Consider a simple case of a single manufacturer that sells to two downstream retailers. In addition, we assume, not unreasonably, that while the manufactured product is the same, the retailers are differentiated at least by location if by no other attribute. In other words, consumers do not view the purchase of the good at each retailer as perfect substitutes so that retail competition is not perfect.

In this context, a horizontal externality emerges in promotion and other services. If one retailer incurs the expense of advertising or providing informational services, it benefits the other retailer as well. For example, if one Lexus dealer runs Lexus commercials on local TV, it potentially raises the demand for all Lexus dealers in the area. Similarly, if one camera store provides information to customers on how to get the best pictures with a Canon digital camera, those customers may then make their final camera purchase from a discount Canon retailer who does not offer such services. In short, there is a temptation for each retailer of a specific brand to free ride on the services provided by other sellers of that brand. As a result, the level of such services will very likely be too low. Moreover, because consumers value such services, this externality not only reduces the profit available to the manufacturer and the retailer, but reduces consumer surplus, as well.[6]

It should be clear how exclusive selling and territorial agreements may remedy the foregoing externality problems. Effectively such contracts limit the number of sellers of the manufacturer's good to just one within any given region or product line. As a result, each retailer reaps a far greater portion of any benefits its services generate. Further, by giving the dealer some monopoly power and therefore some monopoly profit, these restrictions serve to create a real loss if the dealer is found by the manufacturer to be providing too little service and the contract is terminated. [Klein and Murphy (1988).] Hence, exclusive selling and territorial restrictions can serve to raise the service level associated with the manufacturer's good, thereby raising their joint profit and, depending on price effects, possibly consumer surplus as well.

Exclusive selling and territorial arrangements have two other potentially important effects in addition to those just described. Because these contracts result in a single dealer being the only seller of a specific product in its area, the dealer's willingness to dump its merchandise on the market when demand is weak is reduced. This effect can be important in getting dealers to stock an appropriate amount of the manufacturer's good in the first place.[7] The other effect is that an exclusive selling or territorial agreement creates in each region a monopoly upstream supplier selling to a monopoly downstream retailer. This makes the use of a two-part tariff or franchise fee attractive as a tool to prevent the double marginalization and low service problems. Viewed in this light, it should not be surprising that we usually observe selling and franchise fees in the same contract.[8]

So far we have only considered exclusive selling and territorial arrangements in the context of a single manufacturer. When there is more than one upstream manufacturer, these contracts can be used to reduce interbrand competition—to the detriment of consumers. Suppose that there are two upstream manufacturers producing products that are imperfect substitutes. Imagine as well that the two manufacturers sell to a competitive retail sector. If the two manufacturers have identical costs and symmetric demand, then they will set the same wholesale price w^C, which will also be the retail price because competition eliminates

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[6]   This case differs from those considered in Chapter 17 in which downstream competition helped solve the double marginalization problem because here, the retailers sell differentiated products.

[7]   See Chapter 17 for an analysis of uncertain demand and its potentially negative impack on retailer behavior.

[8]   See Chapter 17 and Lafontaine (1993).

any retail markup. Hence, all downstream retailers will earn zero profit. More importantly, this means that every increase in the wholesale price will be one-for-one translated into an equivalent increase in the retail price.

Now, following Rey and Stiglitz (1995) let us imagine that the market for these products can be divided into regions or territories. Suppose further that each manufacturer grants an exclusive territory to a retailer in each territory, giving that retailer the exclusive right to sell its product in that region. As a result, within any given territory each manufacturer's product will be sold by a retail monopoly. We know that selling to a monopoly retailer will give rise to the double-marginalization problem. Why then should the two manufacturers decide to do this? The answer, in part, is that it softens the intensity of the competition between the two brands. It does so because it weakens the link between the wholesale price and the retail price. From the perspective of each retailer, the wholesale price is a cost. Suppose then that one of the manufacturers raises its wholesale price. For the dealer selling this product, costs have risen. The dealer will want to pass on this increase by means of a higher retail price. Competition with the other retailer will limit how much the dealer can do this. However, now under exclusive territories prices are strategic complements. As the rival retailer sees the first dealer's price rising, the rival retailer will see an opportunity to raise its price without losing customers even though its wholesale cost has not risen. Thus, when a manufacturer raises its wholesale price it will no longer lose as many customers as it did when there was competition without exclusive territories. Even though the rival manufacturer does not raise its wholesale price, the rival retailer does raise the retail price.

Of course, both manufacturers realize the foregoing logic. By each granting an exclusive territory, they weaken retail interbrand competition, which feeds back to weaker wholesale competition. As a result, the granting of exclusive territories will lead to higher prices at both the retail and the wholesale level. Whether the agreement will increase manufacturer profit is another question. It might not because even though wholesale prices are higher, the double-marginalization problem means that the quantity sold is lower than it would be if retailing remained competitive. However, if the double-marginalization problem is not too large (as would be the case if the two goods are fairly close substitutes), the exclusive territorial arrangement will also lead to higher upstream profits. If the manufacturing firms can also adopt a two-part tariff arrangement, the double-marginalization problem can be overcome altogether.[9]

It may even be possible to use exclusive selling arrangements to achieve monopoly profit in what would otherwise be a competitive industry. To see this, suppose that the products of the two manufacturers are perfect substitutes. With a competitive retail sector, neither manufacturers nor retailers will make any profit. However, suppose that the two manufacturers coordinate so that within any territory they give the exclusive rights to their products to the same retailer, each agreeing not to sell to other dealers in that region. The lucky retailer in any region is thereby transformed into a monopolist who can set the monopoly retail price. Because monopolies make extra profit, the lucky downstream retailer in any region will be happy with this scheme.

What about the manufacturers? To some extent, their situation is unchanged. Each still produces a good for which there is a very close substitute. Hence, competition between the two should still be fierce. Of course, if this happens, all the monopoly profit will accrue to the retailer. If competition is less than fierce then the manufacturers can extract some of

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[9]   The mechanism by which exclusive territories soften interbrand price competition described in Rey and Stiglitz (1995) is conceptually quite similar to the argument in Bonanno and Vickers (1988).

that profit by means of a two-part tariff. In fact, manufacturers may be able to extract profit even without using two-part tariffs. For instance, manufacturers can offer an exclusive sales contract only if the retailer also agrees to a purchase a minimum amount from the manufacturer even if that manufacturer charges a wholesale price higher than the rival's price. This technique—known as a quantity-forcing requirement—again has the effect of softening wholesale price competition. When each manufacturer does this, each can raise wholesale price above cost without fear of losing sales to the rival. As a result manufacturers now earn some profit.[10] Of course, the higher wholesale prices will translate into higher retail prices. That is, this arrangement does not enhance efficiency. The profit gain of the manufacturers is more than offset by a reduction in retailer profit and a fall in consumer surplus. Yet at the same time, it must be recognized that quantity-forcing can also be used to impose a maximum resale price and, thus limit double-marginalization problems. Thus, such vertical contracts can be socially beneficial but there clearly is a downside risk in that they can often be used to soften competition.

18.3   VERTICAL RESTRAINTS AND MARKET FORECLOSURE

Most of the foregoing analysis has considered the potential anticompetitive effects of vertical restraints in terms of their ability to reduce either interbrand or intrabrand competition. However, the primary concern in antitrust policy has been the potential for one firm to use such restraints to foreclose markets entirely to its rivals. In this view, exclusivity restraints have the potential to be used as a predatory instrument that eliminates either upstream or downstream rivals similar to the Rasmussen, Ramseyer, and Wiley (1991) model already noted. Here we focus on two models explicitly set in a vertical context.

18.3.1   Private Contracts

Imagine a monopoly manufacturer selling to n downstream retailers who compete as Cournot competitors. We will initially assume that $n = 2$ and, for convenience, also assume that the only retail cost is the wholesale price W. Ideally, the manufacturer would like to achieve the monopoly outcome, which we will designate as an output of Q^M selling at retail price P^M. Hence, it would like each retailer to sell $q_1 = q_2 = Q^M/2$. It could do this by a quantity-forcing agreement that sells to each the amount $Q^M/2$ at a wholesale price W^M equal to marginal cost and using a fixed fee F to collect the resultant monopoly profit for each firm. For example, if the inverse demand is: $P = 140 - Q$ and marginal cost is $c = \$20$, then the manufacturer could enter a fixed-quantity contract of $q_1 = q_2 = 30$. Selling at marginal cost c will then result in a price of $P = \$80$ and operating profit at each retailer of \$1,800, which the manufacturer can capture by setting $F = \$1,800$.

