Inducing Cooperation with a Carrot Instead of a Stick

David E. Mills
Department of Economics
P.O. Box 400182
University of Virginia
Charlottesville, VA 22904-4182
434.924.3061 (phone)
434.924.7659 (fax)
mills@virginia.edu

Running Head: Inducing Cooperation

Abstract

The Supreme Court's reasoning in *Leegin* turned on the insight that manufacturers may use resale price maintenance (RPM) for procompetitive purposes. This paper presents a model of manufacturer-retailer interactions that clarifies why, as a rule, retailers and manufacturers are joint beneficiaries of service-inducing RPM. The model identifies factors that determine how RPM-generated benefits are allocated between a manufacturer and its retailers. The paper then shows that manufacturers may use market share discounts (MSD) in lieu of RPM or other vertical restraints to induce retailer performance. The outcomes and efficiency effects that are achieved with RPM can be replicated and usually surpassed if manufacturers substitute MSD for RPM, thereby enabling a manufacturer to retain all incremental profit rather than conceding some of it to retailers.

Keywords: Resale Price Maintenance, Market Share Discounts, induced retailer services, antitrust

I. Introduction

Much has been made of the influence of economics on antitrust policy in recent decades (Kovacic and Shapiro, 2000, and White, 2010). There is no better example of this influence than the shift that has taken place in the antitrust treatment of minimum resale price maintenance (RPM): In *Dr. Miles Medical Co. v. John D. Park & Sons. Co.*, 220 U.S. 373 (1911), the Supreme Court held that it is illegal *per se* for a manufacturer to enter into an agreement with retailers that specifies a minimum resale price. This decision reflected the antitrust hostility toward vertical restraints that prevailed for several decades before a more nuanced understanding of vertical price restraints[1] took hold among economists and antitrust scholars. After nearly a century, the Court overruled *Dr. Miles* and held in *Leegin Creative Leather Products, Inc. v. PSKS, Inc.*, 551 U.S. 877 (2007), that "vertical price restraints are to be judged by the rule of reason" (p. 1).

This dramatic reversal was based squarely on economic reasoning and on a half-century's developments in the economic theory of vertical relationships.[2] The Court observed that "[e]conomics literature is replete with procompetitive justifications for a manufacturer's use of resale price maintenance" and specifically relied on the justification that the practice "encourages retailers to invest in services or promotional efforts that aid the manufacturer's position as against rival manufacturers" (p. 2). By placing RPM under the rule of reason, *Leegin* affirms the antitrust priority of preserving *interbrand* competition and recognizes that certain restraints on *intrabrand* competition can serve this purpose.

---

[1] Across-the-board hostility toward vertical non-price restraints broke down first. The Court's decision in *Continental T.V. Inc. v. GTE Sylvania Inc.*, 433 U.S. 36 (1977), directed that these vertical arrangements be submitted to a rule-of-reason analysis.

[2] Mathewson and Winter (1998, p. 59) aver that "RPM is the most important vertical restraint in terms of both the frequency of use and the number of legal cases generated."

There are several and somewhat diverse economic theories that explain why a manufacturer might use RPM to build and maintain an efficient distribution system. These theories, some of which were advanced more than half a century ago, attribute procompetitive or benign effects to the practice.[3] The most influential procompetitive theories of RPM focus on manufacturers' efforts to induce retailers to provide "retailer services" that promote the sale of their brands. This is the role that Leegin Creative Leather Products, Inc. attributed to its suggested retail price policy when that policy was challenged by the plaintiff in *Leegin.* The Court's decision in *Leegin* legitimized this role and validated the procompetitive effects of this use of RPM.

Retailer-service theories of RPM hold that retailers can perform customer services or supply brand-specific information to their customers that promote sales of particular brands. Pre-sale assistance by knowledgeable salespersons, product placement, and various shopping amenities are familiar examples of such services. Manufacturers have an interest in eliciting these services from retailers, but retailers' financial incentives are not the same as those of the manufacturers. Eliciting services contractually is not always feasible. Incomplete information and costly monitoring may prevent manufacturers from inducing services in this way.

To overcome this contracting problem and secure the services that they seek from retailers, manufacturers may use price or non-price vertical restraints to align retailers' interests with their own. Hovenkamp (2005) explains this in terms of the agency problem that manufacturers face:

[3] To be sure, there are anticompetitive theories of RPM that warrant continued antitrust vigilance. These theories mainly involve horizontal price-fixing: either upstream or downstream. Mathewson and Winter (1998) and Elzinga and Mills (2008), among others, enumerate and distinguish both the various procompetitive and anticompetitive theories of RPM.

> "Manufacturers profit when their distribution systems work as efficiently as possible. While dealers collectively profit when a manufacturer's product is highly successful, individual dealers often profit even more when they can earn high markups by limiting competition with other dealers in the same brand. The interests of manufacturers and dealers are thus sometimes at odds, and this tension explains most vertical intrabrand restraints" (p. 184).

Telser (1960), whose procompetitive theory of RPM came first, observed that retailers are deterred from providing services that manufacturers seek when they cannot recover their cost because free-riding retailers that do not provide services undercut their retail prices.[4] He recognized that a manufacturer may implement RPM to eliminate the threat of free riding by establishing a minimum retail price that encourages (or at least enables) retailers to provide the services the manufacturer seeks.

Other procompetitive theories of RPM that feature retailer services followed. Telser's theory applies to retailer services that: (i) affect the demands of those consumers who encounter the retailer directly; and that (ii) do not prevent consumers from purchasing the brand from a different retailer than the one that provides the services. The closely related theories of RPM put forward by Marvel and McCafferty (1984) and Klein and Murphy (1988) apply to retailer services that have one but not both of these characteristics.

