

## **Inducing Downstream Selling Effort with Market Share Discounts**

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### **Abstract**

Loyalty discounts and rebates are pricing schemes that offer incentives to buyers for reaching or exceeding certain sales thresholds. In the case of market share discounts, thresholds are expressed as a percentage of the buyer's total purchase requirements. Although market share discounts may have exclusionary effects under certain circumstances when a seller has significant market power, there are plausible non-exclusionary reasons for offering them as well. Two such reasons – rent extraction and inducing downstream selling effort – are explored in this paper. The paper considers the case of a manufacturer who sells a differentiated good through a network of heterogeneous, non-exclusive retailers. The manufacturer offers market share discounts to induce non-contractible selling effort such as brand-specific information or customer service from those retailers who possess certain unobservable characteristics. In some instances, market share discounts induce increased selling effort and improve market performance as compared to linear pricing. In other instances, they have no effect on aggregate benefits, but merely shift the rents created by induced selling effort upstream to the manufacturer. In no instance, as long as the producers of substitute goods retain sufficient sales to remain viable, do market share discounts impair market performance.

## ***I. Introduction***

Loyalty discounts and rebates are pricing schemes that offer incentives to buyers for reaching or exceeding certain sales thresholds. There are many kinds of loyalty discounts. “Quantity discounts” have thresholds expressed in terms of a buyer’s unit purchase volume. Some quantity discounts are applied to all of the units purchased by the buyer if the sales target is achieved. Others are applied only to those units purchased in excess of the target.<sup>2</sup> *Market share* discounts have thresholds expressed as a percentage of the buyer’s total purchase requirements. These discounts typically are applied to all of the units purchased if a buyer reaches or exceeds a market share target (Patrick Greenlee and David Reitman, 2005).<sup>3</sup> While some loyalty discounts arise in retail markets, market share discounts usually arise in wholesale or intermediate goods markets.

In recent years, the offer of loyalty discounts by dominant firms has become a prominent antitrust issue.<sup>4</sup> Loyalty discounts, including those with market share thresholds, have been challenged under the antitrust laws in the U. S. as well as in Europe for their putative exclusionary effects.<sup>5</sup> These practices typically receive harsher treatment in Europe than in the U. S. In Europe, the *Michelin* court concluded that a dominant firm’s loyalty discounts are abusive unless they are justified by the firm’s cost structure. In the U. S., courts generally have been more permissive because they recognize that loyalty discounts are not always or necessarily exclusionary.

Market share discounts are controversial because they explicitly invite buyers to substitute the seller’s goods for those of rivals.<sup>6</sup> This feature is not problematic in markets that are structurally competitive. But in markets where there is a dominant firm,

that firm's market share discounts may reduce the demand for its rivals' goods to levels so low that these rivals cannot recover their fixed costs. The dominant firm's market share discounts may deter small-scale entry for similar reasons.<sup>7</sup>

Of course the rationale for market share discounts, even in the case of a dominant firm, may not be exclusion. Non-exclusionary reasons for this kind of pricing are rent extraction and improved efficiency in production or distribution. Like other forms of price discrimination, discounts based on market share performance may be offered by sellers to extract surplus from buyers rather than to weaken or eliminate competitors. Rent extraction per se usually is not an antitrust offense. Dennis W. Carlton and Kenneth Heyer distinguish firm conduct that extracts surplus from conduct that extends market power and propose that “[c]onduct merely to extract surplus the firm has created independent of the conduct's effect on rivals should be permitted. Conversely, . . . conduct that extends the firm's market power by impairing the competitive constraints imposed by rivals. . . presents a legitimate cause for concern” (p. 1).

Another non-exclusionary reason for offering market share discounts is that, in some circumstances, they increase the efficiency of distribution channels. This paper demonstrates that manufacturers who distribute their goods through non-exclusive retailers may use market share discounts to induce non-contractible downstream selling effort that improves market performance.

The paper considers a manufacturer who sells a differentiated good through a network of retailers who also distribute substitute goods. The manufacturer could be a dominant firm, but even if not the firm still has some degree of market power because of

product differentiation. Retailers serve separate retail markets with different numbers of consumers. Each retailer, due to its size, location, or some other distinguishing characteristic, has market power when reselling the goods to consumers in its own market. For instance, many retailers have some degree of market power in the sale of one good because consumers shop for bundles of several goods. Shopping for bundles to reduce shopping costs reduces consumers' in-store demand elasticities for specific goods.<sup>8</sup>

Some consumers are willing to pay a premium for the manufacturer's differentiated good, but others are not. Retailers are positioned to supply brand-specific information or perform brand-specific customer services that increase the number of consumers who are willing to pay a premium for the manufacturer's good. This selling effort is non-contractible because monitoring performance would be costly or infeasible. The retailer's selling effort must be directed at all of its consumers because the retailer cannot distinguish (*ex ante*) which consumers are susceptible to its influence.

For one type of retailer, the surplus created by brand-specific selling effort is greater than its cost. But for another type of retailer, selling effort costs more than the surplus it creates. The manufacturer cannot observe (*ex ante*) a retailer's type or size. Interactions between the manufacturer and the retailers are modeled as a two-stage game where the manufacturer offers terms of sale first followed by retailers' responses.

The paper shows that in this setting the manufacturer can use an across-the-board market share discount to separate retailers by type but not by size. Low-cost retailers of any size are induced to provide selling effort and are compensated accordingly.<sup>9</sup> High-cost retailers are neither induced nor compensated. With more

retailer types, further separation can be achieved using multi-tier market share discounts.

To assess the welfare effects of this pricing tactic, outcomes are compared to scenarios where the manufacturer is constrained by antitrust or regulation to charge uniform wholesale prices. Based on this comparison, market share discounts improve market performance by inducing otherwise underproduced selling effort in some circumstances. In other circumstances the same discounts merely shift rents created by retailers' selling efforts upstream to the manufacturer. This analysis indicates that introducing market share discounts never impairs market performance. This result even extends to a dominant firm's market share discounts as long as the producers of substitute goods retain sufficient sales to remain viable.

Other across-the-board pricing schemes, such as quantity discounts, minimum purchase requirements, and resale price maintenance cannot achieve the same result. The distinguishing feature of market share discounts is that they utilize *proportional* targets that do not discriminate by firm size.

Previous papers investigating market share discounts have focused on rent extraction and exclusionary effects. None have explored their use for inducing downstream selling effort. Patrick Greenlee and David Reitman (2004) examine rent extraction in a model where differentiated-products Bertrand duopolists selling to competitive buyers compete via market share discounts. Among other results they find that, in equilibrium, buyers take advantage of only one of the sellers' market share discounts. The other seller is not excluded from the market and the effect of market share discounts on consumers is ambiguous.

Leslie M. Marx and Greg Shaffer also focus on the rent shifting effects of market share discounts in a model with two sellers and a single buyer who contracts sequentially with the sellers. In their analysis market share discounts only shift rents and have “no effect on the prices consumers pay, product variety, or welfare” (p. 26).

Emphasizing the similarity of market share discounts and exclusive dealing, Willard K. Tom, David A. Balto and Neil W. Averitt focus on potential exclusionary effects. They reason that since complete foreclosure from the market is not necessary for an exclusive dealing arrangement to be held illegal, market share discounts with sufficient foreclosure also may be anticompetitive.<sup>10</sup> Of course, the similarity of market share discounts and exclusive dealing also suggests procompetitive effects. Benjamin Klein and Andres V. Lerner observe that “[a] procompetitive justification for . . . preferred distribution contracts [such as market share discounts] . . . may appear to be related to the procompetitive justification for exclusive dealing contracts, with exclusive dealing merely interpreted as an extreme form (100%) of preferred distribution” (p. 562, footnote omitted).