   However, if the contracts between the manufacturer and each retailer are not public, there is a difficulty in achieving the above outcome. Suppose that the monopolist signs a contract with retailer 1 as specified above, i.e., a quantity-forcing agreement in which retailer 1 takes possession of (and sells) 30 units at wholesale price $W = c = \$20$, and agrees to pay a fixed fee of $F1 = \$1800$, with a view to doing the same with retailer 2. The problem is that having signed this contract with retailer 1, the manufacturer will now no longer wish

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[10]   Note that in the final equilibrium the quantity constraint does not need to be binding.

to do the same with retailer 2. Why? Because we know from studying the Cournot model in Chapter 9 that retailer 2's best response function with $W = c = \$20$ is:

$$q_2^* = \frac{140 - W}{2} - \frac{q_1}{2} = \frac{140 - c}{2} - \frac{q_1}{2} = 60 - \frac{q_1}{2} \tag{18.1}$$

Hence, given an output of 30 units by retailer 1, retailer 2's best response is *not* 30 units but 45 units when $W = c = \$20$. Thus, in its secret dealing with retailer 2, the manufacturer would now wish to sell a quantity-forcing contract for 45 units. Combined with the 30 units sold by retailer 1, this will drive the retail price to \$65 at which price, retailer 2 will earn \$2,025 in operating profit (given that it too buys at cost c) that again will be collected by a fixed fee $F_2 = \$2,025$. By exploiting retailer 1 who now suffers a \$450 loss, the manufacturer has raised its profit to $\$2025 + \$1800 = \$3825$; \$225 more than the \$3,600 pure monopoly profit. The result would obviously be the same if the manufacturer had first signed an agreement with retailer 2.

Of course, each retailer can foresee the possibility of the manufacturer's exploitation. As a result, each will be reluctant to sign any contract calling for half of the monopoly output and a fixed fee of \$1800 knowing that the manufacturer may secretly try to undermine this deal in its negotiations with the rival retailer. In fact, a little intuition suggests that the only credible outcome is for the manufacturer to offer contracts that essentially duplicate the Cournot outcome with each retailer selling 40 units. By extension, the equilibrium outcome with $n = 3$ retailers would be that each sells 30 units. More generally, our result from Chapter 9 that with linear inverse demand of $P = A - Q$, and marginal cost c the symmetric Cournot outcome with n firms is that each produces $\dfrac{A - c}{n + 1}$ units, implies that in this example, each retailer sells $120/(n + 1)$ so that total output increases as equilibrium, n, gets larger and larger and with it, so does the profit loss the manufacturer suffers due to its lack of credibility. The Reality Checkbox concerning the contract between Macy's and Martha Stewart illustrates that fears of producer secret deals are quite legitimate.

In this setting, the attraction of an exclusive retail contract that designates just one retailer as the manufacturer's selling agent is clear. Committing to selling through just one retailer prevents the manufacturer from exploiting its downstream partner. As a result, it can obtain a contract to sell the monopoly output of 60 units exclusively to one retailer leading to the monopoly price of \$80 and monopoly profit of \$3,600, again collected through a fixed fee F.[11]

18.3.2   Slotting Allowances and Exclusion

As noted above, vertical restraints can be imposed on either the upstream or downstream firm and while early attention focused on the restrictions imposed on dealers, increasing attention has been paid to the restraints on the upstream firm's behavior. Such restraints have become somewhat more common in recent years with the rise of very large retail chains such as Wal-Mart, whose size gives them significant if not dominant bargaining power with their suppliers. One manifestation of such retailer power is the increasing use of slotting allowances or fees by which retailers claim an up front payment from the producer in return for shelf space.

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[11]   This basic argument was first presented by Hart and Tirole (1990) and refined and extended by O'Brien and Shaffer (1992). See also Comanor and Rey (2000).

Reality Checkpoint

Macy's Wants to Take Penney's from Martha Stewart

In January 2012, Ron Johnson, the newly hired chief executive for the department chain J. C. Penney, announced a bold new makeover for the struggling retailer. Johnson had formerly been a chief executive for Apple and his plan was to transform the Penney's experience by making it much more like a visit to an Apple retail store. Frequent sales promotions would be eliminated in favor of three standard prices—everyday, monthly sales, and clearance prices. More importantly, the plan called for each of the vast majority of Penney's stores to be remodeled and divided into 100 small boutiques with a service center. The hope was to get shoppers into the store by giving them a hands-on experience with products and having specialized experts available to talk with about the pros and cons of each item. This also meant lining up specialized, attractive brand name products, including many offered by Martha Stewart Omnimedia Living. That's where the trouble started.

It turned out that Macy's already had signed a 12-year exclusive agreement with Martha Stewart Living that gave it the sole rights to manufacture and sell the Martha Stewart-branded goods until 2018. The announcement by Penney's of its plans came on the heels of the company's purchase of 16.6 percent of Martha Stewart stock for 38.5 million. Macy's claimed that this was part of a secret deal by which Penny's would invest in Martha Stewart in return for that company's agreeing to breach its contract with Macy's and selling its products in J. C. Penney stores.

Martha Stewart of course denied these charges. It said that the goods it would sell at Penney's were not the ones it agreed to sell exclusively at Macy's. It also claimed that Macy's had mainly used the Martha Stewart agreement to get customers in its store and then promoted other goods instead. The case, in which courts have so far tended to support Macy's, involves many of the issues common to vertical restraint contracts, including adequate retail service concerns and fears of secret deals that possibly renege on previous agreements. Whatever the final outcome, however, the fact that the new business plan called for remodeling the 700 largest of Penney's 1,100 stores means that more than a few Penney's are at stake.

Sources: S. Clifford, "J. C. Penney to Revise Pricing Methods and Limit Promotions," *New York Times*, January 25, 2012, p. B1; and "J. C. Penney is Sued over Martha Stewart Deal," *New York Times*, August 16, 2012, p. B3.

In the context of large, imperfectly competitive retailers, Shaffer (1991) has argued that such slotting fees may be a means by which these firms soften both downstream and upstream price competition. Roughly, the argument is that the fees enable the retailers to pay high wholesale prices that, in turn, limit the incentive to cut retail prices at the margin. Essentially, having collected their profit up front via the slotting fees means that the retailers compete less aggressively at the margin on price.

In addtion, there is again a major concern that slotting allowances will lead to market exclusion. Recall our observation in Chapter 12 that firms with market power will typically be willing to spend more to protect it than an entrant will be willing to spend to break into the market. Slotting fees may be an explicit illustration of this point in which upstream producers with market power outbid smaller entrants for the scarce shelf space.[12] In this case, smaller producers are foreclosed access to the retail market.

[12]   For evidence on this point, see the Federal Trade Commission report, *Slotting Allowances in the Retail Grocery Industry: Selected Case Studies in Five Product Categories*, 2003.

Alternatively, slotting fees can be part of an exclusive relation that forecloses access to manufactured goods to some retailers, as shown by Marx and Shaffer (2007). Their model is one of three stages. In the first stage, retailers offer contracts to producers with three critical parameters. The first is the slotting fee S that must be paid to the retailer immediately upon the contract's signing. The second and third parameters are the familiar fixed fee F and wholesale price W paid to the manufacturer but *only* if the retailer actually sells any positive amount so that it actually buys goods from the producer.

To get a rough sense of the Marx and Shaffer (2007) model, return to our Cournot example above. Because demand is given by $P = 140 - Q$, and the producer's marginal cost is $c = \$20$, we know that the monopoly outcome for an integrated firm and hence the overall profit maximum is $Q^M = 60$ and $P^M = \$80$, so that the maximum industry profit is $\Pi^M = \$3,600$. To achieve this symmetrically, contracts in which each firm faces a wholesale price $W = \$50$ is required. At this wholesale price, substitution into the best response function (18.1) along with the symmetry requirement that $q_1 = q_2$ results in both firms producing 30 units so that total output is 60 and the retail price is $80 as in the integrated monopoly case. Note that if this equilibrium were to occur, each retailer would earn an operating profit of ($80 - $50) × 30 = $900. Likewise, the upstream manufacturer would earn an operating profit of ($50 - $20) × 60 = $1800. How this total of $3,600 in operating profit is ultimately shared will then depend on the slotting allowances S and lump sum procurement fee F in each contract.

In considering the determination of S and F, we need to recognize two features of the bargaining environment. First, the retailers have the initiative. Each makes a "take it or leave it" contract offer to the manufacturer. Hence, the manufacturer will always say yes to a contract that raises its profit above what would be earned if it says no. Second, the manufacturer does not have to say yes to both retail contracts. It can choose one and not the other in which case we have one retailer foreclosed.

For example, suppose that as suggested above each retailer offers a contract to the manufacturerwith a wholesale price $W = \$50$, a slotting fee $S = \$500$, and a lump sum fee paid to the manufacturer $F = \$100$. Acceptance of both of these contracts by the manufacturer will result in each retailer ordering and selling 30 units, earning $900 in operating profit plus $500 in slotting allowances less $100 in fixed production fees for a total profit at each retailer of $1,300. The manufacturer would then earn an operating profit of $1,800 plus $200 in production fees less $1,000 in slotting payments for a net profit of $1,000.

