

# The Economics of Vertical Restraints\*

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## 1 Introduction

Most relationships between producers and distributors consist of sophisticated contracts using more than the simple linear pricing rules that are the heart of most microeconomic textbooks. Instead, they are often governed by contractual provisions, referred to as *vertical restraints*, that not only set more general terms for payments (non-linear prices - two-part tariffs, quantity discounts -, royalties, slotting allowances), but also include terms limiting one party's decisions (resale price maintenance, quantity fixing, tie-ins) or softening competition (exclusive dealing, franchising, exclusive territories).

The motivations for vertical restraints and their impact on economic welfare have been actively debated by academics. Some believe that vertical agreements are very different from agreements between competing firms and appear only when they help improving the efficiency of the vertical structure. Competition agencies should therefore let firms design

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these arrangements as they wish. Others believe that any contractual term that restrict one party's freedom of trade - and this would be the case for most if not all vertical restraints - can only be harmful and should thus be banned. This paper aims at offering an economic perspective on this debate.

## 1.1 Common vertical restraints

We first briefly describe the most common vertical restraints building on the classification proposed by Rey and Tirole (1986).

### 1.1.1 Payment schemes

A uniform price constitutes a linear pricing rule according to which the payment is proportional to the quantity bought by the distributor. Several provisions allow the firms to depart from this constant unit price.

- *Non-linear tariffs*

The simplest form of non-linear pricing consists in including, besides the uniform wholesale price ( $w$ ), a franchise fee ( $F$ ). This combination ( $T(q) = F + wq$ ) is also referred to as a *two-part tariff*. Other forms of non-linear tariffs include progressive rebates on the quantity bought by the distributor (*quantity discounts*). Note that it suffices to observe who carries the manufacturer's products to enforce a franchise fee provision, whereas more general non-linear prices may be more difficult to enforce if arbitrage is possible: for instance, if the manufacturer is unable to observe the quantity sold by each retailer, the distributors might then be able to get a higher rebate by pooling their orders.

- *Royalties*

Royalties are another kind of payment, based on the distributor's sales measured either in units or in revenues. Contrarily to linear or non-linear wholesale tariffs, royalties do not depend solely on the quantity bought to the manufacturer but also on the quantity actually sold by the distributor. Royalties may depend as well on the sales of other goods by the retailer, thereby allowing the manufacturer to

impose a tax on the rival's products. Note that royalties are effective only if the manufacturer is able to closely monitor the distributor's sales.

All these different payment structures directly affect the way the joint profit is shared between the producer and the distributor, but also indirectly affect the "targets" (retail prices, promotional effort, ...) that determine this joint profit.

### 1.1.2 Provisions limiting the parties' rights

- *Resale price maintenance (RPM)*

Resale price maintenance is a provision according to which the final price charged to consumers is not set by the distributor but imposed by the producer. This restriction has several variants, including maximum retail price (price ceiling), minimum price (price floor), non-binding "recommended retail price" or advertised price. Resale price maintenance or price floors supposes that price cuts can be detected at a sufficiently low cost. Note that these price cuts can take the form of non-monetary concessions such as free delivery for instance.

- *Quantity fixing*

Quantity fixing is a provision that specifies the quantity to be bought and resold by the retailer. Variants include quantity forcing which imposes to purchase a minimum quantity, and quantity rationing which specifies a maximum quota. If demand is known and depends only on the final price, then quantity forcing is equivalent to a price ceiling and quantity rationing to a price floor, and therefore quantity fixing is equivalent to resale price maintenance.<sup>1</sup>

- *Tie-in*

Tie-in provisions imposes on the distributor to buy one or more goods from the manufacturer on the top of the ones that the distributor initially wants to carry. *Full-line forcing* is a particular type of tying which requires the distributor to carry the manufacturer's whole range of products. The use of tie-in supposes that the manufacturer can verify the range of goods actually carried by the distributor.

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<sup>1</sup>This equivalence between price and quantity controls vanishes if the distributor can sell to or buy from other distributors.

- *Exclusivity clauses*

Producer and distributor may also sign exclusivity agreements. These exclusivity clauses might limit only the distributor's or both parties rights.

Under an *exclusive dealing* agreement, the distributor agrees not to engage in any other business that competes directly with the manufacturer's activities (or even in any other business). A variant consists of *exclusive purchasing* which requires the distributor to buy all goods exclusively from the manufacturer.

Territorial or customer provisions may limit the "territory" (either geographical or defined as a specific segment of the market such as distribution through mail rather than through retail stores) or the group of customers (small versus large businesses, individual customers versus business clients) that a particular distributor is allowed to serve. On the other hand, by granting an *exclusive territory*, the manufacturer commits itself not to allow any other distributor to serve the customer in this territory thereby eliminating any intrabrand competition. Enforcing territorial provisions may be rather difficult: while it is relatively straightforward to set the number of outlets at a given location, it may be more difficult to check whether a distributor is competing outside its territory.

This list is of course not exhaustive. The manufacturer may for example commit itself to a minimum quality, to specific (nationwide) advertising or to technical support; the distributor may commit itself to specific level of promotional effort or customer services (e.g after-sales services). Some other clauses may limit one party's right to compete with the other after termination of the relationship.

## 1.2 Legal treatment

In this section we briefly present the legal situation of vertical restraints in the United States and the European Union. In both jurisdictions, cases involving vertical contracts can be deemed illegal either because they restrict competition (Section 1 of the Sherman Act in the U.S. or Article 81 of the European Communities Treaty) or because they constitute an abuse of dominant position (Section 2 or Article 82).

### 1.2.1 U.S. competition policy towards vertical restraints

Vertical restraints have been part of antitrust enforcement in the U.S. for a long time. It was as early as 1911 that the Supreme Court ruled in *Dr. Miles* that resale price maintenance was illegal *per se* and this ruling still governs such agreements.<sup>2</sup> Although there is a long history of antitrust towards vertical restraints, policies have not been consistent over time and have often changed sharply over relatively short periods of time.<sup>3</sup> If the attitude of competition authorities and enforcement agencies towards minimum RPM has been constant over time (*per se* illegality), this has not been the case for non-price restraints especially over the past 30 or 40 years. In the early 1920's following cases such as *Standard Oil* or *Colgate*, vertical restraints were usually assessed on a case-by-case basis.<sup>4</sup> This was then confirmed in 1963 in *White Motors* when the Supreme Court stated that it knew “*too little of the actual impact of (exclusive territories)*” and that “*the legality of the territorial and customer limitations should be determined only after a trial.*”<sup>5</sup> A sharp turn then occurred in 1967, when following the *Schwinn* ruling all vertical restraints became illegal *per se*.<sup>6</sup> This very tough attitude towards all vertical restraints was heavily criticized especially by the so-called Chicago School and the authorities eventually adopted a more permissive attitude towards non-price restraints ten years later: in 1977, the Supreme Court concluded in *GTE Sylvania* that pro- and anti-competitive effects should be evaluated and that these restraints should therefore be treated under the Rule of Reason.<sup>7</sup> Price restraints (such as RPM) however remained illegal *per se*. A further move towards a very lenient policy started when the Reagan administration took office in 1981. It was then widely accepted that vertical restraints were likely to be pro-competitive and, when the *Vertical Restraints Guidelines* were published by the U.S. Department of Justice in 1985, they were regarded as rendering all non-price restraints legal. As noted by Comanor and Rey (1997) it is then “*hardly surprising that neither federal antitrust*

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<sup>2</sup>See *Dr. Miles v. John D. Park & Sons Co.*, 220 U.S. 373 (1911).

<sup>3</sup>For a more exhaustive presentation of the evolution of competition policy in the U.S. see Kovacic and Shapiro (2000).

<sup>4</sup>See *Standard Oil Co. v. United States*, 221 U.S. 1 (1911) and *United States v. Colgate & Co.*, 250 U.S. 300 (1919).

<sup>5</sup>See *White Motors Co. v. United States*, 372 U.S. 253 (1967).

<sup>6</sup>See for instance *United States v. Arnold, Schwinn & Co.*, 388 U.S. 365 (1988).

<sup>7</sup>See *Continental T.V, Inc. v. GTE Sylvania*, 433 U.S. 36 (1977).