There is some discussion in the literature of procompetitive market share discounts.<sup>11</sup> David Spector observes that, as compared to quantity discounts, the proportional target feature of market share discounts makes them a superior nonlinear pricing tactic where the sellers’ goal is to increase sales to different sized buyers by offering “marginal” prices that are below “average” prices. He also suggests that market share discounts may be used by a manufacturer to protect its investment in training retailers by limiting the extent to which competing manufacturers could free ride on that

training.<sup>12</sup> The use of market share discounts as a mechanism for inducing efficient downstream selling effort is not widely recognized.

## ***II. Ordinary Linear Pricing***

Suppose firm  $M$  produces a differentiated good and distributes it to consumers through retailers that serve separate retail markets. Undifferentiated versions of the same good are produced by competitive manufacturers and are sold to consumers through the same retailer network. Every producer has constant marginal costs which to simplify matters are assumed to be zero. Firm  $M$ 's cost of differentiating its brand is fixed and sunk. Retailers' markets have different numbers of consumers, but the manufacturer cannot observe (*ex ante*) the exogenous size of any retailer's market. Retailers' marginal costs of distribution are constant and also are assumed to be zero.

Suppose retailer  $i$ 's market has a continuum of  $h_i$  consumers, where  $h_i > 0 \forall i \in R$ . Every consumer (in every market) has a reservation price of 1 for a single unit of an undifferentiated brand of the good. Some consumers recognize and value brand  $M$ 's distinguishing characteristics and have a reservation price of  $1+z$  for a single unit of that brand, where  $z \in (0,1)$ .<sup>13</sup> The  $M$ -preferring fraction of consumers in every market is  $\lambda \in (0,1)$ . The remaining consumers are indifferent among all brands including brand  $M$ . Every consumer (in every market) maximizes her surplus by purchasing one unit of an undifferentiated brand, one unit of brand  $M$ , or neither, depending on retail prices.

Just as firm  $M$  is unable to observe (*ex ante*) the size of a retailer's market, the retailer is unable to observe (*ex ante*) whether a given customer is  $M$ -preferring. However every retailer and firm  $M$  know the values of  $z$  and  $\lambda$  that characterize the entire population of consumers and therefore are the same in every market.

The competitive wholesale price for units of the undifferentiated brands is  $w_0 = 0$ . Market size is the only retailer-specific characteristic in the model and is unobservable to firm  $M$ . This means there is no reason for the manufacturer to negotiate or impose retailer-specific terms of sale. Instead, firm  $M$  offers every retailer the same linear price  $w_M$ .

Let the firms' interactions be depicted by a two-stage game: in the first stage firm  $M$  announces  $w_M$ , and in the second stage each retailer  $i \in R$  responds independently by setting its retail prices  $p_i^0$  and  $p_i^M$  and purchasing the corresponding quantities.

Beginning with stage two, retailer  $i$  has the option to earn profits of at least  $h_i$  no matter what wholesale price firm  $M$  announces. This is because the retailer can resell  $h_i$  units of the undifferentiated brands for  $p_i^0 = 1$  and refuse to carry brand  $M$ . Because this option assures the retailer a profit of 1 from each consumer it serves, firm  $M$  would be able to sell the retailer  $\lambda h_i$  units of brand  $M$  if  $w_M \leq z$  or none otherwise. Thus constrained, firm  $M$ 's profit is maximized by charging  $w_M = z$ . Equilibrium outcomes are as follow.

**Proposition 1:** For all feasible values of the model's parameters, there is a perfect equilibrium in which firm  $M$  charges  $w_M = z$  and earns profits of  $\pi_i^M = \lambda z h_i$  from the sale of  $\lambda h_i$  units of brand  $M$  to retailer  $i$ ,  $\forall i \in R$ . Retailer  $i$ 's prices are  $p_i^M = 1 + z$  and  $p_i^O = 1$  and its profits are  $\pi_i^R = h_i$ ,  $\forall i \in R$ .

Every  $M$ -preferring consumer (in every market) buys a unit of brand  $M$  and all other consumers buy units of an undifferentiated brand. Consumers' rectangular demands, coupled with retailers' market power, precludes any consumers' surplus in equilibrium. Although firm  $M$  captures the entire incremental rent created by brand  $M$ , the availability of undifferentiated brands allows retailers to retain part of the profit from the sale of brand  $M$ . Any change in the characteristics of the undifferentiated brands that raises consumers' reservation prices more than the competitive wholesale price for those brands would increase retailers' profits on all sales, including sales of brand  $M$ . The same change would reduce firm  $M$ 's profits.<sup>14</sup>

### **III. Discounts to Induce Service**

Now suppose that retailers can supply useful brand-specific information about brand  $M$ , or perform brand-specific customer services on behalf of firm  $M$ . This selling effort increases the fraction of a retailer's consumers who will pay a premium for brand  $M$ . Some kinds of brand-specific selling effort by retailers can be specified and monitored by manufacturers with sufficient ease and precision that their performance can be induced contractually. Examples might include advantageous shelf position or prominent in-store signage to call attention to the brand. Other kinds of brand-specific

selling effort, such as featuring a brand in sales presentations or consultations with consumers, are less easily specified and monitored. Some forms of selling effort are unobservable (to firm  $M$ ) or are idiosyncratic and retailer-specific. As a practical matter, this kind of downstream selling effort is non-contractible. It is “not economically feasible for a manufacturer to write an explicit, enforceable, contract with a dealer for the supply of desired dealer service” (Benjamin Klein and Kevin M. Murphy, p. 267).

Assume that every retailer has the ability, by providing relevant information or customer service, to increase the fraction of its consumers who attach a premium of  $z$  to brand  $M$  from  $\lambda$  to  $\lambda + \theta$ , where  $\theta \in (0, 1 - \lambda)$ . The reservation prices of the retailer’s remaining consumers are unchanged by the retailers’ selling effort. One interpretation of this assumption is that a fraction  $\theta$  of every retailer’s consumers have a latent preference for brand  $M$  that can be unlocked by the information or service supplied by the retailer.

Of course, there is a cost to the retailer of supplying this information or service. And for some retailers the cost exceeds the joint value of that effort to firm- $M$  and the retailer. To capture this kind of heterogeneity, we assume that the cost of supplying the indicated selling effort is different for different retailers. Specifically, assume that there are two types of retailers,  $L$  and  $H$ . Retailer “types” and “sizes” are uncorrelated. Every retailer knows its type and size, but firm  $M$  cannot distinguish retailers by type or size *ex ante*.

The retailer’s cost to supply the indicated selling effort depends on the firm’s size because the requisite information or service must be made available to all of the retailer’s customers. Because the retailer cannot distinguish (*ex ante*) those consumers

who are susceptible to its selling effort, it cannot supply selling effort to susceptible consumers alone. For retailer  $i \in R_L$  this cost is  $f_L h_i$ , and for retailer  $j \in R_H$  it is  $f_H h_j$ , where  $f_H > \theta z > f_L > 0$ . These inequalities mean that it is only the type- $L$  retailers (of any size) whose selling effort costs less than the benefits it contributes.