So, if the manufacturer accepts both contracts, the outcome mimics the integrated monopoly maximum. Yet this *cannot be* an equilibrium because each retailer would have an incentive to raise its slotting fee. Suppose for example that retailer 1 raises S_1 to $540. If the manufacturer accepts this and continues to supply retailer 2 as well, the only change is a transfer of $40 in net profit to retailer 1 at the expense of the manufacturer who now earns just $960. Of course, the manufacturer could reject retailer 1 and work only with retailer 2 with $W_2 = \$50$, $S_2 = \$500$ and $F_2 = \$100$ as before. In that case though, retailer 2 becomes a retail monopoly who, with $W_2 = \$50$, will sell 45 units at a price of $95 each, implying a total operating profit of $1,350 for the manufacturer. In addition, the manufacturer earns a $100 lump sum fee from retailer 2 but pays a $500 slotting fee as before. Hence, rejecting retailer 1 and working only with retailer 2 will cause the manufacturer's net profit to fall to $950 − $10 less than if it accepts retailer 1's offer and works with both. Knowing the manufacturer will accept, retailer 1 will raise its slotting fee to $540 or even higher.

Of course, retailer 2 also understands the situation. It too has an incentive to request higher slotting fees perhaps even higher than $540. In this regard, it is instructive to consider the case in which both retailers set $S_1 = S_2 = \$550$. With all other contract features the same, the manufacturer continues to sell 30 units to each retailer and earn total operating profit of $1,800. It also collects a combined $200 in lump sum payments but now pays $1,100 in slotting fees so that its total net profit is $900. Yet again the manufacturer cannot do better by accepting only one of the contracts. That one lucky retailer would have a monopoly and sell 45 units. The manufacturer then earns $1,350 in operating profit plus

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Reality Checkpoint

Mylan's Antianxiety Drug Pricing Caused a Lot of Anxiety

In July 2000, the Federal Trade Commission reached a record $147 million settlement with Mylan Pharmaceuticals and three other firms: Cambrex, a New Jersey chemical supplier; Profarmaco, an Italian drug supplier owned by Cambrex; and Gyma Laboratories of America, Profarmaco's American distributor. The case centered on the FTC's allegation of an explicit attempt by Mylan to foreclose competitors to the key ingredients in two major antianxiety drugs, lorazepam and clorazepate.

Lorazepam is the generic form of *Ativan* and clorazepate is the generic form of *Tranxene*. Through the early to mid 1990s, increasing competition among generic manufacturers forced the prices of these drugs down. By 1997, both lorazepam and clorazepate prices were at essentially competitive levels. Towards the end of that year, the generic manufacturer, Mylan, entered into exclusive licenses with Profarmco, Cambrex, and Gyma, under which Mylan agreed to share the profits from its lorazepam and clorazepate sales with these three firms in return for their agreeing to supply Mylan exclusively with the key active ingredient in each drug. As these firms controlled virtually all of the available North American supply of these ingredients, Mylan's competitors soon found they could not compete in either product market. Mylan then acted. In January 1998, Mylan raised the wholesale price of clorazepate from $11.36 to $377.00 for a 500 dose bottle. A few months later, it raised the wholesale price of lorazepam from $7.30 to $190 for a 500-dose bottle. Because doctors at that time were writing over 20 million prescriptions per year for these drugs, these price increases had a major shock effect. Consumer and doctor outrage were particularly strong because these drugs are often used to calm patients suffering from protracted illnesses, including those with Alzheimer's and related dementia, and the terminally ill.

Mylan executives never admitted any wrongdoing. They said that they were settling because otherwise the case would drag on and create lots of uncertainty and more costs for them. Under the proposed settlement, $100 million will be paid in a fund shared by all fifty states. An additional $35 million will be used to settle private lawsuits brought by some large health care institutions, and $12 million will be paid to the government and private lawyers to cover legal costs. The vast bulk of these payments is meant to "disgorge" Mylan of the illegal profits it earned as a result of its foreclosing the market for these antianxiety drugs to other competitors.

Source: S. Labaton, "Generic Drug-Maker Agrees to Settlement in Price-Fixing Case," *New York Times* 13 July 2000, front page; and Federal Trade Commission, "FTC Reaches Record Financial Settlement to Settle Charges of Price-fixing in Generic Drug Market," 29 November 2000, http://www.ftc.gov/opa/2000/11/mylanfin.shtm

$100 as a lump sum less $550 in slotting fees for a net profit of $900—exactly the same as if it accepts both contracts.

The foregoing example is no coincidence. In any conceivable equilibrium in which the manufacturer accepts the contract offer of both firms, it must be the case that it would earn exactly the same profit by accepting only one of those contracts and letting the winner act as a retail monopolist. Otherwise, at least one retailer will want to demand more in slotting fees.

The insight of the Marx and Shaffer (2007) analysis readily follows because it is clear that an equilibrium in which the manufacturer supplies both retailers is not really possible. While the manufacturer may be indifferent between supplying one or both retailers, the retailers themselves are not. Suppose, for instance, that we reach the point just described with each retailer setting $S_i = \$550$, $W_i = \$50$, and $F_i = \$100$. While the manufacturer neither gains nor loses if it supplies only one retailer under these terms, the retailer who gets the monopoly clearly gains. While a downstream duopolist earns net profit of $1350, a retail monopoly earns $2475. The downstream firms will therefore compete for the manufacturer's exclusive supply by offering more generous contracts.

In our symmetric example, equilibrium is reached when each retailer charges a slotting fee of $S_i = 0$; a wholesale price of $W_i = \$20$; and a lump sum payment of $F_i = \$3600$. More generally, one retailer is likely to have some cost or other advantage over its rival. Suppose then that retailer 1 can generate $3700 in operating profit when it buys at $W_1 = \$20$ as opposed to the $3600 assumed for retailer 2. In that case, competition between the two retailers to be the exclusive dealer will end with retailer 2 offering a slotting fee of $S_2 = 0$; $W_2 = \$20$; and $F_2 = \$3600$, while retailer 1 wins the contract with $S_1 = \$99.99$; $W_1 = \$20$ and $F_1 = \$3700$. Retailer 1's advantage allows it to win the bidding by just slightly beating retailer 2's offer but it must do this in a precise way. Specifically, retailer 1 cannot win with the contract $S_1 = \$0$; $W_1 = \$20$ and $F_1 = \$3600.01$ even though that results in the same manufacturer net profit because that contract—once it is signed—permits retailer 1 to operate profitably even if firm 2 enters and produces some small amount. That is, retailer 2 will find it profitable to offer a contract other than $S_2 = 0$; $W_2 = \$20$; and $F_2 = \$3600$, that the manufacturer will accept with the result that retailer 1's operating profit falls below $3700. In contrast, the contract $S_1 = \$99.99$, $W_1 = \$20$, and $F_1 = \$3700$ is only profitable if the manufacturer does not sell to retailer 2. The up-front slotting fee S_i thus dictates that the winning contract must be one that impels an exclusive manufacturer-dealer relation. In general, this exclusivity will imply a welfare loss, e.g., if the two retailers sell differentiated products so that variety falls when one retailer is excluded. In sum, while exclusive contracts can promote services and efficiency, they can also be used to soften price competition and foreclose markets.

18.4   VERTICAL RESTRICTIONS IN AFTERMARKETS

The vertical restrictions that we have examined so far primarily reflect constraints on the sale of the same product as it moves through the chain from the upstream producer to the downstream dealer. In recent years, a different kind of vertical restriction has caught the interest of economists and policy makers alike—one that is closely related to the tying arrangements that we considered in Chapter 13. This restriction effectively involves an excusive selling arrangement in what are known as aftermarkets.

The key legal case in the aftermarkets debate is the *Kodak* case. The specifics of that case are as follows. Kodak was one of a number of manufacturers of micrographic

equipment—used for creating, viewing, and printing microfilm and microfiche—and office copiers. This was the primary, or foremarket. However, Kodak also provided repair parts and services to these machines through a nationwide network of technicians. Kodak advertised the quality of this network as a means of persuading consumers to buy its machines in the first place. Because no one needs micrographic or copier parts and services if they have not already purchased a micrographic machine or copier, the parts and services market is referred to as the aftermarket.

Just as in the foremarket, Kodak had competition in the aftermarket. There were many independent firms providing parts and services to firms using Kodak's office machines. However, to the extent that these independent firms needed replacement parts, they relied on Kodak to provide them. Kodak was happy enough to do so until it lost a service contract with Computer Service Corporation (CSC) to an independent firm, Image Technical Services (ITS). After that, Kodak announced a new policy of not providing replacement parts to any independent service provider. Effectively, Kodak imposed a monopoly in the servicing of its machines by exclusively selling the necessary parts to only Kodak technicians. Without those parts, independent repair services would find it impossible to make such repairs. As Kodak enforced the new policy more and more strictly, ITS and other independents filed a lawsuit contesting Kodak's action.

