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**Διατριβή υποβληθείσα προς μερική εκπλήρωση
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για την απόκτηση του
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Υπεύθυνος Καθηγητής: Νικόλαος Βέττας
Οικονομικό Πανεπιστήμιο Αθηνών

Εξεταστής Καθηγητής: Κωνσταντίνος Γάτσιος
Οικονομικό Πανεπιστήμιο Αθηνών

Εξεταστής Καθηγητής: Ελευθέριος Ζαχαριάς
Οικονομικό Πανεπιστήμιο Αθηνών

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Vertical Relations in Oligopolistic Markets

Abstract

This literature review examines some important insights on the effects of vertical relations, with an emphasis on oligopolistic markets. After a brief description of the most common vertical relations, in the first part of the thesis we discuss the effects of vertical restraints in non-strategic environments, presenting how such restraints can facilitate the coordination within a vertical structure, how enhanced coordination can improve the efficiency of the vertical structure, and how this can in some cases benefit consumers, as well as the firms involved. We also discuss how vertical restraints can solve commitment problems within a vertical structure, enabling it to exercise market power, thus harming social welfare.

In the second part of the thesis we focus on the strategic effects of vertical restraints, when these are employed in oligopolistic markets. We discuss how vertical restraints can be used by competing manufacturers to credibly commit on non-aggressive behavior against each other, thereby helping them to maintain high retail prices and enjoy collusive profits, as well as how such restraints can help cartelization by improving the observability of deviation from a cartel agreement. We also discuss how vertical restraints can be used by firms to achieve collusive outcomes in common agency situations. Finally, we present an extensive discussion on the various ways in which vertical restraints can be used by firms to create entry barriers and prevent potential rivals from accessing a market.

One of the main conclusions drawn from the review of the literature on vertical restraints is that in markets where competition is strong such restraints are unlikely to have a negative welfare impact. In this sense regulation should be focused primarily on cases where the firms involved have significant market power. Another important observation is that in a given market setting many different types of vertical restraints can be alternatively used to obtain the same results. Conversely, we note that the same type of restraint can have different effects when used under different market conditions. These observations imply that there is no thumb-rule to assess the welfare impact of vertical restraints. Therefore competition authorities should probably examine the effects of vertical restraints on a case-by-case basis, using a rule of reason, rather than prohibiting the use of certain types of restraints per se.



1. Introduction

In most markets a manufacturer of goods rather than contacting the final consumer directly, it does so through intermediate firms, called retailers. The relationship between a manufacturer and a retailer is governed by contracts, which usually include much more sophisticated provisions than the linear pricing assumed in many microeconomic models. These provisions that govern a vertical relationship, known as vertical restraints, can either be terms defining a more complex pricing scheme (e.g. two-part tariffs, quantity discounts), or terms restricting one party's decision power (e.g. resale price maintenance), or even provision affecting competition among retailers (e.g. exclusive dealing, exclusive territories). Vertical relationships is a more general term, that apart from vertical restraints also covers vertical integration (mergers and acquisitions). As we will later see, vertical integration can be considered as a sophisticated form of vertical restraint. In the following we will focus our attention on vertical restraints, since the conclusions drawn from the study of those restraints can be extended to cover vertical integration.

By altering the behavior of the parties involved, vertical restraints affect the performance of markets and eventually have an impact on social welfare. The study of vertical restraints has attracted the attention of economists and the impact of such restraints has been strongly debated. Some economists believe vertical restraints mostly help improve the efficiency of vertical structures, rather than dampen competition, hence their overall welfare effect is more likely to be positive and such practices should not be banned. Other academics stress the potential anti-competitive effects of vertical restraints, calling for their regulation.

In this thesis we will present some of the most important cases examined in the literature regarding vertical restraints. The study of these cases focuses on the interactions of firms in an upstream or wholesale market with firms in a downstream or retail market. In what follows the terms manufacturer, producer or upstream firm will be used interchangeably, as will be the case for the terms retailer, distributor and downstream firm. The terms vertical structure and vertical chain will also be considered equivalent. In the next sections we present the most common types of vertical relations, and we discuss briefly how vertical restraints are treated by competition authorities in the United States and in the European Union. Chapter 2 presents some major topics of vertical restraints facilitating coordination in non-strategic environments, including the double marginalization problem, issues related to retail services provision and other cases. In Chapter 3 we discuss the anti-competitive potential of vertical restraints. Examining the function of vertical restraints in market environments where there is strategic interaction between firms, we discuss how vertical restraints can facilitate coordination among competing firms, how such restraints can help firms sustain a cartel and also under what circumstances and in what ways vertical restraints can be used to create barriers to entry, preventing potential rivals from entering the market. Finally, the conclusions and policy implications of this review are presented in Chapter 4.



1.1 Types of vertical restraints

There are many types of restraints that can be imposed on a vertical relationship between a manufacturer and a retailer. Some of the most important such vertical restraints are the following.

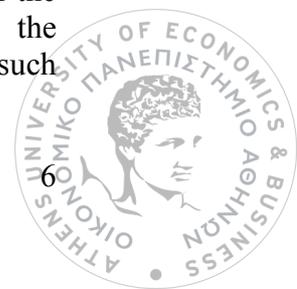
- **Non-linear tariffs.** Linear pricing, the payment scheme in which payment is proportional to the quantity bought, is the simplest way of pricing. Apart from using a uniform price however, other, more complex, payment schemes are often used in transactions between firms. A typical such scheme is for the seller to charge a fixed franchise fee F , which the buyer must pay in order to be entitled to deal with the seller, and charge a uniform wholesale price w on the quantity sold. This payment scheme is usually called a two-part tariff and is denoted by $T(q) = F + wq$. Under a two-part tariff scheme the larger the quantity bought, the lower the effective unit price, since the fixed fee is shared on a greater number of units. Another form of non-linear pricing is quantity discounts, also known as progressive rebates, which has a similar effect as two-part tariffs, in the sense that the effective unit price is reduced as quantity increases. Quantity discounts however may be harder to enforce than two-part tariffs. If a manufacturer offers quantity discounts and cannot observe the final retail sales of each distributor, then retailers, engaging in a form of arbitrage, may pool their orders, enjoying a discount.

- **Royalties.** Royalties are another way of pricing, in which the price paid to the manufacturer depends not only on the quantity bought by the retailer, but on the quantity actually sold in the retail market. Royalties can also depend on other variables, such as sales of rival brands made by the retailer, and in this sense royalties differ from typical non-linear pricing.

- **Resale price maintenance (RPM).** RPM refers to an agreement, under which the retail price charged to consumers is not decided by the retailer, but it is imposed by the manufacturer. Other restrictions such as price ceilings (maximum allowed retail price) or price floors that are imposed by the manufacturer on the retailer have similar function. In order to impose RPM, a manufacturer needs to be able to monitor the effective retail price, which is not always an easy task, since retail discounts can have non-monetary forms, such as free services provided by the retailer to the buyer of the product.

- **Quantity fixing.** Quantity fixing refers to agreements under which the retailer is not free to decide the quantity it is going to buy, but instead the manufacturer imposes the quantity to be bought and resold by the retailer. As with RPM, there are many variants of quantity fixing, such as quantity forcing, where the manufacturer imposes a minimum quantity that has to be bought by the retailer, or quantity rationing, where a maximum quantity is imposed. When consumer demand is known, and when it is only affected by the product's price, quantity fixing is equivalent to RPM, while quantity forcing and rationing are equivalent to a price ceiling and a price floor respectively.

- **Tie-in.** Tie-in (or tying) is a type of restraint, according to which the manufacturer imposes on the retailer to carry more than one of the manufacturer's products, even if the retailer would like to carry fewer such



brands, or only one of them. A special case of tying is full-line forcing, where the manufacturer demands that the retailer carries the entire range of the manufacturer's products.

- **Exclusivity agreements.** These are agreements signed by the manufacturer and the retailer, that limit the rights of one of the parties, usually the retailer, or of both parties involved. One of the most common exclusivity agreements is exclusive dealing, whereby the retailer is prohibited from dealing with other manufacturers, or is even prohibited from being active in any business, other than distributing the manufacturer's product. Other common types of exclusivity terms include the assignation of exclusive territories, or exclusive market segments. These are provisions that limit the market in which the retailer can be active, either in geographical terms in the case of exclusive territories, or in terms of market segment, e.g. allowing the retailer to deal only with business clients, rather than individuals, or allowing distribution only by mail, and not through retail stores. In the case of exclusive territory agreements, the manufacturer's rights are also limited, as it usually commits not to allow any other retailer to sell its product in the territory, thus ruling out any intra-brand competition within the territory. Note though, that a manufacturer assigning exclusive territories to its retailers might face difficulties in ensuring there are no violations of the agreements. It may be easy to control how many delegated retailers are established in a particular territory, but it is not always easy to prevent a retailer from serving customers outside its territory.

Apart from those common types of vertical restraints that were presented above, there can be numerous other ones. A manufacturer can agree to provide a minimum level of quality, or a certain warranty covering its product, or it could commit to provide a certain level of services, such as advertising campaigns. A retailer could agree to provide a certain level of customer services, such as after-sale services, or it could also be agreed that one of the parties will not compete with the other one for a certain period of time after the termination of their relationship.

Often however, firms may conclude that it is difficult to enforce the vertical restraints that would like to impose on the relationship with their partners, and may opt for vertical integration with their partners, as a means to make the partner behave in the desired way. Integration can either take the form of a merger of two firms, or an acquisition of the one by the other. Vertical integration creates a uniform entity, resolving any conflict of interests that might exist between the previously distinct firms, thus allowing the new entity to pursue its goals unobstructed. In this sense vertical integration can be considered as an extreme form of vertical restraint, although the legal treatment of vertical integration is often very different than that of other vertical restraints.



1.2 Legal Treatment of vertical restraints

In this section we will briefly discuss the major jurisprudence trends regarding vertical restraints in the United States and the European Union, making reference to some important cases. Both in the US and in the EU a vertical restraints case can be deemed illegal either because the restraints involved limit competition, (the relevant legal provisions being Section 1 of the Sherman Act in the US, or Article 101 of the Treaty on the Functioning of the European Union (TFEU – Lisbon Treaty) in the EU)¹, or because the imposition of the restraints constitutes an abuse of dominant power (cases that are governed by Section 2 of the Sherman Act, or Article 102 of the TFEU).

1.2.1 US policy toward vertical restraints

Courts in the United States have been dealing with cases of vertical restraints for a long time. However antitrust policies toward vertical restraints have not been consistent over time. Resale price maintenance has been treated by US courts as illegal per se since the early 20th century, beginning with the Supreme Court's ruling in *Dr. Miles v. John Park & Sons*,² and this policy was considered one of the few consistent treatments of vertical restraints by US jurisprudence. As recently as 2007 however, this trend has been reversed by the Court's ruling in *Leegin v. PSKS*,³ where per se illegality of RPM was abolished, and the court ordered for the case to be examined under a rule of reason.