*agency brought a single case against a vertical restraint during the twelve Reagan - Bush years.”*

Following another change of administration, competition policy switched again towards an active enforcement under the rule of Reason as it was stated in 1996 by Robert Pitofsky, the then Federal Trade Commission (FTC) chairman: *“The Commission of the 1990s has tried to strike a middle ground between what many people believe was an excessively active enforcement in the 1960s and the minimalist enforcement of the 1980s. In the process we have restored much of the antitrust agenda that was abandoned during the period 1980 through 1988. For example, the Commission investigates and is prepared to enforce the law against resale price maintenance agreements, some carefully selected non-price vertical restrictions, attempts to monopolize, boycotts and vertical and conglomerate mergers - all areas of antitrust that were left completely or largely unenforced during much of the 1980s.”*

This move towards active enforcement was confirmed as early as May 1996 when the FTC brought charges against *Toys R Us* for abuse of dominant position and exclusionary practices. In 1998, *Toys R Us* was requested to stop the “warehouse policy” that it had first introduced in 1992.<sup>8</sup> The FTC (as expressed by its then chairman Robert Pitofsky) explained that *“Toys R Us wanted to prevent consumers from comparing the price and quality of products in the clubs to the price and quality of the same toys displayed and sold at Toys R Us, and thereby to reduce the effectiveness of the clubs as competitors.”* *Toys R Us* was in essence forcing the manufacturers not to sell to the warehouse clubs which were threatening its market shares. The agreement between *Toys R Us* and its main suppliers (including major toy manufacturers such as *Mattel*, *Fisher Price* or *Tyco*) imposed for instance that all special, exclusive or clearance products had to be offered first to *Toys R Us* to see if it wanted to buy the product. New or promoted products could be sold to warehouse clubs only if they were carrying the manufacturer’s entire line. It appeared that the *Toys R Us* was carefully enforcing the agreement by threatening to stop buying from any producer that was reported to have “cheated the agreement” and sold to warehouse clubs. This policy proved to be very effective as noted by the FTC:

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<sup>8</sup>This decision was later confirmed by the Court of Appeals (7<sup>th</sup> Circuit) in 2000. See *Toy R Us, Inc. v. FTC*, Docket 9278.

“After the boycott took hold in 1993, Costco’s toy sales decreased by 1.6 percent despite total sales growth of 19.5 percent. (...) (R)eversal of the clubs’ success as toy retailers can also be seen by examining individual toy manufacturer’s sales to the clubs. For example, Mattel’s sales to warehouse clubs declined from over \$23 million in 1991 to \$7.5 million in 1993.” In 1997, 44 states, the District of Columbia and Puerto Rico sued *Toy R Us* (and the manufacturers involved in the boycott) and in a settlement in 1999, the firms agreed to pay an aggregate sum of more \$56 million (in cash for costs of suits and fees, and in charitable distribution of toys).<sup>9</sup> As noted by Comanor and Rey (1997), this was “a sharp break from past enforcement practices, under which such restraints were rarely if ever challenged.” Another important implication of the case is that large distributors could be sued for abuse of dominant position although their market shares might not be very large. In his case, *Toys R Us* share of toys sales nationally was only 20%. However, the FTC noted that although “*Toys R Us* market as a toy retailer was measured, it was clear that its boycott was having an effect on the market.”

The *Toys R Us* marked a major change towards a more vigorous enforcement and since then, U.S. authorities have continued their efforts and opened a number of cases involving major firms, the most famous one being the everlasting case against *Microsoft*. Recent cases with important vertical components such as *United States v. Microsoft*, *LePage v. 3M* or the U.S. D.O.J. investigation of *Orbitz* seem to signal a more active enforcement policy towards vertical restraints.<sup>10</sup> Although these are all important cases, we will not detail them here as they involve issues on tying and foreclosure that are considered in another chapter.

### 1.2.2 European Competition Policy towards vertical restraints

In contrast to U.S. antitrust laws which date back to 1890 and are primarily concerned with the promotion of competition, European Competition Law is much more recent and promoting competition is not a goal in itself but only a mean to achieve single market integration. Under Article 81(1) of the European Communities Treaty, any agreement

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<sup>9</sup>See *State of New York, et al. v. Toys R’ Us, et al.* (1997 MDL 1211 - U.S.D.Ct., Eastern District of New York).

<sup>10</sup>See *United States v. Microsoft*, Civil Action No 98-1232 and *LePage v. 3M*, 324 F. 3d 141 (3d Circ. 2003).

“which may affect trade between Member States and which has as (its) object or effect the prevention, restriction or distortion of competition within the common market” is prohibited. As mentioned by Verouden (2003), “the Commission has fairly consistently chosen a strict interpretation of the concept of restriction of competition.”<sup>11</sup> This has been and is still particularly true for territorial restraints especially if the boundaries of these territories are national borders and such agreements are used to restrict parallel imports. In 1964, the Commission concluded in *Grundig - Consten* that an exclusive dealing agreement that made *Consten* the exclusive supplier of various *Grundig* products in France was restrictive because it was preventing re-exports by *Consten*.<sup>12,13</sup> This case was also the first to establish that vertical and not only horizontal agreements fell under Article 81(1). More recently, *Nintendo* (and some of its distributors), *Volkswagen A.G.*, *Opel Netherlands B.V.* and *DaimlerChrysler A.G.* were respectively fined EUR 168 million, 90 million, 43 million and 72 million for attempting to restrict parallel imports.<sup>14</sup>

A particular feature of European Competition Law is that, under Article 81(3), agreements that fall under the scope of Article 81(1) and should therefore be banned, may 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.” When the implementation of Article 81 came into force in 1962, under regulation 17/1962 an agreement had to be notified to the Commission in order to benefit from an exemption. As a result, within a few years the Commission was overwhelmed by the number of notifications. To speed up the process, the European Commission then identified categories of distribution arrangements (e.g. exclusive dealing or franchising agreements) which were exempted in block. This rather formalistic and bureaucratic ap-

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<sup>11</sup>Verouden (2003) also offers an extensive survey of the interpretation and application of Article 81(1) over the past 40 years.

<sup>12</sup>It is worth noting that the rules implementing Article 81(1) - which was then known as Article 85(1) of the Treaty of Rome (signed in 1957) - only came into force in 1962.

<sup>13</sup>This decision was confirmed in 1966 by the European Court of Justice. See Commission Decision, *Official Journal of the European Communities* 161, 20 October 1964, and European Court of Justice, *Consten and Grundig v. Commission*, joined cases 56/64 and 58/64, 13 July 1966.

<sup>14</sup>See case *Nintendo* COMP/35.587 [Commission Decision, *OJ L255*, 8 October 2003], *Volkswagen A.G.* COMP/36.693 [Commission Decision, *OJ L262*, 2 October 2001], *Opel Netherlands B.V.* COMP36.653 [Commission Decision, *OJ L59*, 28 February 2001] and *DaimlerChrysler A.G.* COMP 38/0.64.

proach was often criticized for creating “straight-jackets”, and calls were made for a more flexible, economic-based approach. In 1996, the Commission published a Green Paper on Vertical Restraints, which included an economic analysis of the impact of vertical restraints on competition. The conclusions of this Green Paper and the debate that followed led to the adoption of a new Block Exemption Regime in 1999, the publication of new guidelines in 2000 and the removal of the obligation of notification in May 2004.<sup>15</sup> These new guidelines take on board most insights from the economic literature and constitute a major shift of policy; in particular, decisions are no longer based primarily on the type of restraint considered but also account for the market environment: *“For most vertical restraints, competition concerns can only arise if there is insufficient inter-brand competition, i.e. if there is some degree of market power at the level of the supplier or the buyer or at both levels. If there is insufficient inter-brand, the protection of inter- and intra-brand competition becomes important.”*

Although the enforcement of Article 81 has changed over the years, price restraints such as resale price maintenance (RPM) have always been banned per se (although recommended retail prices and maximum prices are acceptable). The Commission’s view can be summarized by the *Pronuptia* decision in which the Commission found that RPM was restricting intrabrand competition:<sup>16</sup> *“certain provisions restrict competition between the members of the network. That is true of provisions (...) which prevent franchisees from engaging in price competition with each other.”* RPM is thus on a “black list” of practices that would prevent any exclusive dealing or franchising agreement to be granted exemption under the block exemption regime.

The authorities attitude towards non-price restraints is much more lenient. Territorial or customer restrictions may be granted exemption under Article 81(3) except if they prevent parallel imports: exclusive territories provisions have for instance been granted exemption in the *Pronuptia* case and in a number of other franchising agreements considered by the Commission, territorial or customer restrictions qualified for exemption. At the same time similar arrangements have been deemed illegal in the *Grundig - Consten*

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<sup>15</sup>See Commission Regulation (EC) 2790/99, OJCE 1999 (L336), Commission Notice - Guidelines on Vertical Restraints, OJCE 2000 (C291) and Council Regulation (EC) 1/2003, OJCE 2003 (L1).