Marvel and McCafferty's theory emphasizes the "quality certification" service that retailers with reputations for selling high-quality merchandise perform for manufacturers. This service has the second characteristic of Telser's retailer services and, like Telser's, focuses on the role that RPM plays in the prevention of free riding. But the services to which Marvel and McCafferty draw attention do not have the first characteristic of Telser's retailer services. The

[4] See also Telser (1990).

reach of the reputational benefit that a discriminating retailer confers on the manufacturer is not limited to the customers of the discriminating retailer, but extends to every customer. Marvel and McCafferty's argument "does not require that dealers provide tangible services, but rests instead on the mere willingness of dealers to stock the product in question. . . [because] . . . consumers care where a product is sold but do not care where they purchase their own supplies of the good" (p. 347).

The retailer services that Klein and Murphy's theory of RPM emphasize have the first characteristic of Telser's retailer services, but not the second. This theory shares with Telser's the notion that manufacturers seek to elicit tangible activities that alter the demands of those consumers one-by-one. But Klein and Murphy do not share Telser's concern with the prevention of free riding. They hold that manufacturers' RPM policies often have nothing to do with free riding.

Instead, Klein and Murphy interpret RPM as a device for enforcing incomplete performance contracts that are aimed at stimulating and securing non-contractible retail services in support of a manufacturer's brand. An RPM-protected profit margin is said to induce retailers to provide the services that are sought by the manufacturer in order to avoid termination and forfeiture of that margin. This mechanism is entirely different than one that removes the incentive for discounters to undercut the prices of their full-service rivals.

It is clear from Telser's theory that RPM *enables* retailers to provide services that support sales of a given manufacturer's brand. But it is less clear why RPM actually *compels* retailers to invest the funds that are provided by an RPM-protected profit margin in supplying those services. Klein and Murphy maintain that in Telser's theory, in which free riding must be defeated, RPM does not "create a direct incentive for retailers to supply desired services" (p.

266). They suggest that retailers may prefer using the funds that are supplied by an RPM-protected margin on one brand to promote the sale of unrelated products or "may merely take the additional money . . . and continue to free ride" (p. 266). This observation leads Klein and Murphy to question whether Telser's theory of RPM actually explains why manufacturers adopt the practice.

An alternative conclusion to be drawn from Klein and Murphy's observation is that Telser's theory requires an RPM-protected profit margin that makes it more profitable for retailers to provide services than not. Depending on the cost and effectiveness of the retailer services sought, it may be possible for a manufacturer to offer a margin that is sufficiently generous that its best use is the use that is intended by the manufacturer. Mathewson and Winter (1998, p. 67, n. 17) write that "[t]he amount of service provided increases not because each retailer has 'more profit to spend on service' as is often argued, but because the marginal benefit of providing service has increased."

It follows that if RPM is to be an effective mechanism for eliciting retailer services that promote the sale of a manufacturer's product, then some of the net benefits created by those services must accrue to the retailers who provide them. Otherwise retailers would make more profit by free riding. This means that the manufacturer who implements RPM to induce downstream selling effort cannot capture all of the gains that RPM produces.

This paper presents a model of manufacturer-retailer interactions that clarifies why, as a rule, retailers and manufacturers are joint beneficiaries of service-inducing RPM. The model identifies factors that determine how RPM-generated benefits are allocated between a manufacturer and its retailers. The paper then goes on to explore an alternative solution to manufacturers' problem of inducing retailers to supply an efficient level of services, and

compares this solution to RPM. In lieu of RPM or any other vertical restraint, manufacturers may use market share discounts (MSD) to create an incentive for retailers to perform services that support sales of the manufacturer's brand. MSD policies are a form of non-linear pricing that offers retailers "loyalty discounts" or "loyalty rebates" that are conditional on the retailer's sales of the manufacturer's brand comprising a certain share of the retailer's total sales of the product in question.

MSD is not a substitute for RPM in every set of circumstances. The kinds of retailer services that can be elicited with MSD are those that have Telser's first characteristic, but may or may not have the second characteristic. MSD is effective for summoning those retailer services that influence consumers individually, not collectively. For this reason, the analysis of RPM and MSD that follows is relevant to inducing services that fit Telser's theory and Klein and Murphy's theory. The analysis is not relevant to the quality certification services in Marvel and McCafferty's theory.[5]

As will be seen, the outcomes and efficiency effects that Telser and Klein and Murphy attribute to RPM can be replicated and usually surpassed if manufacturers substitute MSD for RPM. To induce efficient retailer services in this framework, manufacturers' RPM policy must concede to retailers some of the incremental profit that is created by those services. But if MSD is used in lieu of RPM or any other vertical restraint, manufacturers may induce those services and retain all of the incremental profit that they create.

II. Distributing a Differentiated Consumer Good

[5] Nor does it apply to Deneckere, Marvel, and Peck's (1997) theory that RPM keeps retail prices from falling too far during periods of unexpected slack demand and deterring retailers from carrying inventories that are too lean from the perspective of the manufacturer, or to Inderst and Pfeil's (2014) "image theory" of RPM.

Manufacturer *M* sells a differentiated brand of a consumer good to a network *R* of competing retailers. Other manufacturers sell undifferentiated brands of the same good to the same retailers. Every manufacturer has a constant marginal cost of production, which is assumed to be zero to simplify analysis. Firm *M*'s cost of differentiating its brand from the others is fixed and sunk. Retailers' marginal cost of selling a unit of the good is *c* regardless of brand.

There are *S* consumers in the retail market who have a reservation value of *v* for a single unit of an undifferentiated brand of the good, where $v \geq c$. Some consumers recognize and value brand *M*'s distinguishing characteristics and have reservation values for brand *M* that are $v + z$ where $z > v - c$.[6] The fraction of consumers who are *M*-preferring is $\lambda \in [0,1)$.