In court Kodak asked for a summary dismissal of the plaintiffs' case. Kodak's basic argument ran along the following lines. There were many other producers of photographic office equipment implying that Kodak faced competition in the foremarket. As a result, Kodak argued it could not possibly exert monopoly power in the aftermarket. Before making a purchase in the foremarket, consumers consider the full cost of, say, a copier—both the price at the initial time of purchase and the price of services later. If Kodak were to try to charge a high price in the aftermarket for services, it would only attract foremarket customers if it reduced its machine prices by a corresponding amount. Hence, Kodak argued that it could not impose monopoly pricing in the aftermarket. The Supreme Court rejected Kodak's contention. Later, a jury turned in a verdict against Kodak.

The Kodak case was followed by a number of similar cases. Again, the central issue is whether and how a firm can exercise monopoly power in the aftermarket if it does not have such power in the foremarket. To illustrate the issues, consider the following simple example in which we assume the interest rate r is zero so that discounting can be ignored. Two firms, Kodak and Lexsung, each sell a machine that lasts potentially for two periods, which is the same time frame as the typical consumer's horizon. While the machines may look physically different they are identical in the eyes of consumers, each of whom values the services of the machine at $50 per period. We designate the prices of a new Kodak and Lexsung machine as P_M^K and P_M^L, respectively. Competition is in prices (Bertrand), so the assumption that consumers view the machines as perfect substitutes implies that the price will fall to marginal cost, which we here assume to be $P_M^K = P_M^L = \$50$.

While each machine runs perfectly well during the first period, there is a 50 percent chance that each will break down and need repairs in the second period. In principle, consumers whose machine breaks down can do one of two things. They can either return to the foremarket and buy a new machine for $50 (with a view to selling it as a used machine after one period) or, they can buy repair services from a competitive repair market. In this case, repair prices could never exceed $25—the net cost of buying either a new or used machine. However, we will rule out the first alternative by assuming that once a particular machine has been bought, consumers are "locked in" to that brand, perhaps because they have made investments in training to use that brand or because they have bought peripheral

equipment that only works with that brand. This "lock-in" means that for the 50 percent of consumers whose machine breaks down, the only option is to have it repaired. Moreover, as in the original Kodak case, repair requires Kodak parts. That is, the "lock in" effect applies to both the original machine and repair services and it is the latter that enable Kodak to monopolize the repair of its own machines. Initially, however, we assume a competitive repair market for both types of machines and, for convenience, a marginal cost of 0 for repairs. Hence, competition implies that the initial repair price is also zero.

Kodak's basic defense is easy to see. Suppose that at the start of the first period Kodak had imposed an aftermarkets restriction that only Kodak technicians can repair Kodak machines. Given that they would be locked in after purchasing a machine, and given that in the face of such a breakdown, a Kodak consumer would be willing to pay as much as $50 for a one-period repair, Kodak could in principle charge very close to that amount for its monopoly repair service. However, any first-period buyer of a Kodak machine would then recognize that if he or she buys a machine from Kodak at price P_M^K the buyer will later face with probability 0.5 a second-period repair cost of $50. Thus, the anticipated price of a Kodak machine over for two periods would be $P_M^K + 0.5 * \$50 = P_M^K + \$25$. In contrast, the price of a Lexsung machine over two periods would be P_M^L because it costs zero to repair. Because the two machines are perfect substitutes, Bertrand competition will force P_M^L to $50 as before. Yet given its monopoly repair price of $50, this means that Kodak will lose all its customers unless P_M^K falls to $25, so that $P_M^K + \$25 - \$50$, matching its rival whose machines are viewed as functionally identical to Kodak's. At this price, Kodak will lose $25 on every new machine it will sell. To be sure, it will later earn $50 in repair profit on half of these but this does no more than just offset the loss incurred on every new machine. More generally, the simple analysis suggests that any increase in Kodak's repair price translates one-for-one into an offsetting reduction in its machine price with the result that monopolizing the repair market does not increase its profit.

There are, however, counter arguments to Kodak's argument. The simplest is that there are likely some consumers who do not fully incorporate subsequent repair costs into their equipment purchasing calculations. This assumption might not seem terribly realistic in the context of our simple two-period example. Yet the reality of durable machines is that they often last for far more than two periods and there are multiple repair issues that can arise. As a result, it may be difficult for some consumers to form rigorous expectations of later repair costs and they may therefore just ignore these. Moreover, even if consumers can look far ahead over the lifetime of a machine they would still need a fair bit of information to make a sensible forecast of later repair costs. If that information can only be acquired at great cost, then it may not be worth getting so that again, consumers ignore later repair expenses.

Take our example above. Initially, both Kodak and Lexsung are selling their machines at a price of $50 each and consumers face a later repair price of 0. Let us assume that in this market outcome each firm serves 100 new customers each period. Suppose that if Kodak now monopolizes the market for repairing its machines and sets a price of $50 for repairs it will lose 98 but not all 100 of its new machine customers unless it also lowers its price by an amount equal to the expected repair cost of $25. Losing those 98 customers does not really hurt Kodak, however, because in the initial equilibrium it was not earning any profit from them in any case. In contrast, Kodak will earn an average of $50 of extra profit from the two consumers who do remain. It will earn five times that amount if in contrast to retaining only 2 percent of its customers it retains 10 percent. Thus, if information is incomplete for at least some consumers then monopolization of the aftermarket can be profitable. Moreover, Gabaix and Laibson (2006) suggest that the presence of some unsophisticated consumers

can interact with the lock-in effects just described to make firms unwilling to announce low aftermarket prices even when they can and even when competition is strong.[13]

A second motivation to pursue the aftermarket monopoly is sometimes referred to as installed base opportunism. Even if we assume that the information issue is not important so that consumers who have not yet purchased a machine can incorporate aftermarket prices into their purchase decisions, Kodak can still take advantage of those who have already bought its machine. That is, we may envision the market as one with waves of overlapping cohorts of consumers so that at any time there are new consumers about to buy a machine for a two-year horizon and old consumers who bought a new machine one year earlier and are now only seeking a final year's worth of service from the machine. Imagine now that these old consumers bought the Kodak machine for the initial equilibrium price of $50 and that it was only at the end of the first period that Kodak instituted its monopoly repair strategy. While new machine sales of Kodak machines will have to be at a price of $25 per unit, these older consumers have already paid $50 and cannot undo that purchase. They will be taken by surprise by the Kodak move and, as they are locked into the Kodak brand, they will be forced to pay the higher Kodak repair prices.

However, the gain from exploiting its previously installed base is essentially a one-time gain. It only extracts profit from those consumers who paid an initial high machine price *before* Kodak monopolized the repair service (or before it exercised its monopoly power) and therefore expected to pay only the marginal cost. Once Kodak makes its monopolizing move, all future consumers will purchase machines elsewhere unless Kodak reduces the price or unless it restores competitive pricing for its services. Moreover, such opportunism is likely to have a negative impact on Kodak's reputation in the foremarket. Unless the opportunity for future profits is small—perhaps because the market is in decline—the short-run gain may not be worth this cost.

At the same time, it is important to recognize that to the extent Kodak keeps prices close to marginal cost, that temptation to exploit those second-stage consumers who are locked in will always be present. That is, it will be difficult if not impossible for Kodak to commit credibly to a policy of always setting its repair price at marginal cost. There is no profit foregone if one loses customers who are only paying a marginal cost price while there is a bound to be some profit available from charging those locked in customers a price above cost, but this can only be accomplished if Kodak has monopoly power in the repairs market. If it does, Borenstein, MacKie-Mason, and Netz (2000) demonstrate that the only aftermarket prices to which Kodak can commit to keep constant through time are prices that exceed marginal cost—and that therefore eliminate this temptation. The equilibrium can then be one of inefficiently high aftermarket prices and somewhat inefficiently low foremarket prices, with the result that consumers replace their machines too frequently.

In short, whenever there are lock-in effects, the potential for aftermarket profits via exclusionary restraints cannot be ruled out by economic theory as Kodak originally asked.[14]

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[13] In the Gabaix and Laibson (2006), the interaction between the lock-in and the presence of some unsophisticated consumers induces firms to charge super-competitive prices to aftermarket products, e.g., hotel phone use and rental car insurance, and low prices for the foremarket goods, rooms, and rented cars.

[14] Chen and Ross (1993) explore the case in which the foremarket is imperfectly competitve so that firms can use the aftermarket products as part of a tying price discrimination strategy of the type discussed in Chapter 5. Note too that Miao (2010) shows that if consumers are myopic and firms are simultaneously active in both the foremarket and the aftermarket, Kodak's argument is invalid because it implies a pricing inconsistency.