<sup>16</sup>See *Official Journal of the European Communities* 13, 15 January 1987.

case since their effect was to restrict parallel imports. Following a very similar line of argument, exclusive purchasing clauses which are seen as restriction of competition and thus fall under Article 81(1) have often been exempted under Article 81(3). This is usually the case for franchising agreements in which “*an obligation not to buy from alternative suppliers must be justified by the need to protect the identity or reputation of the network or the franchisor’s intellectual property.*” It should nevertheless be noted that the decision to grant exemption for territorial restrictions or exclusive purchasing requirements depends on the type of distribution arrangements. Although they are usually acceptable when included in franchising agreements they tend not to be exempted under exclusive or selective distribution agreements.

Although some of the major recent antitrust cases outside cartel enforcement have been in relation to restriction of parallel imports - thereby confirming the importance of single market integration as a goal -, some recent decisions are direct evaluation of the anti-competitive effects of vertical restraints. In 2001, *Michelin* was fined EUR 20 million for abuse of dominant position (Article 82) for using a system of rebates (a particular kind of non-linear tariff) that induces retailers to buy exclusively from *Michelin* and thus prevented them from choosing freely.<sup>17</sup> In March 2004, *Microsoft* was fined a record EUR 497 million for abuse of dominant position on the market for operation systems for PCs for practices amounting to bundling.<sup>18</sup>

In October 2004, the European Commission moved closer to reach a settlement with *The Coca-Cola Company (TCCC)* to end its five-year long investigation of the company’s practices.<sup>19</sup> Using a new competition policy tool that offers firms the possibility to make voluntary binding commitments to settle a case, *TCCC* offered to remove some majors conditions from its contracts with its customers. It will thus stop offering target and growth rebates or exclusivity arrangements. It will also stop requiring customers to buy less popular products such as *Vanilla Coke* or *Sprite* in order to obtain the best-selling products that are *Coca-Cola* and *Fanta Orange*. Finally, customer will be allowed to use 20% of the space in the coolers provided for free by *TCCC* to store any product of their

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<sup>17</sup>See case *Michelin* COMP/36.041 [Commission Decision, *OJ L143*, 31 May 2002].

<sup>18</sup>See case *Microsoft* COMP/37.792.

<sup>19</sup>See case *TCCC* COMP/39.116.

choice.<sup>20</sup> According to the Commission, these commitments “*will bring more competition to the European market for carbonated soft drinks and increase consumer choice in shops and at cafés.*” This case seems to confirm the idea that vertical restraints are seen as having strong anti-competitive effects when there is a lack of inter-brand competition.

The paper is organized as follows. Section 2 focuses on vertical coordination issues: vertical restraints can be used to restore the efficiency of the vertical interaction (for instance by solving double marginalization or free-riding problems), although the impact on consumer surplus and economic efficiency are unclear. Section 3 then reviews how vertical restraints can eliminate or reduce the competition between rival vertical structures. Section 4 summarizes the findings and discusses their implications for competition policy.

## 2 Vertical coordination

This theme has been the first and most often analyzed in the economic literature. The emphasis is placed on coordination problems within a given vertical structure (i.e. between a producer and its retailer(s)) rather than on the interaction with other vertical structures. Hence, most of the contributions consider the case of a unique producer dealing with one or more retailers.

The vertical structure considered as a whole faces a number of decision variables: some affect the joint profit (retail prices, quantity sold to consumers, selling efforts, ...) while others affect the way this joint profit is shared between the different parties (wholesale price, franchise fee, ...). The decentralization of the decision variables that affect the joint profit (the “targets”) to the retailers can cause inefficiencies since they create externalities that have to be correctly accounted for. Vertical restraints can then be used as means to coordinate and restore the efficiency of the vertical structure. As we will now show, this does not necessarily mean that it is in the consumers’ (or society as a whole) best interest to eliminate or correct these externalities.

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<sup>20</sup>A similar issue had been raised in 1991 in a case involving leading ice-cream makers *Langnese-Igol* and *Schöller*. See Motta (2004, pp. 391-398) for an analysis of the case.

## 2.1 Double marginalization

Double marginalization has been the first coordination problem formally analyzed (Spengler, 1950) and refers to situations where both the producer and the retailer enjoy some market power. In such situations, they both add a mark-up to their costs thereby leading to excessive prices. The externality arises from the fact that each firm, when setting its mark-up does not take into account the impact of this decision on the other firm's profit. For instance, when setting the final price, the retailer trades off an increase in its margin against a decrease in the quantity sold, but does not take into account the reduction in the producer's profit due to the decrease in the quantity.

As an example, consider the case of successive monopolies (as shown in figure 1) with constant marginal costs,  $c$  for the producer and  $\gamma$  for the distributor. Denote respectively by  $w$  and  $p$  the producer's (uniform) wholesale price and the distributor's retail price, and by  $q = D(p)$  the consumer demand.

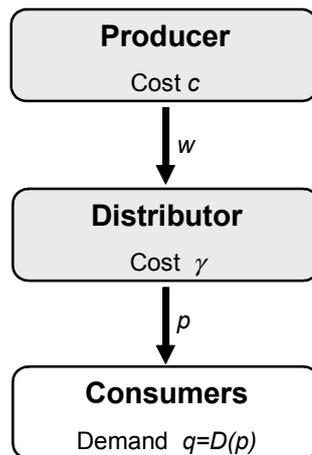


Figure 1: Successive monopolies and the double marginalization problem

The aggregate profit of the two firms depends only upon the retail price  $p$  and the monopoly (or joint-profit maximizing) price is characterized by:

$$p^M(c) = \arg \max_p [(p - c - \gamma) D(p)].$$

In such a situation, each of the two firms has an incentive to set its price above its perceived marginal cost. To achieve a positive profit, the producer will thus set a wholesale price above its marginal cost ( $w > c$ ) and the retailer will then choose the retail price  $p$  that

maximizes its profit, that is:

$$p^M(w) = \arg \max_p [(p - w - \gamma) D(p)],$$

which leads to a final price larger than the monopoly price and to a joint profit below its maximum level (monopoly profit).<sup>21</sup>

This double marginalization problem can be solved using a variety of vertical restraints:

- An obvious solution consists in controlling the retail price using resale price maintenance (imposing  $p = p^M(c)$ ) and setting the wholesale price so as to achieve the desire sharing of the monopoly profit. A price ceiling ( $p \leq p^M(c)$ ) would actually suffice here and a minimum quota ( $q \geq D(p^M(c))$ ) would be equivalent.
- Alternative solutions include non-linear tariffs, the simplest form being a two-part tariff,  $T(q) = cq + F$ . By setting a wholesale price equal to its marginal cost  $c$ , the producer gives the right incentives to the distributor who now faces a perceived marginal cost equal to  $c + \gamma$  and set the retail price at the monopoly level  $p^M(c)$ . The franchise fee  $F$  can then be used to share the profit as desired.

This simple analysis yields several insights. First, vertical restraints allow the manufacturer and the retailer to maximize joint profits. Furthermore, these restraints used to solve the double marginalization problem not only maximize the joint profit, but also lead to lower prices thereby benefiting consumers and hence increasing the total welfare.

Notice that vertical restraints are not necessarily needed to solve the double the marginalization problem. Introducing a strong intrabrand competition (using several perfectly substitutable retailers) would remove the retail mark-up. The manufacturer could then set the wholesale price equal to  $p^M(c) - \gamma$ , thus leading to a retail price equal to the monopoly price  $p^M(c)$ .

Different types of restraints (RPM, quotas, non-linear tariffs) appear as substitutes for a better efficiency. However, this equivalence vanishes when market conditions such as demand or distribution costs are uncertain and the retailer is risk-averse. A two-part tariff (of the form  $T(q) = cq + F$ ) will ensure that the distributor will always select

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<sup>21</sup>A simple revealed preference argument (see Tirole, 1988) implies that the monopoly price  $p^M(c)$  increases with the cost.

the retail price that maximizes the aggregate profit of the vertical structure, but the distributor will then have to bear all the risk. RPM on the other hand does not allow the distributor to adjust the retail price after a demand or (retail) cost shock. This means that the vertical restraints will not perfectly solve the double marginalization problem if there is uncertainty and are no longer equivalent. For instance, RPM is preferred to two-part tariffs when demand is uncertain, whereas two-part tariffs yield a higher joint profit than RPM under cost uncertainty (Rey and Tirole, 1986).

## 2.2 Retail services

Distributors usually provide a range of services that affect the demand for the products that are on offer: services such as free delivery, pre-sale advice to potential buyers, use of salespersons or cashiers to reduce waiting times, show-rooms, after-sales services or parking facilities, tend to attract more customers to a store and may even play an essential role in the success of some products.

