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Vertical Price Restraints

When the holiday season approaches, you will likely want to make some purchases. These could include asked-for books, apparel, jewelry, or perhaps some toys for your younger siblings or relatives. Suppose that buying a toy is your top priority. Once in the market for toys, you must decide what brand of toy, say Lego, Playmobile, or Fisher–Price, is your best buy. You may realize that the same Fisher–Price toy is available at both Wal-Mart and Toys "R" Us, but that you can find the customized Lego train set only at the small toyshop on your college town's Main Street. The decisions of what toy to buy and where to buy it are affected by two different levels of competition. One level is the competition between the different manufacturers of toys or what we might call brand competition. The other level is competition between the different retailers who sell toys to customers, that is, retail competition.

Let's continue with the story a bit further. After deciding what and where to buy your holiday presents, you will then need to get back home. Suppose you want to drive home. This will put you in the market for a car if you do not already have one. (Remember that this is the holiday season, traditionally a time of big spending.) When you begin to shop for a new automobile, you will quickly discover that you cannot buy one at Sears or at any other large department store. For instance, to buy a Ford Taurus you will need to go to a Ford dealership; to buy a Toyota Corolla you will have to visit a Toyota dealership, and so on.

Even after the purchase of the car, there still remain some shopping decisions. On your drive home, you will likely need to purchase some fuel. You will discover that you can only get Mobil gasoline at a Mobil station, British Petroleum gasoline at a BP station, and Sunoco gasoline at a Sunoco station. This may or may not strike you as terribly odd. Yet it is certainly different from when you bought some Cheerios to eat as a healthy, low-sugar snack during the drive. To make that purchase you did not have to worry about finding a General Mills dealership. Almost every grocery store from your local corner convenience store to the discount supermarket chain carries that brand of cereal.

Now the fact that you are reading this book clearly shows that you are a bright and inquisitive student. So, at some point in your trip home—perhaps as the tedium of driving builds—you will likely ask yourself, "What's going on, here? What makes the retailing of cars, toys, gasoline, and cereal so different?" "What is the relationship between manufacturers, on the one hand, and retailers, on the other?" "What sorts of agreements exist between manufacturers and retailers that lead to this wide array of retailing options?"

These questions lie at the heart of the next two chapters. Our goal is to understand what explains the variety of relationships between manufacturers and retailers. Toy stores and supermarkets sell the products of many different manufacturers. Gasoline stations and auto dealers sell the products of only one or, at most, a few manufacturers. These different arrangements must reflect the various contractual agreements made between manufacturers and retailers, each of whom accepts some restraints on their behavior. In some cases the contractual arrangement restricts the price at which the retailer can sell the manufacturer's product.

If you do decide to buy a car then you will probably find that a new car has a sticker on it indicating the Manufacturer's Suggested Retail Price. This is the price at which the carmaker "suggests" that the dealer should sell to you. It is only a suggested price but it does serve as a reference point for the dealer's pricing decision and probably restrains the dealer's behavior in some way. More broadly, it indicates the general nature of vertical price restrictions. Replace the word "suggested" with the word "required" and you have what is called resale price maintenance (RPM). Because of the great attention historically given to vertical price agreements they are the focus of this chapter.

Other aspects of the contractual agreements between manufacturers and retailers can restrict who the manufacturer sells to, or who the retailer buys from, or can set the level of promotional and support services each party is expected to provide, and so on. These are called non-price vertical restraints and are the topic of the next chapter. There may be sound economic reasons for vertical restraints and in this chapter we consider arguments that suggest RPM agreements may actually be pro-competitive.

18.1 RESALE PRICE MAINTENANCE: SOME HISTORICAL BACKGROUND

In the United States, RPM agreements were initially considered to be a form of price-fixing outlawed under the Sherman antitrust act and were therefore considered illegal per se. The view—first enunciated in the 1911 decision of the Supreme Court in the *Dr. Miles* case[1]—was that since the Sherman Act clearly outlawed any arrangement for different retailers to collude on a common price, the attempt by a manufacturer to achieve the same outcome by means of an agreement with a retailer should also be prohibited. Moreover, this view was applied to RPM agreements that set retail price ceilings as well as price floors. Such restrictions, according to the courts, could not be justified either by arguing that the economic environment in which the agreement was made was special or by arguing that the agreement would actually lower prices to consumers.

Since the *Dr. Miles* case the legal framework in which RPM agreements have been evaluated has, however, grown increasingly permissive, although that growth has been sporadic. The first important development was the *Colgate* case of 1919 in which the Supreme Court ruled that a unilateral decision by a producer to stop supplying a specific price-cutting dealer was legitimate, so long as this was not part of an RPM involving many separate dealers.[2] This permissive attitude was expanded in the wake of the Great Depression by the Miller-Tydings Act of 1937, which explicitly exempted RPM agreements from antitrust prosecution. At that time, RPM agreements became legal. Moreover, their use was greatly strengthened by the 1952 McGuire Act, which permitted the enforcement of an RPM agreement even on

[1] *Dr. Miles Co. v. John D. Park and Sons, Co.*, 220 U.S. 373 (1911).
[2] *United States v. Colgate & Co.*, 250 U.S. 300 (1919).

Reality Checkpoint

Yesterday's News

Resale price maintenance contracts have both a variety of motivations and a variable legal history. One clear motivation, however, is to resolve the double marginalization problem and, in particular, to insure that retailers do not set downstream prices too high. The important case of *Albrecht v. The Herald Co.*, settled in 1968, nicely illustrates this point.

The Herald Co. was a newspaper firm publishing, among others, the St. Louis *Globe Democrat*. In turn, the company hired various carriers to deliver the morning paper to subscribers. Each carrier was given an exclusive territory from which all other carriers were excluded. On the newspaper itself, Herald printed its suggested retail price for the *Globe Democrat*.

Albrecht was one of the carriers hired by the newspaper who served about 1,200 customers. In 1961, Albrecht began charging his customers a newspaper price above that recommended by Herald. The company quickly objected. When its several requests that Albrecht lower the price back to the suggested retail charge were rejected by Albrecht, Herald took decisive action. It contacted Albrecht's customers and offered to deliver the paper to them itself at the lower price. Subsequently, it contracted with an alternative carrier to "invade" Albrecht's exclusive territory, again, delivering the paper at the lower recommended price. Albrecht's response was thoroughly American. The firm sued Herald for breach of contract and for attempting to fix prices in violation of the Sherman Act.

In its 1968 decision, the U.S. Supreme Court found in Albrecht's favor. The decision found that Herald's efforts to force a specific price on Albrecht amounted to price-fixing and was therefore per se illegal in keeping with the court's treatment of all price-setting agreements. Thus, once it was determined that Herald was in fact trying to enforce a price restraint there was no defense. The *Albrecht* case did not sit well with many economists and others who recognized the double-marginalization problem and, more broadly, the possibility that some vertical price arrangements might actually be good for consumers as well as for firms. Gradually, this learning spread to the courts as well. The *Sharp* case of 1988 expanded the *Colgate* exception to the per se ruling. However, the major break came with the court's ruling in *State Oil v. Khan*.

Barkat Khan was a midwestern gasoline dealer supplied by State Oil. The oil firm required that all dealers who set a markup of more than 3.25 cents per gallon would have to rebate the excess markup to the company, itself. Much like Albrecht, Khan began to exceed this maximum and when State Oil complained, Khan filed suit. As the case progressed to the Supreme Court, it generated enormous interest. Newspapers, auto manufacturers, and the U.S. Department of Justice were among the many urging the court to reverse the *Albrecht* decision and eliminate the per se status of vertical price agreements. On the other side, associations representing auto dealers and service station owners, as well as 33 states' attorney generals filed briefs urging the court to hold to the *Albrecht* finding.

The court's decision was dramatic. Not only did it find in favor of State Oil, but it also made an explicit statement that vertical price agreements stipulating *maximum* prices would no longer be per se illegal. This is not to say they would be automatically legal. However, they would be subject to a rule of reason and therefore permitted if it could be shown that there was a legitimate justification for their use and if they did not substantially lessen competition. What made the decision particularly compelling was that it was unanimous—a rarity in Supreme Court cases. However, while the court opened the door to resale price arrangements that limited *maximum* prices, the per se illegality of agreements setting *minimum* prices was maintained. The court was not quite ready to address that question in 1997.

Sources: *Albrecht v. The Herald Co.*, 390 U.S. 150 (1968), and *State Oil v. Khan*, 522 U.S. 3 (1997). See also, L. Greenhouse, "High Court, in Antitrust Ruling, Says Price Ceilings Are Allowed," *New York Times*, November 5, 1997, p. A1.

firms who had not signed on to the arrangement, provided at least one retailer and manufacturer had agreed to it.

The one loophole in the Miller-Tydings and McGuire legislation was that it required participation by state legislatures to make it effective. Some states, however, continued to prohibit RPM agreements so that in these states, RPM agreements did not become legal. Over time, this led to considerable discounting of prices in these states relative to those with pro-RPM legislation. Consumers willing to drive across the state line, or just willing to deal with a mail-order firm, were able to gain access to discount stores with lower prices. Such competition put tremendous pressure on firms participating in RPM agreements. In 1975, in the wake of the substantial inflation induced by OPEC's four-fold increase in the price of crude oil, both the Miller-Tydings and the McGuire Acts were repealed. This reestablished the presumed illegality of RPM agreements, but it did not remove the ability of manufacturers to cut off discount dealers established by the *Colgate* decision.

