha$,$\gamma$) space as the proportion of monopoly markets increases (i.e. as $\mu$ increases). The illustration in Figure 2 is for the case where $\mu$ = ½, with higher (respectively, lower) values of $\mu$ the second area where local pricing is preferred shrinks (expands) slightly.

*3.4. Profit Comparison for the Entrants*

Having observed the chain-store's preferences over pricing policy according to different local market conditions, we now turn to consider briefly the entrants' position. Let us consider how the choice of pricing policy affects post-entry competition for the entrants. The difference in profits for each entrant according to whether the chain-store practises local pricing as opposed to uniform pricing is as follows:

$$\pi^L_{Eh} - \pi^U_{Eh} = \frac{M\gamma(1-\gamma)[2(1-\gamma)-\alpha(2-\gamma)]}{[(2-\gamma)(C(4-\gamma^2)+4M(1-\gamma^2))]^2} \times [2(C(4-\gamma^2)+16M(4-\gamma)(1-\gamma^2))+M\gamma\alpha(1+\gamma)(2-\gamma)] \qquad \forall_h \tag{18}$$

*Proposition 2.* Each entrant prefers the chain-store to price locally if $p^m < p^c$ and price uniformly if $p^m > p^c$ for $\gamma \in (0,1)$, otherwise it is indifferent over the chain-store's price policy.

*Proof.* Observe that all terms in (18) are strictly positive for $\gamma \in (0,1)$ with the exception of the square bracketed term on the numerator in the first part of (18). This term, which is independent of *C* and *M*, is positive (respectively, negative), so the whole expression is positive (negative), if $p^m < (>)\ p^c$. When $\alpha = 1$ or $p^m = p^c$ then the whole expression equals zero. *Q.E.D.*

The entrant's preferences, based on this profit comparison, can also be represented in diagrammatic form in Figure 2. It is interesting to make comparisons across the zones. We know that in region L1, $\Pi^L_I > \Pi^U_I$ and $\pi^L_E > \pi^U_E$ and by assumption, $\pi^L_E > 0$ (it does not matter whether $\pi^U_E > 0$ or not). Given this framework, the equilibrium is that in region L1, the incumbent practises local pricing and entry occurs. Note here that the entrant is also in favour of local pricing, contrary to some casual intuition on the topic (but those prices are higher).

In region U, each firm gains from uniform pricing so that the incumbent practises uniform pricing and entry occurs. This is an interesting case because it says that a failure to shade prices dependent on competition does not mean a failure to recognise competition. In this zone, strategic accommodation can be profitably accomplished by the chain-store since it softens competition in the contested markets.

However, region L2 is also very interesting. This is where the incumbent practices local pricing (since $\Pi^L_I > \Pi^U_I$) in circumstances where the entrant would prefer uniform pricing (since $\pi^U_E > \pi^L_E$). There is the possibility that local pricing can keep out a firm that would find entry profitable under uniform prices (if it were the case that $\pi^U_E > 0 > \pi^L_E$). Here it should be observed that the entrants' preferences are fully aligned with the incumbent chain-store's when $p^m < p^c$, given that uniform pricing would have the effect of intensifying competition in contested markets, to the detriment of both entrants and the incumbent. However, in the other two regions, the extent of alignment in preferences is only partial. The entrants would always prefer the chain-store to adopt uniform pricing as this dampens competition and raises their profits in the contested markets. However, as was seen in the previous subsection, the chain-store would only prefer to adopt uniform pricing so long as the loss of profits from its monopoly markets was not too great. This applies when $p^m < p^c Z_I$ (i.e. zone U). Thus, for high values of $\alpha$ and/or $\gamma$, occurring in zone L2, the preferences of the incumbent and the entrants are likely to be at variance.