The other types of vertical restraints have seen policy reversals more often. In the early 20th century and until the late 1960s vertical restraints were treated on a case-by-case basis, with the Supreme Court explicitly ruling that this should be the policy treatment, as in *White Motors v. US*.⁴ In 1967 a drastic change in policy occurred with the Court's ruling in *US v Schwinn*,⁵ when all vertical restraints became illegal per se. After a fierce critique on this tough policy regime, mostly by economists of the Chicago School, another policy change occurred in 1977 with the Court's ruling in *Continental TV v. GTE Sylvania*,⁶ switching to a more permissive treatment of non-price restraints, which should now be judged under the rule of reason, while price restraints such as RPM were still deemed per se illegal. This trend was reinforced under the Reagan administration by the US Department of Justice, with the vertical Restraints Guidelines it published in 1985. These new guidelines were virtually rendering all non-price restraints legal, and as a result federal anti-trust agencies in the US brought no single case of vertical restraints during the three consecutive Republican terms of the 1980s and early 1990s. Another change in policy occurred

¹ The rules included in the Articles 101 and 102 of the TFEU, were formerly included in the Articles 81 and 82 of the European Communities Treaty, and earlier in the Articles 85 and 86 of the Treaty of Rome respectively.

² See case *Dr. Miles Medical Co. v. John D. Park & Sons Co.*, 220 US 373 (1911)

³ See case *Leegin Creative Leather Products, Inc. v. PSKS, Inc.*, 551 US 877 (2007)

⁴ See case *White Motors Co. v. United States*, 372 US 253 (1967)

⁵ See case *United States v. Arnold Schwinn & Co.*, 388 US 365 (1988)

⁶ See case *Continental TV, Inc. v. GTE Sylvania*, 433 US 36 (1977)



under the Democratic administration in 1996, when the Federal Trade Commission (FTC) brought a case against Toys'R'Us.⁷ The attitude against non-price restraints was switched back to a case-by-case treatment under the rule of reason, with competition authorities actively enforcing antitrust-law and examining cases even of firms that have relatively low market shares. The vigorous enforcement trend that commenced with the Toys'R'Us case continues ever since, with many major cases being investigated by competition authorities.

1.2.2 EU policy toward vertical restraints

While in the US antitrust laws have always been aiming at promoting competition, European competition law is primarily concerned with promoting the integration of the single European market. In this sense promoting competition is treated rather as a means to achieve integration, than as a goal in itself. Nevertheless, the European Commission has been consistently strict in cases of competition restriction, especially in cases of territorial restraints used by firms to restrict parallel imports. In a characteristic such example, the Commission ruled in 1964 that the exclusive dealing agreement under which Consten distributed Grundig products in France was illegal, because it banned re-exports by Consten.⁸ This was also the first case to broaden the scope of Article 101 to include vertical agreements, rather than horizontal ones only. Since then many other cases of exclusive dealing have been judged in breach of Article 101 for restricting parallel imports, some of the most famous ones being Nintendo, Volkswagen A.G., Opel Netherlands B.V. and DaimlerChrysler A.G.⁹

However, under Article 101(3), agreements that restrict competition, and thus should be banned, can be exempted if they “contribute to improving the production or distribution of goods or to promoting technical or economic progress while allowing consumers a fair share of the resulting benefit”. In the first years of the implementation of Article 101, in the early 1960s, a company had to notify the Commission about an agreement, in order to gain such an exemption. This resulted to an overwhelming amount of work-load for the Commission. To tackle this problem, it was decided that some specific categories of distribution agreements, such as franchising contracts, could be exempted without any further review by the Commission (block exemptions). This policy regime, however, has been characterized as too bureaucratic and was criticized for creating “straightjackets”. In response to this critique, and to calls for an economics-based approach in treating exemptions, the Commission published a Green Paper on Vertical Restraints in 1996, which included an economic analysis of the effects of vertical restraints on competition. The Green paper triggered a debate, that led to a new block exemptions regime in 1999, a new set of guidelines being published in 2000 and ultimately to the abolition of the obligation of firms to notify the Commission about their agreements, in 2004. Under the new guidelines issued in 1999, a vertical restraints case is not judged solely on the grounds of the type of the restraint; the market environment in which the restraint is applied is also taken into consideration. These guidelines stress the importance of intra-brand

⁷ See case Toys'R'Us, Inc. v. FTC, Docket 9278

⁸ See case Consten and Grundig v. Commission, cases 56/64 and 58/64, 13 July 1966

⁹ See cases Nintendo COMP/35.587, Volkswagen A.G. COMP/36.693, Opel Netherlands B.V. COMP/36.693, DaimlerChrysler A.G. COMP/38.064



competition in determining the effects of vertical restraints on welfare, underlining that vertical restraints are only likely to be socially harmful, if the firms involved enjoy significant market power.

The enforcement of Article 101 may have changed many times over the years; however the policy against resale price maintenance has remained fairly consistent. RPM has always been considered per se illegal. The Pronuptia case,¹⁰ where the Commission focuses on RPM restricting intra-brand competition, is a typical example of the Commission's attitude towards RPM. Any agreement including RPM could stand no chance of benefiting from the block exemption regime.

Other types of vertical restraints are treated less strictly. Territorial restrictions can be exempted, under Article 101(3), provided that they do not restrict parallel exports. Exclusive purchasing agreements, such as franchising, can also be granted exemption, for instance if they serve the protection of the intellectual property or the reputation of the franchisor. Recent judgments made by the Commission, such as the fine imposed to Michelin for using a system of rebates to tie its retailers, the infamous fine imposed on Microsoft for bundling practices, or the settlement it reached with the Coca-Cola Company regarding its rebating scheme and its exclusive dealing and bundling practices, confirm that the Commission considers the effects of vertical restraints to be negative in markets, where intra-brand competition is weak.¹¹

¹⁰ See Official Journal of the European Communities 13, 15 January 1987

¹¹ See cases Michelin COMP/36.041, Microsoft COMP/37.792, The Coca-Cola Company COMP/39.116



2. Intra-Brand Competition

In this chapter we focus on the effects of vertical restraints on the relationship of a manufacturer and its retailers, ignoring the effects that the adoption of such restraints may have on other vertical structures. The models used to study such interactions typically consist of a monopolist manufacturer distributing its products through one or more retailers. In such setups the decisions on how economic variables will be set, such as choices on the level of wholesale or retail prices, are not taken centrally, as would be the case if the firms were vertically integrated. Instead different parties make choices on different economic variables. However, each firm's choices do not only affect its own performance, but also affect the performance of all the other firms composing the vertical structure. This interdependence creates externalities, which may lead to an inefficient market outcome. The use of vertical restraints can help the firms within a vertical structure to better coordinate and correct for those externalities, restoring the efficiency for the structure as a whole. In some cases, as we shall see below, this efficiency improvement caused by the use of vertical restraints can also be to the benefit of the consumers. In other cases however, the total welfare impact of vertical restraints may not be so clear.

2.1 Double Marginalization

The double marginalization problem, studied by Spengler (1950) was the first coordination problem to be formally analyzed. This problem arises when firms in both levels of a vertical structure possess some market power. In such a case both the upstream and the downstream firm add a positive markup on their respective costs, which leads to excessively high prices in the retail market. The root of this problem of excessive pricing is that when the distributor sets the retail price, it does not take into account the impact of its decision to the manufacturer's profit. This externality is the cause of the excessive retail pricing, which affects adversely both the vertical chain's total profits and consumer surplus. Solving this externality problem would restore optimal pricing, that is would reduce the retail price, benefiting both the vertical structure as a whole and the consumers.

This argument can be illustrated by the following example. Assume a monopolist manufacturer supplying a monopolist retailer, as shown in figure 2.1, where the manufacturer's and the retailer's marginal costs are c and γ respectively, w is the uniform wholesale price charged by the manufacturer to the retailer, p is the retail price and $q=D(p)$ is the consumer demand.



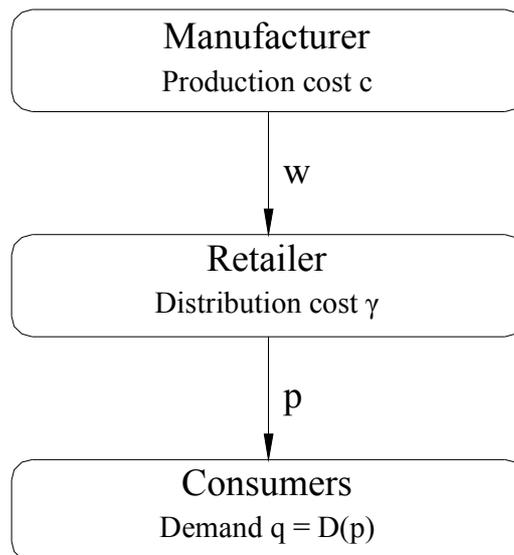


Figure 2.1
The double-marginalization problem

The joint-profit maximizing price, i.e. the price that would maximize the total profits of both firms constituting the vertical structure, is:

$$p^M(c) = \operatorname{argmax}_{(p)}[(p - c - \gamma)D(p)]$$

However, since the two firms act separately, the manufacturer will have a motive to impose a wholesale price above its marginal cost, i.e. $w > c$, in order to make some profits. Then the retailer will maximize its own profits by setting a retail price:

$$p^M(w) = \operatorname{argmax}_{(p)}[(p - w - \gamma)D(p)]$$

The price selected by the retailer will clearly be higher than the joint-profit maximizing one, resulting not only to lower profits for the vertical structure as a whole, but also to a lower consumer surplus, than what would be the case under the joint-profit maximizing price.

The double marginalization problem can be solved using vertical restraints. In fact different types of vertical restraints are suitable to solve it.

One solution would be for the manufacturer to impose resale price maintenance (RPM) on the distributor, setting the retail price on its joint-profit maximizing level, (or 'monopoly level') $p^{\text{RPM}} = p^M(c)$. Then the desirable distribution of the monopoly profits among the two firms could be achieved by adjusting the wholesale price.

Another solution could be to use a simple form of non-linear pricing, for instance a two-parts tariff of the form $T(q) = wq + F$, in order to give the distributor the correct incentives, so that it sets the retail price on the monopoly level. This can be achieved by setting the wholesale price equal to the manufacturer's production cost ($w = c$). This would make the maximization problem of the distributor equivalent to the maximization problem of the vertical structure as a whole, thus the retailer would

set the price at the monopoly level. Using the franchise fee F , the manufacturer can then achieve the desired distribution of profits.

By solving the double marginalization problem the vertical chain maximizes joint profits, while at the same time the retail price that the consumers face falls, therefore the consumer surplus is increased. In this sense the solution of the problem clearly improves welfare.

It is interesting to note however, that vertical restraints are not the only way to solve the double marginalization problem. Another possible solution would be to eliminate downstream market power, for example by introducing several perfectly substitutable retailers. This would also eliminate the retailers' markups and the manufacturer could directly control the retail price using its wholesale price. Retailers facing a wholesale price $w = p^M(c) - \gamma$, would set a retail price at the monopoly level.

Although in the simple example examined above we see that different restraints have exactly the same effects, this may not be the case in more complex situations, for instance when some sort of uncertainty exists. Rey and Tirole (1986) point out that when there is demand uncertainty or distribution cost uncertainty, vertical restraints do not solve perfectly the double marginalization problem. Two-part tariffs for example ensure that the retailer will be free to choose the profit maximizing retail price, but it bears all the risk by accepting to pay a fixed franchise fee. RPM on the other hand, while ensuring that the risk is shared among the manufacturer and the retailer, does not allow the retailer to optimize the price in case of a shock on the distribution cost, or on demand conditions. Different vertical restraints are no longer equivalent in case of uncertainty. In fact Rey and Tirole demonstrate that RPM is more appropriate in cases of demand uncertainty, whereas two-part tariffs should be preferred under distribution cost uncertainty.