Suppose retailers decide whether to supply the indicated selling effort in the second stage of the game when, as before, they set retail prices. Although type- $L$  retailers' selling effort would increase joint profits with firm  $M$  by increasing brand- $M$ 's share of sales, these retailers have no incentive to supply that selling effort unless firm  $M$  charges a wholesale price low enough for the retailers to recover their costs on the incremental sales those activities produce.

If firm  $M$  lacks a less expensive mechanism for conveying the relevant information or providing the relevant customer service, the firm may try to induce selling effort from these retailers with its pricing. Firm  $M$  could achieve this by reducing  $w_M$  enough to make it worthwhile for type- $L$  retailers to invest in the necessary promotional activities. However, an across-the-board price cut that is just sufficient to induce selling effort from type- $L$  retailers would transfer rents to type- $H$  retailers who would not promote brand  $M$ . Inducing type- $L$  retailers' selling effort in this way may or may not be more profitable for firm  $M$  than setting  $w_M = z$  and forgoing that selling effort.

In any case, there is a more profitable pricing strategy for firm  $M$  that employs a *market share* incentive. This strategy induces type- $L$  retailers, but not type- $H$  retailers, to put forth the selling effort sought by firm  $M$ . It also avoids a transfer of rents to type- $H$  retailers whose inefficient selling efforts are neither sought nor induced.

Notice that if firm  $M$  charges a wholesale price of

$$\hat{w}_M \equiv z - \frac{f_L}{\lambda + \theta} \quad (1)$$

or less for brand  $M$ , this would induce every retailer  $i \in R_L$  to put forth the selling effort sought by the manufacturer. This is because the retailer's cost  $f_L h_i$  would be offset by the incremental savings from increasing brand- $M$  unit sales to  $(\lambda + \theta)h_i$ . The price  $\hat{w}_M$  would not induce retailer  $j \in R_H$  to supply selling effort because the retailer's cost  $f_H h_j$  would be greater than the incremental savings  $f_L h_j$  from increasing brand- $M$  unit sales to  $(\lambda + \theta)h_j$ . As seen in the following proposition (proof in the Appendix), firm  $M$  can offer retailers a pricing menu that includes a market share discount to separate retailers by type. Type- $L$  retailers pay  $\hat{w}_M$  and provide promotional support for brand  $M$ , and type- $H$  retailers pay  $w_M = z$  and provide no promotional support.

**Proposition 2:** *For all feasible values of the model's parameters, there is a perfect equilibrium in which firm  $M$  sets its wholesale price equal to  $w_M = z$  and offers a discounted price of  $\hat{w}_M$  to any retailer whose brand- $M$  share of retail sales is at least  $\lambda + \theta$ . Retailer  $i$ 's prices are  $p_i^M = 1 + z$  and  $p_i^0 = 1$ ,  $\forall i \in R_L \cup R_H$ , but only type- $L$  retailers supply brand-specific selling effort and collect the discount. Retailer  $i$ 's profits are  $\pi_i^R = h_i \forall i \in R_L \cup R_H$ . Firm  $M$ 's profits from the sale of  $(\lambda + \theta)h_i$  units of brand  $M$  to each retailer  $i \in R_L$  are  $\pi_i^M = [z(\lambda + \theta) - f_L]h_i$  and its profits from the sale of  $\lambda h_j$  units of brand  $M$  to each retailer  $j \in R_H$  are  $\pi_j^M = \lambda z h_j$ .*

Equilibrium prices and quantities are shown in **Figure 1**. Retailer  $j \in R_H$  provides no brand-specific selling effort and pays a wholesale price of  $w_M = z$  for  $\lambda h_j$  units of brand  $M$ . Retailer  $i \in R_L$  invests  $f_L h_i$  in brand-specific selling effort and recovers this investment by qualifying for firm  $M$ 's market share discount that reduces its price to  $\hat{w}_M$ .

Using a market share incentive, firm  $M$  induces type- $L$  retailers to promote brand  $M$  and captures all of the rent created by these promotional activities. This holds no matter what the relative number of retailers of the two types is. It also holds no matter what the firms' sizes are. Because the market share requirement serves as an effective screening device, efficient promotion and complete capture of the resulting rent are achieved without sacrificing any of the firm's profit from sales to type- $H$  retailers.

Although market share discounts generally are applied to all of the units a customer purchases once the market share requirement is met, a discount of  $f_L / \theta$  applied only to the incremental units  $\theta h_i$  purchased by retailer  $i \in L$  would give the same result as in *Proposition 2*. Sreya Kolay, et al. show the same equivalency between all-units discounts and incremental-units discounts in a bilateral monopoly model of retail contracting where the firms contract with complete information about demand. In their model, however, these discounts are not equivalent if the upstream firm cannot observe the downstream firm's demand. With incomplete information, the upstream firm can extract more profit using an all-units discount in their model.

Notice that firm *M* could not achieve the same result as in *Proposition 2* using an across-the-board *quantity* discount, regardless of whether that discount applied to all units of the brand a retailer purchased or only the incremental units elicited by retailer promotions. Nor could it be achieved by imposing an across-the-board minimum purchase requirement. These measures would not perform as well as a market share discount because the increase in unit sales firm *M* seeks to induce is retailer-specific. It is the *proportionality* of the output threshold that triggers the discount that makes an across-the-board market share discount advantageous for the manufacturer.<sup>15</sup>

Notice also that firm *M* could not achieve the result in *Proposition 2* by using resale price maintenance (RPM). Manufacturers sometimes find it advantageous to use RPM requirements to prevent downstream competition from making it unprofitable for retailers or distributors to provide promotional services in support of the manufacturers' brands. By assuring retailers of an adequate retail margin to recover their investments in this kind of service, manufacturers induce those investments with an RPM requirement (Lester G. Telser, and Howard P. Marvel and Stephen McCafferty). In the present instance, RPM is neither necessary for firm *M* to control retailers' margins, nor sufficient for compensating only those firms who promote brand *M*.

The result that firm *M* captures the entire rent created by induced downstream selling effort stems from the assumption that the manufacturer has the first move and can make a take-or-leave offer to retailers. A different assumption about interactions between firm *M* and the retailers may alter that distribution. One alternative would be bilateral bargaining arrangements where firm *M* negotiates separate terms of sale with every retailer instead of setting terms of sale that apply to all transactions. With full

information (e.g., firm  $M$  knows the size and type of each retailer), the Nash bargaining solution would distribute the rents created by promotional activity in a way that reflects the firms' relative bargaining power.<sup>16</sup> This outcome can be shown to reproduce the result derived here that efficient selling effort is elicited and that retailers who can supply that effort achieve greater brand- $M$  market shares and pay lower wholesale prices (David E. Mills, 2007).