Consumers are fully informed about retailers' prices for brand *M* as well as the other brands, and they maximize their surplus by purchasing one unit of an undifferentiated brand, one unit of brand *M*, or neither, depending on those prices. Assume that if all retailers charge the same price for the undifferentiated brands and the same, albeit higher, price for brand *M*, consumers distribute themselves randomly in such a way that retailer *i* serves s_i consumers where $\sum_{i \in R} s_i = 1$. Otherwise consumers converge on the low-price retailer(s). Of the s_i consumers that are served by retailer *i*, λs_i are *M*-preferring consumers and $(1-\lambda)s_i$ are consumers with no brand preference. Finally, suppose for now that there are no services that retailers can perform in support of brand-*M* sales that would alter either *z* or λ.

Under these conditions, competition among the undifferentiated-brand manufacturers drives the wholesale price of those brands to $w_0 = 0$. Competition among the retailers then drives

[6] The assumption that $z > v - c$ simplifies the analysis, but it is not strictly necessary for the principal results that follow.

the retail price of those brands to $p_0 = c$. Firm M maximizes its profit by setting its wholesale price to $w_M = z$. Retail competition then drives the retail price of brand M to $p_M = z + c$. With these prices, retailer i purchases and resells λs_i units of brand M and $(1-\lambda)s_i$ units of the other brands. The retailers and the manufacturers of undifferentiated brands all earn zero profit, and firm M captures the entire premium that M-preferring consumers attach to that brand. This equilibrium is summarized by:

$$\begin{aligned} w_0 &= 0 \\ p_0 &= c \\ w_M &= z \\ p_M &= z + c \\ \pi_i &= 0 \ \forall \ i \in R \\ \pi_M &= \lambda z S, \end{aligned} \tag{1}$$

where π_i and π_M are the profits of retailer i and manufacturer M respectively. Every consumer's surplus is $v - c$ regardless of whether they purchase a unit of brand M or an undifferentiated brand.

III. Inducing Retailer Support with RPM

Next, following Telser, suppose that retailers can perform customer services or supply brand-specific information in support of brand-M sales. Assume that every retailer has the ability, by providing relevant customer service or information, to increase the fraction of its customers who attach a premium of z to brand M from λ to $\lambda + \theta$, where $\theta \in (0, 1-\lambda)$. The reservation values of the retailer's remaining customers are unaffected by this selling effort. An interpretation of this assumption is that a fraction θ of all consumers have a latent preference for brand M that can be unlocked by a retailer that offers "full service."

Brand-specific selling effort by retailers takes many forms. Sometimes it involves activities that are specified and monitored by a manufacturer so that retailers' performance can be induced contractually. But often the kind of selling effort a manufacturer wants to elicit is idiosyncratic, retailer-specific and unobservable. As a practical matter, this kind of selling effort by retailers is prohibitively expensive to monitor and enforce and therefore non-contractible. Assume that full service – the selling effort that causes some consumers to revise their reservation values for brand-*M* – involves activities that are non-contractible and cannot be sold to consumers in a separate transaction.

Suppose that for a retailer with s_i customers, the cost of providing full service is fs_i, where $f < \theta z$. This cost is less than the incremental value that full service creates, and is proportional to the firm's size because the requisite services or information must be made available to all s_i of the retailer's customers -- not just those θs_i customers who are susceptible. Suppose further that a retailer can only recover this cost on sales of brand *M* or on sales of the undifferentiated brands.

Retail competition prevents retailers from recovering the cost of providing full service by charging more for the undifferentiated brands. If retailer *i* attempted to recoup this cost by charging a higher price than p_0 for the undifferentiated brands, $(1-\lambda)s_i$ of the firm's customers would be drawn away by other retailers that do not incur the cost of full service and can afford to undercut the higher price. Similarly, no retailer could recover the cost of providing full service by raising its retail price for brand *M*. If retailer *i* provided full service and attempted to recoup the cost fs_i by raising its price of brand *M*, free-riding retailers that do not provide full service could profitably undercut this higher price and draw away the firm's λs_i *M*-preferring customers.

In addition, if consumers incur only a small transaction cost when visiting a second retailer, then retailer *i*'s brand-*M* sales to its θs_i susceptible customers also would be diverted to free riders.

All of this implies that every retailer would charge the prices (p_M, p_0) and that no retailer would invest. As a result, only λS consumers would purchase brand *M*, and prices and profits would remain as in (1). This would be an inefficient outcome because enhanced selling effort would create more value than it costs.

To circumvent this difficulty and extract more profit from the sale of its brand, manufacturer *M* must provide an incentive for retailers to provide full service. Telser showed that the imposition of RPM creates this incentive. In the present model, manufacturer *M*'s most profitable RPM policy involves a wholesale price that is less than w_M in order to incentivize retailers to provide full service and a minimum retail price of p_M (because no consumer would be willing to pay a higher price). Enforcing the minimum retail price requirement eliminates retailers' free-riding opportunity, and the RPM-protected profit margin encourages retailers to invest in the provision of full service. In this way RPM increases brand-*M* sales by θS units and shifts the cost of retailers' full service upstream to manufacturer *M*.

For this to work, it is not enough for firm *M* merely to reduce the wholesale price of brand *M* to where retailers can recover the cost of providing full service and earn zero profit. If retailer *i* is offered a wholesale price that merely absorbs this cost, the firm would exploit the RPM-protected profit margin by only selling brand *M* to its *M*-preferring consumers and forgoing the cost of full service. As Klein and Murphy (1988) explained, reducing the wholesale price of brand *M* by only enough to recover the cost of full service is an inadequate incentive to induce full service. Firm *M*'s wholesale price reduction in conjunction with RPM must be large

enough for a retailer to make at least as much profit by investing in full service as by simply pocketing the RPM-protected margin on those brand-*M* sales that require no extra effort.