2.2 Retail Services Provision

The retail demand of a product is often affected by services provided by the retailer, such as free delivery of the product to the customer's premises, dedicated salespersons assisting customers, pre-sale information provided to a potential customer, showrooms or after-sale services. These services can create externalities between the retailer and its supplier, as they can also create externalities among different retailers of the same product, in case that a retailer can free-ride on services offered by other distributors. Different kinds of retail services can be appropriated at different degrees, so in the case of pre-sale advice services for example a free-riding problem would be likely to arise, whereas in the case of free parking facilities at a retail store it wouldn't. In the following sections we examine the impact of externalities related to retail services provision and how vertical structures can solve these problems using vertical restraints.

2.2.1 Retail services and successive monopolies

We extend the simple model used in the previous section, to include one more variable, the retail effort. This new variable, denoted by e , corresponds to the level of retail services provided by the distributor. Figure 2.2 illustrates this model.

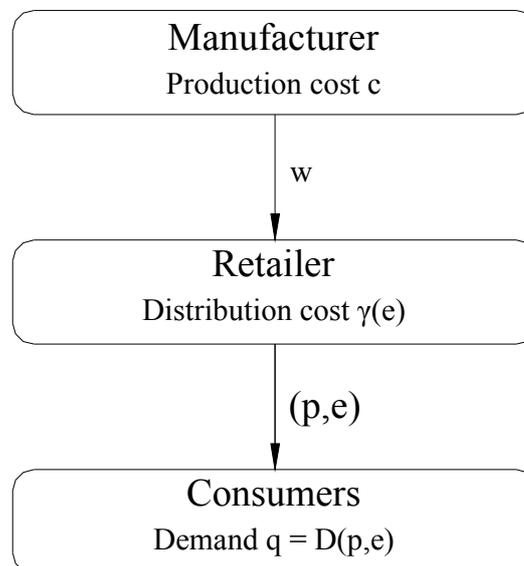


Figure 2.2
Retail services provision in a successive monopolies setup

The consumer demand is now a function of both price and retail effort: $q = D(p,e)$, with $\partial_e D > 0$.¹² Both retail price and effort are chosen by the distributor. Retail effort also affects retail cost $\gamma(e)$ ($\gamma'(e) > 0$). Considering the inverse demand $p=P(q,e)$ (with $\partial_q P < 0$ and $\partial_e P > 0$) the joint-profit maximizing quantity and effort are determined by the following maximization problem:

$$(q^M(c), e^M(c)) = \operatorname{argmax}_{(q,e)} [(P(q,e) - c - \gamma(e))q]$$

Under linear pricing, the retailer faces the same optimization problem as the one described above, with the sole difference that it perceives its own marginal cost as equal to $w + \gamma(e)$, instead of $c + \gamma(e)$. The manufacturer would choose the wholesale price in order to maximize its own profits, and would eventually choose $w^* > c$, in order to gain a positive profit. Therefore the retailer, having a marginal cost greater than c , will choose less quantity and less effort, than what would be optimal for the vertical chain as a whole. This is a typical externalities problem, as the retailer does not take into account the effects of its choices on the manufacturer's profits.

As in the double marginalization problem, there are different types of vertical restraints that can be employed to restore the efficient outcome.

- The manufacturer could use a combination of RPM and a requirement for the retailer to provide a certain level of services. RPM alone would not be sufficient, because it would not solve the externality problem in services provision. Using RPM and a minimum services requirement the joint profits are restored to the monopoly level, and the wholesale price can be used to share those profits as desired. This solution however would require that the manufacturer can observe not only the price charged to the final customers, but also the level of services that the retailer provides.

- A two-part tariff would be another option, and it has the advantage that it does not require the manufacturer to monitor the level of the retailer's effort. Using a tariff of the form $T(q) = cq + F$ the manufacturer gives the retailer the right incentives to choose the level of effort and the quantity that maximize joint profits, since a wholesale price equal to c implies that the retailer's profits coincide with the monopoly profits. The fixed fee can then be used to achieve the desired allocation of profits.

2.2.2 Retail services and intra-brand competition

Contrary to what was the case in the simple double marginalization problem, the retail services coordination problem cannot always be solved only by increasing downstream competition among retailers. With perfect intra-brand competition the manufacturer would be charging a wholesale price above its marginal cost in order to get some profit, while the competing retailers would offer the combination of retail price and services that is favored by the consumers. This would generally be different than the price-services combination that maximizes the profits of the vertical

¹² In the following $\partial_x A$ denotes the partial derivative $\partial A / \partial x$.



structure. In this case, the efficiency of the vertical structure can be restored using various combinations of vertical restraints.

- Using RPM the manufacturer can control the price level and using the wholesale price w can control the level of services provided by a retailer, since the competitive environment will force the retailers to offer the highest possible level of services compatible with non-negative profit.
- Combining two-part tariffs with exclusive territories would also restore efficiency. By assigning exclusive territories the manufacturer eliminates the intra-brand competition, and each retailer becomes a monopolist in its respective territory. Therefore for every monopolist retailer, using two-part tariffs will yield the same outcome, as in the sequential monopolies case discussed in the previous section.

It should be noted though, that in the case of retail services, solving the coordination problem does not necessarily improve welfare. The profit maximizing quantity and level of services are likely to be different than the socially desirable ones. Increasing the level of services and retail prices in a way that improves joint profits for the vertical structure, may well harm consumer surplus and even total welfare. This may happen because the monopolistic vertical structure will tend to attract the marginal consumers, choosing price-services combinations that suit their preferences, but ignoring the impact of those choices on the surplus of infra-marginal consumers. In cases when marginal consumers are willing to accept higher prices in return for more services, compared to what the average consumer prefers, the vertical chain may choose to satisfy the tastes of those marginal consumers, thereby harming the average ones. The reduction in consumer surplus caused to those infra-marginal consumers may offset the increase in the surplus of the marginal consumers, and perhaps even the profits of the vertical chain, leading to a reduction to total welfare. Therefore the impact of solving the services coordination problem on total welfare is ambiguous. However this impact on total welfare is likely to be negative only when the vertical structure has substantial market power. In a competitive environment, an increase in the price and services of a particular vertical structure would probably not harm consumer surplus, since consumers who prefer lower levels of services and prices would be able to switch to the product of a competing vertical chain.

Vertical restraints can also be used to solve free-riding problems in services provision between retailers of the same product. In such cases a manufacturer could assign exclusive territories, to eliminate a retailer's ability to free-ride on a fellow retailer's services effort. In the presence of such free-riding problems, competition between the retailers would lead to under-provision of services, relative to the socially desirable level, therefore the use of vertical restraints, by solving the free-riding problem, is likely to be beneficial for total welfare.

2.3 Multi-product manufacturer

We have seen that vertical restraints can be used to facilitate coordination within a vertical chain, in order to solve either double marginalization problems or to correct distributors' incentives in retail services provision cases. However there may be other reasons for a manufacturer to use vertical restraints, namely a manufacturer may have a strategic motive, within its own vertical structure, to employ vertical restraints, in order to achieve a desirable distribution of profits. A typical example is the case of a multi product manufacturer, distributing its imperfectly substitutable products through a monopolist retailer, as illustrated in figure 2.3.

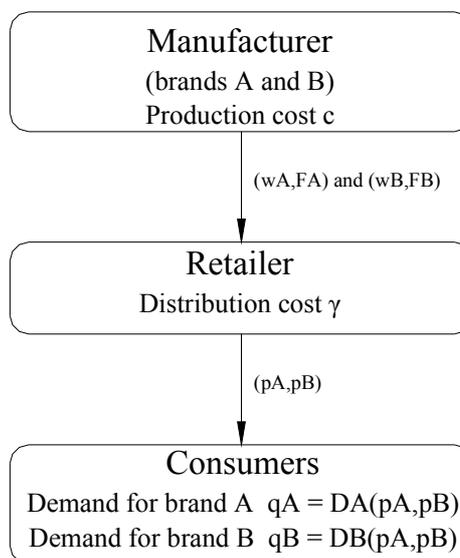


Figure 2.3
Multi-product manufacturer and monopolist retailer

In such a context, vertical restraints are used both to solve the double marginalization problem that arises, as well as to affect the allocation of the joint profits. A single instrument, such as two-part tariffs, would not be sufficient to achieve both goals. In this case the manufacturer would rather use a combination of restraints.

Shaffer (1991a) demonstrates that in this framework the retailer's discretion to decide not to carry one product brand, leads to the retailer being always able to extract a positive rent. This fact creates the profit sharing problem, since the manufacturer faces a trade-off between maximizing the joint profits, and extracting profits from the retailer.

Assume that the manufacturer offers a two-part tariff for each of its two products, $T_i(q_i) = w_i q_i + F_i$, with $i = A, B$. The retailer chooses the retail prices $p_A^M(w_A, w_B)$ and $p_B^M(w_A, w_B)$, and, if it carries both brands, its profits come from the maximization of:

$$\pi^M(p_A, p_B) = (p_A - w_A - \gamma) D_A(p_A, p_B) + (p_B - w_B - \gamma) D_B(p_A, p_B)$$

If $\pi_{A+B}^M(w_A, w_B)$ is the solution of this maximization problem, then the retailer's profits are:

$$\pi^R(A, B) = \pi_{A+B}^M(w_A, w_B) - F_A - F_B$$

If the manufacturer decided to set its wholesale price equal to its marginal cost, then the retailer would act exactly as a vertically integrated structure and would therefore maximize the joint-profit of the vertical structure by setting retail prices at their monopoly levels.

Suppose the retailer chooses to carry only one brand, say brand B. In this case its profits would be:

$$\pi^R(B) = \pi_B^M(w_B) - F_B$$

$$\text{where: } \pi_B^M(w_B) = \max_{(p_B)} [(p_B - w_B - \gamma) D_B(0, p_B)]$$

Since the two brands are imperfect substitutes, an increase in the sales of the one brand will harm the sales of the other. Therefore, if the retailer had already decided to carry brand B, then the maximum fee it would accept for agreeing to also carry brand A would be no more than the marginal contribution to the overall retail profit, of selling product A, i.e.:

$$F_A = \pi_{A+B}^M(w_A, w_B) - \pi_B^M(w_B)$$

The above expression for F_A is usually increasing in w_B , therefore the manufacturer will set a wholesale price above its marginal cost $w_B > c$. The same argument holds for the wholesale price of product A. Since the wholesale prices are set above the optimal level for joint-profit maximization, the prices in the retail market will be higher than in the monopoly case. Hence, we notice that two-part tariffs alone are not sufficient to allow the vertical structure to perfectly coordinate.¹³

In order to restore the maximum joint profits, the manufacturer would have to employ additional vertical restraints, imposing for instance full-line forcing terms to the retailer. Under full-line forcing the retailer no longer has the option to carry only one of the brands, hence the strategic rent is eliminated, and the manufacturer can set wholesale prices equal to marginal cost and restore the maximum joint profits. Apart from full-line forcing, other vertical restraints, such as RPM, discounts based on total quantity (aggregate rebates) or discounts based on the number of brands carried by the retailer, could yield the same results.