The results in *Proposition 2* generalize to some cases where retailers have heterogeneous consumer populations. For instance, let  $\lambda_i \in (0, \bar{\lambda})$  be the  $M$ -preferring fraction of retailer  $i$ 's consumers  $\forall i \in R_L \cup R_H$ , where  $\bar{\lambda} < 1$ . Assume that retailers' values of this fraction are uncorrelated with their types and sizes. Next suppose that by providing relevant information or customer service, any retailer's  $M$ -preferring fraction increases to  $\phi$ , where  $\phi \in (\bar{\lambda}, 1)$ . This means that the  $M$ -preferring fraction of consumers is different for retailers before they supply brand-specific selling effort, but is the same for all retailers who supply that selling effort. In this instance, firm  $M$  can achieve a result similar to that in *Proposition 2* by making the wholesale price discount equal to  $f_L / \phi$  and by making the market share that triggers the discount equal to  $\phi$ .<sup>17</sup>

The distributional effects of market share discounts might be markedly different if retailers have access to *two* brands of the good (or more) where each is preferred by some consumers, and where other consumers with no preference can be induced to prefer each when retailers supply exclusive brand-specific selling effort. When two manufacturers compete with market share discounts to win retailer loyalty, various outcomes are possible. For instance if the cost of providing selling effort only differs

among retailers ( $f_L$  or  $f_H$ ) and not across brands, then outcomes depend on how the brand-specific values of  $\lambda$  and  $\theta$  are distributed among retailers. For certain configurations, retailers may sort themselves into three categories: those who are loyal to brand  $A$ , those who are loyal to brand  $B$ , and those who provide no brand-specific selling effort.<sup>18</sup> With two manufacturers competing with market share discounts for loyal retailers, the manufacturers' profits would be less and some retailers' profits would be greater.

#### **IV. Welfare Effects**

To assess the welfare effects of firm  $M$ 's market share discount, the equilibrium in *Proposition 2* may be compared to the outcome where firm  $M$  is constrained by antitrust or regulation to charge a uniform wholesale price to all of its retailers. There are two cases to consider where firm  $M$  must charge a uniform price. In the "high-price" case, firm  $M$  would choose to forgo the benefits of type- $L$  retailers' selling efforts in order to charge a high price and extract as much profit as possible from its sales to type- $H$  retailers. In this case, firm  $M$ 's uniform price would be  $w_M = z$  as in *Proposition 1*. In the "low-price" case, firm  $M$  would charge a lower wholesale price  $w_M < z$  to induce selling effort from type- $L$  retailers. To accomplish this firm  $M$  would have to accept reduced profits from type- $H$  retailers, who also would pay the low price but who would not promote the brand. Whether firm  $M$  chooses a high or low wholesale price depends on which of these options is more profitable. It is the more profitable case (for

a given set of parameter values) that should be compared to outcomes in *Proposition 2* to assess the welfare effects of imposing a uniform pricing constraint on the firm.

In the “high-price” case, outcomes would be those indicated in *Proposition 1*. In the “low-price” case, firm  $M$  would reduce its wholesale price to induce promotional activities from type- $L$  retailers in spite of lost profits from sales to type- $H$  retailers. Type- $L$  retailers’ best response to any  $w_M \leq \hat{w}_M$  would be to promote brand  $M$  because the profit on incremental sales of the brand would offset or exceed the cost of selling effort. Type- $H$  retailers would not respond to such a price by promoting the brand unless

$$w_M \leq z - \frac{f_H}{\lambda + \theta} < \hat{w}_M.$$

If firm  $M$  intends to induce selling effort from only the type- $L$  retailers, the firm would charge the wholesale price  $\hat{w}_M$ . As a result, every retailer  $i \in R_L$  would purchase and resell  $(\lambda + \theta)h_i$  units of brand  $M$  and every retailer  $j \in R_H$  would purchase and resell  $\lambda h_j$  units. Retail prices would be  $p_M = 1 + z$  and  $p_0 = 1$  in every market and firms’ profits would be:

$$\begin{aligned} \pi_i^R &= h_i \text{ and } \pi_i^M = (z(\lambda + \theta) - f_L)h_i \quad \forall i \in R_L \\ \pi_j^R &= (1 + \frac{\lambda f_L}{\lambda + \theta})h_j \text{ and } \pi_j^M = (z\lambda - \frac{\lambda f_L}{\lambda + \theta})h_j \quad \forall j \in R_H \end{aligned} \quad (2)$$

If firm  $M$  charges a low price, its profits are shown in (2). If the firm charges a high price, its profits are shown in *Proposition 1*. Comparing firm  $M$ ’s profits under these two scenarios indicates that it is more profitable for the firm to charge a high price where (i) type- $L$  retailers are small and few compared to type- $H$  retailers, (ii)  $f_L$ , the type- $L$  retailers’ cost of promoting brand  $M$ , is large, (iii)  $z$ , the premium  $M$ -preferring

consumers are willing to pay for the brand, is small, and (iv)  $\theta$ , the fraction of consumers who are susceptible to influence, is small. (And conversely for a low price.)

The welfare effects of firm  $M$ 's market share discount are different depending on whether a high-price or low-price equilibrium would arise with uniform wholesale pricing. If constraining firm  $M$  to charge a uniform wholesale price leads to a "high-price equilibrium," then lifting that constraint so the firm could implement a market share discount would be a Pareto improvement. Comparing firms' profits in *Proposition 1* to those in *Proposition 2* indicates that firm  $M$ 's profit from sales to the type- $L$  retailers would increase if it used a market share discount, but nothing else would change. Because firm  $M$  captures all of the benefits created by retailers' selling effort, retailers neither gain nor lose from lifting the constraint. Consumer welfare also is unchanged when the constraint is lifted because demands are inelastic.

If constraining firm  $M$  to charge a uniform price leads to a "low-price equilibrium," then lifting that constraint so the firm could implement a market share discount would not affect the supply of downstream selling effort. This policy change would only have redistributive effects. Comparing firms' profits in (2) to those in *Proposition 2* shows that lifting the constraint would simply transfer rents from type- $H$  retailers to firm  $M$ .

In sum, the welfare effects of firm  $M$ 's market share discount would never impair market performance. And sometimes it would improve market performance by inducing efficient downstream selling effort not otherwise forthcoming.

Under the conditions assumed in this model, the market share discount offered even by a manufacturer with a large market share would have at worst an innocuous effect on welfare. Of course, this conclusion does not apply for a dominant firm who

uses market share discounts to induce downstream activities that effectively shut competing producers out of the market. This would happen if competing producers have substantial fixed costs and the dominant firm's pricing reduced their sales to levels so low that they could not recover those costs (Michael D. Whinston). This outcome is precluded in the present model by the assumption that firm  $M$ 's competitors produce with constant returns to scale and therefore could survive with arbitrarily low output levels as  $\lambda + \theta \rightarrow 1$ . Under different assumptions about the firms' costs, the market share discounts of a dominant firm might have significant exclusionary effects. But this concern is tempered by knowledge that it is in the interest of retailers to sustain vulnerable competing producers. Retailers would resist a dominant firm's exclusionary strategy to avoid the demise of competing suppliers whose presence gives retailers leverage in their dealings with the dominant firm.

### ***V. Tiered Discounts***

The model can be extended to distribution networks with even more retailer heterogeneity. Just as a market share incentive allows firm  $M$  to separate retailers who can supply efficient selling effort from those who cannot, tiered market share incentives may allow further separation where retailers' abilities are more heterogeneous.