The manufacturer's profit-maximizing RPM policy involves a minimum retail price of p_M and a wholesale price w_M^{rpm} that satisfies:

$$(p_M - w_M^{rpm} - c)(\lambda + \theta)s_i - fs_i = (p_M - w_M^{rpm} - c)\lambda s_i. \tag{2}$$

Equation (2) implies that:

$$w_M^{rpm} = z - \frac{f}{\theta}. \tag{3}$$

By implementing the RPM policy (p_M, w_M^{rpm}), the manufacturer induces retailers to provide full service and increases brand-*M* sales to $(\lambda + \theta)S$ units. Retailers' and the manufacturer's profits in this equilibrium are:

$$\begin{aligned} \pi_i^{rpm} &= (p_M - w_M^{rpm} - c)(\lambda + \theta)s_i - fs_i, \ \forall\ i \in R \\ \pi_M^{rpm} &= w_M^{rpm}(\lambda + \theta)S. \end{aligned} \tag{4}$$

Substituting (3) into (4), these expressions become:

$$\begin{aligned} \pi_i^{rpm} &= \frac{\lambda f}{\theta} s_i, \ \forall\ i \in R \\ \pi_M^{rpm} &= \lambda zS + (\theta z - f)S - \frac{\lambda f}{\theta} S. \end{aligned} \tag{5}$$

Although the number of consumers who choose brand *M* is greater with RPM, every consumer's surplus remains $v - c$ regardless of which brand is purchased.

Of course, manufacturer *M* does not implement the RPM policy (p_M, w_M^{rpm}) unless $\pi_M^{rpm} \geq \pi_M$. This condition reduces to:

$$f \leq (\frac{\theta}{\lambda + \theta})\theta z. \tag{6}$$

Inequality (6) indicates, unsurprisingly, that manufacturer *M* is more likely to implement RPM if the per-customer cost of inducing retailers to perform the relevant activities is small. The inequality also shows that the manufacturer is more likely to implement RPM if θ, the fraction of consumers who are susceptible to retailer influence, is greater, and if λ, the fraction of consumers whose preference for brand *M* does not require retailers' brand support, is less. This is because the payoff to firm *M* of implementing RPM comes from sales to susceptible consumers, and not from sales to *ex ante M*-preferring consumers.

It is necessary in order for firm *M* to profit from RPM that the per-customer cost of providing full service be less than the incremental value it creates. But inequality (6) shows that the assumption $f < \theta z$ is not sufficient for the profitability of RPM except in the limiting case where $\lambda = 0$. If there are no *ex ante M*-preferring consumers in the market -- as might occur for instance when an entrant introduces a new brand in the market -- then no consumer is willing to pay a premium for the brand apart from retailers' enhanced selling effort. In this instance, without retailer sales support every consumer finds brand *M* indistinguishable from the other brands. In this limiting case, $f < \theta z$ is a sufficient condition for RPM to be profitable for manufacturer *M*. This result comports with the observations that new entrants may use RPM to gain a foothold in an existing market[7] or to establish a market for a new product.[8]

RPM increases total profit in the vertical structure by $(\theta z - f)S$. The expressions for firms' profits in (5) show how that profit is divided between manufacturer *M* and the retailers. This division depends on the prevalence of *ex ante M*-preferring consumers. Firm *M* earns more

[7] The Court's *Leegin* opinion acknowledges that"[r]etail price maintenance can . . . increase interbrand competition by facilitating market entry for new firms and brands and by encouraging retailer services that would not be provided . . . absent free riding" (p. 2).
[8] Mathewson and Winter (1998, p. 60) note that "RPM is often used in the early part of a product's life cycle to aid in the establishment of the distribution system."

profit, and the retailers earn less, the smaller is λ. The manufacturer generally cannot extract all of the profit created by the RPM-induced retail services of competitive retailers. This is because retailers must be allowed to retain part of those profits as an inducement to incur the cost of providing full service rather than retaining the entire RPM-protected margin on sales to their *M*-preferring customers without incurring those costs. The role of this inducement is similar to that of the RPM-sustained "quasi-rent stream" that Klein and Murphy (1988, p. 267) attribute to RPM. Both payment streams serve as a necessary incentive to prevent retailer non-performance. In Klein and Murphy's framework, this payment stream prevents retailer non-performance by creating a penalty (termination) in the event that non-performance is detected. In the present framework, the payment stream makes it more profitable for the retailer to perform than not even if non-performance could not be detected.

In the limiting case where $\lambda = 0$, the manufacturer captures all of the profit that is created by RPM. The distribution of this profit is more favorable to retailers when there are many *ex ante M*-preferring consumers because the manufacturer must provide an incentive to keep the retailers from reaping the protected margin on sales to these consumers without incurring the cost of offering full service. In the limiting case of course, there are no such consumers, and the retailers earn no profit from firm *M'*s RPM policy.

Although the retailers that distribute brand *M* are assumed to differ in size, thus far we have assumed that they are equally proficient in providing full service to support increased brand-*M* sales. One consequence of this assumption, as we have seen, is that manufacturer *M'*s RPM policy elicits full service from every retailer. If some retailers are unable to supply the kind of brand support required to cause susceptible consumers to revise their reservation values

for brand M, or are unable to do so at a cost that is less than the incremental value created, then it is less profitable for firm M to use RPM to elicit retailer services.

Suppose that the network R of retailers is partitioned into $\underline{R}$ and $\bar{R}$, where those retailers $i \in \underline{R}$ can perform the requisite brand-support activities for a cost fs_i as before, and those retailers $i \in \bar{R}$ cannot. Assume that the ability to supply this selling effort is unobservable to the manufacturer and is uncorrelated with firm size or any other retailer characteristic that is observable. When manufacturer M implements the RPM policy (p_M, w_M^{rpm}) in this instance, only those retailers $i \in \underline{R}$ provide full service and sell $(\lambda + \theta)s_i$ units of brand M. Those retailers $i \in \bar{R}$ do not provide full service and sell only λs_i units of brand M, retaining the RPM-protected margin on those sales.