Restoring the efficiency of the vertical structure in the case of the multi-product manufacturer, results to lower consumer prices, hence it improves consumer surplus. Therefore, in the multi-product manufacturer case examined above, as in the double marginalization cases, the application of vertical restraints has a beneficial effect not only on the vertical structure, but also on social welfare.

¹³ Nevertheless, as has been noted by Verge (2001), more complex forms of nonlinear pricing, including e.g. quantity forcing, could improve the performance of the vertical structure by partially improving its efficiency.

2.4 Vertical restraints as a commitment technology

In this section we will see another example of a manufacturer having a strategic incentive, still within its own vertical chain, to impose vertical restraints. This time the strategic motive of the manufacturer is to restore its credibility. Vertical restraints can enable the manufacturer to credibly commit itself to honoring the agreements it signs with its retailers.

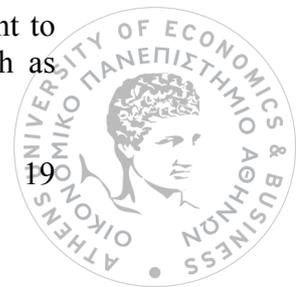
A monopolist manufacturer dealing with many competing retailers has a motive to limit its supply, so that the retail prices are kept high and the monopoly profits are achieved in aggregate by the vertical structure. Then the manufacturer can share these profits with its retailers in the desired way. However, as demonstrated by Hart and Tirole (1990), when dealing with each retailer separately the supplier has an incentive to behave opportunistically and cheat on the other retailers. This behavior will be expected by the retailers, and will affect the agreement terms they will be willing to accept. This may make it impossible for the joint-profit maximizing wholesale payment scheme to be accepted by the retailers. Therefore, the presence of the incentive for opportunistic behavior may make the monopolistic outcome unachievable.

Assume, for instance, that a monopolist manufacturer supplies two retailers who compete in quantities in the retail market (competition à la Cournot), facing no distribution costs, q^M being the monopoly quantity and π^M being the monopoly profit. The ideal outcome for the manufacturer, which would be achievable if offers were observable, would be to supply each retailer with $q^M/2$ and charge a fixed fee equal to $\pi^M/2$. However, in a typical Cournot setup, the best response of a firm, when its rival sells half the monopoly quantity, is to sell more than that, i.e. the best response is $q^{BR} = BR(q^M/2) > q^M/2$. Being a best response, q^{BR} enables the firm to enjoy higher profits than $\pi^M/2$. Therefore a firm that knows its rival can only sell $q^M/2$, would be willing to buy more than this quantity. In this sense, if the manufacturer can renegotiate secretly with one of the retailers, then it has an incentive to offer a larger quantity and receive a larger payment by this retailer, thereby raising upstream profits. But this behavior would be anticipated by retailers, thus they would not be willing to accept the joint-profit maximizing offer ($q^M/2, \pi^M/2$) in the first place. In fact each time a retailer is offered a quantity q , it will anticipate that its rival will get an offer equal to the best response to q in the standard Cournot competition context, which is:

$$BR(q) = \operatorname{argmax}_{(q')} [P(q', q)q' - C(q')]$$

Therefore the only sustainable outcome would be the standard Cournot equilibrium. This is a typical case of a manufacturer having potential market power, but being unable to fully exercise it, because it is unable to credibly commit itself to honoring its agreements. The same problem would occur even with perfectly observable negotiations, if the retailers are contacted by the manufacturer sequentially. In this case the manufacturer, when dealing with the second retailer, would have a motive to free-ride on the profits of the first one, and this behavior would be anticipated by the first retailer, leading to the exact same outcome: the only equilibrium would be the standard Cournot one.

In order to restore the maximum joint profits, the manufacturer would want to eliminate downstream competition using some form of vertical restraints, such as



imposing RPM (a price floor would suffice). If the retail price is set on its monopoly level, and a retailer knows its rival has bought $q^M/2$, then the retailer will not be willing to offer a higher payment in order to buy for itself more quantity than $q^M/2$. Knowing this, the manufacturer would have no incentive to cheat on a retailer, in other words the manufacturer, when dealing with one of its retailers, can credibly commit itself not to free-ride on this retailer's profits by offering an advantage to its rival. The retailers in turn knowing that the manufacturer has no reason to cheat on them would accept the joint-profit maximizing offer ($q^M/2, \pi^M/2$). Therefore RPM, by eliminating the manufacturer's incentive for opportunistic behavior, functions as a commitment technology, which enables the vertical chain to coordinate and achieve joint-profit maximization.

O'Brien and Shaffer (1992) examine a similar problem in a Bertrand competition framework. In this case the inability of the manufacturer to credibly commit, makes it unable to exercise its potential market power, and leads to a perfectly competitive outcome, where the retail price is equal to the marginal cost. The argument is the same as in Hart and Tirole. When a manufacturer and a retailer negotiate, they have an incentive to free-ride on the other retailer's profits. Vertical restraints, such as RPM, can solve this problem. By imposing wholesale and retail prices equal to the monopoly price, the manufacturer enjoys the all the profits of the vertical chain, therefore it no longer has a motive to free-ride on any retailers profits, and the monopoly outcome is achieved.

In cases like the ones discussed, vertical restraints can have an adverse welfare effect. When vertical restraints are used as a commitment technology, helping a vertical structure to exercise its potential market power, they lead to higher retail prices, harming consumer surplus. Indeed it is quite likely that the reduction in consumer surplus will not be compensated by the increase in the profits of the vertical structure, in which case total welfare is reduced.

2.5 Other coordination problems

Often distributors simultaneously carry the products of many different manufacturers. If a manufacturer reduces its wholesale price below its marginal cost, it motivates the common retailer to favor this manufacturer's product. From the point of view of the other manufacturers this is a distortion in the efficiency of their vertical structure. Hence manufacturers may consider using vertical restraints, such as exclusivity agreements, to correct for such distortions. Similar problems can occur when manufacturers can free-ride on each other's customer services, and such problems can also be solved using vertical restraints.

In many cases there are decisions taken by manufacturers, which affect retailers' profits as well, such as central advertising campaigns, decisions concerning the quality of the product or the warranty offered. This fact will therefore cause externalities that reduce the efficiency of the vertical structure, just as was the case with retail services. A solution to such externality problems may also be the use of vertical restraints, such as contract terms that oblige the manufacturer to offer a minimum level of nationwide advertising, a minimum warranty etc.

Another problem that often arises in vertical structures is that one of the firms involved has to make specific investments, which are necessary in order for the firm to engage in the vertical relationship but are of little residual value, or even of no residual value at all, to the firm in case the relationship is broken. If there is no form of commitment between the parties, the fear of opportunistic behavior may lead to underinvestment. The firm that has to make the specific investment may be initially offered by its counterpart attractive agreement terms, in return for a certain level of investment. If it accepts, however and proceeds with the specific investment, its counterpart will have a motive to re-negotiate the initial agreement, offering less appealing terms. The investor-firm may nevertheless find it less damaging to accept the new terms, than to break the partnership altogether, and suffer a loss equal to the sunk cost of the specific investment. This, of course, will be anticipated by the would-be-investor firm, which would not accept the initial agreement in the first place. This problem may make an agreement on the joint-profit maximizing level of specific investment impossible to agree upon, leading to a sub-optimal level of investment. Again vertical restraints, such as exclusive territories or exclusive dealing arrangements, with provisions that prevent the termination of the agreement, or the alteration of its terms for a period of time, can be used as a means to commit and solve such problems, allowing the efficient level of specific investment to be achieved.

3. Inter-brand competition - Oligopolistic markets

In the previous sections we have seen how vertical restraints can be used to facilitate coordination within a given vertical chain, improve efficiency and restore profitability. In this section we focus on the effects of vertical restraints in strategic contexts, where such restraints can be used to affect inter-brand competition, i.e. competition among different vertical structures. First we examine the static effects of vertical restraints, namely how vertical restraints can be used by firms to secure their market power, or increase it. We discuss cases where vertical restraints can be used to dampen competition among manufacturers or even help manufacturers to form a cartel, as well as cases where vertical restraints can assist global cartelization in both upstream and downstream markets. Finally we discuss the potential dynamic effects of vertical restraints, as a means to deter entry and thus shape the structure of a market itself.

3.1 Competition Dampening

Vertical restraints used by a vertical structure affect the incentives, and thus alter the behavior of the firms involved. This alteration of behavior will be expected by the rival vertical structures in a strategic environment, therefore it will affect the competitors' choices as well. In this sense a vertical structure can use vertical restraints to credibly commit in less aggressive behavior against its rivals, thereby softening competition. There are many examples in the literature of how vertical restraints can play the role of a commitment instrument in a strategic environment.

Bonanno and Vickers (1988) have suggested that when two rival vertical structures compete, manufacturers may want to delegate the sales of their products to retailers, instead of selling themselves in the retail market, because in a market structure with independent retailers each manufacturer has an incentive to increase its wholesale price. A retailer facing a high wholesale price will be less aggressive, and a manufacturer knowing that the rival's retailer is non-aggressive has a motive to set its own price higher. In this way using independent retailers helps manufacturers credibly commit themselves to less aggression. Vertical restraints allowing the manufacturers to retrieve profits from the retail market, such as non linear pricing, will then ease the application of such a scheme.

A similar situation is examined by Rey and Stiglitz (1988,1995), where it is suggested that vertical restraints that reduce intra-brand competition, also help dampen inter-brand competition among rival vertical chains. If competition within a given vertical chain is fierce, then the retail prices are likely to be close to the wholesale price. Such a situation would be equivalent to the manufacturer itself selling the product in the retail market, a case in which the manufacturer has no way to credibly commit itself on non-aggressive behavior against its competitors. Vertical restraints, such as exclusive territories, can be used to eliminate intra-brand competition, delegate some decision power to the retailers and make them responsive to the rival retailers' choices and through them to the rival manufacturer's wholesale

prices. Hence assigning exclusive territories can serve as a mechanism for a manufacturer to commit itself to less aggressive behavior, and thus motivate the rival manufacturer to also set higher prices.

Notice however, that only some types of vertical restraints can be used as a commitment technology, as discussed above. This commitment technique is based on the delegation of some decision power to an independent retailer. Vertical restraints such as exclusive territories give the retailer the discretion to decide on its price, in contrast to a competitive environment where the retailer would have no such freedom. However other vertical restraints such as RPM, under which the retailer has no decision power, cannot generate the same results.

The core idea of using vertical restraints to dampen competition is that manufacturers employing such restraints can effectively commit on non-aggressive behavior against each other. In this sense, exclusive territories are a very powerful instrument, since they are easily observable by the rival manufacturer, and they can not be easily renegotiated. Non-linear contracts, like the ones proposed by Bonanno and Vickers, are likely to be less effective, since it is faster and easier for a manufacturer to observe how many retailers its rival has assigned in a given territory, than to collect information about the type of contracts its rival has signed and the terms included in them, which at any case can easily be renegotiated. Therefore, exclusive territories are likely to have a higher competition dampening effect than non-linear pricing.