These efforts will not only generate vertical externalities between the producer and its retailers, but also horizontal externalities between the different distributors of the same product. The degree of appropriability of such services will play a crucial role in our analysis. Providing pre-sale advice to customer will indeed create horizontal externalities (giving rise to the well-known *free-riding* problem), whereas competing retailers are unlikely to benefit from an increase in the number of cashiers.

### 2.2.1 Successive monopolies

To illustrate this, let us start with the simplest model and extend the successive monopolies setting presented earlier by introducing an additional choice variable,  $e$ , representing retail effort. As shown in figure 2, the distributor now chooses both the retail price  $p$  and an effort level  $e$  which increases consumer demand  $q = D(p, e)$  (with  $\partial_e D > 0$ ) and the retail cost  $\gamma(e)$  (with  $\gamma' > 0$ ).

Only  $p$  and  $e$  matter for the vertical structure and these two variables are now the two “targets” that affect the joint profit. It would also be equivalent to reason with quantity sold rather than retail price considering the inverse demand function  $p = P(q, e)$  (which then satisfies  $\partial_q P < 0$  and  $\partial_e P > 0$ ). The two “targets” are now the quantity  $q$  and the

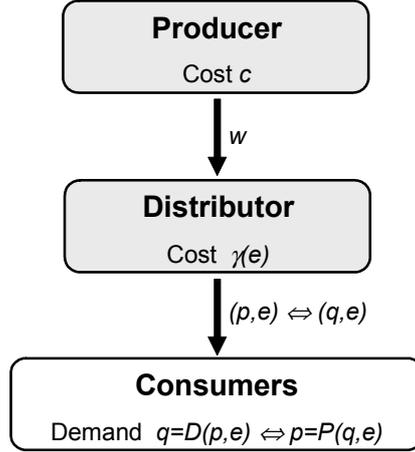


Figure 2: Successive monopolies with retail services

effort level  $e$ , and their optimal values are given by:

$$(q^M(c), e^M(c)) = \arg \max_{(q,e)} [(P(q,e) - c - \gamma(e))q].$$

When facing a simple linear tariff (i.e. a uniform wholesale price  $w$ ), the distributor perceives a marginal cost equal to  $w + \gamma(e)$  and thus chooses the same quantity ( $q^M(w)$ ) and effort level ( $e^M(w)$ ) than would a vertical structure with aggregate marginal cost  $w + \gamma(e)$ . The producer will hence choose the wholesale price  $w$  so as to maximize the its own profit given the distributor's reaction to this wholesale tariff:

$$w^* = \arg \max_w [(w - c)q^M(w)].$$

This leads the manufacturer to choose a wholesale price higher than its marginal cost ( $w^* > c$ ). The distributor will in turn choose a quantity below the optimal level, that is, an excessive retail price (double marginalization) and too little effort. The basic reason is that, when choosing level of effort and its price, the distributor does not take into account the impact of these decisions on the producer's profit  $(w - c)D(p, e)$ .

Once again the joint profit is not maximized. The main reason is that the producer's has only one instrument (the wholesale price  $w$ ) to control the two targets that affect the joint profit ( $p$  - or  $q$  - and  $e$ ) as well as the allocation of this profit. There are again several equivalent ways (at least under perfect information) to solve this coordination problem:

- RPM (or a price ceiling) alone would not be sufficient because it would not control efficiently the effort level. However, a price ceiling combined with the requirement to

provide a minimum level of retail services would restore the efficiency of the vertical structure: the manufacturer directly monitors the two “targets” and can then use the wholesale price to achieve the desired allocation of the joint profit.

- A two-part tariff could as well be efficient. Charging  $T(q) = cq + F$  leads to the distributor to choose both the level of effort ( $e^M(c)$ ) and the retail price ( $p^M(c)$ ), with  $p^M(c) = P(q^M(c), e^M(c))$  that maximize the joint profit, since retail profit coincides - up to a constant - with joint profit. The franchise fee can then be adjusted to achieve the desired sharing of profit.

Once again, several types of vertical restraints allow the producer and the distributor to achieve joint-profit maximization. However, in contrast with the case of pure double marginalization, solving the coordination problem is not necessarily socially desirable. The socially optimal quantity ( $q^S$ ) and effort level ( $e^S$ ) are solution of the total welfare maximization:

$$(q^S, e^S) = \arg \max_{(q,e)} [S(q, e) - (c + \gamma(e)) q],$$

where  $S(q, e) = \int_0^q P(x, e) dx$  represents the consumer surplus. Under the standard regularity assumptions, the socially optimal values are the unique solutions of the first-order conditions and are characterized by:

$$P(q^S, e^S) - c - \gamma(e^S) = 0 \text{ and } \gamma'(e^S) = \partial_e S(q^S, e^S) = \int_0^{q^S} \partial_e P(x, e^S) dx;$$

whereas the joint-profit maximizing quantity and effort levels are given by (dropping the argument  $c$ ):

$$P(q^M, e^M) - c - \gamma(e^M) = -\partial_q P(q^M, e^M) q^M \text{ and } \gamma'(e^M) = \partial_e P(q^M, e^M).$$

Firms and consumers are likely to disagree over the optimal level of services, or more precisely, over the right balance between retail prices and services. An increase in the level of services (together with an increase in the retail price) that increases the level of aggregate profit may well reduce consumer surplus and even total welfare. The reason is that the vertical structure is interested in attracting the marginal consumers and thus tend to neglect the impact of their decisions on the infra-marginal consumers. It may well

be the case that marginal consumers would be willing to pay more for an increase in the level of services but that this might hurt the majority of consumers thereby decreasing consumer surplus.<sup>22</sup>

### 2.2.2 Intra-brand competition

In contrast to the pure double marginalization case, intra-brand competition does not necessarily facilitate coordination on retail services. Intra-brand competition pushes the distributors to reflect consumers' preferences over prices and services: in other words, competition between the retailers eliminates the retail mark-up and induces distributors to choose the consumers' preferred balance between retail price and level of services. However, the producer may react in order to counterbalance this effect given that the vertical structure's and the consumers' interests are likely to differ. As a result, the joint-profit is not maximized.

Once again the use of vertical restraints can restore the efficiency of the vertical structure and some combinations are equivalent:

- RPM, this time in the form of a price floor, is sufficient. Intra-brand competition will lead to the distributor to choose the highest level of effort compatible with non-negative profit, that is, such that  $\gamma(e) = p - w$ . The producer can therefore use RPM to control the price level ( $p = p^M$ ) and the wholesale price to monitor the level of effort ( $w = p^M - \gamma(e^M)$ ).
- Two-part tariffs alone would not be sufficient. However, the joint-profit maximizing outcome can be achieved by combining a two-part tariffs with the assignation of exclusive territories to the retailers. Exclusive territories will then remove any intra-brand competition and the two-part tariff (of the form  $T(q) = cq + F$ ) makes the distributor the residual claimant of the joint profit as in the single distributor case.

However, from the economic welfare point of view, the comparison between the joint-profit maximizing outcome and the outcome achieved with linear tariffs only is usually

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<sup>22</sup>See for instance Motta (2003, chapter 6) for a formal analysis of the impact of vertical restraints in this context.

ambiguous (see for instance Caillaud and Rey (1987), Comanor (1985) and Sherer (1983)). This comes again from the divergence between the preferences of the marginal consumers and those of the infra-marginal ones. This divergence is likely to be important when the vertical structure enjoys a substantial market power: if consumers have alternative solutions, an increase in the price and level of services is unlikely to harm the consumers as they would then be able to switch to an alternative product.<sup>23</sup>

Finally, if the retail services are subject to free-riding (this would for instance be relevant for pre-sales advice), vertical restraints can be used to mitigate this problem: with exclusive territories a retailer can no longer free-ride on the retail effort exerted by a competitor (see Mathewson and Winter (1994)).<sup>24</sup> In such situations, the competition between retailers is likely to generate an insufficient level of services from both the firms' and the consumers' point of view. Vertical restraints are thus likely to be socially desirable.

### **2.3 Multi-product manufacturer and the retailer's rent**

As we have already seen, vertical restraints can be used to achieve joint-profit maximization either by solving a double marginalization or by giving the right incentives to the retailer(s) to provide the appropriate level of services to the customers. Strategic motives within a given vertical structure may also play a role and give rise to the use of some restraints. This is for instance the case when a monopolist producer sells several imperfectly substitutable products through a monopolist distributor (as shown in figure 3). Vertical restraints now plays two roles: one is to solve the double marginalization problem (that would arise if the manufacturer was to use linear wholesale tariffs). However, in this case two-part tariffs that would be sufficient to maximize the joint profit in the single product case are no longer sufficient.