To make sense of all the above results, let us provide some general intuition. At the point where $\alpha = 2(1-\gamma)/(2-\gamma)$ all prices are the same. As $\alpha$ increases above this, the Individual Monopoly price ($p^m$) increases most rapidly ($\partial p^m/\partial\alpha = 1/2$), followed by the Uniform price set by the incumbent, then the price set by an entrant. The Individual Contested price ($p^c$) does not increase at all. Thus the benefit to the incumbent of setting an individual price in each type of market is that price is tailored more exactly to the market conditions. In the absence of competition (in either market), this would be the only effect, so that profits would be no lower under individual pricing than under uniform pricing. However, where there is competition in the market, there is an additional strategic effect. Raising the price in the contested market through binding oneself to uniform pricing induces a rise in the entrant's price through a softening of competition (notice that the entrant's price rises although the impact of $\alpha$ is solely indirect). This strategic effect is sufficient to raise profits for both players, at least for a range of parameters. In the case of the incumbent, since there is always a trade-off involved in uniform pricing; the area where profits are raised is substantially limited. But in the case of the entrant, softening of competition is always beneficial, so that we would expect a much larger area over which the entrant would prefer uniform pricing.

Of course, if each monopoly market is sufficiently smaller than each contested market, price is lower in the former. In this case, the logic works in reverse - lowering price in the contested market induces a more competitive response by the entrant, reducing profits. Hence under these circumstances, both the chain and the entrant will strictly prefer individual pricing.

## 4. Consumer Welfare Analysis

Thus far we have only considered the preferences of the firms competing in the market. Clearly, the choice of price policy, which can alter the balance of prices in the markets, may have an impact on consumers and thereby social welfare. To consider the welfare effects of the chain-store's choice over pricing policy, we focus here on consumers' interests, assessing the effects on (aggregate) consumer surplus and commenting briefly on the impact on net economic welfare.

Given that choice is fixed, consumers would naturally prefer the lowest possible prices in their respective markets. In the present setting, consumers in the different markets may be expected to have divergent interests over the chain-store's pricing policy. As $p^m$ rises above $p^c$, the monopoly price becomes higher than the uniform price, becomes higher than the contested market price. Thus, in small markets, consumers are worse off with local pricing, whereas in large markets they are better off with local pricing. Clearly, whichever policy the chain-store ultimately decides on, consumers in those markets where price is lowered (compared to what would emerge under the alternative pricing regime) would benefit, while the other consumers would lose out. Accordingly, there is unlikely to be unanimity of preferences amongst consumers.

To consider the overall impact on consumers we can consider the respective levels of aggregate consumer surplus under each pricing regime, recognising that different consumer groups will likely have different preferences but looking at the net difference. Here we define this in terms of an unweighted aggregation of the different consumer utility functions. Specifically, aggregate consumer surplus, $S$, is taken as the aggregation of the (constrained) representative consumer utility functions over the

$$S = \sum_{h=1}^{C}\left(q_{Ih} + q_{Eh} - \tfrac{1}{2}[(q_{Ih})^2 + 2\gamma q_{Ih}q_{Eh} + (q_{Eh})^2] + m_h - p_{Ih}q_{Ih} - p_{Eh}q_{Eh}\right) + \sum_{k=1+C}^{N}\left(\alpha q_{Ik} - \tfrac{1}{2}(q_{Ik})^2 + m_k - p_{Ik}q_{Ik}\right) \tag{19}$$

various contested and monopoly markets (i.e. respectively over $V_h(q_{Ih},q_{Eh})$ $\forall_h$ and $V_k(q_{Ik})$ $\forall_k$):