Note though, that the welfare reducing effects of vertical restraints we have seen in this section critically depend on the nature of competition. The examples we have discussed assume that if a vertical chain raises its retail price, the rival vertical chain would follow suit. This however may not be the case in markets where firms compete in quantities. In such markets a rise in one chain's price, that is a reduction in its quantity, may trigger a reduction in the rival chain's price, i.e. an increase in the rival's quantity. In such a setup each manufacturer would have a motive to use vertical restraints to increase the aggression of its retailers. In the case of two-part tariffs, for example, a manufacturer could set a wholesale price below its marginal cost, to motivate its distributor to set a low retail price. Under such conditions the market equilibrium would be that both firms bring larger quantities to the market, and consumers enjoy lower prices, therefore the use of vertical restraints clearly benefits consumers. In such a setup the manufacturers face a form of a prisoner's dilemma: it is privately optimal for each manufacturer to reinforce its retailer's aggression, but if both manufacturers follow this strategy they end up with lower profits, than what they would enjoy had they not acted strategically. Notice that under such circumstances a ban on vertical restraints would help manufacturers solve the prisoner's dilemma and coordinate, leading to higher retail prices, and lower consumer surplus.

Note also that vertical restraints can be employed by a vertical chain to soften competition, regardless of which member of the vertical chain has the bargaining power. Shaffer (1991b) demonstrates that in a setup similar to Bonanno and Vickers, where the retailers have all the bargaining power, vertical chains would still have a motive to employ vertical restraints. In specific, the retailers would impose a wholesale price above the marginal production cost in order to dampen retail competition, and would retrieve the manufacturers' profits by imposing negative franchise fees, also known as "slotting allowances".

When manufacturers can choose the number of their retailers, the ability to apply vertical restraints can drastically alter their incentives. In a setup where the rival

manufacturers first simultaneously determine how many retailers they will deal with, and then retailers compete à la Cournot in the retail market, such as the one proposed by Baye, Crocker and Ju (1996), if fixed fees are the only form of payments that the retailers make to the manufacturers, then manufacturers have an incentive to hire many retailers. This is because by hiring a large number of retailers, a manufacturer commits itself to aggressive behavior against its rivals. However, if in a similar setup the manufacturers can charge two-part tariffs, this result is reversed, as demonstrated by Saggi and Vettas (1999). In this case the manufacturers have two ways to commit in aggressive behavior in the retail market, namely the number of their respective retailers and the wholesale prices charged. Now each manufacturer will have a motive to delegate as few retailers as possible in the first stage, in order to signal to its rival that it shall not compete aggressively, thus avoiding to trigger aggressive wholesale pricing by the rival in the next stage. In equilibrium each manufacturer will choose to have a single exclusive retailer. In the second stage each manufacturer sets a very low wholesale price, in order to motivate its retailer to strongly compete with its rival, and redeems the resulting retail profit using the franchise fee.

Therefore in a given setup, the type of vertical restraints that the firms are allowed to use determines their incentives, their strategic interaction and ultimately the outcome of this interaction. A change as small as allowing the firms to also charge a wholesale price, instead of a fixed fee only, leads to a completely different market structure, with one exclusive retailer, instead of many retailers per manufacturer.

3.2 Collusion

It has often been argued in courts that vertical restraints, and especially price restraints, can help manufacturers form cartels. The US Supreme Court has consistently argued that price restraints reduce competition by facilitating cartelization.¹⁴ This argument has been discussed by Mathewson and Winter (1998), and more recently by Jullien and Rey (2007), who pointed out that in markets with fluctuating retail costs, it would be hard for manufacturers to observe when other producers deviate from a cartel agreement. In such conditions a change in the retail price of a vertical chain can be caused by changes in retail cost, rather than changes in wholesale prices. Therefore a manufacturer cannot infer the change of a rival's wholesale price, i.e. the deviation of a rival from the cartel agreement, simply by observing retail prices. Vertical restraints, such as RPM, can eliminate retail price fluctuation. In a market where every vertical chain uses RPM, a change in the retail price of one vertical structure definitely constitutes a deviation from the cartel agreement. In this case RPM, by making such deviations of a manufacturer easily observable by its rivals, facilitates collusion. However RPM would not allow retailers to adapt to distribution cost fluctuations or demand shocks. This inflexibility could create inefficiencies, which have to be traded-off by the manufacturers against the benefits they would enjoy from cartelization. Jullien and Rey discuss specific circumstances under which these inefficiencies are compensated by the gains from cartelization. This would be the case, for instance, when the retailers mainly face distribution cost shocks, rather than demand fluctuations. However, their analysis suggests that the use of RPM can only be harmful to social welfare when the degree of differentiation between the rival vertical structures' products is high enough.

¹⁴ A characteristic example is *Business Electronics Corp. v Sharp Electronics*, 485 US 727 (2988)



3.3 Common Agency

So far we have focused our attention on manufacturers using exclusive agents to distribute their products. In the following sections we examine situations where retailers deal with more than one manufacturer, and we discuss how vertical restraints can be used to facilitate collusive outcomes. First we examine a setup with a monopolist retailer dealing with multiple manufacturers, and then a more general one where multiple retailers deal each with many manufacturers.

3.3.1 Single common agent

Bernheim and Whinston (1985) describe situation where two manufacturers distribute their products through a monopolist retailer and demonstrate that when two-part tariffs are used, instead of linear pricing, the equilibrium prices rise. To illustrate the intuition behind this result, assume there are two manufacturers A and B, selling their differentiated goods through a monopolist retailer R, as illustrated in figure 3.1.

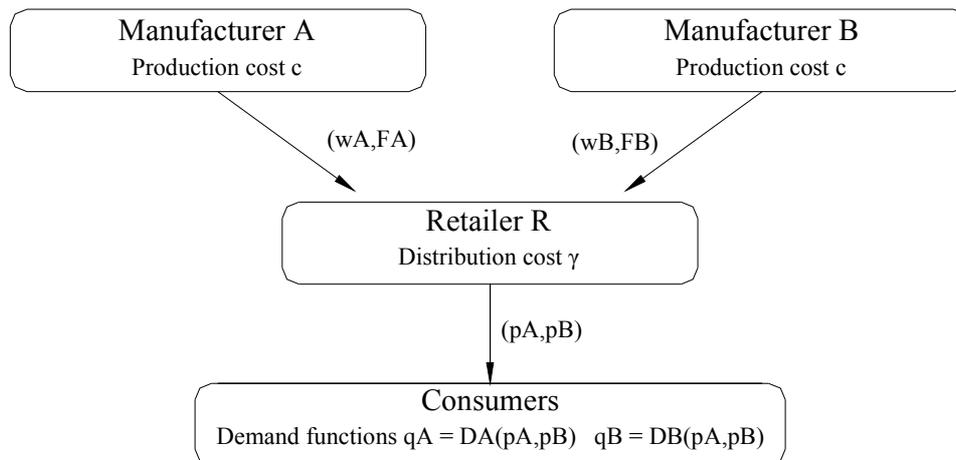


Figure 3.1

Two differentiated manufacturers distributing through the same monopolist retailer

Production and distribution costs are constant and equal to c and γ respectively, p_A and p_B are the retail prices of the products, $D_i(p_A, p_B)$ is the demand for product i and (w_i, F_i) is the two part tariff offered by manufacturer i to the retailer, with $i = A, B$.

The retailer sets the retail prices for the two products, given the wholesale prices set by the manufacturers, in order to maximize downstream profit.

The prices $(p_A^M(w_A, w_B), p_B^M(w_A, w_B))$ are the solutions of the maximization problem:

$$\operatorname{argmax}_{(p_A, p_B)} [(p_A - w_A - \gamma)D_A(p_A, p_B) + (p_B - w_B - \gamma)D_B(p_A, p_B)]$$

Let $\pi_{A+B}^M(w_A, w_B)$ be the maximum retail profit and $q_A^M(w_A, w_B)$, $q_B^M(w_A, w_B)$ the quantities of the two products. If the manufacturers set the wholesale prices equal to the common marginal production cost, then the retailer would set retail prices at their joint-profit maximizing level. Similarly to the case of the multi-product manufacturer previously discussed, if the retailer opts to deal with both manufacturers, then an increase in the sales of the one product implies a reduction in the sales of the other one. Thus, each manufacturer can only charge a fee no greater than the marginal contribution of its product's sales to the overall retailer's profits. In this case again the retailer can enjoy a rent.

If the retailer chooses to carry both brands, its profits are:

$$\pi^R(A, B) = \pi_{A+B}^M(w_A, w_B) - F_A - F_B$$

Whereas, if it chooses to carry only one brand, say brand B, the retail profits are:

$$\pi^R(B) = \pi_B^M(w_B) - F_B$$

with:

$$\pi_B^M(w_B) = \max_{(p_B)} [(p_B - w_B - \gamma)D_B(0, p_B)]$$

The maximum fee that can be charged by manufacturer A is therefore:

$$F_A^{\max} = \pi_{A+B}^M(w_A, w_B) - \pi_B^M(w_B)$$

Manufacturer A will choose its wholesale price in order to maximize its own profits, under the constraint that its franchise fee cannot exceed F_A^{\max} .

If both manufacturers set wholesale prices equal to their marginal production cost, then the retailer will select the joint-profit maximizing prices. If one manufacturer, say B, sets $w_B = c$, then the best response of the manufacturer A would be also to set $w_A = c$, because manufacturer A will have an incentive to maximize the total retailer's profits. In this case, given the contract offered to the retailer by manufacturer B, manufacturer A's profits are equal to the retail profits up to a constant. This is because, in contrast to the multi product manufacturer case, here a single manufacturer cannot control the rent left to the retailer. Given the offer made by manufacturer B to the retailer, manufacturer A treats the retailer's rent as a constant. In this sense manufacturer A has a motive to maximize retail profits, since it can extract all these profits, except for the constant retailer's rent and the constant fee payable to manufacturer B (F_B). Furthermore, it can be proved that this is the only equilibrium.

In the setup examined here, each manufacturer internalizes the impact of its decisions on the rival brand's sales only to the extent that a reduction in those sales affects the retailer's profit margin, i.e. the effect on the rival manufacturer's profit margin is an externality. Yet, when both manufacturers set wholesale prices equal to marginal costs, there is no wholesale markup and the externality is eliminated. With this externality issue solved, the individual manufacturers' decisions will lead to joint-profit maximization.

3.3.2 Two common agents

In this section we will discuss the role vertical restraints can play in a context where there is both upstream and downstream competition, i.e. in a setup where manufacturers can deal with multiple retailers and each retailer can carry the products of many manufacturers. Focusing on such a setup with two manufacturers and two retailers, where only linear pricing can be applied, Dobson and Waterson (2007) emphasize the importance of product differentiation, both upstream and downstream, as well as that of the allocation of bargaining power, in determining the effects of vertical restraints, such as RPM. Their analysis points out that RPM is more likely to be beneficial to welfare when double marginalization problems are more intense, which is the case when the manufacturers have more bargaining power than their retailers.

Rey and Vergé (2002) use a similar setup of a bilateral duopoly and, assuming two-part tariffs can be applied, demonstrate how RPM can be employed to eliminate competition, both in the upstream and in the downstream level, and lead to a collusive outcome.

This argument can be illustrated considering a setup as the one depicted in figure 3.2.