Two subsequent legal cases have expanded the ability of manufacturers to impose retail price restrictions. In the *Sharp Electronics* case,[3] the Court broadened its *Colgate* exception by allowing a manufacturer to terminate a discount dealer even if this was the result of other dealers' complaints. Then, in the 1997 *State Oil v. Khan* case, the Court moved to renounce explicitly any per se illegality for RPM agreements establishing a maximum price or a price ceiling. Recently, in the *Leegin* case of 2007, the court reversed the *Dr. Miles* per se ruling and held that all resale price agreements, maximum or minimum, should be subject to a rule of reason test.

The fear underlying the resistance to any legal justification for RPM agreements is, of course, that such agreements amount to either explicit or implicit collusion. There are two main ways in which this could happen. First, and most obviously, RPM agreements restrict price competition between retailers and so may foster retailer price-fixing conspiracies. What makes an RPM particularly attractive in this view is that it puts responsibility for the implementation and the enforcement of the cartel on the manufacturers, thereby protecting the retailers from any prosecution. Further, if the RPM extends automatically to new entrants, then it may also work to protect incumbent retailers from price-cutting entrants.

Alternatively, RPM agreements may foster collusion among manufacturers. In the first instance, a manufacturers' cartel would collude on wholesale prices. However, cartels can only survive if they can prevent cheating on the cartel agreement. If the cartel members can agree on a minimum price that each will impose on their retailers, then cheating becomes less likely. No member manufacturer could increase its sales by defecting from the cartel and charging a lower wholesale price because, given the stipulated retail price, consumer demand would not change. Moreover, if such a defecting manufacturer also lowered the minimum retail price at which it required retailers to sell, its cheating would very quickly be caught by the other manufacturers.

It is important to understand manufacturers' and retailers' incentives to restrict price, and of course the effect of such restrictions on consumer welfare. In this light the historical record is helpful. It is noteworthy that most of the political support for legislation such as the Miller-Tydings and McGuire Acts did not come from upstream manufacturers, but rather from downstream retailers. The retail lobby has consistently led the fight to legalize and enforce RPM agreements at both the federal and state levels. In addition, as documented by both Overstreet (1983) and Steiner (1985), the vast majority of RPM legal cases have been ones in which the issue was the setting of a minimum retail price, not a maximum price. Similar evidence for the United Kingdom has been presented by Pickering (1966). This record strongly

[3] *Business Electronics Corp. v. Sharp Electronics Corp.* 488 U.S. 717 (1988).

Reality Checkpoint

Leather Cuts All Too Deep

On December 7, 2006, the United States Supreme Court agreed to hear the case, *Leegin Creative Leather Products, Inc. v. PSKS, Inc.*, No. 06A179. In accepting this case, the court signaled that is was ready to review its century-old policy on resale price maintenance. The court's decision in the case could give manufacturers and franchisors considerably more leeway in controlling the retail prices paid by consumers.

Leegin is a manufacturer of a line of women's accessories. In 1997, it initiated a new marketing policy designed to encourage retailers to promote its brand in a separate section of their stores. In order to participate in this program, retailers had to pledge to adhere to Leegin's suggested prices at all times. One of those retailers was PSKS. However, while it initially agreed to participate in Leegin's marketing initiative, PSKS found in mid-2002 that the product was not selling as hoped. Therefore, it placed its entire line of Leegin's products on sale. On discovering this, Leegin suspended its shipments of product to PSKS.

PSKS demonstrated at trial that its sales and profits decreased substantially as a result of Leegin's action. It argued that it was not bound by Leegin's promotion agreement and, specifically, by that part of the agreement that required that it not price below Leegin's stipulated minimum because such agreements are per se unlawful. While the *Colgate* decision would allow Leegin's not to supply PSKS, the per se rule makes the agreement invalid. Under that rule, once the conduct is proven, liability is found without the need to show an adverse impact on competition. The jury agreed with PSKS and awarded the firm $1.2 million in damages, which was then trebled, plus attorneys' fees of approximately $350,000.

On appeal, Leegin did not contest the finding that there had been an unlawful agreement. Rather, it challenged the application of the per se rule to vertical minimum resale price maintenance. However, the United States Court of Appeals for the Fifth Circuit affirmed the district court's decision. The case then went to the Supreme Court.

As noted in the text, the Supreme Court decided that *maximum* resale price agreements would no longer be subject to the per se rule but, instead, be evaluated under the rule of reason. That decision, however, left intact the per se unlawful status of *minimum* resale price agreements. On June 28, the Supreme Court issued its decision. In *Leegin Creative Leather Products, Inc. v. PSKS, Inc.*, 551 U.S. _____(2007) the court overturned the century-old *Miles* case precedent. The ruling meant that now minimum as well as maximum resale price maintenance agreements would be subject to a rule of reason test.

Source: S. LaBaton, "Century-Old Ban Lifted on Minimum Retail Pricing," *New York Times*, June 29, 2007, p. A1.

suggests that if RPM agreements have been anti-competitive, it has been retail competition that has been suppressed.

18.2 VERTICAL PRICE RESTRAINTS AS A RESPONSE TO DOUBLE-MARGINALIZATION

One reason that a manufacturer may wish to restrict the pricing discretion of a downstream retailer is to remedy the double-marginalization problem. Let us review that argument first. Consider the simple case of a monopoly manufacturer selling to a single or monopoly retailer.

The manufacturer produces the good at constant unit cost c and sells it to the retailer at a wholesale price r. The retailer then resells the product to consumers at price P. For simplicity, we will assume for now that the retailer has no retailing cost. Consumer demand for the good is described by the linear demand function $P = A - BQ$. Hence, marginal revenue in the downstream market is $MR = A - 2BQ$. Equating marginal revenue and marginal cost downstream yields the optimal downstream output, $Q^D = (A - r)/2B$. Substituting this into the demand function then implies that the associated optimal downstream or retail price, P^D is:

$$P^D = \frac{A + r}{2} \tag{18.1}$$

This will yield a maximum downstream profit, $\Pi^D = (A - r)^2/4B$.

At the downstream price, $P^D = (A + r)/2$, the retailer sells $Q^D = (A - r)/2B$ units of the good, which must also be the amount sold by the upstream supplier. Accordingly, $Q^D = (A - r)/2B$ describes the demand facing the upstream firm given any price it charges r. The inverse demand function confronting the upstream firm is thus $r = A - 2BQ$. This implies a marginal revenue curve upstream of $MR = A - 4BQ$. Equating this with the manufacturer's marginal cost c, then yields the upstream manufacturer's profit-maximizing output, Q^U, and, by implication, its optimal wholesale price, r^U. These are

$$Q^U = (A - c)/4B, \text{ and} \tag{18.2}$$
$$r^U = (A + c)/2.$$

An integrated firm resulting from a merger of the downstream and upstream companies will earn greater profit and set a lower retail price because the merger eliminates the double marginalization inherent in the preceding analysis. Such a merger transforms the two firms into a simple monopoly whose goal is to maximize total profit from manufacturing and retailing. The final price to consumers under integration is $p^I = (A + c)/2$ and output is $Q^I = (A - c)/2$.

For example, if consumer demand (in inverse form) is described by $P = 100 - 2Q$, then the monopoly retailer's marginal revenue is $MR^D = 100 - 4Q$. Profit maximization at the retail level requires that this be equated to whatever wholesale price r the manufacturer sets. In turn, this implies that the manufacturer's demand curve is $r = 100 - 4Q$. Hence, his marginal revenue curve is $MR^U = 100 - 8Q$. Accordingly, if the manufacturer incurs a constant production cost of \$12 per unit, he will produce eleven units. These will be sold to the retailer at a wholesale price of $r = \$56$. The goods will then retail at a price of \$78. Total profit is \$242 for the retailer and \$484 for the manufacturer. By contrast, an integrated firm facing the same demand curve will set the retail price at $p^I = \$56$, at which it will sell $Q = 22$ units. It will earn a total profit of \$968, which clearly exceeds the total combined profit of the separate manufacturer and retailing firms (\$968 > \$242 + \$484). Consumer surplus also increases under integration since consumers now get more of the product at a lower price.

This simple example suggests that there are gains from having the manufacturer restrict the retailer's price decision. Specifically, the manufacturer may impose a retail price agreement that requires that the retailer never charge a price above \$56. With this restriction in place, the manufacturer would then set a wholesale price also equal to \$56. The retailer would then have to charge that price as well. By the terms of the contract, the retailer cannot set a higher price and has no interest to set a lower one. By imposing a maximum price at which

the retailer can sell, the manufacturer can achieve an outcome in which total the retail price is the one that maximizes the total combined profit and which, moreover, transfers all of that profit to the manufacturer itself.

18.1

Practice Problem

Tiger-el is an upstream manufacturer of electric trains that sells wholesale to The Great Toy Store, the only such store in the area. Demand for the trains at the retail store level in inverse form is $P = 1{,}000 - 2Q$, where Q is the total number of trains sold. The Great Toy Store incurs no service cost in selling the train. Its only cost is the wholesale price it pays for each train. Tiger-el incurs a production cost of $40 per train.

a. What wholesale price should Tiger-el charge for its trains? What price will these trains sell for at retail? How many trains will be sold?
b. What profit will the toy store and the retailer earn under the pricing choices found in part (a)?
c. What would be the retail price and the quantity sold if Tiger-el sold the trains to the toy store at cost but received a 66.67 percent sales royalty on every train sold? What would each firm's profit now be?