To illustrate, suppose firm  $M$ 's distribution network includes three types of retailers: types 0, 1, and 2. As before, assume that retailer "types" and "sizes" are uncorrelated, and that firm  $M$  does not know the retailers' types and sizes *ex ante*. Retailer types are distinguished as follows. First, no retailer  $k \in R_0$  has the ability to supply selling effort that would increase its fraction of  $M$ -preferring consumers.<sup>19</sup> Next,

every retailer  $i \in R_1$  has the ability to increase the fraction of  $M$ -preferring consumers from  $\lambda$  to  $\lambda + \theta_1$  by undertaking activities that cost  $f_1 h_i$ . Similarly, every retailer  $j \in R_2$  has the ability to increase the fraction of  $M$ -preferring consumers from  $\lambda$  to  $\lambda + \theta_2$  for the cost  $f_2 h_j$ . Suppose these parameters satisfy the following conditions:

$$1 - \lambda > \theta_2 > \theta_1 > 0, \quad (3)$$

$$f_1 < \theta_1 z, \text{ and } f_2 < \theta_2 z \quad (4)$$

$$\frac{f_2}{\lambda + \theta_2} > \frac{f_1}{\lambda + \theta_1} \quad (5)$$

$$\frac{f_2}{\lambda + \theta_2} \leq \frac{f_1}{\lambda + \theta_1} + \frac{(1 - \lambda - \theta_1)}{\lambda + \theta_1} \quad (6)$$

Assumption (3) indicates that type-2 retailers can increase their fraction of  $M$ -preferring consumers more than type-1 retailers. Assumption (4) indicates that both type-1 and type-2 retailers can promote brand  $M$  efficiently. Assumption (5) indicates that retailers' costs increase (between types) more than in proportion to the effectiveness of their selling effort. Better performance, where it is available, costs more, but there are diminishing returns to investing in downstream selling effort. Finally, assumption (6) places a bound on the magnitude of the diminishing returns depicted in assumption (5).

Suppose as before that retailers decide whether to supply selling effort in the second stage of the game. The following proposition (proof in the Appendix) describes

an equilibrium in which firm  $M$  uses tiered market share discounts to induce selling efforts from both type-1 and type-2 retailers.

**Proposition 3:** *For all feasible values of the model's parameters that satisfy condition (3)-(6), there is a perfect equilibrium in which firm  $M$  sets its wholesale price equal to  $w_M = z$  and offers discounts of  $\frac{f_1}{\lambda + \theta_1}$  to any retailer whose brand- $M$  share of retail sales is at least  $\lambda + \theta_1$  or  $\frac{f_2}{\lambda + \theta_2}$  to retailers whose brand- $M$  share of retail sales is at least  $\lambda + \theta_2$ . Retailers' prices are  $p_i^M = 1 + z$  and  $p_i^0 = 1, \forall i \in R_0 \cup R_1 \cup R_2$ . Type-1 and type-2 retailers supply brand-specific selling effort and qualify for the discounts  $\frac{f_1}{\lambda + \theta_1}$  and  $\frac{f_2}{\lambda + \theta_2}$  respectively. Retailers' profits are  $\pi_i^R = h_i, \forall i \in R_0 \cup R_1 \cup R_2$ . Firm  $M$ 's profits from the sale of  $(\lambda + \theta_1)h_i$  units to each retailer  $i \in R_1$  are  $\pi_i^M = [z(\lambda + \theta_1) - f_1]h_i$ , its profits from the sale of  $(\lambda + \theta_2)h_j$  units to each retailer  $j \in R_2$  are  $\pi_j^M = [z(\lambda + \theta_2) - f_2]h_j$ , and its profits from the sale of  $\lambda h_k$  units to each retailer  $k \in R_0$  are  $\pi_k^M = \lambda z h_k$ .*

This proposition identifies a situation where firm  $M$  can implement tiered market share discounts to induce heterogeneous retailers to provide efficient promotional support for its brand and to capture all of the rent created by these promotional activities. Notice that type-2 retailers achieve a brand- $M$  market share  $(\lambda + \theta_2)$  that is greater than those of other retailers. Also, type-1 retailers' brand- $M$  market share

$(\lambda + \theta_1)$  is greater than type-0 retailers' brand- $M$  market share  $\lambda$ . Type-2 retailers also receive a discount  $\frac{f_2}{\lambda + \theta_2}$  that is greater than the discount  $\frac{f_1}{\lambda + \theta_1}$  received by type-1 retailers. Type-0 retailers do not qualify for a discount. That is, the retailers who achieve larger brand- $M$  market shares get larger discounts. This result holds no matter what the relative number and size of retailers of the various types is. As before, the main consequence of pricing with market share discounts is to extract surplus and induce downstream selling effort. Aggregate benefits do not decrease and may increase, creating a Pareto improvement.

## **VI. Examples**

The increased-selling-effort explanation for market share discounts offered in this paper is not a universal explanation for this practice. But it is a plausible explanation in some instances where the practice has been challenged under the antitrust laws.<sup>20</sup> Consider two examples.

Cigarette manufacturers Philip Morris and R. J. Reynolds (RJR) were challenged (independently) by groups of wholesale distributors because they offered loyalty rebates to distributors whose cigarette sales achieve certain market share targets. The distributors claimed that the loyalty rebates constituted price discrimination in violation of the Robinson-Patman Act because the largest rebates were beyond the reach of distributors whose business focused on the sale of discount cigarette brands. The manufacturers maintained that their loyalty programs were designed to elicit stronger customer support for their cigarette brands from multi-brand distributors. Concluding

that the companies' discounts were equally and realistically available to all distributors, the trial court dismissed these cases at the summary judgment stage.<sup>21</sup> The increased-selling-effort explanation for market share discounts described in this paper lends some theoretical support to the manufacturers' claims and to the Circuit Judge's assessment that "RJR sought to enlist wholesalers in RJR's marketing efforts by providing financial incentives to wholesalers *willing to focus* on RJR savings brands (emphasis added)."<sup>22</sup>

Most pharmaceutical manufacturers offer discounts on certain prescription drugs to hospitals and managed care organizations that have the ability to influence the prescribing pattern of physicians (Kenneth G. Elzinga and David E. Mills, and Christopher M. Snyder and Sara F. Ellison). In some cases these discounts depend on a specific drug's fraction of the customer's total usage of drugs in the relevant therapeutic class. Various retail drug stores challenged these discounts because, for the most part, these retailers were not equipped to exert as much influence over prescribing patterns as hospitals and managed care organizations. The manufacturers countered that their discounts were designed to incentivize those customers who were positioned to influence prescription patterns. Many of the cases in this sprawling litigation were settled outside of court.<sup>23</sup>

The outcomes of these cases are an indication that U. S. courts have been cautious about reading anticompetitive motives into the use of market share discounts.<sup>24</sup> This paper offers an economic justification for this cautious treatment of market share discounts.