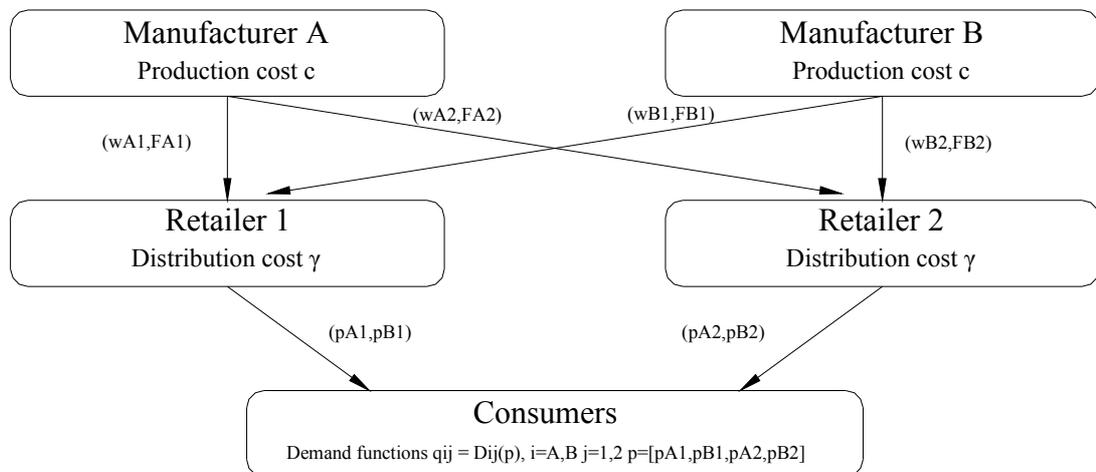


Figure 3.2
Manufacturers and retailers with interlocking relationships

Each of the manufacturers A and B produces a different brand of a product, with the two brands being imperfect substitutes. The manufacturers distribute their products through two differentiated retailers, 1 and 2. Retailer differentiation can be conceived as different retail shop locations, or different level of services provided to the consumer. Consequently, there are four imperfectly substitutable products available in the retail market for the consumers to choose, depending on who the

manufacturer of the product is, and on which retailer the consumer buys the product from. The production and distribution marginal costs are constant and equal to c and γ respectively, while the consumer demand for a product of brand i ($i = A, B$) bought from the retailer j ($j = 1, 2$) is $D_{ij}(\mathbf{p})$ where \mathbf{p} is the vector of the retail prices of all four products available, i.e. $\mathbf{p} = [p_{A1}, p_{B1}, p_{A2}, p_{B2}]$.

Manufacturers offer simultaneously a two-part tariff to each retailer, and also set the retail price. In order to simplify the illustration of the argument, here we will only focus on the case that all offers are accepted, assuming that if any retailer rejects an offer, the market fails and no firm makes any profit. Rey and Vergé demonstrate that the conclusions derived from such a simplified setup still hold true in many other, more realistic setups, so long as retailers have no market power and no manufacturer can exclude its rival from any retailer's store.

When all offers are accepted, retailers set prices so as to maximize their respective profits. That is, for $j = 1, 2$:

$$\pi_j = (p_{Aj} - w_{Aj} - \gamma)D_{Aj}(\mathbf{p}) + (p_{Bj} - w_{Bj} - \gamma)D_{Bj}(\mathbf{p}) - F_{Aj} - F_{Bj}$$

We have assumed that a retailer can either accept both offers or have zero profit, hence the maximum fee a manufacturer can impose, would be such as to leave the retailer with zero profit. In this sense all retail profits will be extracted by the manufacturers, who would impose the maximum acceptable franchise fees. Therefore each manufacturer has an incentive to maximize the total retail profits, given the contract terms offered by its rival, in a way similar to what we have seen in the case of the single common agent.

When only two-part tariffs are used, and RPM is not, the outcome is somewhat competitive. On the one hand there is the effect of retailers acting as common agents for each manufacturer, which helps the manufacturers maintain monopoly retail prices, as demonstrated by Bernheim and Whinston in the single common agent model discussed in the previous section. This effect pushes wholesale prices towards the production marginal cost. On the other hand, in this double oligopoly setup, apart from upstream, there is also downstream competition. Here the manufacturers have a motive to set wholesale prices higher than the production marginal cost, in order to soften downstream competition. But if wholesale prices are higher than marginal cost, then there are positive wholesale profit margins. A manufacturer, when choosing the contract terms it will offer, will not internalize their effects on the rival manufacturer's markup, hence it has a motive to free-ride on the rival's profit margin. This inefficiency will eventually lead to prices below the joint-profit maximizing level.

If manufacturers are able to impose retail prices, they no longer need to use wholesale pricing to soften retail competition. They can easily eliminate all downstream competition using RPM. In this case a manufacturer could set retail prices to their the joint-profit maximizing level (the monopoly level), set wholesale prices equal to marginal production cost and transfer profits from the retailers using franchise fees. If one manufacturer does that, then it would be a best response for the other to follow the exact same steps (as we have seen, given the rival's choices each manufacturer has a motive to maximize total retail profits).

In this sense RPM can be used to achieve the monopoly outcome. Using RPM, the manufacturers manage to eliminate both upstream and downstream competition and enjoy maximum profits.

3.4 Foreclosure

Firms can use vertical restraints to foreclose market access to potential rivals. By signing exclusive dealing agreements with all the available retailers, for instance, a manufacturer can impose difficulties to the entry in the market of a more efficient potential competitor, in the sense that the potential entrant will be forced to set up its own retail network. If the distribution of good in a particular market is characterized by significant economies of scale or scope, such exclusivity deals secured by an incumbent manufacturer would increase the cost of entry of potential competitors. For example, if the retailers distributing an incumbent manufacturer's product, can also distribute the product of a potential entrant, and if selling both brands creates synergies for the retailer, then the potential entrant could enjoy low retail cost by using incumbent retailers. In such a case, exclusive dealing agreements tying retailers to the incumbent manufacturer would force the potential entrant to find other, less efficient ways of distributing its product, thus increasing its cost. The increase in potential rivals costs could be so high, that entry could be prevented.

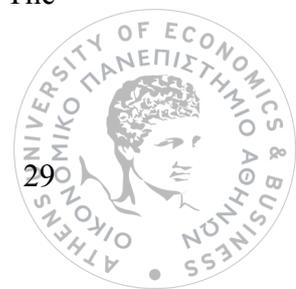
In a similar manner tying-up retailers with exclusive deals might lead to foreclosure in cases when entry in the retail market is difficult, for example when there is only a limited number of retailers of adequate quality, or when appropriate locations for the installation of a retail store are scarce. When retailers are committed to exclusive dealing with an incumbent manufacturer, the cost of entry for a potential competitor is raised, therefore entry itself is deterred.

Such practices of raising a rival's costs that can be employed by a manufacturer to prevent, or just to delay, the entry of a potential rival, can as well be used against incumbent competitors, to help reduce their market shares, or even drive them out of the market.

However, such exclusivity agreements may be harmful for retailers, who might benefit from carrying different brands of products, or from increased upstream competition. Of course retailers can be compensated for such damages if the manufacturer shares with them some of its profits from deterring a rival's entry. Yet the potential of exclusivity agreements as tools facilitating foreclosure has been contested, with economists, mostly by the Chicago School, arguing that such agreements cannot be profitable overall. A retailer would clearly prefer to enjoy upstream competition and dealing with potentially more efficient suppliers, than limiting its options with an exclusivity agreement, and would only accept such an agreement if it was fully compensated by the manufacturer for the loss of profit it would otherwise enjoy. Posner (1976) and Bork (1978) have suggested however, that the extra profits enjoyed by a manufacturer when entry is deterred are not enough to compensate the retailer.

3.4.1 Foreclosure by extracting rents for the entrant

Aghion and Bolton (1987) proposed a way in which exclusivity can be used to at least partially deter entry, giving thereby an answer to the Chicago School. The situation they discussed is presented in figure 3.3.



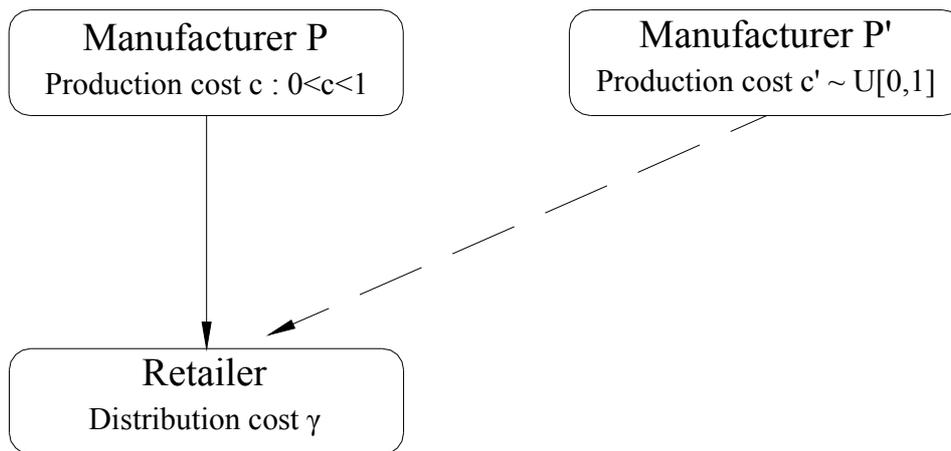


Figure 3.3
Double monopoly with potential upstream entry

The market consists of an incumbent manufacturer P dealing with a retailer D. The marginal production cost of producer P is constant and equal to c ($0 < c < 1$). A potential entrant P' may enter the market. The marginal production cost of the potential entrant is unknown to the incumbents and is uniformly distributed over the interval $[0, 1]$. The retailer is a monopolist in the retail market and has a constant distribution marginal cost γ . The consumer demand is inelastic and equal to $Q=1$, as long as the retail price does not exceed the consumer's reservation price $r > c + \gamma$.

First assume that exclusive dealing is not allowed. The resulting game will consist of the following steps. The potential entrant decides whether to enter the market or not, then, in the case of entry, both manufacturers set their wholesale prices simultaneously, say w and w' for the incumbent and the entrant respectively. Then the retailer buys from the cheapest manufacturer and sells to the consumers at a retail price $p = r$.