Evaluating the terms with respect to the different equilibrium values under local and uniform pricing to identify aggregate consumer surplus under each regime, i.e. respectively $S^L$ and $S^U$, while abstracting from any income effects, shows

$$S^L = C/[(1+\gamma)(2-\gamma)^2] + (M\alpha^2)/8 \tag{20}$$

$$\begin{aligned} S^U = [&C(2C^2(2+\gamma)^2 + 2CM(2+\gamma)(1-\gamma^2)(2(3+\gamma)-\alpha(2+\gamma)) \\ &+ M^2(1+\gamma)(1-\gamma^2)(4(1-\gamma)(5+3\gamma) - 4\alpha(1-\gamma)(4+3\gamma) + \alpha^2(4-3\gamma^2))) \\ &+ M(1+\gamma)(C(2+\gamma)(1-\gamma-\alpha(2-\gamma)) + 2\alpha M(1-\gamma^2))^2] \\ &\div [2(1+\gamma)(C(4-\gamma^2) + 4M(1-\gamma^2))^2] \end{aligned} \tag{21}$$

Taking the difference between the two levels reveals

$$\begin{aligned} S^L - S^U = &-\frac{CM[2(1-\gamma) - \alpha(2-\gamma)]}{8(2-\gamma)^2[C(4-\gamma^2) + 4M(1-\gamma^2)]^2} \\ &\times [C(2-\gamma)(2+\gamma)^2(2(6-\gamma)(1-\gamma) - 3\alpha(2-\gamma)^2) \\ &+ 4M(1-\gamma^2)(2(1-\gamma)(12+4\gamma-3\gamma^2) - \alpha(2-\gamma)(12-5\gamma))] \end{aligned} \tag{22}$$

As with the profit comparison for the chain-store, (17), the sign of the above expression rests on the sign of the term in square brackets on the numerator in the first part of the equation and the square bracketed term in the second part of the equation. It can be shown that this expression is negative for $\alpha = 0$, $\alpha = 1$ (for $\gamma \neq 1$) or $\gamma = 0$ (for $\alpha \neq 1$), i.e. aggregate consumer surplus is greater under uniform pricing. However, as with the profit comparison, this result is not universal as the following proposition establishes:

*Proposition 3.* For $\alpha \in (0,1)$ there exists a zone in $(\alpha,\gamma)$ space for which aggregate consumer surplus is greater under local pricing. This zone has two boundaries. The first boundary is given by the condition that the contested market price is equal to the monopoly market price, i.e. $p^m = p^c$. The other boundary lies strictly above (i.e. outside) the first.

*Proof.* The sign of equation (22) rests on two terms. These two terms can be re-expressed to yield two conditions, relating $\alpha$ and $\gamma$, such that when either holds the value of (22) is zero. Specifically $S^L = S^U$ if $\alpha = 2(1\text{-}\gamma)/(2\text{-}\gamma)$ or $\alpha = [2(1\text{-}\gamma)/(2\text{-}\gamma)]Z_S$, where $Z_S \equiv [C(6\text{-}\gamma)(2+\gamma)(4\text{-}\gamma^2) + 4M(1\text{-}\gamma^2)(12+4\gamma\text{-}3\gamma^2)]/[3C(4\text{-}\gamma^2)^2 + 4M(1\text{-}\gamma^2)(12\text{-}5\gamma^2)] \in [1,{}^{13}/_7)$. Note that the first condition then amounts to $p^m = p^c$ while the second is $p^m = p^cZ_S$. Next, observe that $Z_S$ takes a value strictly greater than unity as long as $\gamma \in (0,1)$. This follows since $(6\text{-}\gamma)(2+\gamma)C > 3(4\text{-}\gamma^2)C$ and $(12+4\gamma\text{-}3\gamma^2)M > (12\text{-}5\gamma^2)M$. Accordingly, the second condition requires higher values of $\alpha$ for it to hold when compared to the first condition. Finally, it can be observed that the extreme values of $\alpha$ and $\gamma$ do not support $S^L > S^U$, so accordingly the zone which supports $S^L > S^U$ must apply where $\alpha,\gamma \in (0,1)$ with $p^m = p^c$ operating as the lower boundary and $p^m = p^cZ_S$ as the upper boundary. *Q.E.D.*

As with the chain-store profit comparison, conditions can be readily identified with respect to the nature and shape of these boundaries. The inner boundary is, of course, the same as before where $p^m = p^c$, i.e. strictly downward sloping and concave in $(\alpha,\gamma)$ space. The outer boundary can also be shown to be strictly downward sloping and concave. As with the profit comparison, the two boundaries converge at opposite extremes of the parameter space, i.e. as $\alpha \to 1$, $\gamma \to 0$ and $\alpha \to 0$, $\gamma \to 1$.