Where the total number of consumers served by the retailers $i \in \underline{R}$ in this equilibrium is $\underline{S} = \sum_{i \in \underline{R}} s_i$, unit sales of brand M are $\lambda S + \theta \underline{S}$ and firms' profits are:

$$\begin{aligned} \pi_i^{rpm} &= \frac{\lambda f}{\theta} s_i, \ \forall \ i \in R \\ \pi_M^{rpm} &= \lambda z S + (\theta z - f)\underline{S} - \frac{\lambda f}{\theta} S. \end{aligned} \tag{7}$$

Retailers' profits differ by firm size as before, but those profits are the same regardless of whether the retailer provides the kind of services sought by the manufacturer. What is more, comparing equations (7) with (5), we see that retailers' profits are the same regardless of whether all or only some retailers are capable of providing full service. Although the manufacturer makes more profit when there are more retailers that provide full service, retailers' profits are the same no matter how many provide full service. Every consumer's surplus remains $v - c$ regardless of which brand the consumer chooses.

Manufacturer *M*'s profit in (7) is less than indicated in (5) because there are fewer retailers that are capable of inducing incremental sales of brand *M*. As before, manufacturer *M* does not implement the RPM policy (p_M, w_M^{rpm}) unless $\pi_M^{rpm} \geq \pi_M$. This condition is met here when:

$$f \leq (\frac{\theta \underline{S}}{\lambda S + \theta \underline{S}})\theta z. \tag{8}$$

A comparison of inequalities (8) and (6) indicates that the threshold level of *f*, below which RPM becomes profitable for the manufacturer, is lower when some of the retailers in the firm's distribution network are not equipped to provide full service. This is because the size of the wholesale price reduction that firm *M* is willing to offer every retailer is smaller when there are fewer retailers that invest in this price reduction in enhanced selling effort. The likelihood that firm *M* finds RPM profitable is lower when $\frac{\underline{S}}{S}$ is small.

Summarizing, RPM is an effective device for incentivizing retailers to provide services of the kind Telser envisioned, but it generally does not allow the manufacturer to capture all of the value that is created by the selling effort that it induces. There are two reasons why the retailers capture part of this added value: First, as shown in equation (5), even if RPM causes all retailers in the market to supply full service in support of brand *M*, the retailers retain some of the value created by their effort (except in the limiting case where $\lambda = 0$). The manufacturer must concede as much of this value to retailers as the retailers could capture by doing nothing to enhance the value of brand *M* and simply retaining the RPM-protected margin on sales to their *M*-preferring consumers. The second reason why retailers capture part of the value that is created by enhanced selling effort is that the manufacturer's optimal RPM-protected margin may be insufficient to induce full service from every retailer. Those retailers that do not (or cannot)

provide full service still retain the protected margin on sales to their *M*-preferring consumers, so the manufacturer's profit in (7) is less than in (5).

IV. Inducing Retailer Support with Market Share Discounts

RPM is not the only manufacturer pricing practice that can be used to induce retailers to provide efficient, sales-increasing selling effort on behalf of the manufacturer. MSD provides another pricing tactic that manufacturer *M* might employ in lieu of RPM to induce retailer brand support. This tactic has the attractive (to the manufacturer) feature that it induces enhanced selling effort and increased sales without the partial diversion of profit to retailers that occurs with RPM in (5) and (7).

Consider how MSD works with a network of retailers *R* that differ in size and have different capabilities for providing the kind of selling effort that manufacturer *M* wants to elicit: As before, assume that those retailers $i \in \underline{R}$ can perform the requisite brand-support activities for a cost fs_i where $f < z\theta$, and those retailers $i \in \overline{R}$ cannot.

Firm *M*'s goal is to provide at minimum cost an incentive for retailers $i \in \underline{R}$ to provide full service and to avoid compensating those retailers $i \in \overline{R}$ that do not. This is achieved by implementing a MSD program. Manufacturer *M* discounts the wholesale price of brand *M* to those retailers whose sales performance demonstrates that they provide full service.[9] Other retailers must pay the full wholesale price. The way that retailers demonstrate that they provide full service is by achieving brand-*M* market shares of $\lambda + \theta$. This demonstration involves allowing firm *M* or a credible third party to audit retailers' internal sales records to verify their brand-*M* market shares. Observing retailers' brand-*M* market shares enables the manufacturer to

[9] The discount can be remitted to retailers in the form of a *rebate* to assure performance.

separate full-service retailers from the rest -- even though the manufacturer cannot directly observe, or can only monitor at considerable expense, every relevant dimension of retailers' selling efforts.

There are two kinds of MSD programs that the manufacturer might use. An *all-units* MSD program would offer retailers a discount on every unit of brand *M* that is purchased as long as the retailer's market share reaches $\lambda + \theta$.[10] An *incremental* MSD program would offer retailers a discount only on those units that exceed a market share requirement of λ.

Consider the all-units MSD first. With an all-units MSD, the manufacturer calibrates its wholesale price discount to enable retailers $i \in \underline{R}$ to recover the cost of providing full service and still match the retail price that is charged by non-performing retailers $i \in \overline{R}$. Hypothetically, it might be possible for a retailer to achieve a brand-*M* market share of $\lambda + \theta$ without providing full service. This could be done by merely raising the price of the undifferentiated brands above p_0 to deter sales of those brands, or by terminating the distribution of the undifferentiated brands. We assume that these ways of qualifying for manufacturer *M*'s discount are precluded because firm *M* could detect them easily at negligible cost in the course of doing business with the retailers. While manufacturer *M* cannot distinguish *ex ante* those retailers $i \in \underline{R}$ from those $i \in \overline{R}$, the firm should be able to detect *ex post* and exclude from participation a retailer that contrives to qualify for the discount without making any effort to increase brand-*M* sales.

Suppose firm *M* charges a wholesale price of w_M to retailers with brand-*M* market shares less than $\lambda + \theta$, and a discounted price that is less than w_M to retailers with brand-*M* market shares of at least $\lambda + \theta$. With the wholesale prices

[10] Kolay, Shaffer, and Ordover (2004) show that a manufacturer may use an all-units volume discount as an incentive for retailers to increase downstream sales, thereby overcoming the double-marginalization problem.

$$w_M^{msd} = \left\{ \begin{array}{c} z \text{ if unit sales} < (\lambda + \theta) s_i \\ z - \dfrac{f}{\lambda + \theta} \text{ if unit sales} \geq (\lambda + \theta) s_i \end{array} \right\}. \tag{9}$$

retail competition establishes a retail price of p_M. Every retailer $i \in \underline{R}$ provides full service, qualifies for the discount, and sells $(\lambda + \theta) s_i$ units of brand *M*; while those retailers $i \in \bar{R}$ do not qualify for the discount and sell only λs_i units of brand *M*.