It is clear that the potential entrant will enter only if it is more efficient than the incumbent manufacturer, that is when $c' < c$, which occurs with probability c , and if it enters, it will set a wholesale price equal to c . In such a case the profits of each firm involved, i.e. the producers P and P' and the retailer, will be:

$$\pi_P(E) = 0, \quad \pi_{P'}(E) = c - c' \quad \text{and} \quad \pi_D(E) = r - c - \gamma$$

Yet if the potential entrant has a higher cost than the incumbent, which occurs with probability $(1 - c)$, then it will not enter the market, and the incumbent monopolist manufacturer will set a wholesale price $w = r - \gamma$. In this case the profits for each firm will be:

$$\pi_P(N) = r - c - \gamma, \quad \pi_{P'}(N) = 0 \quad \text{and} \quad \pi_D(N) = 0$$

The incumbent manufacturer and the retailer would therefore anticipate ex ante to get profits:

$$\pi_P^* = (1 - c)(r - c - \gamma) \quad \text{and} \quad \pi_D^* = c(r - c - \gamma)$$

Assuming that an exclusive dealing agreement could be signed by the incumbents, we notice that the incumbent manufacturer has no motive to offer a compensation high enough for the retailer to accept such a deal. In this setup exclusive dealing will not appear; this is a result that confirms the Chicago school argument. Yet Aghion and Bolton demonstrate that a milder kind of exclusivity agreements can appear in equilibrium. They suggest that the incumbents could sign a contract, obliging the retailer to pay compensation to the manufacturer, in case the retailer opts to deal with the other supplier. This form of exclusivity contract would therefore consist of a wholesale price w , at which the retailer buys from the incumbent manufacturer, and a penalty p payable to the manufacturer, should the retailer break the exclusivity agreement and deal with a competitor, i.e. with the potential entrant. Under such an agreement, the retailer would choose to break the exclusive relationship and deal with the entrant only if $w' + p \leq w$. The potential entrant would therefore actually enter only if its cost is low enough, namely $c' \leq w - p$. Hence, with probability $(w - p)$ entry occurs, and the entrant charges a wholesale price equal to $w' = w - p$. The retailer's profit, after breaking the exclusivity agreement and dealing with the entrant, will then be $\pi_D = r - w' - \gamma$.

The incumbent manufacturer chooses the contract terms by solving the following maximization problem:

$$\max_{(w,p)} [(w - p)p + (1 - w + p)(w - c)]$$

subject to the constraint that the retailer accepts the exclusivity agreement, i.e.:

$$r - w - \gamma \geq c(r - c - \gamma)$$

The solution of this maximization problem is:

$$\begin{aligned} w^* &= r - \gamma - c(r - c - \gamma) \\ p^* &= w^* - c/2 = (1 - c)(r - c - \gamma) + c/2 \end{aligned}$$

and the expected profits for the incumbent manufacturer are:

$$\pi_p^{ED} = (1 - c)(r - c - \gamma) + c^2/4 = \pi_p^* + c^2/4$$

In such a framework the entrance of a more efficient potential manufacturer can be effectively prevented. A potential rival would only enter if it is much more efficient than the incumbent manufacturer, i.e. if $c' \leq c/2$. The critical factor in this setup is the penalty payable to the incumbent manufacturer if the retailer breaks the exclusivity agreement. Under such a regime an entrant will have to provide to the retailer with compensation equal to the amount of the penalty, in order for the latter to break the exclusivity deal. In essence, the penalty is paid by the entrant. This payment that the entrant makes increases the joint profit of the incumbents, and is shared among them by means of the wholesale price. Therefore, in this setup, exclusive dealing can be profitable to both the incumbent manufacturer and the retailer, since this mild exclusivity arrangement allows them in the case of entry to extract some of the entrant's profits.

3.4.2 Foreclosure by extracting rents from retailers

Another important intuition on the possible foreclosure effects of exclusivity agreements has been provided by Rasmusen, Ramseyer and Wiley (1991). They discuss a way, in which exclusive dealing can effectively be used to deter entry of a more efficient potential rival, that is essentially different than the rent extraction from the entrant suggested by Aghion and Bolton. In the example of Rasmusen, Ramseyer and Wiley only simple two-part tariff contracts are used, without any penalty provisions for breaking exclusivity. The authors' argument is based on the assumptions that entry in the market can only occur if the entrant can sell its product to a minimum number of consumers, that no retailer can distribute this minimum necessary quantity on its own and that retailers cannot effectively coordinate with each other. In such a framework, if an incumbent manufacturer can secure exclusivity agreements with a minimum number of retailers, then entry can be deterred, since the remaining retailers would not be enough to support the minimum sales required by the potential entrant. If entry is indeed deterred, the remaining retailers that have not engaged in an exclusivity agreement are left with no alternative supplier but the incumbent manufacturer, which can then extract some extra rents from dealing with those retailers. The incumbent manufacturer can share some of these extra profits with its exclusive retailers, giving them a motive to accept the exclusivity agreements in the first place. Assuming the manufacturer makes simultaneous offers to all of the retailers, one of the possible equilibria would be that every retailer accepts the exclusivity agreement, for fear of being left the only non-exclusive retailer having to face a monopolist supplier. In such an equilibrium no single retailer would have a motive to unilaterally deviate, since so single retailer can buy large enough a quantity to sustain entry.

However in the setup of Rasmusen, Ramseyer and Wiley, other equilibria are also possible, notably a coalition equilibrium, where retailers coordinate and reject the incumbent manufacturer's offers for exclusive dealing. Segal and Whinston (2000) have demonstrated though, that if the manufacturer can make discriminatory offers to the retailers, the foreclosure equilibrium can be made coalition-proof. When discrimination is possible the manufacturer can control the magnitude of the externality caused by each retailer accepting exclusive dealing to those retailers that are left with no option, thus the manufacturer can customize its offers in such a way, as to rule out retailer coordination, ensuring that foreclosure will be the only equilibrium.

The Segal and Whinston analysis, as well as that of Rasmusen, Ramseyer and Wiley, is based on the assumption that there is no competition among retailers. Retailers are treated as final consumers of the products, which is equivalent to assuming that each retailer is acting as a monopolist on its own independent market. Fumagalli and Motta (2006) extend the analysis, allowing for competition between retailers. The most significant result of this analysis is that if the competition among retailers is intense, then they will not accept exclusivity agreements with the manufacturer. At the extreme case, distributors would compete à la Bertrand in the retail market, and each retailer would by definition be able to fully cover market demand, hence an essential assumption of Aghion and Bolton would no longer hold true. In such an extreme setup, when all other retailers have accepted exclusivity agreements, a single retailer would have a motive to decline the exclusivity offer, deal

with the more efficient potential entrant and capture the entire market. In this sense Fumagalli and Motta emphasize that exclusive dealing can only be harmful, by facilitating foreclosure, when competition is limited, a result consistent with what we have seen in many other cases of vertical restraints applications.

3.4.3 Foreclosure in both upstream and downstream markets

Comanor and Rey (2000) have proposed yet another way in which exclusivity agreements can be used to deter efficient entry, pinpointing that when entry is possible both upstream and downstream, then incumbents in both levels may have an incentive to deter it, by engaging in an exclusive relationship. In specific, they examine a setup, where an entry that occurs in either the upstream or the downstream level not only introduces (or strengthens) competition at that level, but also triggers entry in the other level, thus introducing (or strengthening) competition in the other level as well. If such an increase in competition in both levels actually occurs, it may negatively affect the profits of incumbent firms at both levels. Hence the incumbents may have an incentive to commit in an exclusive dealing agreement. To illustrate this point consider an extension of the Aghion and Bolton setup, as shown in figure 3.4.

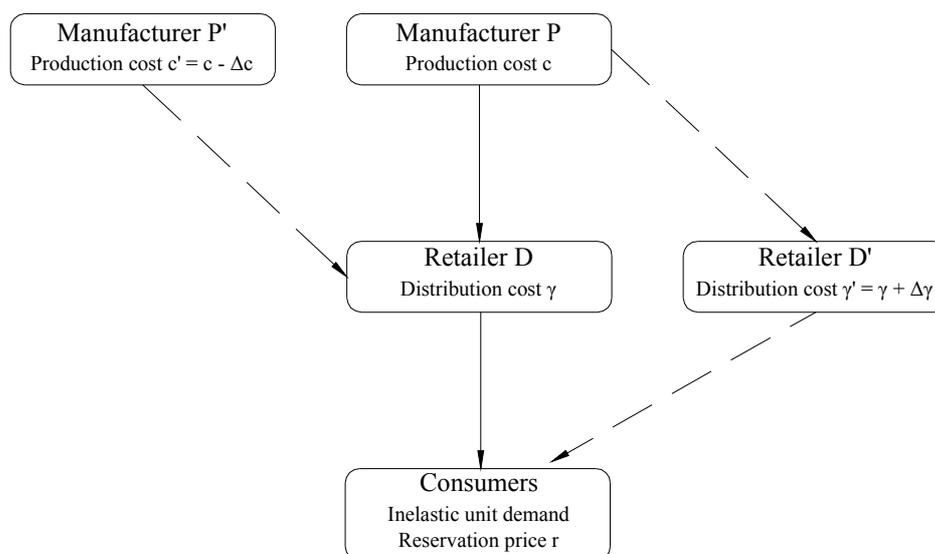


Figure 3.4
Potential entry in both the upstream and downstream level

An incumbent manufacturer P, producing with constant marginal cost c , distributes its product through an incumbent retailer D, which faces a constant marginal distribution cost γ . The consumer demand is inelastic and equal to one unit ($Q = 1$), while the consumer's reservation price is r , with $r > c + \gamma$. Since both firms are monopolists, each in its respective market level, the retailer will set a retail price equal to r , and the two incumbents will share a total profit equal to:

$$\pi_P^* + \pi_D^* = r - c - \gamma$$

Now assume that the incumbent retailer can be supplied by a more efficient alternative manufacturer P', producing with marginal cost $c' = c - \Delta c$, and the incumbent manufacturer can distribute its product through another retailer D', which however is less efficient than the incumbent, having a marginal distribution cost equal to $\gamma' = \gamma + \Delta\gamma$. Also assume that the alternative manufacturer does not have access to the alternative retailer (which would be equivalent to assuming that the incumbent manufacturer sets up its own distribution network), and that if entry occurs at any level, firms will compete à la Bertrand. Finally assume that $c + \gamma' \leq r$, which ensures that even the less efficient possible vertical structure is viable.

If the incumbents are not bound by an exclusivity agreement, the incumbent retailer will have a motive to switch to the more efficient alternative manufacturer, and the incumbent manufacturer will be left with no other option, but to switch to the less efficient alternative retailer. In this context, entry at the upstream level does not only introduce competition in that level, but is also triggers entry in the downstream level, introducing competition there as well. The result is two competing vertical structures, the efficient one formed by the couple P'-D, with total cost $(c + \gamma - \Delta c)$, and the less efficient one formed by the pair P-D', with total cost $(c + \gamma + \Delta\gamma)$. In the upstream level Bertrand competition among manufacturers leads to a wholesale price equal to c , while in the retail market competition in prices among distributors yields a retail price equal to $(c + \gamma + \Delta\gamma)$. Only the efficient vertical structure will be active in equilibrium, and the profits of each firm will then be:

$$\pi_P^{**} = \pi_D^{**} = 0, \quad \pi_{P'}^{**} = \Delta c, \quad \pi_{D'}^{**} = \Delta\gamma$$

Therefore, assuming $\Delta\gamma$ is small enough, in the case of double entry the joint profits for the pair of the incumbents are lower than when no entry occurs, i.e.:

$$\pi_P^{**} + \pi_D^{**} = \Delta\gamma < r - c - \gamma = \pi_P^* + \pi_D^*$$

In such a context the two incumbent firms may find it profitable to engage in an exclusive dealing relationship. Exclusive dealing could be attractive for both incumbents, even when the manufacturer has all the bargaining power, case in which one would expect the retailer to be willing to promote upstream competition. Since the joint profits are greater in the exclusive dealing case, the manufacturer can always offer the retailer a large enough portion of those joint profits, by setting a lower wholesale price, to make exclusive dealing attractive to the latter.