At the same time, it is prudent to recognize that there are practical limits on firms pursuing such profits. Companies may be reluctant to exploit any aftermarket power for fear of the damage this brings to their reputation—a damage that may extend to all their products and not just those for which there are important aftermarkets. Consumers may be able to avoid being locked in by renting instead of buying. Firms may compete by offering more complete information or long-term service contracts. Further, contrary to our simplifying assumptions, access to a used equipment market may place a further constraint on any aftermarket monopoly profits.

Because the aftermarket scenario applies to a wide variety of products—automobiles, consumer appliances, office and medical equipment, to name just a few—the *Kodak* case

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Reality Checkpoint

Aftermarkets After Kodak

The controversy over the aftermarkets issue raised in the Kodak case has continued to this day. However, while early cases such as *Allen-Myland v. IBM* 33 F.3d 194 (3rd Cir. 1994) were very much in keeping with the initial Kodak finding the courts have increasingly restricted the applicability of the "Kodak doctrine".

The Allen-Myland case involved the market for maintaining and upgrading IBM mainframe computers—at the time a market almost as valuable as the mainframe market itself. Allen-Myland had a large share of this business until IBM began to offer lower installation prices for firms promising to use only IBM's upgrade services. IBM then also required customers to return used parts so as to dry up a potential alternative part sources. Allen-Myland sued and won.

In *PSI v. Honeywell*, 104 F.3d 811 (6th Cir. 1997), the Court considered the case of another computer systems repair firm PSI. When Honeywell began prohibiting computer chip makers from selling Honeywell parts to independent repair services such as PSI, PSI sued contending that this practice was precisely that found to be illegal in the *Kodak* case. However, PSI lost largely because the Court rejected the repair lock-in argument.

Most recently, the district court in Maryland held in favor of Océ North America against an allegation of illegal aftermarket monopolization made by MCS Services (*Océ North America, Inc. v. MCS Services, Inc*., D.Md., No. 1:10-CV-984-WMN, 6/14/11). Océ manufactures high-speed continuous form printers. Using very large spools of perforated paper, these printers can run off over a thousand pages per minute and typically cost several hundred thousand dollars. Along with MCS, Océ and other firms offered both maintenance services as well as replacement of the toner the printers used. Servicing the printers though required access to Océ software and Océ stopped providing that to rivals. In addition, Océ began to require that its customers use only Océ-approved toner. The court rejected MCS's allegation of monopoly on two grounds. First, it said that Kodak did not apply to intellectual property such as the Océ software. Second, the court argued that the technical sophistication required to use the printers meant that the customers were sophisticated buyers who would demand a discount in the printer price if the service and toner prices ever rose.

Sources: G. Graham, "IBM Sent Back by Appeals Court to Face Retrial in Anti-Trust Suit," *Financial Times*, August 18, 1994, p. 6; D. Goldfine and K. Vorrasi, 2004. "The Fall of the *Kodak* Aftermarket Doctrine: Dying a Slow Death in the Lower Courts" *Antitrust Law Journal* 72 (January): 209–31.

has deservedly received much attention from academics, lawyers, and policy-makers. The consensus that seems to have emerged over time is that while it was right to deny Kodak's initial request for dismissal, i.e., economic theory does not rule out gains from aftermarket monopolization even when the foremarket is highly competitive, it is difficult in practice for the courts to determine clearly the extent of consumer harm in such cases. As a result, application of the *Kodak* doctrine has waned over time. (See Reality Checkpoint.)

18.5   PUBLIC POLICY TOWARD VERTICAL RESTRAINTS

Non-price vertical agreements can have both positive and negative effects. Accordingly, a "rule of reason" approach has dominated the legal cases in this area. The outcome in the courts typically reflects the court's balancing of the conflicting pro- and anti-competitive forces. Not all analysts agree on the wisdom of this approach. For some, such as Posner (1981), the potential efficiency gains of exclusive selling and territorial agreements are likely to be sufficiently large that all such vertical restrictions ought to be considered *per se* legal under the antitrust laws. The argument is essentially that vertical restrictions must at least benefit the upstream and downstream firms that have agreed to such restraints. They may, as we have seen, benefit consumers as well. Attempting to use a rule of reason and judge each situation on a case-by-case method will, in this view, be very difficult and produce a large number of inconsistent and quite possibly wrong decisions. Accordingly, the wisest course for antitrust policy is simply to let all vertical restrictions alone. The US Justice Department came close to adopting such a view in its Vertical Restraints Guidelines of 1985, and there was little prosecution of vertical arrangements for the next several years. However, those guidelines were rejected in 1993 and the antitrust authorities have since taken a still tolerant but somewhat less generous attitude towards vertical restraints.

A similar fluctuation in policy has been observed in Europe. Up until the late 1990s, the approach taken by the European Union was largely one of condemnation for any type of non-price vertical restraint in general, coupled with broad exemptions for specific arrangements, especially franchise contracts. However, in 1999 as economic integration became more complete, the European Union adopted its own Vertical Restraint Guidelines that applied a much more lenient treatment of vertical restraints again based on a rule-of-reason approach.

A good bit of tolerance toward non-price restrictions is probably warranted. While there are many well justified concerns about the potential for these restraints to exert anticompetitive effects, the great bulk of the empirical evidence is that such restraints are usually good for producers and have either positive or at least no negative consequences for consumers.[15] Moreover, when studies do find negative consequences for consumers, it is usually because they find a rise in retail prices. Yet this may occur for benign reasons. Recall the free-riding problem in our earlier *Tylenol* example. Because the cost of *Tylenol's* advertising is reflected in its price, the more free-riding is a serious problem, the more we would expect Johnson & Johnson to seek an exclusive dealing contract or other vertical restraint. In other words, it is likely that we will observe vertical restrictions most in precisely those markets where manufacturers have to make serious investments in advertising or quality improvement that need to be protected. Because the expense of those investments will be reflected in the product price, this also means that the use of those restrictions will be associated with higher prices. Yet the restriction is not the cause of the

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[15]   See Lafontaine and Slade (2007).

higher price and its use does not necessarily hurt consumers. When the possible endogeneity of vertical restraints is recognized, the accumulated empirical evidence implies even more strongly that the use of such restraints has generally been beneficial.

Sometimes non-price vertical restraints are imposed by the government and sometimes these restraints have a negative effect. For example, in many states, independent opticians have been prohibited from fitting contact lenses. Instead, lens wearers have been required to see an ophthalmologist or optometrist, thereby effectively tying the purchase of lenses to the services of these professionals. Hass-Wilson (1987) found that such policies raised consumer prices without any improvement in quality. They also diminished the variety of consumer choices. Such findings are not unusual in the case of state-imposed vertical restrictions.[16]

The efforts of policy makers to balance anticompetitive effects such as entry deterrence against the efficiency gains that exclusive dealing can generate are illustrated by a US case involving the two principal manufacturers of the water pumps used by fire engines. Hale Products, Inc., and Waterous Company, Inc. were the pump-makers in question. Each manufactured the water pump that is installed on fire trucks in the United States. Each sold its pumps directly to the makers of such fire trucks through exclusive dealing contracts. Those fire truck manufacturers who bought from Hale agreed not to buy from any other pump-maker, and likewise for those who agreed to purchase their pumps from Waterous. In determining the effect of these agreements, the FTC noted that together the two firms accounted for 90 percent of the US market for water pumps and had done so for nearly fifty years, with the remainder accounted for by a small third firm, W. S. Darley & Company. During that time, no new entrant had come into the market. This was taken as evidence by the FTC that the exclusive dealing agreements had effectively blocked such entry. In addition, the FTC alleged that the agreements also worked to reduce competition between Hale and Waterous. Documents were presented indicating that each firm realized that so long as it dealt only with its half of the engine manufacturers, it did not need to fear competition from the other. Further, the FTC noted that neither pump-maker would wish to cheat on this tacit agreement because such cheating would be quickly detected. Waterous would know immediately that if it lost a pump customer it was likely won by Hale. The same would be true for Hale. Ultimately, the FTC prevailed and the two firms agreed to cease the exclusive dealing arrangements.[17]

The above procedure illustrates how a rule of reason operates in practice. The threshold issue is the fraction of the market such agreements cover. Unless that fraction is large, the agreements are presumed not to weaken competition in any meaningful way and are therefore deemed legal. Even if the threshold is reached however, that merely sets the stage for subsequent investigation. The question then becomes whether the restrictions are substantially harmful to competition. Here, factors such as the history of entry, the behavior of prices, and the potential for free-riding problems need to be examined. This is a complicated process and the *per se* presumption of legality suggested by Posner (1981) is understandably tempting. Our view is that there are sufficient grounds for concern that the continued use of a rule of reason approach is warranted despite the difficulties that entails.