Firms' profits in this equilibrium are:

$$\begin{aligned} \pi_i^{msd} &= (p_M - c - w_M^{msd})(\lambda + \theta) s_i - f s_i, \ \forall \ i \in \underline{R} \\ \pi_i^{msd} &= (p_M - c - w_M^{msd}) \lambda s_i \ \ \forall \ i \in \bar{R} \\ \pi_M^{rpm} &= \sum_{i \in \underline{R}} w_M^{rpm} (\lambda + \theta) s_i + \sum_{i \in \bar{R}} w_M^{rpm} \lambda s_i. \end{aligned} \tag{10}$$

or by substituting (9) into (10):

$$\begin{aligned} \pi_i^{msd} &= 0, \ \forall \ i \in R \\ \pi_M^{msd} &= \lambda z S + (\theta z - f) \underline{S}. \end{aligned} \tag{11}$$

Every consumer's surplus is $v - c$ regardless of whether a consumer purchases a unit of brand *M* or an undifferentiated brand.

Before we compare this outcome with the outcome that is produced by RPM, consider what happens if the manufacturer uses an incremental MSD instead of an all-units MSD to encourage retailer selling effort. Suppose firm *M* charges every retailer *i* a wholesale price of w_M for the first λs_i units sold and a discounted price of $w_M - \dfrac{f}{\theta}$ for any additional brand-*M* sales. With this, retail competition once again establishes a retail price of p_M. Every retailer $i \in \underline{R}$ provides full service, qualifies for the discount on incremental units of brand *M*, and sells $(\lambda + \theta) s_i$ units. Those retailers $i \in \bar{R}$ do not qualify for the discount and sell only λs_i units of brand *M*.

Firms' profits in this equilibrium are:

$$\pi_i^{msd} = (p_M - c - w_M)\lambda s_i + (p_M - c - (w_M - \frac{f}{\theta}))\theta s_i - fs_i, \ \forall \ i \in \underline{R}$$
$$\pi_i^{msd} = (p_M - c - w_M)\lambda s_i \ \forall \ i \in \bar{R} \qquad (12)$$
$$\pi_M^{rpm} = \sum_{i \in \underline{R}} w_M^{rpm}(\lambda + \theta)s_i + \sum_{i \in \bar{R}} w_M^{rpm}\lambda s_i,$$

which also simplifies to (11). Every consumer's surplus is $v - c$.

Using either kind of MSD enables manufacturer *M* to induce selling effort on the part of retailers who can perform this function efficiently. This occurs without inducing inefficient selling effort from any retailer, and without any loss in consumer welfare. This outcome holds no matter how many retailers are capable of performing this function. It also holds no matter how large or small the retailers are and no matter whether they are similar or disparate in size.[11]

A comparison of the expressions for firms' profits in (11) with those in (7) shows that manufacturer *M'*s profit is greater when using MSD to induce full service rather than RPM. With MSD, the manufacturer captures all of the profit that is attributable to enhanced retailer services. The retailers whose selling effort creates this increment of profit get none of it. Nor do the non-performing retailers. Except in the limiting case where $\lambda = 0$, RPM requires that the manufacturer share the profit that is attributable to induced retailer services with the retailers in order keep them from exploiting the RPM-protected margin. RPM even requires that retailers that are incapable of performing value-added services are indirect beneficiaries of the services

[11] The free-rider problem that Telser identified extends to the "quality certification" service that a retailer with a reputation for selling high-quality merchandise provides manufacturers (Marvel and McCafferty, 1984). A manufacturer may use RPM to insure that such retailers are not deterred from carrying the manufacturer's brand by free-riding discounters. A market-share incentive program is not a good substitute for RPM for eliciting this kind of retailer service. This is because quality certification is a market signal that depends on whether the retailer carries the manufacturer's brand and not on how many units of that brand the retailer sells.

performed by other retailers. The diversion of profit that accompanies RPM is averted if the manufacturer uses MSD.

Although the amount of profit that is attributable to enhanced retailer services is the same with either pricing policy, the manufacturer makes $\frac{\lambda f}{\theta} S$ more profit using MSD instead of RPM. This difference is greater when λ is greater and when θ is smaller. When the fraction of consumers λ who are *M*-preferring is large -- as when, for instance, brand-*M* already has a substantial loyal following of consumers -- MSD is advantageous for the manufacturer because it avoids paying retailers a bounty of $\frac{f}{\theta}$ on each sale to these consumers as happens with RPM. When the fraction θ of consumers who are susceptible to the influence of retailers is small – as, for instance, when the highly specialized retailer services are sought to influence a narrow consumer demographic -- MSD is more advantageous for the manufacturer because the size of the bounty that is required by RPM is greater.

Notice that firm *M* could not achieve the same result using a quantity discount. Nor could it be achieved with a minimum purchase requirement. These measures would not perform as well as MSD because the increase in unit sales that firm *M* seeks to induce depends on the size of the retailer. It is the proportionality of discount-triggering thresholds that makes MSD advantageous for a manufacturer that sells to different-sized retailers. Also, discounts that are based on market shares instead of quantities are advantageous when demand fluctuates so that *S* and $s_i \forall i$ fluctuate.[12]

[12] Even a program of individualized volume discounts could replicate the outcome of "one size fits all" MSD only where aggregate demand is stationary. Zenger (2012, p. 756) notes that "market share contracts render rebate thresholds insensitive to aggregate demand fluctuations, which enables firms to compete for marginal sales in the face of uncertain demand."