We have shown that one motivation for the manufacturer to restrain the pricing of the retailer is the double marginalization problem. In such a setting, an RPM agreement acts as a ceiling on the price consumers pay. As the *Albrecht* and *Khan* cases (see inset) illustrate, this motivation is clearly one of the forces that leads manufacturing firms to seek such restraints. However, the double-marginalization cannot be the sole explanation for vertical price restriction. The issue in double-marginalization is that in the absence of an RPM agreement, the retail price will be too high. Yet much of the support for vertical price restraints reflects the view that without them retail prices will be too low.

No double-marginalization issue will occur if either the upstream market or the downstream market is competitive. If the manufacturer competes with other producers to sell to a single retailer, then the wholesale price will fall to marginal cost c, or $12 in our earlier example. Equating marginal revenue with marginal cost, the retailer will then set a price to consumers of $(A + c)/2$ which of course is the same as the integrated price. Thus, in our example, competition in the upstream market will result in a retail price of ($100 + $12)/2 = $56. A similar result will obtain if the retail market is competitive. In this case, the manufacturer will find that the retail price will be the same as the wholesale price r. As a result, all the manufacturer need do is set the wholesale price at $56 to each retailer. With competition at either the wholesale or retail level, only one segment adds a markup. Therefore, no double markup will occur.

If neither the wholesale nor retail sector is competitive, then of course, the double-marginalization problem is potentially a real one. However, there are solutions other than the establishment of an RPM agreement. One solution for the upstream manufacturer is to adopt a nonlinear pricing strategy. In particular, it can adopt a two-part tariff pricing strategy. The manufacturer specifies that the retailer first pay a lump sum amount T and only after that be permitted to buy as much of the product as it wishes at the price r per unit. The optimal pricing strategy in such a two-part scheme calls for the per unit fee r to be set equal to marginal cost c. With a wholesale price of c, the retailer maximizes profit by setting a

price of $(A + c)/2$ just as in the case in which the manufacturing market is competitive. Selling at this price the retailer will earn the maximum total profit of

$$\pi^D(c, T) = \frac{(A - c)^2}{4B} - T \tag{18.3}$$

Once again using the numerical values from our earlier example in which the market inverse demand curve was given by $P = 100 - 2Q$, and $c = \$12$, we find that the retailer's profit will be $\$968 - T$. The role of the fixed fee T is now clear. It is this fee that permits the manufacturer to claim some of the total profit generated by its product. Presumably, the manufacturer would set T no less than \$616 since this is the amount he could earn without the agreement. By the same logic, T could be no greater than \$726, since values above this amount would leave the retailer with less than the \$242 that she could earn in the absence of the agreement. Accordingly, we would expect T to lie somewhere between \$616 and \$726, depending on the outcome of negotiations between the two parties. Whatever value is chosen for T, the point is that this somewhat more complicated vertical arrangement solves the double-marginalization problem without recourse to an RPM agreement.

We hasten to add that the two-part pricing arrangement just described is not merely a theoretical curiosity. It is precisely the agreement specified in many franchising contracts. Franchising is a vertical relationship under which an upstream company gives a downstream firm, or franchisee, the exclusive right to market and sell its product. Franchise contracts typically involve the franchisee paying a lump sum amount up front to the franchiser for the right to carry the product. In our discussion, T corresponds to this franchising fee.[4]

In sum, double-marginalization can be a real problem that reduces profit at both the manufacturing and retailing levels when both manufacturer and retailer possess market power. RPM agreements that put a ceiling on the retail price can solve this issue. Yet the double-marginalization problem cannot be the only reason that we observe such agreements. There are at least three reasons why. First, many RPM contracts are motivated by a desire to establish a floor and not a ceiling on the retail price. Second, the double-marginalization problem does not arise when either the upstream retail market or the downstream manufacturing market is competitive. Finally, even when double-marginalization is a legitimate concern, firms can and do use alternative arrangements to remedy the problem. We now consider other possible explanations for the use of RPM agreements.

18.3 RPM AGREEMENTS AND RETAIL PRICE DISCRIMINATION

If a retailer can figure out "who is who" on its demand curve and separate consumers into different groups the retailer will find it profitable to charge the different groups different prices for the same good. In particular, the retailer will wish to charge a higher price to those customers with less elastic demand. Coupons, quantity discounts, variations in quality in which the price difference does not match the cost difference, and market segmentation are all mechanisms by which a retailer may price discriminate. However, while such price discrimination can enhance retail profits, it can make life difficult for the upstream manufacturer.

[4] See O'Brien and Schaffer (1994) for further theoretical analysis. See Lafontaine (1992, 1993, and 1995) for evidence on this point.

To see how retail price discrimination can raise problems for the manufacturer, we return to our example to illustrate the issue. Suppose now that the retailer actually serves two, separate markets. In each market, retail demand is characterized by $P = 100 - 2Q$ and, again, the only retail cost is the wholesale price r set by the manufacturer. In one market, the retailer is a monopolist. In the other, the retailer faces competition from a potential rival who will buy from the manufacturer and sell at the retail cost r if the retailer ever charges a price greater than r. In the first market, the retailer can add a markup to the wholesale price r, but in the second, potential competition forces the retailer to sell at a retail price exactly equal to r. Again we assume that the manufacturer's unit cost is $c = \$12$.

Although the retailer sells in two markets, there is just one contract covering all its purchases from the manufacturer. Following our logic from above, we will allow this contract to specify both a wholesale price r and an upfront franchise fee, T. The manufacturer's problem is to choose T and r to maximize its total profit. We know that each market is capable of generating \$968 in total profit and that to achieve this profit it is necessary to set a retail price of $P = \$56$. Again, however, the manufacturer cannot sign a separate contract with this retailer for the goods sold in each market separately. Instead, the manufacturer must sign a single contract that covers the total amount of goods sold by the retailer in both markets.

Without an RPM agreement the manufacturer's dilemma should now be clear. To achieve a retail price of \$56 in the competitive market, it needs to set the wholesale price r also equal to \$56. This will lead to 22 units being sold and (\$56 − \$12) = \$44 being earned on each for the desired total of \$968 in this segment. However, if the manufacturer specifies a wholesale price of $r = \$56$, then in the monopolized market, the retailer will set a price of \$78 and sell only 11 units, leading to a total profit in this market of only (\$78 − \$12) × 11 = \$616. Although, the manufacturer may be able to capture part or even all of this profit by means of the franchise fee, it is still well below the potential maximum of \$968. Of course, the manufacturer could lower the wholesale price r. Yet as we know, to realize the maximum profit of \$968 in the monopolized market requires that the wholesale price fall all the way to cost, i.e., to \$12. At this price, the profit in the monopolized segment will be maximized but the profit in the competitive segment will fall to zero because in that segment, competition always forces the retail price to equal r.

With a single contract covering all the retailer's wholesale purchases, the manufacturer faces a painful tradeoff if the retailer can price discriminate. In order to capture profit from customers with less elastic demand (those in the monopolized market) the wholesale price should be close to marginal cost. However, to capture profit from customers with more elastic demand (those in the competitive market), requires a wholesale price well above marginal cost.

In the Appendix to this chapter, we show that, without an RPM agreement, the best that the manufacturer can do in this case is to set a wholesale price of \$47.20 which results in a combined profit from both markets of \$1,742.40. The retail prices in the monopolized and competitive market are then, respectively, \$73.60 and \$47.20. Relative to the profit maximizing retail price of \$56 in each market, the price is too high in the monopolized segment and too low in the competitive segment.

An RPM agreement, however, can solve the manufacturer's problem. One solution is to set a wholesale price of $r = \$56$ and to impose an RPM agreement that the retail price can never exceed this amount. Alternatively, one could set a wholesale price of \$12 and impose an RPM requirement that the retail price never fall below \$56. In the first case, the retailer will sell at cost equal to \$56 in the competitive segment and, because of the RPM price

ceiling, also sell at $56 in the monopolized segment. In the second case, the retailer will markup the wholesale cost to a retail price of $56. This will also be the price in the competitive market by virtue of the RPM price floor. In either case, the manufacturer will attempt to extract some or all of the downstream profit by means of a franchise fee, *T*.

There are many reasons why a retailer may be able to successfully price discriminate. While the two-market story told above is somewhat contrived, it nonetheless serves as a useful illustration of a general principle. Whatever the source of a retailer's ability to discriminate in prices, such discrimination makes it difficult for the upstream manufacturer to establish a wholesale contract that maximizes the total, manufacturing and retail profit unless that agreement includes an RPM provision. Without an RPM agreement, there will be a tendency for the retail price to be too low to consumers with more elastic demand and too high to those whose demand is less elastic.[5]

In the *State Oil v. Khan* case the Supreme Court removed the *per se* presumption against RPM agreements specifying a maximum price. In this case, State Oil Co. had imposed a maximum retail price on its distributors, one of whom, Barkat Khan, tried to exceed that price. However, Khan's actual pricing strategy was more complex. He did want to raise the price to premium buyers, but he wanted to lower the price to consumers of regular grade fuel. That is, Khan wanted to price discriminate. The RPM agreement subsequently legitimized by the Supreme Court appears to have been motivated in part by State Oil's need to prevent such price discrimination. In turn, this suggests that this motivation may well be important in promoting RPM contracts more generally.