As shown by Shaffer (1991a), the problem comes from the fact that the retailer earns

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<sup>23</sup>Winter (1993) offers a detailed analysis of firms' and consumers' objectives when retailers' effort aims at reducing consumers' shopping time. Schulz (2004) shows that, if some consumers do not search for the best price but buy spontaneously, RPM can reduce social welfare even if it increases services to consumers.

<sup>24</sup>Marvel and McCafferty (1984) show that RPM can be used to solve free-riding problem when some kind of quality certification activity undertaken by a retailer is costly and can be "appropriated" by competitors.

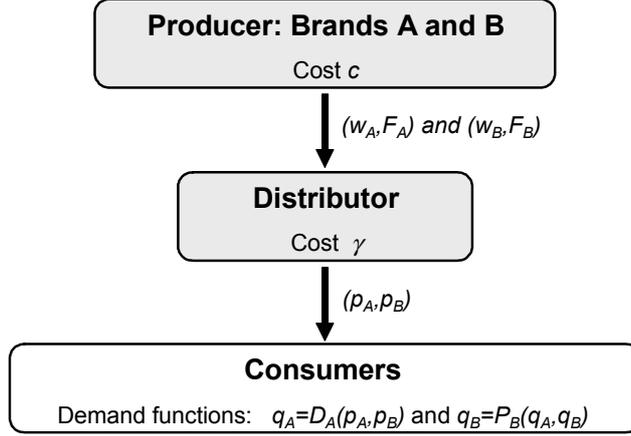


Figure 3: Multi-product monopolist producer

a strictly positive rent attributable to its discretion over brand choice. The producer thus faces a trade-off between maximizing the joint profit and reducing the rent it leaves to the distributor. Suppose that the producers offers two brand-specific two-part tariffs (for  $i = A, B : T_i(q_i) = w_i q_i + F_i$ ). If it carries both brands, the distributor will choose the retail prices  $p_A^M(w_A, w_B)$  and  $p_B^M(w_A, w_B)$  that maximize its own profit:

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

Let denote  $\pi_{A+B}^M(w_A, w_B)$  the corresponding maximum. If it accepts to carry both brands, the retailer thus earns a profit equal to:

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

Note that if the manufacturer was to set both wholesale prices equal to its marginal cost  $c$ , the distributor would be the residual claimant of the joint profits and would thus set retail prices at their monopoly levels.

Because the two brands are imperfect substitutes, introducing brand  $B$  will reduce the sales of product  $A$ . This means that the retailer could also decide to carry one brand only (let say brand  $B$ ) and its profit would then be

$$\pi^R(B) = \pi_B^M(w_B) - F_B, \text{ with } \pi_B^M(w_B) = \max_{p_B} [(p_B - w_B - \gamma) D_B(\emptyset, p_B)].$$

This means that if the retailer has accepted to carry brand  $B$ , the maximal franchise fee that the manufacturer can set for brand  $A$  is equal to the marginal contribution of brand

$A$  to the joint profit:

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

Because this contribution is usually increasing in  $w_B$ , the manufacturer will be willing to increase the wholesale prices above the joint-profit maximizing level ( $w_A, w_B > c$ ) thereby leading to prices above their monopoly levels. This means that brand-specific two-part tariffs are not enough to ensure joint-profit maximization.

Vergé (2001) notes however that more general non-linear tariffs would do better than two-part tariffs. With two-part tariffs, manufacturer  $A$  must for example leave to the retailer a relatively large rent because, if deciding to carry only product  $B$ , the retailer can increase the quantity  $q_B$  so as to maximize its profit on that product. If instead the manufacturer offers more restrictive contract (e.g., quantity forcing contracts of the form  $(q_i, t_i)$ ), the retailer could no longer increase the quantity  $q_B$  if dealing exclusively with  $B$  and the rent to be left by the manufacturer could therefore be lower.<sup>25</sup>

Additional restraints can thus be used to restore the efficiency of the vertical structure. Full-line forcing (imposing to buy both brands) is one obvious candidate. Because the retailer can only choose to carry both brands or nothing, the strategic rent effect vanishes. Setting wholesale prices equal to the marginal production cost thus leads to joint-profit maximization. RPM (price ceilings are again sufficient), aggregate rebates (discounts based on the total quantity sold) or brand discounts (based on the number of brands carried by the distributor) would have the same effect.

As in the standard double marginalization case, vertical restraints are not only privately optimal but are also socially desirable as they reduce the retail prices to their monopoly levels.

## 2.4 Vertical restraints and the commitment problem

When a monopolist manufacturer supplies several competing distributors, it has an interest to restrict its supply so as to maintain high prices and profits, which it can then share with the retailers. However, when dealing with one distributor, the producer has

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<sup>25</sup>Specifying a maximum quantity would suffice. Note that manufacturers still need to leave a positive rent to the retailer, and this rent still increases with the quantities supplied; as a result, the manufacturers will continue to distort the quantities they supply and thus fail to maximize joint profits.

an incentive to “free-ride” on the other competitors. As first shown by Hart and Tirole (1990) such opportunism may prevent the manufacturer from fully exerting its market power.

Suppose for example that a monopolist manufacturer sells its product through two distributors (assume that distribution costs are equal to 0) who then compete à la Cournot (setting quantities rather than prices) on the final market. Denote by  $q^M$  the joint-profit maximizing quantity and by  $\pi^M$  the corresponding profit. The manufacturer would like to sell  $\frac{q^M}{2}$  to each retailer against a fixed payment equal to  $\frac{\pi^M}{2}$ . This would actually be feasible if offers were observable. However, if the manufacturer can secretly renegotiate with one of the retailers, it would be willing to increase the quantity sold to that retailer against a larger payment. This would however be anticipated by the second retailer who would not accept the initial offer any longer. In this context, the only sustainable outcome would be the standard Cournot outcome.

Such opportunistic behavior also arises if the manufacturer contracts sequentially with competing retailers: it then has an incentive to free-ride on early signing retailers when negotiating later deals. If negotiations are simultaneous but secret, each retailer may still worry that its competitors receive secret deals (e.g., lower prices per unit).<sup>26,27</sup>

In order to restore the efficiency of the vertical structure, the monopolist producer has an incentive to reduce retail competition using different kinds of vertical restraints: exclusive rights (or vertical integration) or an industry-wide price floor would eliminate such competition. Whereas Hart and Tirole (1990) consider Cournot competition, O’Brien and Shaffer (1992) analyze a similar issue when differentiated retailers compete in prices. Using the concept of contract equilibrium à la Crémer and Riordan (1987), they show that the opportunism problem leads to the “competitive outcome” (the marginal wholesale price is equal to the marginal cost) and point out that RPM (combined with two-part tariffs) eliminates this risk. The problem is very similar to Hart and Tirole: when negotiating the wholesale contract, a retailer and the manufacturer take the contracts offered

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<sup>26</sup>How this affects the final outcome depends on the type of beliefs formed by the retailers (see McAfee and Schwartz (1994) and Rey and Vergé (2004)).

<sup>27</sup>Martin, Normann and Snyder (2001) have experimented alternative contracting situations between a monopolist supplier and competing retailers. They observe that the monopolist was able to maintain output close to the monopoly level significantly less often when making secret offers.

to the competing distributors as given and therefore do not internalize the retail margins on those products: by setting the retail and wholesale prices equal to the monopoly price, the producer becomes the residual claimant on all retail sales and is no longer willing to free-ride on the other retailers' sales when making an offer to one of the downstream firms.<sup>28</sup>

In this context, vertical restraints are used to restore the ability of the vertical structure to maintain high prices. This will necessarily not only harm the consumers but also reduces total economic welfare.

## 2.5 Other coordination motives

A distributor usually distributes goods for several producers at the same time. Consider now a vertical structure consisting of the retailer and one of the manufacturers. If the wholesale price for one of the products from the competing manufacturers is lower than the (marginal) cost of that product, the distributor may be induced to favor the sales of that other product. From the point of view of the vertical structure, however, this introduces a distortion in the mix of products and reduces total profits. This distortion vanishes if the manufacturer imposes exclusive dealing arrangements. This means however that the products of the other manufacturer will not be present in the retailer's shelves. The use of two-part tariffs can be sufficient to restore the maximization of the industry-wide profit. Free-riding between producers on customer services may create the same problems: marketing activities may have spillovers on other products which might not be properly accounted for by the vertical structure in the absence of vertical restraints. We will come back on these issues when we consider interbrand competition.