V. Antitrust & Market Share Discounts

Both MSD and RPM are efficient mechanisms for inducing brand-specific selling effort from downstream dealers and retailers when that effort creates more value than it costs. Each practice increases total welfare and neither diminishes consumer welfare.[13] The difference in performance when MSD is used instead of RPM is strictly distributional and favors manufacturers.

Although the outcomes that are produced by RPM and MSD are strongly similar, the antitrust treatment of these practices has been quite different. Because it was believed to facilitate collusion, RPM was per se unlawful in the U.S. for a long time before *Leegin* subjected the practice to a rule of reason analysis.[14] MSD programs are more recent than RPM and, at least in the U.S., they have not encountered the same kind of antitrust hostility. The effects that are produced by MSD when it is used to induce retailer services increase total welfare and do not harm consumers or competition. Accordingly, this application of MSD does not warrant an antitrust response. In other circumstances, however, the effects of MSD may be anticompetitive.

Antitrust scrutiny of MSD is warranted when the practice raises the possibility of significant foreclosure (Tom, Balto, and Averitt (2000) and Faella (2008)). There is an inevitable exclusionary element in the use of MSD because incremental sales of the discounter's brand displace the sale of other brands. Although this kind of "exclusion" is not necessarily

[13] Although both RPM and MSD increase total welfare, neither increases consumer welfare in this model. This is due to the simplifying assumption that reservation values for brand *M* for every *M*-preferring consumer and every susceptible consumer are the same. If consumers' reservation values were different, then both RPM and MSD may increase consumer welfare. There is a small increase in consumer welfare, for instance, if a small number of susceptible consumers have latent reservation values for brand *M* of $v + z + \delta$, where δ is small.

[14] Most states enacted "fair trade" laws after the *Miller-Tydings Act of 1937*, but this law was repealed in 1975. Also, *U.S. v. Colgate & Co.*, 250 U.S. 300 (1919) established the "Colgate doctrine," which permitted manufacturers to unilaterally terminate dealers or retailers who do not charge manufacturers' "suggested retail prices."

anticompetitive,[15] it can be problematic in markets where the discounter has a large market share and entry barriers are high. A dominant manufacturer that uses MSD to induce retailer services may effectively shut competing producers out of the market.

The likelihood that rival manufacturers or new entrants are foreclosed is greater with all-units MSD than with incremental MSD. An all-units MSD gives retailers a strong incentive -- sometimes called the "suction effect" -- to achieve the discounter's threshold market share in order to earn the discount on every unit purchased, and not just those on units that exceed the threshold. To remain viable, competing manufacturers must cut their wholesale prices in order to compensate retailers for forgoing the discounts on these "retroactive" units. For a rival manufacturer whose prospective unit sales are much smaller than the discounter's, compensatory pricing of this kind could be infeasible.

The potential exclusionary effect of MSD is greater when the market share threshold that triggers the discount (*i.e.* $\theta \to 1-\lambda$ in the present model) is higher. Also, if competing manufacturers and potential entrants incur substantial fixed costs, a dominant firm's MSD may leave too little room in the market for many (or any) competitors to achieve a scale of operations necessary to cover these costs (Whinston, 1990).[16] However, concern that a discounter's MSD would drive all of the firm's competitors out of the market is tempered by the fact that it is in the interest of retailers to sustain vulnerable competing producers. To avoid the demise of the discounter's competitors, retailers may resist a dominant firm's use of MSD as a monopolization device.

[15] Bernheim and Heeb (2014), for instance, emphasize that the efficiency effects of a business practice must be weighed against any exclusionary effects to determine whether the practice is anticompetitive.
[16] This outcome is precluded in the present model by the assumption that manufacturers of undifferentiated brands produce with constant returns to scale and therefore could survive with arbitrarily low output levels.

In most instances MSD has benign effects or even welfare-enhancing effects (Spector (2005), Faella (2008), Zenger (2012)).[17] Like quantity discounts and other forms of second-degree price discrimination, MSD increases unit sales by reducing the price that buyers pay for marginal units without reducing the price of inframarginal units. This effect is greater when the discount is more aggressive and is greater with all-units MSD than with incremental MSD. Discounts that bring the price of marginal units near to the discounter's marginal cost approach welfare-maximizing conditions.

MSD produces patterns of distribution that are similar to but less extreme than exclusive-dealing arrangements. Although implemented by a financial incentive instead of a requirement, MSD shares some of the welfare-enhancing effects that exclusive-dealing arrangements are known to create. Sellers may seek exclusive-dealing arrangements with dealers or retailers in order to secure their undivided promotional support and maximum selling effort. Relatedly, exclusive dealing enables a supplier to prevent competing suppliers from free riding on the seller's investments in a dealer's sales effectiveness (Marvel, 1982). MSD confers similar benefits without requiring complete exclusivity. The welfare-enhancing effects of MSD that are the focus of this paper and that resemble those created by RPM are similar to those that are associated with exclusive dealing.

Although U.S. antitrust enforcement generally presumes that MSD programs are procompetitive (Kobayashi, 2005), the practice has been challenged. Plaintiffs -- usually without success, as in *Concord Boat Corp. v. Brunswick Corp.*, 34 F. Supp. 2d 1125 (E.D. Ark. 1998) -- have alleged that defendants' MSD programs constitute: (i) an exclusive dealing agreement that violates Section 1 of the Sherman Act; (ii) a monopolization scheme that violates Section 2 of

[17] Inderst and Shaffer (2010) show that the welfare effects of MSD may be positive or negative when used in combination with two-part pricing.

the Sherman Act; or (iii) price discrimination that violates the Robinson-Patman Act. Also, the Federal Trade Commission has challenged MSD programs (*e.g., In re* McCormick & Co., 2000 WL 264190 (FTC 2000)), alleging that the discounts violate the Robinson-Patman Act and Section 5 (Unfair Methods of Competition) of the Federal Trade Commission Act.