18.4 RPM AGREEMENTS TO INSURE THE PROVISION OF RETAIL SERVICES

In the preceding two sections, we have treated retailing as simply an extra stage that occurs between production and final consumption. This approach has allowed us to gain some important insights into the downstream pricing issues that the retailing stage raises. However, our modeling of retailing to date has failed to incorporate any actual positive role for retailers. Retailers such as supermarkets, discount chains, and department stores form the crucial link between those who make goods and those who use them, and these retailers provide many services that are valuable to the manufacturers. Not only do they gather information about customer satisfaction and desired changes in the manufacturer's product, but they also provide such valuable services as the provision of desirable shelf space, large displays, advertising, and product demonstration. These services can be crucial to the marketing and sales of the manufacturer's product.

Consider the magazine industry. Supermarkets and discount chains presently account for over 55 percent of single-copy sales of U.S. magazines. Because such sales are made at the full, nonsubscription price, they are profitable and quite important to publishing firms. Yet the publishers must rely heavily on the efforts of the retailers to sell their magazines. A prominent display near the checkout register, for example, can greatly increase sales. So can advertising, or a promotional visit to the store by a celebrity. Publishers have a deep interest in making sure that the retailers undertake such efforts. In recent years, publishers of People and other magazines, such as Cosmopolitan and Harper's Bazaar, have had tense

[5] See Chen (1999).

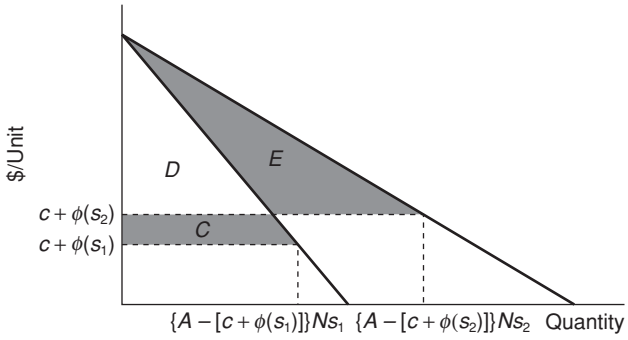

Figure 18.1 The effect of services on demand, costs, and the social surplus
Demand is given by $P = A - Q/sN$. This means that as the level of services rises from s_1 to s_2 the demand curve rotates up and to the right. At service level s_1, marginal cost = $c + \phi(s_1)$. If price equals marginal cost, total demand is $\{A - [c + \phi(s_1)]\}Ns_1$, and social surplus is the sum of areas C and D. At service level s_2, marginal cost = $c + \phi(s_2)$. In this case, equality of price and marginal cost implies that total output = $\{A - [c + \phi(s_2)]\}Ns_2$, and the social surplus is $D + E$.

negotiations with retailers such as Wal-Mart and Winn Dixie supermarkets over the display and promotion of various issues of these publications.[6]

The relationship between a manufacturer and its retailers should address the upstream manufacturer's interest in the provision of retail services, and the motivation for the retailer to incur the expense of such services. Promotion, product demonstration, and simply providing a pleasant place to shop are costly. Moreover, it is extremely difficult for the manufacturer to monitor the provision of such services. Taken together, these two facts mean that a manufacturer cannot simply specify the level of retail services that it wants for its product and assume that they will be provided. What is required is an enforceable contract that specifies the obligations of both the manufacturer and the retailer. It is this aspect of the vertical contract—that pertaining to the provision of retail services—that we now wish to examine.

Let us begin by describing how demand is affected by retail services. Denote by $D(p, s)$ the amount of the good demanded at price p with retail service level s. Increases in the level of services s raise the quantity demanded at any price or, alternatively, raise the willingness to pay of each consumer. We assume that this effect takes the form shown in Figure 18.1. In this case an increase in the service level from say s_1 to s_2 raises most the willingness to pay of the marginal consumer. An example of a demand curve that captures this effect is $Q(p, s) = s(A - p)N$, where N is the number of consumers in the market. In inverse form this is: $p = A - Q/sN$. The top price anyone is willing to pay for the product is $\$A$, no matter the service level, s, and more is bought as s rises.

Providing retail services is costly. Let the cost of supplying s retail services per unit of the good sold be described by a function $\phi(s)$. We will assume that the provision of retail services is subject to diminishing returns so that raising the service level s raises the cost of providing such services and does so at an ever-increasing rate. [In calculus terms,

[6] G. Knecht, "Big Retail Chains Get Special Advance Looks at Magazine Contents," *Wall Street Journal*, October 22, 1997, p. A1.

this means that both $\phi'(s)$ and $\phi''(s)$ exceed zero.] For a given level of services, s, the retailer's marginal cost of selling the manufacturer's product is $r + \phi(s)$. This is the sum of the wholesale price paid to the manufacturer r plus the cost of providing s retail services per unit sold, $\phi(s)$.

We now consider the provision of retail services under a variety of circumstances. We point out in advance that this presentation is a little advanced. For those who wish to skip this section, our main result is that, in the absence of vertical price restraints, it is unlikely that a retailer will provide the manufacturer's preferred level of service. The intuition behind this argument is straightforward. The manufacturer wants a high level of service because this will raise the price consumers are willing to pay and, hence, the manufacturer's profit. Yet while the profit gain of better service flows at least in part to the manufacturer, the cost of providing such service falls entirely on the retailer. Accordingly, the retailer's incentive to offer such service is reduced. Vertical restrictions such as a resale price maintenance agreement may be a way to overcome this difficulty, at least in part.

18.4.1 Optimal Provision of Retail Services

Let's start by figuring out what is the efficient level of services from the viewpoint of society overall, i.e., the level that would maximize the combined consumer and producer surplus. Recall that efficiency in a market requires that price equal marginal cost. Because marginal cost for a given level of services is constant we have that $p = c + \phi(s)$, which means that there is no producer surplus. As shown in Figure 18.1, the social surplus at any price equal to $c + \phi(s)$ is just the triangular area above the cost line but below the demand curve. Accordingly, the optimal choice of service level s is the level of s that maximizes the area of this triangle. By definition, this area is given by $\{A - [c + \phi(s)]\}^2(Ns)/2$. To find the surplus maximizing value of services, denoted by s^*, we take the derivative of this expression with respect to s, and set it equal to zero. This yields:

$$\{A - [c + \phi(s^*)]\}^2 N/2 - Ns^*\{A - [c + \phi(s^*)]\}\phi'(s^*) = 0. \tag{18.4}$$

In turn, this implies that s^* must satisfy:

$$(A - c)/2 = \phi(s^*)/2 + \phi'(s^*)s^*. \tag{18.5}$$

Suppose for instance that $N = 100$, $c = 5$, $A = 10$, and that $\phi(s) = s^2$. Then a small bit of algebra will reveal that the social optimum calls for a service level of $s^* = 1$. (Remember, s is an index and so it is measured in some arbitrary unit.) At this level of service, optimality would require that the price be equal to $c + \phi(s^*) = \$6$.

Now consider what the outcome would be if the monopolist could operate as a vertically integrated manufacturing and retailing business. Certainly, the price will be higher. The monopolist will not make a profit at a price equal to cost. Yet what about the integrated firm's choice of service level s? How would this compare to the optimum described in equation (18.5)?

The profit of the integrated firm depends upon the price it sets and the service level it provides, and is:

$$\pi(p, s) = p(A - p)Ns - [c + \phi(s)](A - p)Ns \tag{18.6}$$

To maximize profit, the firm must choose both the profit-maximizing price p and the service level s. We take the derivative of the profit function with respect to each of these variables and set it equal to zero yielding:

$$\frac{\partial \pi(p, s)}{\partial p} = (A - 2p)Ns + [c + \phi(s)]Ns = 0 \tag{18.7}$$

and

$$\frac{\partial \pi(p, s)}{\partial s} = p(A - p)N - [c + \phi(s)](A - p)N - Ns\phi'(s)(A - p) = 0 \tag{18.8}$$

Equation (18.7) may be simplified to read:

$$p^I = [A + c + \phi(s)]/2 \tag{18.9}$$

Here, p^I is the firm's optimal price conditional upon a given service level s. Equation (18.9) implies that, as usual, the integrated monopolist will set a price of obtaining a unit of the good along with a given service level that exceeds the marginal cost of providing the good and the associated service cost $c + \phi(s)$. This is shown in Figure 18.2.

The next step is straightforward. Substitute the optimal price value from equation (18.9) into condition for the profit-maximizing service level shown in equation (18.8). Simplification then yields the following necessary condition for the profit-maximizing service level s^I:

$$(A - c)/2 = \phi(s^I)/2 + \phi'(s^I)s^I \tag{18.10}$$

Comparing equations (18.5) and (18.10), it is clear that they are the same. Although the integrated monopoly firm sets too high a price, the service level s^I that it chooses is the same as the socially optimal service level s^*. As it turns out, this specific result reflects the particular demand and cost relationships that we assumed and is not fully general. Nevertheless, the result is useful because it does show that the manufacturer's interest in providing retail services is often in harmony with the public interest as well. As we shall shortly see, this is why vertical price restrictions can play a potentially welfare enhancing role.