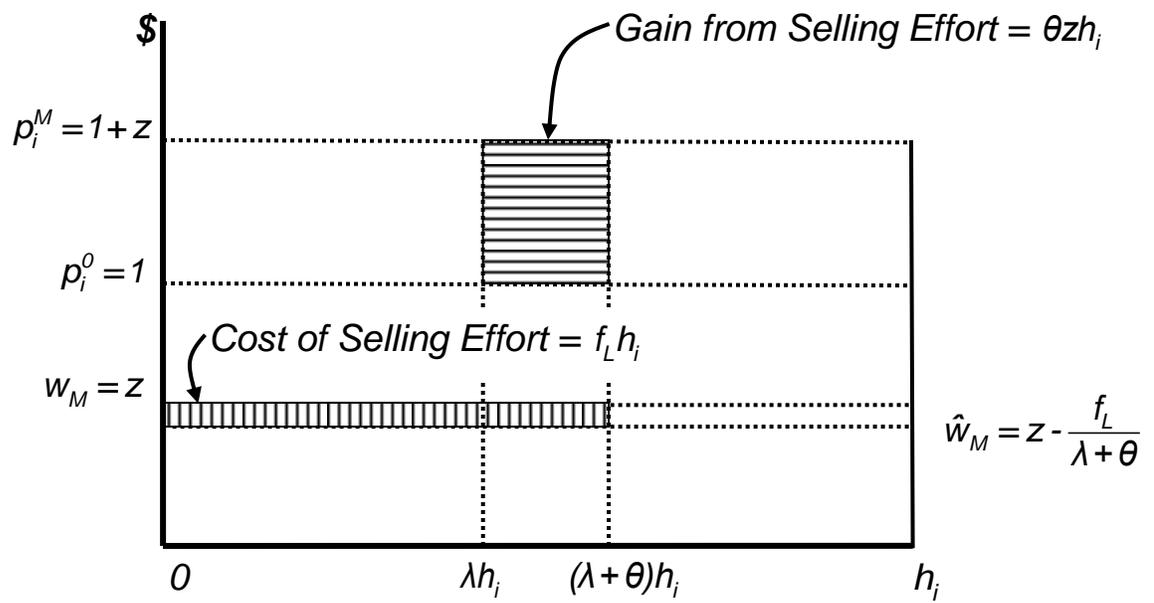


Figure 1

## Appendix

**Proof of Proposition 2:** Suppose firm  $M$  offers retailers the indicated pricing menu in stage one. In stage two, no retailer  $i \in R_L \cup R_H$  could charge retail prices that are more profitable than  $p_i^M = 1+z$  and  $p_i^O = 1$ , regardless of whether the firm invests in selling efforts. To see this, notice that no response with prices  $p_i^M < 1+z$  or  $p_i^O < 1$  could be optimal for any retailer  $i$  because such prices could be increased without changing any consumer's behavior. Next, no response with prices  $p_i^M > 1+z$  and  $p_i^O > 1$  could be optimal for any retailer  $i$  because these prices would eliminate all sales. Prices this high are dominated by  $p_i^M = 1+z$  and  $p_i^O = 1$ . Nor could a response with  $p_i^M > 1+z$  and  $p_i^O = 1$  be better than  $p_i^M = 1+z$  and  $p_i^O = 1$  for any retailer  $i$  because diverting  $M$ -preferring consumers to an undifferentiated brand could produce no more profit. This leaves the prices  $p_i^M = 1+z$  and  $p_i^O > 1$  as the only remaining alternative to  $p_i^M = 1+z$  and  $p_i^O = 1$ . These prices could not be more profitable than  $p_i^M = 1+z$  and  $p_i^O = 1$  for any retailer  $i \in R_L \cup R_H$  that invests in promotional activities because  $p_i^O > 1$  would eliminate sales of the undifferentiated brands without increasing brand- $M$  sales. Nor could  $p_i^M = 1+z$  and  $p_i^O > 1$  be more profitable than  $p_i^M = 1+z$  and  $p_i^O = 1$  for any retailer  $i$  who does not invest in promotional activities. Any retailer  $i \in R_L \cup R_H$  who does not invest in promotional activities yet charges the prices  $p_i^M = 1+z$  and  $p_i^O = 1$  would earn profits of  $h_i$ . If the same retailer charges the prices

$p_i^M = 1 + z$  and  $p_i^0 > 1$ , the firm would sell  $\lambda h_i$  units of brand  $M$ , and no units of the undifferentiated brands. Because this qualifies the retailer for firm  $M$ 's discount, the retailer's profit would be

$$\pi_i^R = \lambda \left(1 + \frac{f_L}{\lambda + \theta}\right) h_i. \quad (7)$$

These profits are less than  $h_i$  if

$$\lambda \left(1 + \frac{f_L}{\lambda + \theta}\right) < 1 \quad (8)$$

or if

$$f_L < (1 - \lambda) \frac{\lambda + \theta}{\lambda}. \quad (9)$$

This inequality is satisfied because  $\frac{\lambda + \theta}{\lambda} > 1$  and because the previous assumptions that  $z < 1$ ,  $\theta < 1 - \lambda$ , and  $f_L < \theta z$  jointly imply that  $f_L < 1 - \lambda$ . Thus every retailer charges the retail prices  $p_i^M = 1 + z$  and  $p_i^0 = 1$  regardless of whether the firm invests in promotional activities.

Also in stage two, a retailer  $i \in R_L$  responds to firm  $M$ 's offer by investing  $f_L h_i$  in selling effort and selling  $(\lambda + \theta) h_i$  units of brand  $M$ . The firm recovers this cost via the discount of  $\frac{f_L}{\lambda + \theta}$  on each of these units and earns profits of  $\pi_i^R = h_i$ . A retailer  $j \in R_H$  sells only  $\lambda h_j$  units of brand  $M$  and earns profits of  $\pi_j^R = h_j$ . The firm does not invest in selling effort because the cost  $f_H h_j$  would be greater than the incremental savings  $f_L h_j$

that result from increasing brand- $M$  sales to  $(\lambda + \theta)h_j$  in order to qualify for the lower price.

With these stage-two responses, firm  $M$ 's profits are

$\pi_i^M = [z(\lambda + \theta) - f_L]h_i \forall i \in R_L$  and  $\pi_j^M = \lambda zh_j \forall j \in R_H$ . This outcome maximizes the rent created by brand  $M$  and transfers the entire rent upstream to firm  $M$ . Therefore, the manufacturer's indicated pricing menu in stage one is an optimal strategy. ■

**Proof of Proposition 3:** Suppose firm  $M$  offers retailers the indicated pricing menu in stage one. In stage two, no retailer  $i \in R_0 \cup R_1 \cup R_2$  could charge retail prices that are more profitable than  $p_i^M = 1 + z$  and  $p_i^0 = 1$ , regardless of whether the firm invests in selling efforts. Reasoning along the same lines as in the proof of *Proposition 2*, we only need to investigate whether charging the prices  $p_i^M = 1 + z$  and  $p_i^0 > 1$  could be more profitable than  $p_i^M = 1 + z$  and  $p_i^0 = 1$  for any retailer  $i \in R_0 \cup R_1 \cup R_2$ . Suppose a retailer who invests nothing in selling effort charges the prices  $p_i^M = 1 + z$  and  $p_i^0 > 1$ . Because  $p_i^0 > 1$  would extinguish all sales of the undifferentiated brands, the retailer would qualify for either discount. Therefore we only need to check to see whether qualifying for the larger discount  $\frac{f_2}{\lambda + \theta_2}$  would make these prices more profitable than  $p_i^M = 1 + z$  and  $p_i^0 = 1$ . With the alternative response, the retailer would sell  $\lambda h_i$  units of brand  $M$  and nothing else. Because this qualifies the retailer for the discount  $\frac{f_2}{\lambda + \theta_2}$ , the firm would earn profit of

$$\pi_i^R = \lambda \left(1 + \frac{f_2}{\lambda + \theta_2}\right) h_i.$$

This is less profit than  $h_i$ , the firm's profit with the prices  $p_i^M = 1 + z$  and  $p_i^O = 1$ , if

$$f_2 < (1 - \lambda) \frac{\lambda + \theta_2}{\lambda}. \quad (10)$$

This inequality is satisfied for the same reason as inequality (9) previously. This establishes that no retailer would opt for setting  $p_i^M = 1 + z$  and  $p_i^O > 1$  without investing in selling effort. Nor would a retailer  $j \in R_2$  invest in selling effort and charge the prices  $p_j^M = 1 + z$  and  $p_j^O > 1$  because this would only eliminate sales of the undifferentiated brands without increasing brand- $M$  sales.