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[16]   States occasionally issue blanket prohibitions on vertical restraints, e.g., bans on direct ownership of service stations by oil refineries. Such restraints on organizational choices can create difficulties. See, e.g., Blass and Carlton (2001). See Steiner (1985) for a general discussion of vertical restraint policy.

[17]   See Federal Trade Commission, Decision and Order, In the Matter of Hale Products Inc., Docket No. C-3694, November 22, 1996; and Decision and Order, In the Matter of Waterous Company, Inc., Docket No. C-3694, November 22, 1996.

18.6   A BRIEF DISCUSSION OF FRANCHISING AND DIVISIONALIZATION

Our discussion of vertical relations has often included references to franchising. In fact, probably the bulk of vertical restrictions arise in the context of franchising agreements because these cover a large fraction of retail sales, roughly over a third. As a result, franchising merits some individual attention of its own.

There are two basic types of franchising agreements. Under the traditional type observed with soft drinks, gasoline, and car dealerships, the upstream franchisor sells its branded product to the downstream franchisee, which then resells this good either to other firms or consumers. More recently, a second type of franchising known as business format franchising has emerged. Here, the franchisee buys the right to a brand name and a complete business plan. Food establishments such as McDonald's and hotel chains such as Marriott are examples of this latter type. Business format franchising has grown rapidly and now accounts for over a quarter of all franchising.[18]

The proliferation of franchised outlets reflects a number of forces. To a large extent, it reflects an effort to internalize the externalities noted above. An advertisement by the McDonald's parent corporation will benefit all McDonald's restaurants. This effect may be particularly important in the modern era of brand proliferation and the resulting consumer need for recognizable brand names that reduce uncertainty about quality and save on shopping time. For the same reasons, franchising also permits the exploitation of scale economies in advertising and the purchase of supplies. However, even after the decision to establish new outlets has been made, a franchisor still has an organizational choice to make. In particular, it has to determine whether it wishes to operate the outlet as a company-owned operation managed by a salaried employee or as an independent franchise run by a profit-maximizing owner.

There are two countervailing forces that affect this choice. On the one hand, a salaried employee running a company-owned outlet may not have strong incentives to put forth effort and maximize profit whereas the franchisee as residual claimant does have incentives much more closely aligned with those of the franchisor. On the other hand, the company-owned outlet can perhaps be more easily monitored and controlled to make sure that it works cooperatively with others in pursuit of the franchisor's goals. In contrast, while an independent franchise owner may have a strong incentive to innovate and earn the maximum profit yielding more for its owner, we need to recognize that maximizing the outlet's profit and maximizing the franchisor's profit can be two different matters. For example, an independent franchisee may not support the promotional and service efforts that maximize the joint profit of all the company's outlets but, instead, free-ride on the efforts of others. Of course, if all outlets do this, promotional and service levels may fall far below the level that maximizes joint profit.

We have seen that vertical restrictions such as exclusive territorial rights may help resolve the incentive conflicts between franchisors and franchisees. Further, by granting a local territorial monopoly, the franchisor may induce franchisee owners to pay a higher initial franchise fee. However, once that fee has been collected, a further potential conflict arises between franchisor and franchisee. The franchising firm may have an incentive to open additional outlets that crowd in on the territory of the initial franchisee.

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[18]   See Lafontaine (1993), Lafontaine and Shaw (1999) and Blair and Lafontaine (2005).

There are at least three reasons for a franchisor to wish to have a large number of franchisees. From a spatial perspective, operating many outlets means that the franchisor is better able to meet the specific preferences of each individual customer. This enables the franchise operation to extract more surplus by charging each customer an amount much closer to a customer's maximum willingness to pay for the most preferred variety. In short, operating many outlets may enhance the franchisor's ability to price discriminate.

In addition, the operation of a large number of outlets may be a means for firm to overcome asymmetric information and attendant moral hazard problems. With just one outlet, the franchisor cannot tell whether a low-profit outcome is due to bad luck—which could happen to anyone—or to the outlet's poor management. With many outlets, it is less likely that they all will have bad luck at the same time. Hence, the average performance of a large number of outlets may serve as a benchmark against which to measure the performance of each franchise individually.

Both of these are perfectly plausible explanations for why franchising is a popular business model and also for why companies might wish to establish various operating divisions as independent profit centers. A third motivation is also possible, however. It is that, operating a large number of independent franchises (or divisions) may be a way for a firm to commit to a large total output. This is the approach taken by Baye, Crocker, and Ju (1996) who analyze the implications of this motive for franchising, or divisionalization, using a two-stage model. In the first stage, there are two independent franchisors, each of which chooses the number of independent franchises that it wishes to establish. In the second stage, the franchises from both franchisors compete in a Cournot quantity-setting game.[19]

Suppose that the franchises of both firms produce a homogeneous product at a constant marginal cost of c. The inverse demand for the product in the downstream market is described by our usual linear function, $P = A - BQ$, where Q is total market output.

In stage one of the game, let n_1 and n_2 denote the number of franchisees established by franchisors 1 and 2, respectively. A franchisor incurs a sunk cost K in the first stage when it sets up a franchise. In stage two, all of the franchisees act as independent players in a simultaneous-move Cournot game. By that we mean that each franchise acts like an independent profit-maximizer.

To solve this game we begin with the stage-two competition. Let q_{ij} denote the output chosen by the ith franchise of firm j, where i runs from 1 to n_j and j is equal to 1 or 2. Let Q_{-ij} describe the total output of all franchises except the ith franchise of firm j. The profit of this franchise π_{ij} can then be written as

$$\pi_{ij}(q_{ij}, Q_{-ij}) = [A - B(Q_{-ij} + q_{ij})]q_{ij} - cq_{ij} \tag{18.2}$$

where total market output Q is equal to $\sum_{j=1}^{2}\sum_{i=1}^{n_j} q_{ij}$.

The ith franchise of firm j chooses output q_{ij} to maximize its profit. This, of course, requires setting its marginal revenue to its marginal cost. This implies in turn that the optimal output of any franchise q_{ij}^* satisfies

$$A - BQ_{-ij} - 2Bq_{ij}^* = c \tag{18.3}$$

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[19]   Rather than franchises, these could be divisions of the company provided that the divisions are established as independent profit centers.

Because all franchises are identical, they must all choose the same optimal output in equilibrium—that is, $q_{ij}^* = q^*$ for all i, j. This greatly simplifies matters. Because there are $n_1 + n_2$ franchises in total, Q_{-ij} must equal $(n_1 + n_2 - 1)q^*$. Substitution into equation (18.3) then yields

$$q^* = \frac{A - c}{(n_1 + n_2 + 1)B} \tag{18.4}$$

from which it follows that the total industry output Q and associated market price P in stage two are

$$Q = \left(\frac{n_1 + n_2}{n_1 + n_2 + 1} \right) \left(\frac{A - c}{B} \right) \text{ and } P = \frac{A + (n_1 + n_2)c}{n_1 + n_2 + 1} \tag{18.5}$$

At this price, each franchise will earn a stage-two profit π_{ij} given by

$$\pi_{ij} = \frac{(A - c)^2}{B(n_1 + n_2 + 1)^2} \tag{18.6}$$

The two franchisors who anticipate competition among franchises in stage two along the lines just described must decide in stage one how many franchises to set up. Firm 1's profit can be written as $\pi_1 = \sum\limits_{i=1}^{n_1} \pi_{i1} - Kn_1$ where K is the cost of establishing a franchise at either firm. Because equation (18.6) shows the profit earned by each of firm 1's n_1 franchises in stage two, we can rewrite firm 1's overall profit as

$$\Pi_1(n_1, n_2) = n_1 \frac{(A - c)^2}{B(n_1 + n_2 + 1)^2} - Kn_1 \tag{18.7}$$

Firm 1 chooses its total number of franchises n_1^* so as to maximize its profit $\Pi_1(n_1, n_2)$ when firm 2 has n_2 franchises of its own. In other words, firm 1 wants to choose a best response n_1^* to the number of franchises, n_2, that firm 2 has. It is straightforward to show that this best response function satisfies[20]

$$\frac{(A - c)^2}{B(1 + n_1^* + n_2)^2} \left(1 - \frac{2n_1^*}{(1 + n_1^* + n_2)} \right) - K = 0 \tag{18.8}$$

Because firm 2 is identical to firm 1, we have a symmetric condition for n_2^*. Therefore, using the notation that $n_1^* = n_2^* = n^*$ and recognizing that this symmetry implies that $n_1^* + n_2^* = 2n^*$, we can solve for n^*. This solution is

$$n^* = \frac{1}{2} \left[\left(\frac{(A - c)^2}{BK} \right)^{1/3} - 1 \right] \tag{18.9}$$

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[20]   The response function in equation (18.8) is derived by taking the derivative of the profit function (18.7) with respect to n_1 and setting it to zero. This technique assumes that we can ignore the constraint that n_1 be an integer.