3.4.4 Foreclosure imposed by retailers' bargaining power

Marx and Shaffer (2006) discuss another way in which vertical restraints can result to foreclosure. They demonstrate that when retailers have high bargaining power, they can impose upfront payments by the manufacturers as a prerequisite to deal with them, called slotting allowances, which can have exclusionary effects. The authors examine a standard intra-brand competition model, a monopolist manufacturer dealing with multiple retailers and negotiating sequentially with each one of them, where it is assumed that the retailers have all the bargaining power. As

we have seen earlier, when the manufacturer has the bargaining power, then two-part tariffs are sufficient for the vertical structure to achieve joint-profit maximization, and in equilibrium the manufacturer would charge a wholesale price above the marginal production cost, in order to control the downstream competition between its retailers, and a franchise fee sufficiently high to collect all the remaining retail profits. However in the setup examined by Marx and Shaffer the retailers make take-it-or-leave-it offers to the manufacturer, imposing the terms of the agreements. In particular, retailers make offers including an upfront payment U (the slotting allowance), paid by the manufacturer at the moment the contract is signed, a franchise fee F paid by the retailer if it eventually buys the product, and a wholesale price w . The authors show that under those conditions the manufacturer is always effectively prevented from dealing with at least one retailer, a result that stands in contrast with the standard intra-brand competition models, which predict joint-profit maximization.

To illustrate this argument, suppose the monopolist manufacturer can distribute its product through two retailers, A and B, with the marginal cost of production being constant and equal to c , the constant marginal distribution cost being equal to γ , and Π_i^M ($i = A, B$) being the maximum joint profit of the vertical structure when only retailer i is active in the retail market. Assume $\Pi_A^M \geq \Pi_B^M$, namely that retailer A is the dominant retailer.

To begin with, notice that in this framework there cannot be an equilibrium, in which all retailers are active in the downstream market. If both retailers being active was an equilibrium, this would mean that the manufacturer would be indifferent (at the very least) between accepting both offers and accepting only one of them. But if the manufacturer dealt exclusively with one retailer, say retailer B, then this retailer would enjoy more gross profit than if both retailers were active, therefore retailer B would have a motive to offer a higher rent to the manufacturer, attracting it to an exclusive relationship.

In a specific example, assume retailer A offers to pay a wholesale price equal to the upstream marginal cost c and demands an upfront payment from the manufacturer equal to $\Pi_A^M - \Pi_B^M$, to be paid when the contract is signed and regardless of whether or not the retailer actually buys the product. The retailer also offers to pay a fixed fee equal to Π_A^M if it actually buys the product. If the manufacturer accepts this offer only, it will end up having a profit equal to Π_B^M , while retailer A will eventually gain $\Pi_A^M - \Pi_B^M$ and retailer B will have no profit, since it does not enter the market. The manufacturer would certainly not improve its position by dealing exclusively with retailer B, since the total profits generated in the retail market in this case are by definition Π_B^M . Furthermore, if the manufacturer accepts both offers, then retailer A will choose not to actually buy the product, because the retail competition will reduce its profit and it will no longer be able to afford to pay the agreed fixed fee, which is equal to Π_A^M . So retailer A will withdraw from the market and enjoy a profit equal to the upfront payment $\Pi_A^M - \Pi_B^M$. As a consequence the manufacturer will have to deal exclusively with retailer B, and the maximum profit the manufacturer could make would be $\Pi_B^M - (\Pi_A^M - \Pi_B^M)$, which is always less than Π_B^M , that would be the upstream profits from dealing exclusively with retailer A.

This example illustrates that by agreeing to pay a large fixed fee if it actually buys the product, the dominant retailer can impose exclusive dealing, thereby excluding the other retailer from the market. That happens because if the manufacturer accepts both retailers' offers, then the dominant retailer can opt not to buy the product.

However, as demonstrated by Rey, Thal and Vergé (2006), if retailers can make offers conditional on exclusive or non-exclusive dealing, then three-part tariffs as the ones discussed above (consisting of an upfront payment, a fixed fee and a wholesale price) are unlikely to lead to exclusion. The authors show that with contingent three-part tariffs non-exclusionary equilibria always exist, and there are equilibria, in which joint-profit maximization is achieved. In such a generalized setup, three-part tariffs may harm consumers by causing higher prices, compared to what would be the case under two-part tariffs, but at the same time three-part tariffs benefit consumers by allow them to find the product in both retailers' stores. The welfare effect of this form of non-linear pricing is therefore unclear, but is more likely to be positive when there is strong competition among retailers. Exclusionary equilibria are more likely when intra-brand competition is strong, thus three-part tariffs, by preventing exclusion, are then more likely to have a positive impact on welfare.

Other types of vertical restraints have also been suggested as means to facilitate foreclosure. In general, vertical restraints that alter a firm's incentives and behaviour vis-à-vis its competitors can be employed to deter entry. By altering its partner's behaviour, an incumbent firm can commit itself to be aggressive in case of entry. For example, a retailer selling a product in an exclusive territory would probably be more aggressive in the event of a geographically limited entry of a competing brand, than the manufacturer of the product would be, if it distributed the product itself. While the manufacturer might consider a less fierce response to competitor entering the territory, for fear of cannibalizing the sales of its product in neighbouring territories, the independent exclusive retailer of this territory would not internalize any such effects and would compete more intensely with the new rival.

4. Conclusions

A first conclusion arising from the above discussion would be that there is no simple way to tell whether a specific type of vertical restraint generally has a welfare-beneficial or welfare-detrimental effect. We have seen examples of both price restraints (such as RPM) and non-price restraints (such as exclusive dealing) improving welfare in some cases, while harming it in others, depending on the specific market structure and conditions, under which those restraints are used. Therefore it is the context in which a vertical restraint is used, that determines its effects, rather than the nature of the restraint itself. Thus there can be no simple rule-of-thumb to determine whether an application of vertical restraints has socially harmful or beneficial effects. A case-specific analysis is necessary to establish whether a specific restraint in a specific context is damaging welfare or not. In this sense a per-se rule, regarding the prohibition or not of a particular type of vertical restraint makes little economic sense. The adoption of a per-se rule for a particular type of restraint, rather than dealing with it on a case-by-case basis, might however be justified by other reasons. For example a per se rule might be preferable, if using such a rule reduces transaction costs or solves legal uncertainty problems.

We have also seen that in many cases different types of vertical restraints can be used by firms to achieve the exact same final outcome. That given, it makes less sense to explicitly ban a particular type of restraint, while allowing other types, that can be used to yield the exact same result. This argument also implies that vertical restraints should rather not be regulated by simple per-se prohibition rules.

Vertical restraints can have efficiency improvement effects. The choices of each firm within a vertical structure usually affect the profits of all firms within this structure, as well as total welfare. However each individual firm is likely not to internalize the effects of its choices on the other firms of the structure. It is thus unlikely that the decisions of the individual firm will lead to maximization of the joint profits of the vertical structure. Restraints that help firms within a vertical structure to coordinate can thus improve the efficiency of the structure. Vertical restraints can facilitate coordination in various ways. The most straightforward such way is the centralization of the decision making, for example by letting the manufacturer decide on the retail prices or on the level of retail services to be provided to final customers. Apart from that, vertical restraints can be used to help the decision maker internalize the effects of its decisions on the interests of the other firms within its vertical structure. A typical example are two-part tariffs, which can be used by a manufacturer to make the retail profits achieved by the distributor equal to the overall profits of the vertical structure (up to a constant). In such a context there is no external effect caused by the retailers pricing decisions and the retailer would thus make such choices as to maximize the joint-profits of the vertical structure. Moreover, vertical restraints can be used to solve free-riding problems between retailers of the same vertical structure. Restraints such as assigning exclusive territories can mute intra-brand competition, thus eliminating any free-riding among retailers.

Restoring the efficiency of the vertical structure, apart from improving the profits of the structure, is often also beneficial for social welfare. The lack of coordination within a vertical structure can lead to excessive pricing in the retail market, as when double marginalization occurs. Solving such inefficiencies reduces

the retail price, therefore also benefits consumers. Since both profits and consumer surplus are improved, restoring efficiency has a positive overall impact on welfare.

However this is not always the case. As we have seen in the case of retail services provision, restoring the efficiency of the vertical structure increases its profits, but does not necessarily benefit consumers overall, since the vertical structure focuses on capturing the marginal consumers, and in so doing it may harm the average ones, reducing total consumer surplus. We have also seen cases, where vertical restraints can act as a commitment technology, solving opportunistic behavior problems and allowing a manufacturer to exercise its potential market power, thus harming consumers, as well as cases where vertical restraints can be used in various ways to dampen inter-brand competition and support collusive outcomes. Moreover we have seen many ways in which vertical restraints can be employed by incumbent firms to prevent potential rivals from accessing a market, thus harming competition and helping the incumbents sustain high prices, damaging consumer surplus.

These remarks support the argument that the legal treatment of vertical restraints should not be based on banning particular types of restraints, considering them as harmful and thus illegal per se, and allowing others, regardless of the context within which they are used.

Efficiency effects and anti-competitive effects are likely to co-exist in a single vertical restraints case. This makes the evaluation of the overall impact of vertical restraints on welfare a complex task, since both the potential positive and negative effects of the restraints have to be taken into account. However, an important concept arises from the review of the literature, which can be useful as a general guideline for assessing the welfare impact of vertical restraints. In almost every case we have discussed, we have seen the importance of the structure of the market, and in specific the importance of the intensity of competition, in determining the impact of vertical restraints on welfare. In some cases we have seen that even when competition is strong, vertical restraints can have welfare damaging effects. We have seen that price restraints can be used to achieve the collusive outcome in markets with interlocking upstream-downstream relations, or to facilitate cartelization by increasing the observability of a potential deviation from a cartel agreement. However, in most of the cases we have noticed that in a competitive market environment the use of vertical restraints is unlikely to have a negative impact on welfare. In the case of services provision, for instance, the existence of inter-brand competition can soften the negative impact of the restraints by providing average consumers with alternative options. Strong intra-brand competition may render two-part tariffs useless as a tool to enable manufacturers to commit themselves to non-aggressive behavior by delegating decision-making power to retailers. Intense competition in the retail market makes it hard for a manufacturer to use exclusivity agreements to foreclose a potential rival.

Therefore a general guideline could be that when the structure of the market ensures that competition among rival vertical chains is strong, vertical restraints are more likely to have a positive overall impact on welfare, by improving the efficiency of the vertical structures, and are unlikely to have anti-competitive consequences. Hence, in strongly competitive market environments vertical restraints would generally not worth much attention from the competition authorities, since the majority of such cases, if examined, would be found harmless to welfare.

On the contrary, when competition in a market is weak, it is likely that vertical restraints will have anti-competitive effects, ranging from facilitating coordination among firms present in the market, to foreclosing access to the market to potential entrants, and those anti-competitive effects can often overwhelm the benefits of any

improvement in efficiency, leading to a negative impact not just on consumer surplus but on overall social welfare. It is on such applications of vertical restraints therefore, that the competition authorities should focus their investigations.

Nevertheless, when assessing the competition conditions of a market and the effects of vertical restraints, competition authorities should focus on inter-brand competition as well, rather than on intra-brand competition only. We have seen examples of vertical restraints that totally eliminate intra-brand competition, but have no negative impact on total welfare, because intra-brand competition is strong enough not to allow the coordinated vertical structure to exercise its potential market power.

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