Regarding the overall impact of the chain-store's choice of pricing policy on consumers, the following corollary shows that the chain-store's preferred pricing regime is generally at odds with that which offers the highest aggregate consumer welfare:

*Corollary.* On an aggregated basis, consumers' preferences are generally, but not universally, divergent from the chain-store's preference over pricing policy.

*Proof.* It can be observed that for $p^m < p^c$ then $\Pi_I^L > \Pi_I^U$ but $S^L < S^U$, i.e. strictly divergent preferences. For $p^m > p^c$ then preferences depend on the respective values of $Z_I$ and $Z_S$. For $p^m < p^cZ_I$ and $p^m < p^cZ_S$ or $p^m > p^cZ_I$ and $p^m > p^cZ_S$ then again preferences are divergent, with respectively $\Pi_I^L < \Pi_I^U$ but $S^L > S^U$ and $\Pi_I^L > \Pi_I^U$ but $S^L < S^U$. Only when $p^m < p^cZ_I$ but $p^m > p^cZ_S$ or $p^m > p^cZ_I$ but $p^m < p^cZ_S$ can there be shared interests, respectively over uniform pricing or local pricing. However, the scope for either of the latter conditions holding is very limited given that they have very similar finite ranges with $Z_I \in [1,2)$ and $Z_S \in [1,{}^{13}/_7)$. Nevertheless, both conditions can hold. Comparing the values of $Z_I$ and $Z_S$ shows that a critical condition exists relating $\mu$ and $\gamma$. Specifically, $Z_I < (>)\ Z_S$ if $\mu < (>)\ [(2+\gamma)(4\text{-}\gamma^2)]/[\gamma^2(8+5\gamma)] \in ({}^9/_{13},\infty)$, so that for $Z_I < Z_S$ it is sufficient that either $\mu < {}^9/_{13} \approx 0.69$ or $\gamma < (\sqrt{13} - 1)/3 \approx 0.93$. Thus a small area where both preferences are for uniform pricing can exist when $\alpha$ takes on high values and $\gamma$ low values, and similarly an area (but likely to be even smaller) can exist where preferences are aligned in favour of local pricing when $\gamma$ is extremely high and $\alpha$ is low. *Q.E.D.*

Figure 3 illustrates Proposition 3, again for the case where $\mu = ½$, with $(\alpha,\gamma)$ space divided into three zones. Here consumers collectively prefer uniform pricing if $\alpha$ and $\gamma$ both take low to moderate values or very high values, represented by zones U1 and U2. Aggregate consumer preferences for local pricing are restricted to a small zone L for other values of $\alpha$ and $\gamma$. Furthermore, comparison with Figure 2 illustrates the general divergence between the chain-store's preferences and those of consumers in total, highlighted in the Corollary. The basic issue is that firms prefer higher prices, consumers lower, so in general there is a conflict between the two views.

[Figure 3 near here]

Clearly, we could go on from here to identify the sum effect on social welfare, measured for example as the sum of consumer surplus and profit, measured without regard to distribution. However, since the functional forms used are clearly special, not much purpose will be served by doing so on this occasion. We have shown there will be opposing effects in general, so the sum impact will depend upon the details of the model, rather than there being any general implications. It is very likely that there will be areas where there is a conflict between the chain-store's preferences and societal preferences, principally when consumer surplus is considerably disadvantaged.[17]

## 5. Conclusions

This paper focuses on an apparently innocuous policy decision facing all chain-stores: whether to commit to local pricing or adopt (uniform) national pricing. Our analysis shows that a range of competitive conditions exists where uniform pricing can raise the incumbent's profits over the case where it simply prices according to resulting local competitive conditions and that the entrant firm is also better off. However, the scope for setting uniform prices in a profitable manner appears limited. The cost of dampening competition in contested markets is lowering prices and thus profits in secure monopoly markets. If the required price drop is too large, strategic accommodation will not be worthwhile and the chain-store would be better off simply setting individual prices to maximise profits in each local market.