Equation (18.9) shows that the greater is $(A - c)$ and/or the smaller is K, the greater is the number of franchises chosen by firm 1 and firm 2 in stage one of the game. Recall that the difference between price and cost is $(A - c)/2$ if the market is monopolized. One implication of this model is that firms will create more franchises the greater the price-cost differential would be under a monopoly. However, having more franchises is tantamount to having more Cournot-type units, and this brings us closer to the competitive equilibrium. Hence, the greater the possible markup under a monopoly, the greater the number of franchises the two firms operate, and the more closely they end up approximating the competitive equilibrium. The firms are locked in a "prisoners' dilemma" in which the best response of each firm acting separately is not optimal from the standpoint of the two firms collectively. The firms independently open up more franchises than they would if they cooperated or colluded.

In short, an additional reason for franchise growth may be that it permits aggressive efforts to claim market share. This encourages firms both to adopt the franchise format and, having chosen that format, to expand the number of franchisees. This results in many more franchises than the number that would maximize industry profits. Moreover, while expanding the number of franchises may be hard on firm profits, it can be especially hard on the profits earned by each individual franchisee. This reflects another case of incentive conflicts that beset vertical relations.[21]

18.1

Practice Problem

Assume two firms confront each other in an industry in which the inverse demand is $P = 100 - Q$. Let marginal cost be constant at $c = 25$, and let the sunk cost of setting up a franchise be $K = 45$.

a. According to equation (18.9), how many franchises will each firm operate?
b. According to equation (18.7), what profit will each firm make if each operates the number of franchises derived in part (a)?
c. According to equation (18.5), what will be the industry price, P, and output, Q?
d. Calculate the industry output, price, and profit earned by a pure monopolist. Compare this with your answers in part (b).

18.7 EMPIRICAL APPLICATION: EXCLUSIVE DEALING IN THE US BEER INDUSTRY

The impact of exclusive dealing and exclusive territorial contracts has been the subject of many studies. The emerging consensus from these studies is that such contracts are beneficial, both for firms and for consumers, when they are not mandated by the

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[21] While we have cast our example in terms of the operation of independent franchisees, it could equally well be cast in terms of operating independent divisions such as the different divisions run by major auto makers such as GM and Ford. Here again, the outcome may be too many divisions from the viewpoint of maximizing industry profits, but with no real way for any one car firm to reduce the number of divisions unilaterally. This may ultimately be why in the wake of the Great Recession and industry reorganization of 2007–09, GM eliminated its *Saturn* and *Pontiac* divisions and Ford eliminated its *Mercury* division.

government but instead, the result of private negotiations. A recent study by Tim Sass (2005) on exclusive dealing in the US domestic beer market is an example of the kind of study that finds support for private vertical contracts.

The US has a three-tiered beer market. At one end of the stream are the beer producers or breweries, such as Anheuser-Busch (AB—now Anheuser-Busch InBev), Miller, and Coors. In the case of a foreign beer, the domestic firm importing that beer plays the role of a producer. Besides producing the beer, brewers also engage in a good bit of advertising and product promotion.

The brewers sell to the next tier, which comprises distributors. These sales are usually made at a constant price per unit, i.e., they typically do not set franchise fees or use two-part tariffs. The distributors warehouse the product, do local advertising and promotion, and also monitor local beer quality. They sell to the third tier, the retailers from whom consumers make their purchases of beer. Again, sales to retailers usually employ linear pricing.

All of the major breweries have exclusive dealing contracts with at least some of their distributors. They also typically assign exclusive territories. The latter means that there is little *intra*brand competition among distributors. However, there is a fair bit of *inter*brand competition. It is very rare that a single distributor possesses a monopoly in a regional market.

Sass (2005) first tries to determine what factors lead to the use of exclusive contracts in the beer market. Data from a *1996/1997 Distributor Brand-Equity Survey* provides evidence on 381 distributor contracts, 69 of which include an exclusive dealing clause (most of these are AB distributors). If foreclosure is a motivation for such contracts, then they should become less likely as market size grows. This is because foreclosure works by denying the rival a sufficiently large sales base to permit exploiting scale economies, and this is harder to do when the market is large. Sass (2005) uses two variables to capture potential market size. One is the population (*POP*) of the distribution region. The other is the state-level market share (*MSD*) of the brewery that is the primary supplier of the distributor.

Another factor has to do with the local market information that the distributor has acquired. A distributor who has a lot of information about local consumer tastes and price responsiveness will likely be less willing to sign an exclusive dealing contract because this limits that distributor's ability to profit from its information. Sass (2005) proxies this information by the number of years (*YRS*) that the distributor has been owned by the same family.

Finally, brewers may want to have exclusive dealing when they have large promotional expenses themselves that raise retail demand for beer in general but which, in the absence of an exclusive arrangement, the distributor might meet by selling an alternative brand. To capture the importance of such non-brand specific advertising, Sass (2005) uses the national advertising of the brewer's primary supplier (*ADS*) and a 1,0 variable indicating whether or not there is a state ban on billboard or sign advertising (*BAN*). If protecting its advertising against free riding is a motivation for the brewer, the first should have a positive effect and the second should have a negative effect.

Because a contract is either classified as an exclusive deal or not, the independent variable in the econometric specification is a 1,0 variable and Sass (2005) estimates this regression using the Probit procedure that we described in the Empirical Application in Chapter 13 regarding the Ellison and Ellison (2006) study of entry into generic drug markets. This means that the estimated coefficients indicate how much a change in the explanatory

variable would raise or lower the *probability* of using an exclusive contract. The results are shown in Table 18.1 below.

Overall, the evidence on the determinants of where exclusive dealing contracts are used in the US beer market implies that these contracts are not used to harm competition. Instead, they appear to be used for the beneficial reason of protecting brewers' investments in their own product promotion. For example, increases in market size as measured by both *POP* and *MSD* raise the likelihood of an excusive dealing clause and the t-statistics indicate that both of these effects are statistically significant. This suggests that these contracts are not being used to foreclose markets to rivals. There is some evidence that the real motive is to protect the brewer's generalized advertising efforts against free riding. While *ADS* is not statistically significant, the presence of a ban against beer advertising on billboards and signs does have a negative effect on exclusive dealing. When there is less promotion, there is less need to protect it with an exclusive dealing contract. Finally, there is also evidence that as distributors gain experience and knowledge of the local market, they are less willing to sign an exclusive dealing contract that might restrict their ability to profit from that information. The coefficient on *YRS* is negative and significant.

Having examined the factors that lead to exclusive dealing, Sass (2005) then turns to examining the market effects that such contracts have. He considers four possible variables that might be affected. These are: 1) the average price paid by the distributor to brewers, *PB*; 2) the price the distributor charges retailers for its primary brand, *PD*; 3) the quantity of the primary brand sold, *QPRIMARY*; and 4) the quantity of all brands sold, *QTOTAL*, each measured in logarithms.

Prices of course, should reflect both supply (i.e. cost) and demand pressures. Assuming that production costs are roughly the same for the brewers, the cost differences in supplying a distributor will reflect shipping costs or the distance from the nearest plant *DIST*; the level of excise taxes *TAX*; and possibly, the presence of a ban on outside advertising *BAN*, which could raise promotional costs. If these variables affect the price paid by the distributor then they should also affect the price paid by the retailer. That price in turn should affect both sales of the primary brand and of all brands. Thus, these three variables belong in all four equations.

To capture demand effects, Sass (2005) uses three variables. These are: 1) per capita income in the distribution territory, *INC*; 2) population in the distribution territory, *POP;* and the percent of the population that is of prime drinking age, *AGESHARE*. Of course, the primary variable of interest is whether or not the distributor in question operated under an exclusive dealing contract, *EXDEAL*. This is a binary variable equal to 1 if there was an exclusive dealing contract and 0 if there was not.

Table 18.1 What explains the use of exclusive dealing in US beer distributor contracts?