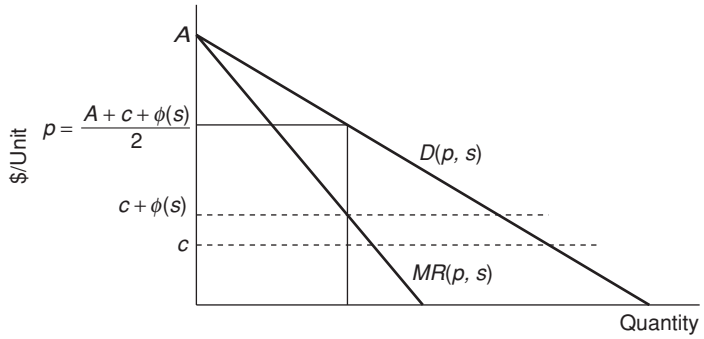

Figure 18.2 The integrated firm's optimal price as a functon of the service level, s

18.4.2 The Case of a Monopoly Retailer and a Monopoly Manufacturer

Let us next examine the case where the retailing of the good is done by an independent monopoly downstream retailer. The manufacturer sells the product to the monopoly retailer at price r, after which the retailer sells the good to final consumers at retail price p^M and provides s^M retail services. Keeping with the values of our earlier example, the retailer's profit downstream is:

$$\Pi^D(p^M, s^M, r) = [p^M - r - \phi(s^M)]D(p^M, s^M) = [p^M - r - \phi(s^M)]s^M(A - p^M). \quad (18.11)$$

As in the case of the integrated firm, the retailer must choose the two strategic variables, price p and the level of services s. The retailer in this case has exactly the same profit-maximizing problem as did the integrated firm of the previous discussion, except that the retailer faces a marginal cost r that may differ from the true production cost c, depending on the upstream firm's price choice. So, we can work out the monopoly retailer's choices just by replacing c with r in equations (18.6) and (18.10). This yields the choices p^M and s^M satisfying

$$p^M = \frac{A + r + \phi(s^M)}{2} \quad (18.12)$$

and

$$(A - r)/2 = \phi(s^M)/2 + \phi'(s^M)s^M. \quad (18.13)$$

Because $r > c$, the price implied by equation (18.12) exceeds that implied by equation (18.9). This is simply the double-marginalization problem again. At any given service level, the monopoly retailer adds her markup to the markup already reflected in the manufacturer's wholesale price. Yet as a comparison of equations (18.10) and (18.13) also makes clear, having $r > c$ means that this double-markup is now compounded by a further problem, namely, a suboptimally low level of retail services. A careful examination of these two equations reveals that when $r > c$ then the level of retail services chosen by the retailer s^M is less than the level s^* that is optimal from the viewpoint of both society and the upstream manufacturer. The intuition behind this outcome is straightforward. Providing retail services is costly and this, along with the fact that the manufacturer charges a wholesale price r above marginal production cost, puts the squeeze on the retailer's profit. In response, the retailer tries to recapture some of her surplus by cutting back on services.

18.2 Practice Problem

Assume as in the example in the text that $c = 5$ while $\phi(s) = s^2$, so that $\phi'(s) = 2s$. Assume that the manufacturer sells through a monopoly retailer and initially sets a wholesale price, r equal to \$6. Assume that retail demand is $Q(p, s) = s(10 - p)100$.

a. What will be the retail service level and the retail price? How much output will be sold at this price and service level combination? What will be the manufacturer's profit?
b. Would the manufacturer's profit rise or fall if it raised its wholesale price to \$7? At this price, how does the profit of the manufacturer selling through the retailer compare with the profit of the integrated manufacturer?

The failure to coordinate the actions of the manufacturer and the retailer leads to a less than desirable outcome—both for the firms and for consumers. Clearly, the manufacturer will not be happy with this situation. From his perspective, the retail firm is charging too high a price and offering too few retail services. Both of these actions reduce the final consumer demand facing the retailer and the profit to the manufacturer. Coordination of the upstream and downstream operations would result in lower prices and better services, increasing the joint profits of the two firms and making consumers better off. In the absence of vertical integration, what can be done to improve the outcome for both manufacturer and retailer?

As with the double marginalization problem, we consider two possible solutions. The first is an RPM agreement. The second is a two-part pricing strategy comprised of a fixed franchise fee T and a constant wholesale price r charged to the monopoly retailer.

In general, resale price maintenance will not solve the upstream manufacturer's problem. It is true that under an RPM agreement, the manufacturer can require the retailer to sell the product at the price p^* and thereby solve the double-marginalization problem. However, since there is no franchise fee, the manufacturer will only make a profit by charging a wholesale price r to the retailer that is greater than marginal cost c. Thus, referring to our earlier example, the RPM agreement could specify that the retail price be \$8, exactly as the integrated firm would choose. In order to make a profit though the manufacturer must set a wholesale price $r > c$, that is, above the \$5 wholesale price charged in the two-part tariff scheme. With the retail price capped at \$8, this means that the retailer now has a smaller margin of price over wholesale cost. Because the contract still leaves the retailer free to choose the level of services s the retailer will react to this profit squeeze by cutting its service provision below s^*. Of course, this is precisely what the manufacturer wishes to avoid.

What happens if the manufacturer adopts a two-part pricing mechanism? To begin with we know that the manufacturer will set r equal to marginal production cost, or $r = c$. Only when r is equal to c is it possible for the retailer's final retail price and level of services to be exactly the same as those chosen by the integrated firm. Accordingly, the manufacturer must set a wholesale price equal to c.

Faced with a wholesale price of $r = c$, however, the retailer is in exactly the same position as our integrated firm was earlier. Hence, it will make the identical choices regarding the price to consumers p^I and the service level s^I. The retailer's profit Π^R prior to paying any franchise fee T will therefore be

$$\Pi^R = [p^I - c - \phi(s^I)]s^I(A - p^I)N \tag{18.14}$$

where p^I and s^I now take on those values that maximize the joint profit of the manufacturer and retailer together, namely, the values described by equations (18.9) and (18.10). Of course, if $r = c$, the manufacturer earns nothing and all profit goes to the retailer. As usual, this is where the franchise fee T comes in. By setting a fee equal to the integrated firm's profit, the manufacturer can capture all that profit for itself. In our earlier example in which $c = \$5$ and demand is $Q = s(10 - p)100$, the manufacturer should set its wholesale price $r = \$5$. The retailer will then find it optimal to set a retail price of \$8 and to provide a service level $s = 1$. This will generate the maximum profit of \$400, which the manufacturer can appropriate by means of a franchise fee T. Of course, if the retailer is truly a monopoly without which the manufacturer cannot bring its good to market, then the retailer is unlikely to agree to such a high franchise fee. Some profit sharing would have to occur. Again however, the point is that this arrangement can yield the optimal service outcome.

The foregoing argument suggests that franchising agreements are superior to an RPM agreement as a means to achieve the provision of retail services. However, this argument rests critically on our assumption that the downstream retail market is monopolized. As we show below, matters change greatly if there is retail competition.

18.4.3 The Case of Competitive Retailing

Let's now consider the case of a competitive retailing sector. This is often the more realistic case. It is also a market structure that should work to the manufacturer's benefit. When there is only one retailer, the manufacturer's reach into the retail market is limited, as is its bargaining power with respect to claiming any of the additional profit that coordination yields. When there are many retailers, both the manufacturer's reach and bargaining power are enhanced. Competition among the retailers downstream will bring the retail price–cost margin to zero, and therefore, minimize the problem of double marginalization. The issue of the provision of promotional or retail services though still remains. We want to determine the level of services s^c provided by a competitive retail sector and compare that level with the manufacturer's preferred amount, s^*.

We assume that all the downstream retailers are identical. Each buys the manufacturer's product at a wholesale price r and incurs the cost $\phi(s)$ per unit of output for retail service s. A little thinking leads us to two quick results. First, we know that retail competition will drive the retail price down to marginal cost. In other words, the price to final consumers will have to be $p = r + \phi(s)$. Second, that same competitive pressure will also force every retailer to offer at that price, the level of services most preferred by consumers. Any retailer who offered a lower service level would quickly lose all his customers. Accordingly, competitive pressure will lead each and every retailer to offer the same retail price and the same service package. The competitive retail price will be $p^C = r + \phi(s^C)$, and the competitive service level s^C will be the level that maximizes consumer surplus given the price p^C. In section 18.4.1 we showed that when the price of the good is equal to its true marginal cost, i.e., when $p = c + \phi(s)$, consumer surplus is $\{A - [c + \phi(s)]\}^2 Ns/2$. It follows that when price $p = r + \phi(s)$ consumer surplus is just $\{A - [r + \phi(s)]\}^2 Ns/2$. Maximizing this with respect to s yields the service level under competitive retailing, s^C

$$(A - r)/2 = \phi(s^C)/2 + \phi'(s^C)s^C \tag{18.15}$$

Comparison of the value s^c that satisfies equation (18.15) with the manufacturer's or the efficient level of services [s^* in equation (18.5) or s^I in (18.10)] reveals that the competitive outcome will again provide too low a level of services so long as the wholesale price r exceeds the production cost c. Since the manufacturer can only earn a profit if $r > c$, we once again have the problem that from the manufacturer's point of view the retail sector—now organized competitively—will provide too low a level of retail services. As always, the source of the problem is that the profit that results from providing increased service flows to the upstream manufacturer. As a result, each competitive retailer focuses only on the cost of services and ignores the extra profit that they bring to the upstream manufacturer.