Competition authorities might be concerned about any pricing policy that seeks to dampen competition, thereby allowing the firm to raise profits by raising prices. Equally, authorities might be concerned about firms using price discrimination to exploit different geographically constrained consumer groups. This paper considers both of these situations. With uniform pricing there is the possibility that it might be used as a form of strategic accommodation. With local pricing, there is obvious third-degree price discrimination with prices set according to different local competitive conditions. Yet, strategic accommodation may not necessarily be against societal interests when higher prices in some (i.e. contested) markets may be compensated for by lower prices in other (i.e. monopoly) markets. This is an area where encouraging entry need not be beneficial to consumers. Enforcement of *uniform pricing* may work as a behavioural remedy, but should be carefully applied. Accordingly, it would appear unsuitable to adopt a blanket ban against either uniform pricing for its strategic accommodation purpose or for local pricing and its exploitation of local conditions.

[17] For the interested reader, the analysis of the effects on net economic welfare, taken as an unweighted sum of producer and consumer surplus, illustrating this point is available on request from the authors.

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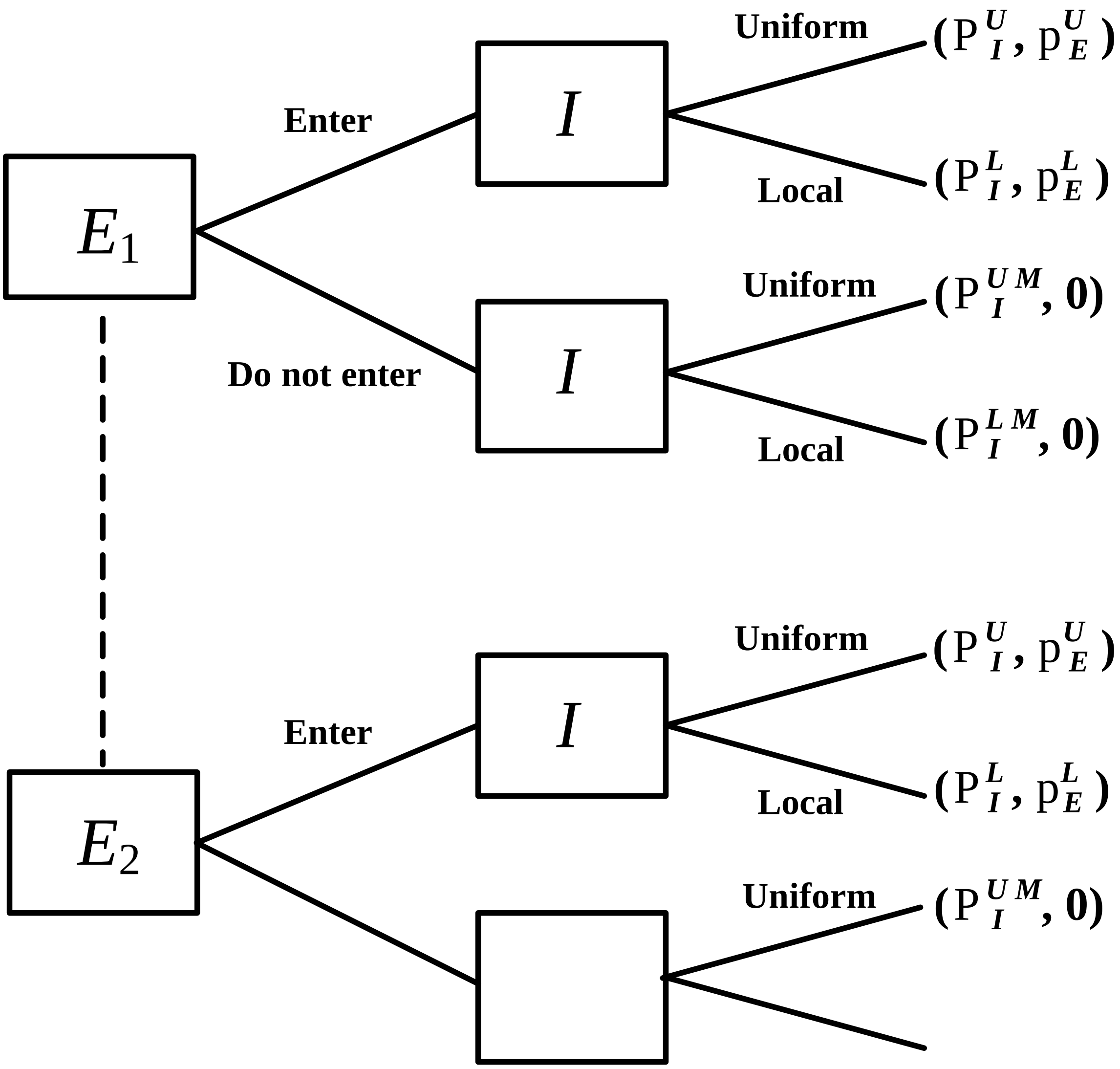