The criterion that should be used to assess the legality of MSD is disputed, and courts have not converged on any single test. Some antitrust scholars and judges hold that challenged MSD programs should be evaluated by the standard that applies to predatory pricing cases as prescribed by *Brooke Group Ltd. v. Brown & Williamson Tobacco Corp,* 509 U.S. 209 (1993). This test would establish a de facto safe harbor for MSD programs with discounted prices that are not below an appropriate measure of the firm's costs.

Others hold that challenged MSD programs should be evaluated under the rule of reason in much the same way as exclusive-dealing arrangements. The first perspective stresses that anticompetitive effects that stem from MSD, if any, are due to low prices that an otherwise viable rival cannot match. The second perspective stresses that any anticompetitive effects that are produced by MSD are due to the foreclosure of viable rivals that necessarily attends the effort of buyers to qualify for discounts.[18] The tension between these two perspectives was at the root of the split decision by the Third Circuit in *ZF Meritor, LLC v. Eaton Corp.,* 696 F.3d 254 (3d Cir. 2012).

Even with this ambiguity about how to assess whether a manufacturer's MSD are unlawful, the regulatory environment in the U.S. is more favorable for MSD than it was for RPM before *Leegin.* The presumption in U.S. antitrust enforcement is that MSD is benign or

[18] Federal Trade Commissioner Wright (2013) advocates assessing the legality of loyalty discounts such as MSD in the same manner as assessing the legality of exclusive dealing. A lively sequence of reactions to this position appears on the antitrust law and economics blog https://truthonthemarket.com.

procompetitive, except where the practice causes significant foreclosure. Bearing in mind that the goal of antitrust enforcement is low prices, courts are cautious about impeding pricing practices that tender discounts. This is as it should be.[19]

[19] Competition law in the E.U. is notably more hostile to loyalty rebates such as MSD. This hostility rises almost to the level of that toward RPM during the *Dr. Miles* era. Zenger (2012, p. 718) writes that "the treatment of loyalty rebates under Article 102 of the Treaty on the Functioning of the European Union (TFEU) is perhaps the most heavily disputed field of European competition policy. Relying mainly on a presumption that rebates are incompatible with the competitive process, the Community Courts have consistently prohibited pricing schemes by dominant firms that involve loyalty discounts unless they are cost-based."

References

Bernheim, B. D. & Heeb, R. A (2014). Framework for the Economic Analysis of Exclusionary Conduct. *The Oxford Handbook of International Antitrust Economics.* 2, 2-39. Blair, R. D. & Sokol, D. D. ed. Oxford: Oxford University Press.

Deneckere, R., Marvel, H. P., & Peck, J. (1997). Demand Uncertainty and Price Maintenance: Markdowns as Destructive Competition. *American Economic Review,* 87, 619-641.

Elzinga, K. G. & Mills, D. E. (2008). The Economics of Resale Price Maintenance. *Issues in Competition Law and Policy.* III, 1841-1858. Wayne D. Collins, W. D. ed. Chicago: American Bar Association.

Faella, G. (2008). The Antitrust Assessment of Loyalty Discounts and Rebates. *Journal of Competition Law & Economics,* 4, 375-410.

Hovenkamp, H. (2005). *The Antitrust Enterprise.* Cambridge: Harvard University Press.

Inderst, R. & Pfeil, S. (2014). An "Image Theory" of RPM. Manuscript available at http://mpra.ub.uni-muenchen.de/54139/.

Inderst, R. & Shaffer, G. (2010). Market-Share Contracts as Facilitating Practices. *RAND Journal of Economics,* 41,709-729.

Klein, B. & Murphy, K. M. (1988). Vertical Restraints as Contract Enforcement Mechanisms. *Journal of Law & Economics,* 31, 265-297.

Kobayashi, B. H. (2005). The Economics of Loyalty Discounts and Antitrust Law in the United States. *Competition Policy International,* 1, 115-148.

Kolay, S., Shaffer, G. & Ordover, J. A. (2004). All-units Discounts in Retail Contracts. *Journal of Economics and Management Strategy,* 13, 429-459.

Kovacic, W. E. & Shapiro, C. (2000). Antitrust Policy: A Century of Economic and Legal Thinking. *Journal of Economic Perspectives,* 14, 43-60.

Marvel, H. P. (1982). Exclusive Dealing. *Journal of Law & Economics,* 1, 6–11.

Marvel, H.P. & McCafferty, S. (1984). Resale Price Maintenance and Quality Certification. *RAND Journal of Economics,* 15, 346-359.

Mathewson, F. & Winter, R. (1998). The Law and Economics of Resale Price Maintenance. *Review of Industrial Organization,* 13, 57-84.

Spector, D. (2005). Loyalty Rebates: An Assessment of Competition Concerns and a Proposed Structured Rule of Reason. *Competition Policy International,* 1, 89-114.

Telser, L. G. (1960). Why Should Manufacturers Want Fair Trade? *Journal of Law & Economics,* 3, 86-105.

Telser, L. G. (1990). Why Should Manufacturers Want Fair Trade II? *Journal of Law & Economics,* 33, 409-417.

Tom, W. K., Balto, D. A., & Averitt, N. W. (2000). Anticompetitive Aspects of Market-Share Discounts and Other Incentives to Exclusive Dealing. *Antitrust Law Journal,* 67, 615-639.

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

White, L. J. (2010). Economics, Economists, and Antitrust: A Tale of Growing Influence. *Better Living through Economics,* 226-48. Siegfried, J. J., ed. Cambridge: Harvard University Press.

Wright, J. D. (2013). Simple but Wrong or Complex but More Accurate? The Case for an Exclusive Dealing-Based Approach to Evaluating Loyalty Discounts, remarks at the Bates White 10th annual Antitrust Conference, available at https://www.ftc.gov/public-statements/2013/06/simple-wrong-or-complex-more-accurate-case-exclusive-dealing-based

Zenger, H. (2012). Loyalty Rebates and the Competitive Process. *Journal of Competition Law & Economics,* 8,717-768.