Is there a solution to this problem of suboptimal service provision in the case of a competitive retail sector? If there is, it will not be reached by means of the two-part tariff strategy that worked before. The reason for this is straightforward. Competition among retailers drives the price-cost margin to zero. Consequently, there is no profit margin in the retail sector from which the manufacturer can extract the lump sum fee T. The only way

that the manufacturer can earn any profit is to set $r > c$. However, unless it takes some additional steps, this will raise retailing costs and thereby create an incentive to cut services further.

The solution is to impose a carefully designed RPM agreement by working backwards from the desired outcomes. The manufacturer wants a retail price equal to the integrated price of p^I. Hence, it should impose an RPM agreement that stipulates p^I at the retail level. The manufacturer also wants a level of services equal to the integrated level of s^I. If the retail price is p^I, then the wholesale price r should be set less than p^I by just enough to cover the cost of providing the desired service level, s^I. In an effort to win consumers, retailers will provide as much service as they can afford given the difference between p^I and r. By setting $p^I - r = \phi(s^I)$, the manufacturer can count on retail competition in services to result in service provision at the desired level s^I. Again, continuing with our numerical example, with $c = \$5$, $A = 10$, and $N = 100$, we have a preferred service level of $s^I = 1$ and an optimal retail price of $p^I = \$8$. The cost of providing this service level $\phi(s) = s^2 = 1$. The manufacturer should impose an RPM agreement with each retailer requiring a retail price of \$8 and sell at a wholesale price of \$7. This will give retailers exactly \$1 of revenue above cost which retailers will then compete away by providing the optimal service level of $s^I = 1$.

18.4.4 Free-riding and the Provision of Retail Services

We have just shown that once there is competition in the retail market, an RPM agreement may become a better arrangement to insure the provision of retail services than a two-part tariff scheme. There is in fact another reason why this may be the case. It is often difficult for a retailer to obtain a higher price when it provides more services. Services that are provided by one retailer, particularly informational services, such as service demonstrations on the strengths and weaknesses of different brands of digital cameras, can be consumed freely by consumers pre purchase but then the consumers may buy the camera at a different—perhaps discount—store. This creates the potential for a serious free-riding problem in the retail sector.

Think about it for a moment. A consumer electronics shop may keep experts on hand to assist a customer in choosing the digital camera that best meets her needs in terms of portability and convenience, works most effectively with her computer and other peripherals, and fits best within her budget. Similarly, wine shops may employ personnel to advise customers regarding the quality of a particular vintage or the food that best accompanies a given wine.

Providing such presale or point of sale services is costly. Unfortunately, there is no obligation for the consumer, once educated by the store's expert staff, to buy from that specific establishment. Quite to the contrary, once fully informed, the consumer has a strong incentive to go to the "no frills" electronics shop down the street or to the discount wine shop around the corner and purchase what she now knows to be the proper digital camera and the appropriate wine at a lower price. Even worse, she is free to share her information with friends who can then use this knowledge to bypass the specialty shops altogether and go directly to the low-price, low-service outlets.

The problem is that information is a public good and, therefore, hard to deny even to those who do not pay for it. The low-price discount dealers in our two simple examples are "free riding" on the specialty shops. We call this behavior free riding because the discounter benefits from the activities of the specialty shop but does not pay for them. The scenarios above indicate the likely outcome of this problem. Specialty shops that incur the cost of providing in-store demonstrations and consultations will lose market share to the "no frills" discount stores.

As such stores come to dominate the retail market, the outcome will be one in which few retail services are provided.

It is important to emphasize that the source of this underprovision of services is, in this setting, somewhat different from the cause of underprovision in our earlier examples. In the analysis of the previous sections, retailers tended to overprice and underservice the products of a monopoly manufacturer because the impact on the manufacturing firm's profit is ignored in setting the retail price and service level. This was true whether the retail sector was monopolized or competitive. In the current case though, we are talking about a problem that is explicitly related to the presence of retail competition. If retailing were monopolized, then no free riding would be possible because there would be no potential free riders. While we already had reason to believe that retail services would be under supplied—at least from the viewpoint of the monopoly manufacturer—the argument just presented implies that this result is all the more likely once we take into account the public good aspect of presale services and the presence of retail competition. To put it another way, the first externality with which we dealt was a vertical one between the downstream and upstream firms. The externality that we now introduce is a horizontal one between the different retail firms.

Yet while the source of the problem is new, the effect from the manufacture's point of view is the same. When retail competition leads to an undersupply of customer services, the manufacturer suffers because this adversely affects the overall demand for the manufacturer's product and reduces the manufacturer's profit. In the present case, however, we do not need to assume anything specific about demand or cost conditions to obtain the result that the undersupply of services will hurt both the manufacturer and consumers. Competitive markets generally do undersupply goods with beneficial externalities, such as the retail services described above. Accordingly, if the resultant losses are sufficiently severe, the extension of monopoly power by means of some sort of vertical restraint may be in the public interest. One such possible restraint is an RPM agreement.

At this point, the advantage of an RPM agreement should be clear. It prevents one retailer from undercutting another and, hence, stifles the emergence of discount stores. In turn, this implies that consumers will visit the retailer who provides the best services since they will not find a lower price elsewhere. By putting a freeze on price discounting, the effect of an RPM agreement is to foreclose discount outlets, resulting in a possibly higher average retail price. Yet this price effect and the loss it imposes on consumers may be offset by the gains that the provision of retail services generate, not only for consumers but for the manufacturer as well.

The view that RPM contracts enhance efficiency by restoring incentives to provide valued retail services, first articulated by Telser (1960), is associated with the Chicago School economists who strongly advocate the efficiency-enhancing role of vertical relationships among firms.[7] The free-riding argument, which endorses the efficiency effect of resale price maintenance, is more or less limited to presale services, such as advertising or instructional demonstrations. Other services, such as warranty service, can easily be provided and, more importantly, charged for by any retailer. In fact, Telser's argument was frequently criticized[8] because it was applied to many goods for which presale informational services play a limited role. In the case of fashion apparel, for example, consumers can go to the store and examine clothes for style and appropriate fit for themselves with little assistance from store personnel.

[7] See also Bork (1966). For a somewhat different view, see Mathewson and Winter (1983 and 1998).

[8] See, e.g., Steiner (1985).

Yet even in these cases, the Chicago School has a rejoinder. The free-riding justification for RPM might still be valid in this alternative setting because such stores play a screening or certification role. One of the services provided by top stores such as Bloomingdales, Neiman-Marcus, and Bergdorf Goodman is to identify and then sell "what's hot" or in fashion. Here again, providing this service is not cheap. Prestigious retail stores must spend considerable resources to build up their reputation for being on the "cutting edge" of fashion trends. When the store carries a manufacturer's fashion line, the store's reputations stands behind the quality or fashionability of the garment. Proponents of RPM agreements argue that if a consumer can go window shopping at a prestigious store to find out "what's in" this season and then buy the apparel at a discount store, we again have the problem of free riding. The discount store free rides on the market research and quality certification of the prestigious store. This problem could become sufficiently severe that, absent RPM protection, no store would find it worthwhile to screen and identify the fashionability and quality of products.[9]

18.5 RETAIL PRICE MAINTENANCE AND UNCERTAIN DEMAND

We have been discussing in the preceding two sections the way in which competitive pressures in the retail market can reduce the profit of the manufacturer and the welfare of consumers by creating disincentives to provide customer services. However, retail competition can be destructive in other ways as well. Consider the case of Nintendo, one of the dominant players in the video games market. When Nintendo first introduced its video game players and cartridges in the late 1980s, it faced one very serious obstacle. This was the recent history of the video game market. Led by Atari, that market grew from $200 million in 1978 to over $3 billion in 1982. However, the market then crashed even more rapidly, with sales falling to just $100 million in 1983. In that year, retailers found themselves with greatly excessive inventories and cut prices drastically in order to liquidate this stock. Atari itself went bankrupt.

The boom-and-bust cycle of the video game market in the early 1980s, and especially the sizable losses incurred in 1983, made retailing firms highly skeptical about the prospects for any new video game product. Nintendo representatives found that department and toy stores were almost totally unwilling to talk to them about their product. Nobody wanted to buy Nintendo's games and risk getting caught with an inventory that could only be sold at distressed prices as in the previous video game cycle. Eventually, of course, Nintendo prevailed. Along with Sony and Microsoft it is a dominant player in the video game market, earning a generous profit as a result. However, that victory was not guaranteed. Nintendo's product—so obviously valued by consumers—might never have survived had it not been for Nintendo's pricing strategy.