**Figure 1 - The basic entry-then-pricing game**

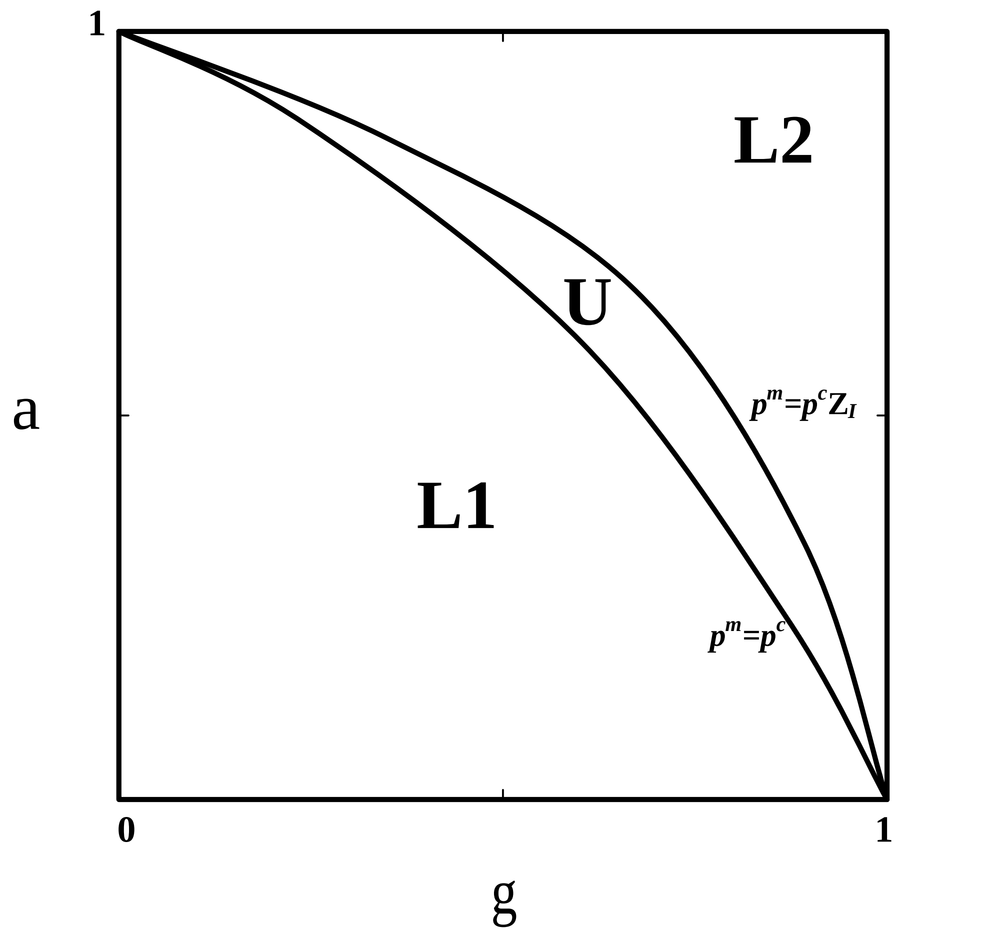


**Figure 2 – The various regions of equilibrium (m = ½)**

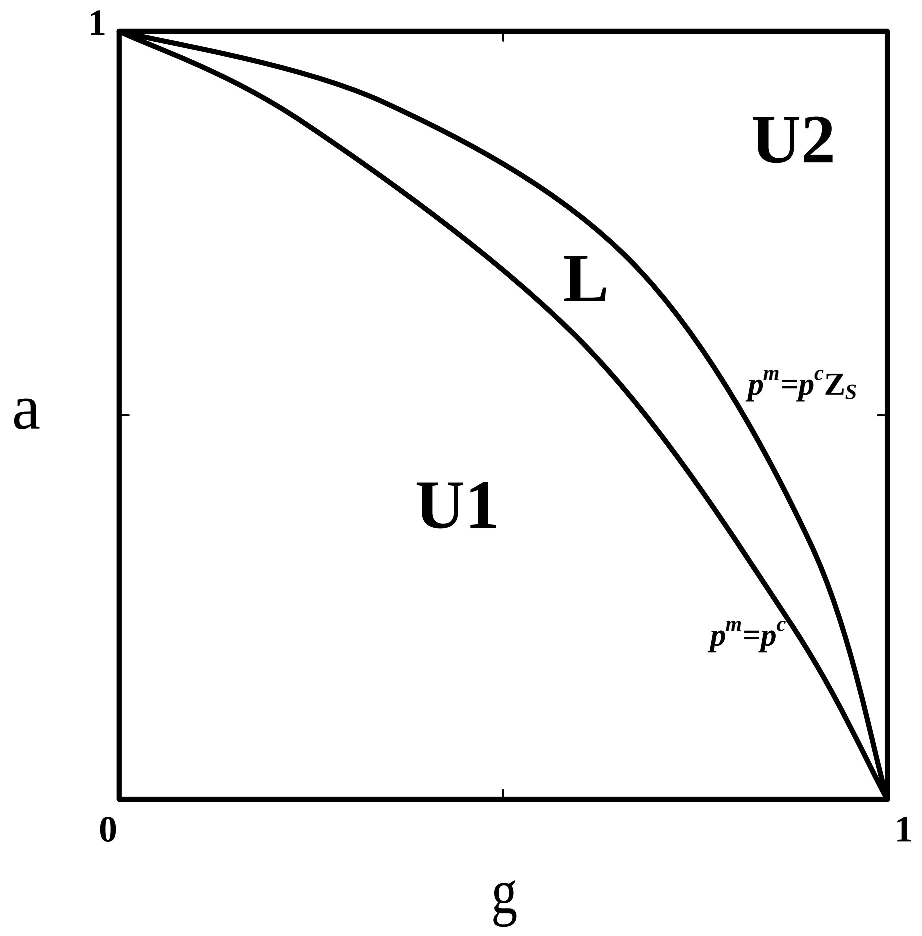


**Figure 3 – Aggregate consumer preferences over chain-store pricing policy (m = ½)**