The final thing to check is whether a retailer  $i \in R_1$  could make more profit by investing in promotional activities and charging the prices  $p_i^M = 1 + z$  and  $p_i^O > 1$  to discourage sales of the undifferentiated brands and qualify for the discount  $\frac{f_2}{\lambda + \theta_2}$ . By responding in this way, the retailer would earn profit of:

$$\pi_i^R = [(\lambda + \theta_1) \left(1 + \frac{f_2}{\lambda + \theta_2}\right) - f_1] h_i \quad (11)$$

If the same firm provides selling effort and charges the prices  $p_i^M = 1 + z$  and  $p_i^O = 1$ , its profit would be  $h_i$ . Thus, providing selling effort and charging the prices

$p_i^M = 1 + z$  and  $p_i^O > 1$  is less profitable if:

$$[(\lambda + \theta_1) \left(1 + \frac{f_2}{\lambda + \theta_2}\right) - f_1] h_i < h_i \quad (12)$$

This inequality holds if the model's parameters that satisfy condition (6). Thus charging the retail prices  $p_i^M = 1 + z$  and  $p_i^O = 1$  in stage two is an optimal response for every retailer  $i \in R_0 \cup R_1 \cup R_2$ , regardless of whether the firm invests in selling effort.

With these stage-two responses, firm  $M$ 's profits from the sale of  $(\lambda + \theta_1)h_i$  units to each retailer  $i \in R_1$  are  $\pi_i^M = [z(\lambda + \theta_1) - f_1]h_i$ ; its profits from the sale of  $(\lambda + \theta_2)h_j$  units to each retailer  $j \in R_2$  are  $\pi_j^M = [z(\lambda + \theta_2) - f_2]h_j$ ; and its profits from the sale of  $\lambda h_k$  units to each retailer  $k \in R_0$  are  $\pi_k^M = \lambda z h_k$ . This outcome maximizes the rent created by brand  $M$  and transfers the entire rent upstream to firm  $M$ . Therefore, the manufacturer's indicated pricing menu in stage one is an optimal strategy. ■

## References

- Bliss, Christopher, Bliss, C. (1988) "A Theory of Retail Pricing," *Journal of Industrial Economics*, 36, pp. 375-391.
- Carlton, Dennis W., and Kenneth Heyer (2008) "Appropriate Antitrust Policy Towards Single-Firm Conduct," U. S. Department of Justice Economic Analysis Group Discussion Paper EAG 08-2.
- Chae, Sreya, and Paul Heidhues (2004) "Buyers' Alliances for Bargaining Power," *Journal of Economics and Management Strategy*, 13, pp. 731-754.
- Chipty, Tasneem, and Christopher M. Snyder (1999) "Buyer Size and Bargaining Power," *Review of Economics and Statistics*, 81, pp. 326-340.
- Elzinga, Kenneth G. and David E. Mills (1997) "The Distribution and Pricing of Prescription Drugs," *International Journal of the Economics of Business*, 4, pp. 287-299.
- DeGraba, Patrick (2005) "Quantity Discounts from Risk Averse Sellers," Federal Trade Commission working paper no. 276.
- Faella, Gianluca., "The Antitrust Assessment of Loyalty Discounts and Rebates," *Journal of Competition Law & Economics*, 4, pp. 375-410.
- Greenlee, Patrick, David Reitman (2008) "Competing with Loyalty Discounts," U. S. Department of Justice Discussion Paper EAG-04-2 (2004).
- (2005) "Distinguishing Competitive and Exclusionary Uses of Loyalty Discounts," *The Antitrust Bulletin*, 50, pp. 441-463.

- Greenlee, Patrick, David Reitman and David S. Sibley (2004) "An Antitrust Analysis of Bundled Loyalty Discounts," U. S. Department of Justice Discussion Paper EAG-04-13 .
- Horn, Henrick, and Asher Wolinsky (1988) "Bilateral Monopolies and Incentives for Merger," *RAND Journal of Economics*, 19, pp. 408-419.
- Hovenkamp, Herbert (1998) *Antitrust Law: An Analysis of Antitrust Principles and Their Application* (New York: Aspen Publishers).
- Inderst, Roman, and Christian Wey (2006) "Buyer Power and Supplier Incentives," manuscript.
- Klein, Benjamin and Murphy, Kevin M. (1988) "Vertical Restraints as Contract Enforcement Mechanisms," *Journal of Law & Economics*, 31, pp. 265-297.
- Klein, Benjamin and Andres V. Lerner (2008) "The Law and Economics of Bundled Pricing: *LePage's, PeaceHealth*, and the Evolving Antitrust Standard," *The Antitrust Bulletin*, 53, pp. 555-586.
- Kobayashi, Bruce (2005) "The Economics of Loyalty Discounts and Antitrust Law in the United States," *Competition Policy International*.
- Kolay, Sreya, Greg Shaffer, and Janusz A. Ordover (2004) "All-Units Discounts in Retail Contracts," *Journal of Economics & Management Strategy*, 13, pp. 429-459.
- Marvel, Howard P. (1982) "Exclusive Dealing," *Journal of Law and Economics*, 25, pp. 1-25.
- Marvel, Howard P. and Stephen McCafferty (1984) "Resale Price Maintenance and Quality Certification," *Rand Journal of Economics*, 15, pp. 340-359.

- Marx, Leslie M. and Greg Shaffer (2004) "Rent Shifting, Exclusion, and Market-Share Discounts," manuscript.
- Mills, David E., (2007) "Quasi-Partnerships in Distribution" *Review of Industrial Organization*, 31, pp. 155-168.
- (1995) "Why Retailers Sell Private Labels," *Journal of Economics and Management Strategy*, 4, pp. 509-528.
- Nalebuff, Barry (2004) "Bundling as an Entry Barrier," *Quarterly Journal of Economics*, 119, pp. 159–187.
- (2005) "Exclusionary Bundling," *The Antitrust Bulletin*, 50, pp. 321-370.
- Oi, Walter (1971) "A Disneyland Dilemma," *Quarterly Journal of Economics*, 85, pp. 77-96.
- Rubinfeld, Daniel L. (2005) "3M's Bundled Rebates: An Economic Perspective," *University of Chicago Law Review*, 72, pp. 243-264.
- Christopher M. Snyder and Sara F. Ellison (forthcoming) "Countervailing Power in Wholesale Pharmaceuticals," *Journal of Industrial Economics*.
- David Spector (2005) "Loyalty Rebates: An Assessment of Competition concerns and a Proposed Structured Rule of Reason," *Competition Policy International* 1 89-114.
- Telser, Lester G. (1960) "Why Would Manufacturers Want Fair Trade?" *Journal of Law & Economics*, 3, pp. 86-105.
- Tom, Willard K., David A. Balto, and Neil W. Averitt (2000) "Anticompetitive Aspects of Market-Share Discounts and Other Incentives to Exclusive Dealing," *Antitrust Law Journal*, 67, pp. 615-640.

Whinston, Michael D. (1990) "Tying, Foreclosure, and Exclusion," *American Economic Review*, 80, pp. 837-859.

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<sup>2</sup> Other pricing schemes, such as offering "free refills" or free items after the  $n$ th purchase, also condition discounts on purchase volume or repeat sales. Sreya Kolay, Greg Shaffer, and Janusz. A. Ordoover distinguish "all-units" discounts from "incremental" discounts and compare their effectiveness in extracting surplus.