Explanatory Variable	Estimated Coefficient	t-Statistic
POP	0.0001	(1.87)
MSD	0.0079	(2.79)
YRS	−0.0017	(−2.10)
ADS	−0.0002	(−0.38)
BAN	−0.0955	(−2.12)

The four regressions suggested by the variables just described are:

$$PB = CONSTANT + a_1 EXDEAL + a_2 DIST + a_3 TAX + a_4 BAN + a_5 INC$$
$$+ a_6 POP + a_7 AGESHARE + \varepsilon_{PB}$$
$$PD = CONSTANT + b_1 EXDEAL + b_2 DIST + b_3 TAX + b_4 BAN + b_5 INC$$
$$+ b_6 POP + b_7 AGESHARE + \varepsilon_{PD}$$
$$QPRIMARY = CONSTANT + c_1 EXDEAL + c_2 DIST + c_3 TAX + c_4 BAN + c_5 INC$$
$$+ c_6 POP + c_7 AGESHARE + \varepsilon_{QPRIMARY}$$
$$QTOTAL = CONSTANT + d_1 EXDEAL + d_2 DIST + d_3 TAX + d_4 BAN + d_5 INC$$
$$+ d_6 POP + d_7 AGESHARE + \varepsilon_{TOTAL}$$

Basically, these are the regressions that Sass (2005) estimates. However, in both the first and the fourth equations, he also includes market share data for three of the major brands to see how the extent of their presence affects the brewer's price to the dealer and final total sales. Sass (2005) also recognizes that the distributor's costs, and therefore price to retailers, may reflect both the distributor's business savvy as captured by the number of years the same family has owned the distributorship, and an additional cost factor based on the average number of retailing stops the distributor must stop at per week. Hence, Sass's final set of regressions are as follows:

$$PB = CONSTANT + a_1 EXDEAL + a_2 DIST + a_3 TAX + a_4 BAN + a_5 INC$$
$$+ a_6 POP + a_7 AGESHARE + MARKET\ SHARE\ EFFECTS + \varepsilon_{PB}$$
$$PD = CONSTANT + b_1 EXDEAL + b_2 DIST + b_3 TAX + b_4 BAN + b_5 INC$$
$$+ b_6 POP + b_7 AGESHARE + OTHER\ COST\ FACTORS + \varepsilon_{PD}$$
$$QPRIMARY = CONSTANT + c_1 EXDEAL + c_2 DIST + c_3 TAX + c_4 BAN + c_5 INC$$
$$+ c_6 POP + c_7 AGESHARE + \varepsilon_{QPRIMARY}$$
$$QTOTAL = CONSTANT + d_1 EXDEAL + d_2 DIST + d_3 TAX + d_4 BAN + d_5 INC$$
$$+ d_6 POP + d_7 AGESHARE + MARKET\ SHARE\ EFFECTS + \varepsilon_{TOTAL}$$

We are mainly interested in the impact of exclusive dealing. Before discussing that effect, however, it is worth noting two features of this system. These are reduced form equations. That is, they are not equations that describe the full supply and demand structure. Instead, they describe the outcome for the dependent variable in terms of the basic factors that underlie supply and demand. In each case, the final term represents the influence of random factors that may affect the brewer's price, the distributor's price, primary brand sales, or total brand sales.

In principle, each of these regressions could be run alone using ordinary least squares (OLS). However, it seems likely that the random factors that, say, raise total demand may also affect primary brand demand and, in turn, feed into prices. In other words, while the regressions may seem independent of each other, there is a correlation between the random forces affecting each one, i.e., ε_{PB}, ε_{PD}, $\varepsilon_{QPRIMARY}$, and ε_{TOTAL} may all be correlated. If

they are, then information about the nature of this correlation can be used to estimate the regression coefficients more precisely. To do this, Sass (2005) employs a regression technique known as Seemingly Unrelated Regression. This approach estimates the four regressions simultaneously by applying an estimate of the correlation across the error terms to construct generalized least squares (GLS) coefficient estimates. The implied effect of exclusive dealing in each of the four regressions is shown Table 18.2 below:

In every case, the effect of an exclusive dealing clause is positive and highly significant. It raises the unit price set by brewers by about 6 percent and the price set by distributors by about 5 percent. Despite these increases, final sales of both the primary producer's brand and of all brands also rise under exclusive dealing. These effects are particularly large. Demand for the brewer's product rises by 32 percent as the result of exclusive dealing. Yet this does not come at the expense of other brands. Instead, their sales rise as well by over 28 percent. In further regressions, Sass (2005) finds that exclusive dealing by one brewer (AB, in particular) does not significantly decrease rival brewers' prices.

The implications of these findings are relatively straightforward. The fact that exclusive dealing rises with the size of the market seems inconsistent with the idea that it is used as an anticompetitive foreclosure device. This inference is strengthened by the finding that such restrictions also do not tend to force rivals to lower their prices. Instead, the fact that exclusive dealing restraints rise with both market size and the presence of restrictions on outdoor advertising is more consistent with the notion that such contracts are used to mitigate conflicts between the brewery and its distributors.

Because the price to the distributor and the distributor's price to the retailer rise while sales volume also rises, there is no doubt that the surplus of brewers and distributors is enhanced by exclusive dealing. What happens to retailers and consumers is less clear. However, the rise in sales volume is sufficiently large that there is a strong supposition that their surplus also goes up. In short, the results of Sass (2005) strongly indicate that exclusive dealing in the US beer industry is welfare enhancing.

Sass's (2005) results are not unusual. For example, Zanarone (2009) examines the impact of 2002 European regulations that made exclusive territories and minimum quantity purchases unlawful. Analysis of thirty-eight contracts—half written before 2002 and half after—shows a systematic shift in decision rights. After the regulations are imposed, auto manufacturers are much more likely to write contracts that allow the manufacturer to: 1) impose a maximum resale price; 2) require minimum contributions to the manufacturer's national advertising budget; and 3) require that dealers implement a customer satisfaction survey and achieve minimum standards in those surveys. Thus, like Sass (2005), the evidence in Zanarone (2009) is again consistent with the idea that the exclusive territories and minimum quantities of the earlier contracts were meant to prevent too high a retail markup and too low a provision of retail services.

Table 18.2   Effect of exclusive dealing on market outcomes

PB Equation		PD Equation		QPRIMARY Equation		QTOTAL Equation	
EXDEAL Coefficient	*t-statistic*	*EXDEAL Coefficient*	*t-statistic*	*EXDEAL Coefficient*	*t-statistic*	*EXDEAL Coefficient*	*t-statistic*
0.0630	(2.73)	0.0368	(2.13)	0.3241	(3.09)	0.2816	(2.74)

Summary

Contracts between manufacturers and the various retailers that sell the manufactured products directly to consumers include a variety of non-price restrictions. These may include an exclusive dealing restriction that prevents the retailer from selling the products of any other manufacturer, or exclusive selling and territorial arrangements that restrain the manufacturer from allowing any other retailer to sell its product. They can also include slotting fees that producers must pay for access to retail distribution. Because these restrictions so clearly have the appearance of a restraint on trade, they fall under suspicion as anticompetitive.

In reality, however, there may be many efficiency gains that lie behind such restrictions. Often they may serve to ensure adequate promotional activities and other consumer services. They may also be useful in creating an environment in which retailers can better handle demand shocks. Yet the fear that these restrictions can be used either to soften competition or to eliminate competitors altogether via restrictions that lead to foreclosure are also justified. In this respect, there seems little alternative to evaluating each case on its own merits.

For the most part, public policy towards vertical restraints has increasingly recognized their potential benefits. This largely reflects the accumulating empirical evidence that these restrictions generally help producers and may help, or at least not hurt consumers. However, the potential for the abuse of market power seems clear, especially when the restrictions apply to a large fraction of the existing market. For this reason, authorities have continued to take a rule-of-reason approach to non-price vertical restraints rather than a *per se* legal one.

Before concluding we note that, in many respects, the retailer acts as an agent on behalf of the manufacturer. It learns about consumer tastes, makes promotional and other service decisions, and, of course, sets the final consumer price. Consequently, the vertical relationship between the producer and the retailer is a principal-agent relationship akin to the relationship between a client and lawyer, or between shareholders and management. The contractual issues that arise between manufacturer and retailer are therefore part of a broader set of questions that arise in connection with contracts that govern all principal-agent relationships. These are important issues in the theory of the firm. For example, what is the difference between a producer connected to its retailer by means of a formal contract and a producer that simply is fully integrated into the retail market; or, for that matter, a producer that operates a retail division? Why do firms choose one form of organization over another? We do not answer these questions here. However, we do want to acknowledge that the issue of vertical relationships is really part of a larger question regarding the boundaries of the firm.

Problems

1. Most beer companies impose an exclusive dealing clause on the supermarkets that sell their products. Discuss whether you think this practice will yield efficient market outcomes.

2. General Motors, Ford, and Daimler-Chrysler all operate many divisions of automobile lines, e.g., *Chevrolet*, *Cadillac*, and *Buick*. Discuss the motivation for this practice. Who do you think this practice benefits the most, automakers or consumers?

3. In Europe, automobile dealers have traditionally been granted exclusive territories. Do you think that this practice should be legal?

4. Review the model of Rasmussen, Ramseyer, and Wiley (1991) from Chapter 13. Why are scale economies important for this argument that exclusive dealing can deter entry?

5. Who would be willing to pay more for the right to use the McDonald's name—an outlet located in the center of Centerville, or one that would do the same amount of business at the interstate turnpike?

6. What are the incentives for McDonald's to require franchisees to buy hamburger buns, meat, napkins, and other supplies from it rather than from other, possibly lower-cost local suppliers, other than the incentive of removing double-marginalization?

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