The Nintendo story was used by Deneckere, Marvel, and Peck (1997) to offer another explanation for RPM agreements when retailing is competitive. Their argument is based on

[9] Matthewson and Winter (1983) make a similar argument that resale price maintenance can benefit consumers by economizing on consumer search costs since consumers will no longer spend time trying to find out which retailer sells at the lowest price. This argument assumes, however, that no other means is available to inform consumers about retail prices.

the simple fact that retail demand for any product is uncertain. Like many of the examples of vertical restrictions offered earlier, this case also raises the possibility that both producers and consumers will benefit from the imposition of an RPM agreement.[10]

When demand is uncertain, a retailer faces a dilemma in determining how much output to stock for sale to final consumers. On the one hand, the retailer will wish to have the amount on hand necessary for profit maximization during periods when demand is strong. On the other hand, if demand is weak, retailers with a lot of stock will have to do one of two things. Either they must throw away the extra output to keep the price high, or they can sell the extra output, thereby lowering the price and perhaps even driving it to zero.[11]

It is in this situation that the behavior of the monopolist and the competitive firm will differ. Faced with weak demand, the monopolist will tend to throw away a good bit of its excess inventory because the monopolist recognizes that every extra unit sold lowers the price on all units. A firm in a competitive retail sector, however, will do the opposite. Under competition, each retailer perceives that its own sales have no or little effect on the market price. Accordingly, each such competitive retailer will try to sell all of its stock. After all, it has already paid for it and it may as well try to get something for it rather than throw any of it away. The problem is that if all retailers act this way the market the price will fall, possibly quite far.

The fact that competition induces sharp price-cutting during periods of weak demand has two implications. First, a manufacturer selling through a competitive retail sector will not earn the profit of an integrated firm. Second, as Nintendo discovered, the manufacturer will also find it difficult to induce retailers to hold any sizable inventory. An RPM agreement that establishes a minimum retail price can solve the manufacturer's problem. The reason is straightforward. Setting a minimum price at which the good can be sold ensures that in periods of low demand, retailers will deal with excess inventory exactly the way that an integrated manufacturer would choose. They will throw away the amount that cannot be sold at the specified retail price.

We illustrate the essential insight of the Deneckere, Marvel, and Peck argument in Figure 18.3. The figure shows the price and profit outcome for an integrated monopolist manufacturer facing variable demand. As usual, we assume a constant unit cost, c. With

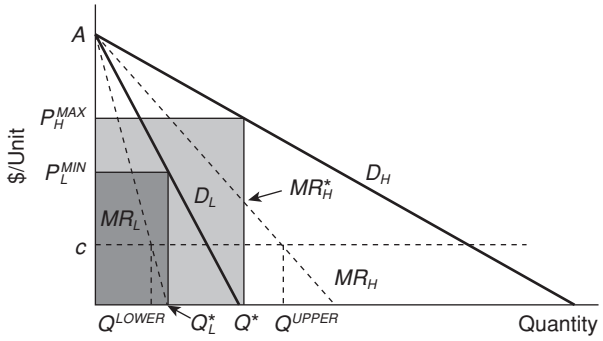

Figure 18.3 Resale price maintenance and variable demand

[10] See also Marvel and McCafferty (1984).

[11] We assume that inventories cannot be stored. Either they physically perish or become worthless due to introduction of new goods.

probability one-half, demand is strong and the demand curve is D_H. Similarly, with probability one-half, demand is weak and the demand curve is D_L. The integrated monopolist then faces a two-stage problem. In stage one, the firm must choose how much to produce, Q. Once the firm has produced this amount, it will have incurred a cost, which is now sunk, equal to cQ. Afterwards, demand will be either strong or weak, D_H or D_L. At that point, the firm will have no additional cost and will simply have to choose how much of the output in its inventory that it actually wants to sell. Of course, the integrated firm can sell no more than it originally produced, Q. Subject to this constraint, however, it will simply sell the amount that maximizes its revenue conditional upon demand. Since all its costs are sunk, revenue maximization and profit maximization amount to the same thing in the second stage.

The integrated firm will never initially produce more than the amount that would maximize profit if it knew for sure that demand would be high. This is an amount at which the marginal revenue when demand is D_H equals marginal production cost, c. It is shown as Q^{UPPER} in Figure 18.3. To produce more than this level would guarantee that the firm earns a marginal revenue below its production cost even in the best of demand conditions. Similarly, the firm will never produce for inventory an amount less than Q^{LOWER}, the amount it would produce if it were certain demand would be low. To do so would guarantee too little inventory even in the weakest of markets. The firm must produce somewhere between Q^{LOWER} and Q^{UPPER}. Within this interval, optimization requires that it choose an amount whereby its marginal cost c equals its expected marginal revenue, or one-half times the marginal revenue in a high-demand state plus one-half times the marginal revenue in a low-demand state.

As we have drawn Figure 18.3, the optimal amount of initial production is Q^*. Note that in this figure, demand is quite variable. As a result, in order to come even close to the true profit-maximizing level in a high-demand state, the amount produced for inventory Q^* would be enough to drive the price to zero if it is all sold in a weak-demand state.

If demand is strong, the firm will sell the entire amount Q^* at the price P_H^{MAX}. If demand is weak, an inventory of Q^* is excessive. Since the integrated firm has already incurred its production cost, all it can do then is maximize its revenue. It will do this by selling the amount Q_L^* at the price, P_L^{MIN}. This is an output at which marginal revenue is zero. Weak demand does not lead the firm to try to liquidate its entire inventory, as such an action would drive the price to zero. Instead, the firm throws away the amount $Q^* - Q_L^*$. When demand is weak, the firm drives its marginal revenue to zero. However, because this occurs where the price is still positive, the firm's total revenue remains greater than zero even in the face of weak demand. Its marginal revenue when demand is strong is the marginal revenue at Q^*, shown here as MR_H^*. Its expected marginal revenue is therefore $MR_H^*/2$ which is an amount just equal to c.

The integrated monopolist firm will expect to earn a positive profit in this story. Its total cost is cQ. Its revenue in a low demand period is $P_L^{MIN}Q_L^*$. This is the lightly shaded rectangle in Figure 18.3. Its revenue in a high-demand period is $P_H^{MAX}Q^*$. This is the sum of the lightly shaded rectangle and the darkly shaded region in the figure. The expected profit for the integrated firm, Π_I^e is therefore

$$\Pi_I^e = \frac{1}{2}P_H^{MAX}Q^* + \frac{1}{2}P_L^{MIN}Q_L^* - CQ^*. \tag{18.16}$$

Now consider what happens under competitive retailing. If competitive retailers stocked the optimal amount Q^*, they would earn less total profit than that shown in equation (18.16).

The reason is the nature of competition. In a low-demand period, the integrated firm sells only up to the point where its marginal revenue is zero. However, competitive firms holding a total inventory of Q^* will sell more than this amount. Each such firm perceives price and marginal revenue to be the same. Hence, having already sunk the cost of acquiring its inventory, each such firm will continue to sell its inventory so long as the price is positive. Yet if demand is weak, the amount Q^* can only be sold by driving the retail price—and not just the marginal revenue—to zero. This means that a competitive retail sector with an inventory equal to Q^* will earn no revenue when demand is low. Of course, when demand is high, retailers will sell the entire stock Q^* for the price P_H^{MAX} and generate exactly the same revenue as would an integrated monopolist. However, because the competitive outcome during a low-demand period is a zero price, competitive retailers will always generate less total profit from the optimal inventory stock, Q^*, than would an integrated monopolist whose revenue remains positive even when demand is weak.

In short, unfettered competition during a period of weak demand dramatically reduces the revenue retailers can expect to earn. Accordingly, a manufacturer can only persuade retailers to stock the optimal amount Q^* by selling to them at a sufficiently low wholesale price P_W, so that retailers can still expect to break even. Since retailers only earn positive revenue when demand is high, $P_W Q^*$ must equal the revenue earned by retailers in a high-demand period, times the probability that such a period occurs. Therefore, $P_W Q^*$ must equal $P_H^{MAX} Q^*/2$, implying that $P_W = P_H^{MAX}/2$. In turn, this implies an expected profit, Π^e, for the manufacturer without an RPM agreement of

$$\Pi^e = \left(\frac{1}{2} P_H^{MAX} - c\right) Q^*. \tag{18.17}$$

A comparison of equations (18.16) and (18.17) shows that the profit of the manufacturer in this case will be less than that earned by its integrated counterpart by an amount equal to $P_L^{MIN} Q_L^*/2$. However, an RPM agreement can save the day. The necessary features of such an agreement are suggested by Figure 18.3. That figure shows that the integrated firm never sells at a price below P_L^{MIN}. So, the nonintegrated manufacturer should negotiate an RPM agreement that likewise prohibits anyone from selling below this price. In addition, it should charge a wholesale price P_W^*, satisfying

$$P_W^* Q^* = \frac{1}{2} P_H^{MAX} Q^* + \frac{1}{2} P_L^{MIN} Q_L^*. \tag{18.18}$$

In turn, this implies that

$$P_W^* = \frac{1}{2} P_H^{MAX} + \frac{1}{2} P_L^{MIN} \frac{Q_L^*}{Q^*}. \tag{18.19}$$

At this wholesale price, the competitive retail sector will in fact buy and inventory the optimal amount, Q^*. Why? When they buy this amount, retailers know that their expected revenue, $P_H^{MAX} Q^*/2 + P_L^{MIN} Q_L^*/2$, just equals their expected cost, $P_W^* Q^*$. Hence, the inventory of Q^* is exactly the amount that leads to an expected profit of zero for retailers. This of course is the equilibrium requirement for a competitive retail sector. Moreover, since

retailers buy the amount Q^* at this wholesale price, the manufacturer's expected profit, Π^e_{RPM}, with an RPM is

$$\Pi^e_{RPM} = P_W Q^* - cQ = \frac{1}{2} P_H^{MAX} Q^* + \frac{1}{2} P_L^{MIN} Q_L^* - cQ^* \tag{18.20}$$

A comparison of equations (18.16) and (18.20) quickly reveals that this RPM agreement permits the manufacturer in this case to earn the same profit as that earned by an integrated firm.