<sup>3</sup> Other loyalty programs involve multi-product pricing. "Bundled discounts" are applied to the sale of two or more goods if buyers purchase one or more of the seller's goods exclusively, or if the buyer's purchases achieve certain market share targets with respect to one or more of the goods.

<sup>4</sup> For good general discussions of the relevant antitrust issues, see the papers by Gianluca Faella, Bruce H. Kobayashi, and David Spector.

<sup>5</sup> Recent prominent cases brought by antitrust authorities include *LePage's* in the U.S. and *Michelin* in Europe. See *LePage's Inc. v. 3M*, 324 F.3d 141 (3d Cir. 2002), *cert. denied*, 124 S. Ct. 2932 (2004) and COMP/E-2/36.041/PO-Michelin (2001).

<sup>6</sup> Quantity discounts are less frequently problematic because they only invite buyers to purchase additional units to take advantage of a lower price. The most obvious explanation for quantity discounts in intermediate product markets is that sellers' costs of serving buyers may not increase in strict proportion with the quantities purchased. Also, quantity discounts may be a price discrimination tactic (Walter Oi) or due to sellers' risk-aversion (Patrick DeGraba). Other explanations attribute quantity discounts to bilateral bargaining between a seller and independent buyers of various sizes (Suchan Chae and Paul Heidhues, Tasneem Chipty and Christopher M. Snyder, Henrick Horn and Asher Wolinsky, and Roman Inderst and Christian Wey).

<sup>7</sup> Bundled discounts are controversial when offered by dominant firms who sell several goods to the same customers because they may disadvantage rivals who only sell one or a few of the goods. Some of the antitrust implications of "bundled discounts" are examined in Patrick Greenlee, David Reitman, and David S. Sibley, in Barry Nalebuff (2004, 2005), Benjamin Klein and Andres V. Lerner, and in Daniel. L. Rubinfeld.

<sup>8</sup> Christopher Bliss identifies this "captive buyer" effect as a contributing factor to retailers' market power in the sale of specific goods that are components of bundles (p. 38).

<sup>9</sup> Lester G. Telser introduced the idea that contractual arrangements between a manufacturer and its retailers could remedy the downstream moral hazard that prevents the efficient distribution of the manufacturer's goods. His analysis involved pre-sale services that retailers provide to help consumers make well-informed decisions. These services are valuable to the manufacturer because they increase the demand for its goods. However, providing these services entails costs for the retailers that must be shifted upstream to the manufacturer. Telser demonstrated that the manufacturer could overcome free riding by retailers and induce valuable pre-sale services by means of vertical restraints such as resale price maintenance or territorial restrictions. Howard P. Marvel and Stephen McCafferty extended the Telser story to "quality certification" services. Benjamin Klein and Kevin M. Murphy took this line of reasoning beyond free riding and argued that vertical restraints are imposed to make retailers comply generally with incomplete performance contracts for promotional services.

<sup>10</sup> Whether a seller's exclusive dealing arrangements with its dealers is held to be illegal depends on how much of the entire *market* is foreclosed from rivals. Herbert Hovenkamp suggests requiring

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“foreclosure of at least 20 percent, and even that number seems rather small . . . . Even at a high foreclosure percentage of, say, 60 percent, we would insist on a showing that as a result of the exclusive dealing contract [rivals] were having a difficult time finding adequate outlets for their product” (¶1821).

<sup>11</sup> Benjamin Klein and Andres V. Lerner caution generally that “b]ecause competition for distribution often leads to preferred distribution arrangements as part of the normal competitive process, one cannot assume that such contracts are used solely as a way to foreclose rivals” (p. 566).

<sup>12</sup> Howard P. Marvel offered this explanation for manufacturers’ use of exclusive contracts.

<sup>13</sup> The assumption that  $z < 1$  means that consumers who prefer brand  $M$  are willing to pay at most twice as much for a unit of this brand. This is a plausible assumption for many differentiated consumer goods, and the assumption simplifies some of the paper’s results.

<sup>14</sup> A similar result follows if retailers can add value to otherwise undifferentiated brands by marketing them as their own private label products (David E. Mills, 1995).

<sup>15</sup> This limitation of quantity discounts would not apply if firm  $M$  could observe *ex ante* the size of every retailer. With this information, firm  $M$  could tailor firm-specific all-units quantity discounts or incremental quantity discounts that would induce selling effort if and only if retailers are type- $L$ . If firm  $M$  could observe both the size and type of each retailer *ex ante*, the screening function of the pricing strategies under investigation would be unnecessary.

<sup>16</sup> A retailer’s outside option would be distributing only undifferentiated brands and firm  $M$ ’s outside option would be forfeiting its sales to the retailer and relying on alternative distribution channels, if any, to reach the retailer’s consumers.

<sup>17</sup> This result could not be achieved with a discount applied only to the incremental units purchased by a retailer because firm  $M$  cannot observe  $\phi - \lambda_i$  for firm  $i$ .

<sup>18</sup> Competition with market share discounts between two manufacturers led to an outcome resembling this pattern in the wholesale cigarette example discussed below.

<sup>19</sup> In the alternative, the cost of supplying the requisite selling effort for the type-0 retailers is so high that the option is irrelevant.

<sup>20</sup> Rent extraction and other kinds of efficiencies may provide better explanations for the market share discounts challenged in some other cases where inducing downstream selling effort did not appear to be a factor. For instance, International Paper offered its customers a 2.5 percent rebate on purchases of carbonizing tissue if customers purchased at least 25 percent of their tissue requirements from International Paper. Larger rebates were offered for even greater percentages. The purpose for these discounts appears to be rent extraction. *American Tara Corporation v. International Paper Company*, No. 79C1470, 1981 WL 375752 (N.D. Ill. July 30, 1981). Brunswick Corporation, the leading manufacturer of inboard and stern-drive marine engines, offered a one percent discount off its list prices to boat builders who committed (for one year) to purchase 60 percent of their marine engines from Brunswick. The discount increased to two percent for commitments to achieve 70 percent and to three percent for commitments to achieve 80 percent. One rationale Brunswick offered for its market share discounts was that the commitments the discounts elicited from boat builders helped the firm reduce production costs. *Concord Boat Corp. v. Brunswick Corp.* 207 F. 3d 1039 (8th Cir. 2000).

<sup>21</sup> The decision was upheld on appeal. *Smith Wholesale Co. v. Philip Morris USA, Inc.*, No. 05-6481, 2007 WL 614237 (6th Cir. Feb. 27, 2007); *Smith Wholesale Co. v. R.J. Reynolds Tobacco Co.*, No. 05-6053, 2007 WL 581660 (6th Cir. Feb. 27, 2007).

<sup>22</sup> *Smith Wholesale Co. v. R.J. Reynolds Tobacco Co.*, No. 05-6053, 2007 WL 581660 (6th Cir. Feb. 27, 2007), p. 3.

<sup>23</sup> *Brand Name Prescription Drugs Antitrust Litigation*, MDL No. 997, U.S.D.C. for N.D. of IL, Eastern Div. The plaintiff retailers also claimed that the manufacturers’ discounts were the fruit of a conspiracy. Some of the conspiracy charges were tried and the court granted a directed verdict for the manufacturers. The verdict was upheld on appeal.

<sup>24</sup> Bruce H. Kobayashi reports that “courts have generally ruled that above-cost volume discounts, including those that use market share discounts and near exclusive thresholds, are lawful and do not violate the antitrust laws” (p. 1).