Some of the manufacturers' choices also affect their distributors' profits indirectly: this is certainly the case for decisions regarding either nation-wide advertising campaigns or product quality. There again, in the absence of specific arrangements a simple linear price is likely to generate vertical externalities and to fail to achieve joint-profit maximization whereas adequately chosen vertical restraints can correct for these externalities and to achieve (or to get closer to) joint-profit maximization.

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<sup>28</sup>Nondiscrimination rules (or "most favored customer" clauses) can in some cases limit opportunism (see DeGraba and Postlewaite (1992) and Marx and Shaffer (2002)).

Lastly, one of the parties must sometimes make specific investments which have little residual value if the relationship is terminated. In that case, the return on such investments must be guaranteed through some long-term commitment otherwise the fear of opportunistic behavior (*hold-up* problem) would lead to underinvestment (see Williamson, 1985 and 1989). Various provisions can again be used to prevent such opportunistic behavior from one or the other party: exclusive territories can for example be granted to protect distributors' investments, while non-competition or exclusive dealing provisions can be used to protect a manufacturer's image and reputation (see for instance Besanko and Perry, 1993).

### **3 Interbrand competition**

We have so far limited our attention to coordination problems within a given vertical structure. We now analyze the impact of vertical restraints on interbrand competition, that is, on the strategic interactions between competing vertical structures. In the first three sections, we focus on short-term or static effects and try to see whether vertical restraints can be used to maintain or even increase existing market power. We see how these restraints can be used to exacerbate market imperfections - for example by reducing competition on the upstream market or even leading to manufacturers' cartels - or to help maintain joint-profit maximizing prices at both the upstream and downstream levels (global cartel). In the last section, we consider long-term or dynamic effects of vertical restraints on the structure of the market.

#### **3.1 Competition dampening**

Vertical restraints used within a given vertical structure are likely to affect the strategic interactions between this distribution channel and rival vertical structures. The terms of the contracts accepted by the distributors affect the nature of the competition between these retailers on the downstream market. Vertical restraints used in a vertical structure will therefore indirectly affect the behavior of rival manufacturers when they set the terms of the contracts with their own distributors. Particular restraints can thus be used by a manufacturer to credibly commit not to behave aggressively vis-à-vis its rivals. Several

authors have applied this idea of precommitment as way to limit interbrand competition.

Bonanno and Vickers (1988) for instance explore the idea, earlier formulated by Vickers (1985), that producers may prefer, for strategic purposes, to delegate the marketing of their products to independent retailers.<sup>29</sup> Rey and Stiglitz (1988, 1995) show that vertical restraints such as exclusive territories, which eliminate intrabrand competition within a vertical structure, can also help to reduce interbrand competition. If the manufacturers maintain a high degree of intrabrand competition, then the final retail price will closely reflect the wholesale price of that particular product. In this sense, direct marketing by the producers is equivalent to having perfect competition between the retailers within each vertical structure. If instead the manufacturers assign exclusive territories to their distributors and thus eliminate intrabrand competition within their distribution network, distributors will freely set their final prices. These final retail prices will then respond to any change in the retail price set by the rival manufacturer's retailers, and will therefore indirectly react to any change in the wholesale price set by rival manufacturer. Assigning exclusive territories will thus act as a pre-commitment to be less "aggressive" and give incentives to the rival manufacturer to set higher prices.

To illustrate this point consider the following situation summarized in figure 4: two manufacturers (1 and 2) produce imperfect substitutes and face the same constant marginal cost of production  $c$ . The producers delegate the marketing to a network of independent retailers (a retailer can only sell one product) and the marginal cost of distribution is constant and equal to  $\gamma$ . When retail prices are  $p_1$  and  $p_2$ , the demand for product  $i$  ( $i = 1, 2$ ) is  $D_i(p_1, p_2)$ .

Suppose first that each retail network consists of several identical retailers who compete in prices. In this case, retail prices will simply reflect perceived costs and we thus have  $p_i = w_i + \gamma$ . Everything thus happens as if the manufacturers were either marketing the products themselves (with the same distribution cost  $\gamma$ ) or dictating the retail prices (for instance using RPM). The resulting price equilibrium is therefore characterized by:

$$\frac{p_i - c - \gamma}{p_i} = \frac{1}{\varepsilon_{ii}(p_1, p_2)},$$

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<sup>29</sup>Related ideas have been developed in the marketing literature (see for example McGuire and Staelin, 1983). Other papers such as Gal-Or (1991) have enriched the delegation model (see Caillaud and Rey (1995) and Irlen (1998) for reviews of this literature).

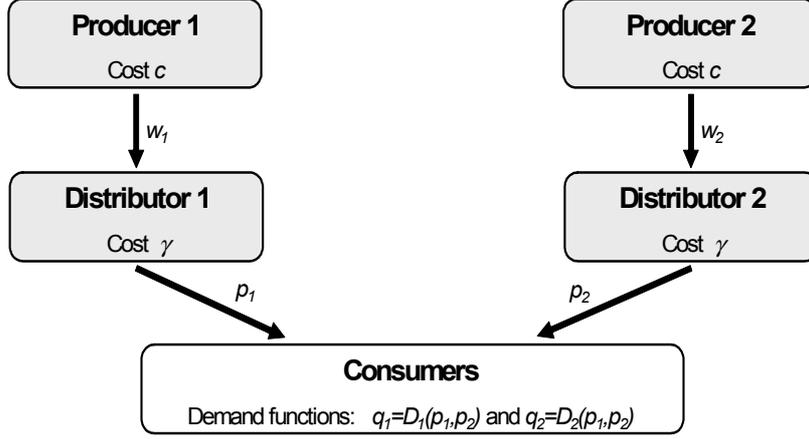


Figure 4: Competing vertical structures

where  $\varepsilon_{ii}(p_1, p_2) = -\partial \log D_i / \partial \log p_i$  denotes the direct price elasticity of the demand for product  $i$ .

Suppose now that that one of the two manufacturers - manufacturer 1, say - assigns exclusive territories to its distributors and assume that each exclusive territory is representative of the overall population. Each distributor of manufacturer 1's product now faces competition only from the retailers distributing manufacturer 2's products. These retailers continue to sell at price  $p_2 = w_2 + \gamma$ , but the retailers selling manufacturer 1's product choose their best response to that price, given a perceived marginal cost equal to  $w_1 + \gamma$ ; that is, they sell at price  $p_1^r(p_2; w_1)$  given by:

$$\frac{p_1^r(p_2; w_1) - w_1 - \gamma}{p_1^r(p_2; w_1)} = \frac{1}{\varepsilon_{11}(p_1^r(p_2; w_1), p_2)}.$$

Given  $w_2$ , manufacturer 1 can still control the retail price of its product by adjusting its wholesale price, and it can recover any retail margin through e.g. franchise fees. But the retail competition stage now alters the elasticity of the demand perceived by the rival manufacturer, which becomes:

$$D_2^r(w_1, w_2) = D_2(p_1^r(w_2 + \gamma; w_1), w_2 + \gamma).$$

The elasticity of this demand is thus given by:

$$\varepsilon_{22}^r(w_1, w_2) = -\frac{\partial \log D_2^r(w_1, w_2)}{\partial \log w_2} = \varepsilon_{22}(p_1^r(p_2; w_1), p_2) + \lambda_{12}(w_1, w_2) \varepsilon_{21}(p_1^r(p_2; w_1), p_2),$$

where  $\lambda_{12} = \partial \log p_1^r / \partial \log p_2$  denotes the elasticity of the best response  $p_1^r$  with respect to the rival retail price  $p_2$ , and  $\varepsilon_{21} = -\partial \log D_2 / \partial \log p_1$  denotes the cross elasticity of the demand for product 2 with respect to the price of product 1. If the two products are substitutes,  $\varepsilon_{21} < 0$ ; moreover, an increase in manufacturer 2's wholesale price  $w_2$  increases the retail price for its product and thus relaxes the competitive pressure on the retailers of product 1, who are then likely to increase their own prices, and thus  $\lambda_{12} > 0$  (that is, retail prices are likely to be strategic complements). This attenuates the elasticity of demand perceived by manufacturer 2 who will therefore be less aggressive and set a higher wholesale price (for a given  $p_1$ ), and thus induce its retailers to set higher retail prices.<sup>30</sup>

Therefore by granting exclusive territories to its retailers, a manufacturer commits to follow-up any price increase and thus encourages its rival to be less aggressive (even when that rival does not impose territorial restrictions), thereby leading to higher wholesale and retail prices.<sup>31</sup>

Note that all vertical restraints may not generate such competition-dampening effects. The key idea is that manufacturers use vertical restraints as a mean to commit themselves not to compete aggressively against their rivals. This is achieved through the delegation of some decision power to the distributors: for instance, granting exclusive territories gives some freedom to the retailers in their choice of retail prices, freedom that is inexistent if intrabrand competition is fierce (in this case a retail price is simply the sum of the corresponding wholesale price and the retailing cost). Therefore vertical restraints that increase the direct control of manufacturers over their retailers, such as RPM for instance, could not be used here.