Something like an RPM arrangement seems to have been the source of Nintendo's ultimate victory. It closely monitored inventories and cut off dealers who sold below Nintendo's suggested retail prices. Nintendo was forced in 1991 to sign a consent decree with the FTC under which it promised not to engage in any further implicit RPM behavior. By that time, however, Nintendo was well established in the video games market.

As the Nintendo example is meant to illustrate, it is not just the manufacturer who may benefit from the RPM agreement just described. Absent an RPM agreement, retailers may not be willing to offer the product to consumers at all. More formally, such an agreement can benefit consumers in the sense that it leads to a bigger expected consumer surplus. The intuition behind this result is that, depending on the nature of demand fluctuations, the equilibrium without an RPM agreement will result in retailers buying less than the amount they would purchase for inventory with such an agreement. As a result, the price during a period of strong demand will be higher without an RPM contract than it would be with one. This price increase hurts consumers and may more than offset the gains consumers enjoy from permitting prices to fall quite far when demand is weak. Hence, under uncertain demand in a competitive retail sector both the manufacturer and consumers can benefit from an RPM agreement.[12]

18.3 Practice Problem

Suppose that demand is either strong (with probability one-half) and described by $Q = (10 - p)100$, or weak (with probability one-half) and described by $Q = (10 - p)30$. To simplify further, assume that the manufacturer's unit cost is constant at $c = 0$.

a. Show that the revenue-maximizing price is \$5 regardless of whether demand is weak or strong.
b. Assume that the firm produces 500 units prior to learning the strength of demand. How much of this will it sell when demand is strong? How much will it sell when demand is weak? What is the firm's expected profit?
c. Suppose now that the firm sells the 500 units through a competitive retail sector. If retailers buy and stock the entire 500 units, what will be the retail price when demand is strong? What will be the retail price when demand is weak?
d. In light of your answer to c, what wholesale price will induce the retailers to purchase initially an inventory of 500? What will be the manufacturer's profit at this price?

[12] The manufacturer always gains from the specified RPM agreement. The outcome for consumers depends on just how variable is demand. If demand is highly variable, consumers are probably hurt by the agreement. However, if demand is only moderately variable, consumers may well benefit from the agreement.

Summary

Consumers buy most of their products from retailers such as department stores, supermarkets, automobile dealers, and gasoline stations. In these and many other cases, the retailer from which the consumer buys is not the firm that originally made the product. The manufacturer lies further upstream in the chain of production.

Because a manufacturer relies on retailers to get his goods to the market, the manufacturer must hope that the retailers will share his views about the appropriate price to consumers and the proper amount of promotional and other services to provide. Unfortunately, this is rarely the case. Double-marginalization and other problems lead to a divergence of interests between the manufacturer and the retailer. However, contractual agreements governing this vertical relationship can resolve some of these differences. Yet such agreements can also facilitate price collusion either among manufacturers or retailers. As a result, public policy regarding vertical restraints is complicated.

In this chapter we have focused on one particular type of vertical restraint—a resale price maintenance or RPM agreement. Such agreements may specify a maximum price above which a retailer may not charge, or a minimum price that the retailer cannot discount. For many years, RPM agreements were considered anticompetitive and treated as per se illegal. However, starting as early as 1919, the courts have chipped away at this strict view so that now RPM agreements and behavior that closely duplicates such a contract even when the contract itself does not formally specify a retail price, are subject to a more flexible rule of reason. This is particularly the case regarding those RPM agreements that stipulate a maximum retail price.

The reason that the courts have moved to a more lenient attitude toward RPM agreements is straightforward. Increasingly, economists and policy makers have understood that without such agreements, problems such as double-marginalization, insuring the provision of services to consumers, and dealing with demand uncertainty, work against consumer as well as producer interests. This is not to say that the concern that vertical price restraints may be anticompetitive is unwarranted. The historical record is clear that the vast majority of support for RPM agreements has come from retailers. The fact that it has also been these same retailers who have supported legislation such as the Miller–Tydings and McGuire Acts suggests that retailers see RPM agreements, at least in part, as a means of suppressing competition that would otherwise emerge in the absence of legislative efforts. However, economic analysis makes it equally clear that the potential benefits of RPM restraints—for consumers as well as producers—are substantial. Viewed in this light, it would seem that a rule of reason approach rather than a per se illegal standard makes sense.

Problems

1. Suppose that a car dealer has a local monopoly in selling Volvos. It pays w to Volvo for each car that it sells, and charges each customer p. The demand curve that the dealer faces is best described by the linear function $Q = 30 - p$, where the price is in units of thousands of dollars.
   a. What is the profit-maximizing price for the dealer to set? At this price, how many Volvos will the dealer sell and what will the dealer's profit from selling the cars be?
   b. Now let us think about how the situation looks from the car manufacturer's point of view. If Volvo charges w per car to its dealer, calculate how many cars the dealer will buy from Volvo. In other words, what is the demand curve facing Volvo? Suppose that it costs Volvo $5,000 to produce each car. What is the profit-maximizing choice of w? What will Volvo's profits be? What price p will the dealer set and what profit will the dealer earn at Volvo's profit-maximizing choice of wholesale price w?
2. Now suppose in problem #1 Volvo operates the dealership and sells directly to its customers. What will be Volvo's profit-maximizing price p? What will Volvo's profit be? Compare your answer in (c) to the answer you worked out in (b). Give an intuitive explanation for why the answers differ.

3. ABC, Inc. is a monopolist selling to competitive retailers. It faces a constant marginal cost of 10. Demand at the retail level is described by $P = 50 - Q$.
   a. What wholesale price will maximize ABC's profit? What retail price will this imply?
   b. What will be the value of consumer surplus if ABC's sets a profit-maximizing wholesale price?
   c. What will be the value of ABC's maximum profit?

4. ABC is still a monopolist selling to competitive retailers but it now discovers that if retailers supply customer services, demand shifts to: $P = 90 - Q$. Each retailer can provide the required services at a total cost of $400.
   a. ABC decides now to implement an RPM agreement with retailers. Under this agreement, what retail price should ABC specify? How many units will retailers sell at this price?
   b. What is consumer surplus under the RPM agreement?

5. Under the RPM agreement and the price specified in 4a), what is the maximum wholesale price that ABC can set? What will its profit at this wholesale price be? Did adoption of the RPM agreement improve social welfare?

6. A significant number of the resale price maintenance cases that have been the subject of antitrust policy involve the pricing of such simple consumer products as Russell Stover candy, Levi's jeans, Arrow shirts, and Colgate toiletries. Who has the incentive for resale price maintenance for these products? Explain why.

7. In the antitrust case *Albrecht v. Herald Co.*, the successive monopoly problem was created by the publisher granting an exclusive territory to the distributor. Could the problem have been solved by opening up home delivery to competition among several distributors?

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Appendix

Manufacturer's Optimal Wholesale Price When Retailer Discriminates between Two Markets

In this appendix, we derive the optimal wholesale price r and fixed fee T that a manufacturer should select to maximize total profit when the retailer sells in two identical markets, one of which is a monopoly but the other of which is constrained by potential entry to sell at a price equal to the wholesale price.

Demand in each market is given by: $P = A - BQ$. Manufacturing cost is c. No cost is incurred in retailing. In the monopolized market, profit maximization by the retailer will lead to an output of:

$$Q_M = \frac{A - r}{2B} \tag{18.A1}$$

and a price of

$$P_M = \frac{A + r}{2} \tag{18.A2}$$

The retailer's profit Π_M^R in this market will therefore be:

$$\Pi_M^R = \frac{(A - r)^2}{4B} \tag{18.A3}$$

Absent any franchise fee T, the manufacturer's profit Π_M^M derived from sales in the retailer's monopoly market will be:

$$\Pi_M^M = \frac{(r - c)(A - r)}{2B} \tag{18.A4}$$

In the entry-constrained market, the price to consumers will be r and the retailer will earn no profit. Output will be given by:

$$Q_C = \frac{A - r}{B} \tag{18.A5}$$

The manufacturer's profit Π_C^M from the retailer's sales in this competitive market will therefore be:

$$\Pi_C^M = \frac{(r - c)(A - r)}{B} \tag{18.A6}$$

For a given r at which the retailer buys goods to be sold in both its markets, total profit to the manufacturer and retailer combined is:

$$\Pi = \Pi_C^M + \Pi_M^M + \frac{(A-r)^2}{4B} = \frac{(r-c)(A-r)}{B} + \frac{(r-c)(A-r)}{2B} + \frac{(A-r)^2}{4B} \tag{18.A7}$$

Maximizing this with respect to r yields the following necessary condition:

$$r = \frac{4A + 6c}{10} \tag{18.A8}$$

With $A = 100$ and $c = 12$, this yields the value of $r = \$47.20$ reported in the text.