As we already said earlier, the key issue is the ability for the manufacturers to pre-commit not to compete fiercely against each other. Assigning exclusive territories is therefore a powerful restraint in this setting as it is easily observable by the rivals and not easily renegotiated. They are also likely to have a better commitment power than

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<sup>30</sup>See Rey and Stiglitz (1995) for a formal analysis of these conditions.

<sup>31</sup>The level of prices in equilibrium will depend upon the exact nature of wholesale contracts and in particular on whether franchise fees are allowed or not; for example, in the absence of franchise fees double marginalization problems are likely to occur and lead to even higher prices. In all cases, however, exclusive territories reduce both interbrand and intrabrand competition.

non-linear contracts (such delegation of pricing decision to a retailer using two-part tariffs as in Bonanno and Vickers, 1985): for example manufacturers are more likely to observe whether rivals have assigned exclusive territories to their retailers (it does take time to set up a new retail outlet) than to have information on whether wholesale tariffs include franchise fees (which could anyway be easily renegotiated). The impact of territorial restraints on the equilibrium retail prices is thus likely to be higher. Although they do not necessarily need to have full information on the terms of the contracts offered by the rival manufacturer to its retailers, it is nevertheless important that the distributors have some knowledge of these wholesale tariffs.<sup>32</sup> Another issue is to identify the set of admissible contracts: in the absence of any restriction, firms could easily achieve the fully collusive outcome as shown by Katz (1991).<sup>33</sup>

Note finally that the key ideas presented here do not rely on the fact that producers have the all bargaining power: think for instance of the Bonanno and Vickers (1985) setting in which the retailers would propose wholesale tariffs to the manufacturers. It would still be the case that vertical restraints can be used within a vertical structure to reduce interbrand competition. Shaffer (1991b) shows that in this case retailers would offer wholesale prices above the marginal cost of production in order to soften competition on the retail market (and thus maintain high prices) and recover the wholesale profit through negative franchise fees (“slotting allowances”).

## 3.2 Collusion

Courts have often argued that vertical price restraints can help manufacturers to sustain a cartel. The U.S. Supreme Court in its decision in *Business Electronics* repeated its previous judgement that “*there was support for the proposition that vertical price restraints reduce intra-brand competition because they facilitate cartelization.*”<sup>34</sup> This argument has been informally used by Telser (1960) and more recently Mathewson and Winter (1998)

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<sup>32</sup>Caillaud, Jullien and Picard (1995) analyze the commitment power of unobservable contracts in the presence of asymmetric information.

<sup>33</sup>Katz (1991) also shows that under some circumstances, unobservable contracts might still have some commitment power.

<sup>34</sup>See *Business Electronics Corp. v. Sharp Electronics*, 485 U.S. 717 (1988) and *Continental T.V. Inc. v. GTE Sylvania Inc.*, 433 U.S. 36 (1977).

argued that the use of RPM could have an even bigger impact when retailing costs can change over time: *“If wholesale prices are not easily observed by each cartel member, cartel stability would suffer because members would have difficulty distinguishing changes in retail prices that were caused by cost changes from cheating the cartel. RPM can enhance cartel stability by eliminating retail price variation.”*

However it is only recently that this argument has been formalized. Jullien and Rey (2000) stress indeed that, by leading to more uniform retail prices, RPM makes price cuts easier to detect and therefore facilitates collusion. In the absence of RPM, retail prices are driven by wholesale prices but also by local shocks on retailing costs or demand conditions. Therefore observing the retail prices does not allow the manufacturers to perfectly infer the wholesale prices and deviations from the collusive agreement cannot be easily identified. Instead, because RPM leads to uniform retail prices, it allows manufacturers to detect deviations at once and therefore makes collusion easier to sustain. However, because retailers cannot respond to changes in demand conditions or retailing cost, price uniformity is not efficient and manufacturers thus have to trade-off this inefficiency against the benefits of collusion.

Nevertheless, as shown by Jullien and Rey (2000), there exist situations for which the additional profit generated by the collusive agreement offsets the loss of profit due to price rigidity. This will for instance be the case when the shocks and the discount factor take intermediate values. RPM will then always be detrimental to both consumer and total welfare as this tends to occur when RPM leads to large increases in average prices.

### **3.3 Interlocking relationships**

We have so far focused on situations where manufacturers distribute their products through distinct retail channels. However, for most consumer goods, retailers carry competing products.

#### **3.3.1 One common agent**

Bernheim and Whinston (1985) show that if two manufacturers decide to sell their goods via the same retailer (this situation is usually referred to as “common agency”), it will give rise to joint-profit maximizing prices being charged at the equilibrium. Their results

remain valid for a fairly large set of common agency situations as long as two-part tariffs can be used.

The intuition for this result is fairly simple: suppose that two manufacturers –  $A$  and  $B$  – producing differentiated goods sell these goods through a monopolist retailer  $R$ . Production and distribution technologies exhibit constant returns to scale and the marginal cost of production and distribution are denoted  $c$  and  $\gamma$  respectively. Finally, we denote by  $D_i(p_A, p_B)$  the demand for good  $i = A, B$  when retail prices are  $p_A$  and  $p_B$ . The manufacturers simultaneously offer two-part tariffs  $(w_i, F_i)$  to the retailer who then sets the retail prices.

Given the wholesale prices that have been offered by the two manufacturers, the retailer will set the prices that maximize its retail profit, that is:

$$(p_A^M(w_A, w_B), p_B^M(w_A, w_B)) = \arg \max_{(p_A, p_B)} \sum_{i=A, B} (p_i - w_i - \gamma) D_i(p_A, p_B).$$

Let denote  $\pi_{A+B}^M(w_A, w_B)$  the corresponding maximum and by  $q_A^M(w_A, w_B)$  and  $q_B^M(w_A, w_B)$  the corresponding quantities. Note that if the two manufacturers were to set the wholesale prices equal to their marginal production cost  $c$ , the distributor would be the residual claimant of the joint profits and would thus set retail prices at their monopoly levels.

This situation presents some similarities with the problem of the multi-product monopolist presented earlier. Consider an equilibrium in which the retailer accepts both offers. Because the two goods are imperfectly substitutable, introducing product  $B$  will reduce the sales of product  $A$ . In order to induce the retailer to sell its product a manufacturer will have to leave a rent to the common agent. If it accepts to carry both brands, the retailer earns a profit equal to:

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

If it accepts the offer made by manufacturer  $i$  only, the retailer earns a profit equal to:

$$\pi^R(i) = \pi_i^M(w_i) - F_i, \text{ with } \pi_i^M(w_i) = \max_{p_i} [(p_i - w_i - \gamma) D_i(\emptyset, p_i)].$$

The highest fixed fee that manufacturer  $A$  can set in order to have its offer accepted is therefore:

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

It will thus choose the wholesale price  $w_A$  that maximizes its profit, knowing it cannot charge a fixed fee higher than  $\bar{F}_A$ . The equilibrium wholesale price  $w_A^*$  is therefore:

$$w_A^* = \arg \max_w \left[ (p_A^M(w, w_B^*) - c - \gamma) q_A^M(w, w_B^*) + (p_B^M(w, w_B^*) - w_B^* - \gamma) q_B^M(w, w_B^*) - \pi_B^M(w_B^*) - F_B^* \right]$$

We can then easily see that, under standard regularity assumptions, the unique equilibrium outcome is such that the two manufacturers set wholesale prices equal to their marginal cost of production and the retailers then set the retail prices at their joint-profit maximizing level.<sup>35</sup> The main difference with the multi-product monopolist case is that although it has to leave a rent to the retailer, a manufacturer cannot influence that rent because it only controls one wholesale price. When it sets its wholesale price, each manufacturer internalizes only partially the impact that this choice has on the sales of the rival's product - more specifically it cares only about the retail mark-up and not the total mark-up on that product. However, if the rival manufacturer has set its wholesale price equal to marginal cost, retail and total mark-up are identical, and a manufacturer now maximizes the industry profit (up to a constant).

### 3.3.2 Two common agents

More interesting are situations in which there is competition both upstream and downstream, and each manufacturer deals with several retailers but each retailer also deals with several retailers. Dobson and Waterson (1997) study a bilateral duopoly with interlocking relationships and show that the welfare effects of RPM depend on the relative degree of upstream and downstream differentiation as well as on retailers' and manufacturers' bargaining powers. Double-marginalization problems are more severe when producers have more bargaining power, so that RPM can be socially preferable in such circumstances. However, this result depends critically on the restriction to linear wholesale prices.<sup>36</sup>

In a similar context of "interlocking relationships" but allowing for two-part tariffs, Rey and Vergé (2002) show that RPM can be used to eliminate both upstream and

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<sup>35</sup>There are multiple equilibria but they only differ in the way the profit is shared between the different parties.

<sup>36</sup>For example, in the set-up used by Dobson and Waterson, which is based on simultaneous Nash-bargaining, the two parties' relative bargaining power would no longer affect retail prices if the firms could adopt two-part tariffs.

downstream competition.

To see the argument, consider the situation summarized in figure 5. Two manufacturers,  $A$  and  $B$ , each produce their own brand of a good and market them through two differentiated retailers, 1 and 2 (Retailers could for example differ in the services they provide to consumers, the location of their stores, etc). There are thus four relevant “products” for the consumers who can choose between brands and between stores. Demand for product  $ij$  (i.e. brand  $i \in \{A, B\}$  sold in store  $j \in \{1, 2\}$ ) is:

$$D_{ij}(\mathbf{p}) \equiv D(p_{ij}, p_{hj}, p_{ik}, p_{hk}) \quad (\text{for any } i \neq h \in \{A, B\} \text{ and any } j \neq k \in \{1, 2\}),$$

and the marginal costs of production and distribution are constant and equal to  $c$  and  $\gamma$  respectively.

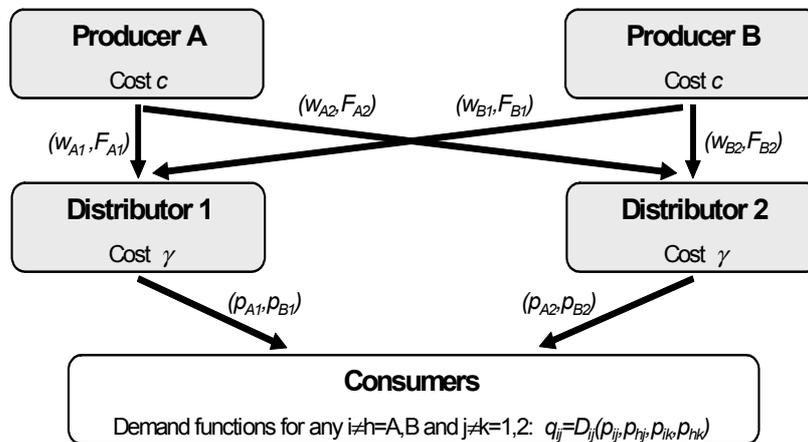


Figure 5: Interlocking relationships

Manufacturers simultaneously offer two-part tariffs to both retailers and, when possible, impose the retail price of their products. In order to keep the presentation as simple as possible we assume that if one of the four offers is rejected, market fails and manufacturers and retailers earn zero profit. This ensures that retailers are willing to accept an offer as long as they make non-negative profit. Rey and Vergé (2002) proposes several more realistic frameworks for which the results presented here remain valid: this will generally be the case there is no retail bottleneck, in the sense that manufacturers can find equally efficient alternative channels for each relevant retail location, that is, if the following two features hold:

- retailers have no market power, so that manufacturers extract all profits;

- manufacturers cannot exclude their rivals from any retail location.

If all offers have been accepted each retailer  $j = 1, 2$  sets its prices  $p_{Aj}$  and  $p_{Bj}$  so as to maximize its profit, given by:

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

For any vector of wholesale prices, we denote by

$$\mathbf{p}^r(\mathbf{w}) = (p_{A1}^r(\mathbf{w}), p_{B1}^r(\mathbf{w}), p_{A2}^r(\mathbf{w}), p_{B2}^r(\mathbf{w}))$$

the retail equilibrium prices, and by  $D_{ij}^r(\mathbf{w}) = D_{ij}(\mathbf{p}^r(\mathbf{w}))$  the resulting demand for each product.

Since retailers can only accept both offers or earn zero profit, the maximum acceptable franchise fees are such that each retailer's profit is non-negative ( $\pi_j \geq 0$ ). Each manufacturer  $i = A, B$  thus seeks to solve:

$$\begin{aligned} & \max_{w_{i1}, w_{i2}, F_{i1}, F_{i2}} (w_{i1} - c)D_{i1}^r(\mathbf{w}) + F_{i1} + (w_{i2} - c)D_{i2}^r(\mathbf{w}) + F_{i2}, \\ & s.t. \quad (p_{i1}^r(\mathbf{w}) - w_{i1} - \gamma)D_{i1}^r(\mathbf{w}) - F_{i1} + (p_{j1}^r(\mathbf{w}) - w_{j1} - \gamma)D_{j1}^r(\mathbf{w}) - F_{j1} \geq 0 \\ & \quad (p_{i2}^r(\mathbf{w}) - w_{i2} - \gamma)D_{i2}^r(\mathbf{w}) - F_{i2} + (p_{j2}^r(\mathbf{w}) - w_{j2} - \gamma)D_{j2}^r(\mathbf{w}) - F_{j2} \geq 0 \end{aligned}$$

Since the participation constraints are clearly binding, this program is equivalent to:

$$\max_{w_{i1}, w_{i2}} \Pi_i^r(\mathbf{w}) \equiv \sum_{j=1,2} (p_{ij}^r(\mathbf{w}) - c - \gamma) D_{ij}^r(\mathbf{w}) + (p_{hj}^r(\mathbf{w}) - w_{hj} - \gamma) D_{hj}^r(\mathbf{w}). \quad (\mathcal{M})$$

When contracts consist of two-part tariffs only, competition leads to a somewhat competitive outcome. This result is not entirely obvious since retailers act as “common agents” for both manufacturers and Bernheim and Whinston (1985, 1986) emphasize that common agency help maintaining monopoly prices and quantities. The essential difference here is that there exists competition on both the upstream and the downstream market. Using the same retailers (the “common agents”) eliminates the impact of the upstream competition. However, to prevent the competition between retailers to drive prices down, manufacturers must charge wholesale prices above marginal costs. But then, as seen from the manufacturers' maximization program ( $\mathcal{M}$ ), each manufacturer does not internalize the total mark-up on the rival's products (but only the retail margin) and therefore has an incentive to “free-ride” on the rival's upstream margin. This finally leads to prices below the industry-wide profit maximizing level (hereafter “monopoly level”).

If manufacturers can use RPM, they no longer need to rely on wholesale prices to maintain high retail prices. They can thus:

- (i) set retail prices to the monopoly level;
- (ii) charge wholesale prices that simply reflect production costs ( $w_{ij} = c$ ); and
- (iii) use franchise fees to recover the resulting profits. And indeed, if one manufacturer does this, it is its rival's best interest to do it too. For example, if manufacturer  $B$  adopts this policy, than manufacturer  $A$ 's profit boils down to (with  $\mathbf{p} = (p_{A1}, p_{B1}^M, p_{A2}, p_{B2}^M)$ ):

$$\Pi_A = \sum_{j=1,2} ((p_{Aj} - c - \gamma) D_{Aj}(\mathbf{p}) + (p_{Bj}^M - c - \gamma) D_{Bj}(\mathbf{p}) - F_{Bj}).$$

This thus coincide (up to a constant) with the integrated monopoly profits and manufacturer  $A$  has indeed an incentive to maintain monopoly prices for its own products. In addition, since profits can be shared through franchise fees as well as through wholesale prices, manufacturer  $A$  is indeed willing to “sell at cost” ( $w_{Aj} = c$ ) and recover profits solely through the franchise fees. Therefore, RPM allows firms to sustain monopoly prices, in spite of the fact that, in principle, there is competition in both the upstream and downstream segments.

### 3.4 Exclusive Dealing and Foreclosure

In some circumstances, vertical restraints may be used to foreclose market access and prevent the entry of potentially more efficient competitors. One possible strategy might be to sign-up available distributors into exclusive dealing arrangements, thereby forcing potential new suppliers to set-up their own distribution systems. If there are large economies of scope or scale in the distribution sector, these exclusive arrangements would raise the entry cost of potential rivals: if for example the manufacturer is distributing its products through retailers who could also distribute the products of a potential competing manufacturer, and if there are synergies from distributing both lines of products, a potential competitor entering the market could have low retailing costs; exclusive dealing provisions would rule this out and thus force a potential competitor to distribute its products in a less efficient way - and the increased distribution costs could deter entry.

A similar entry barrier might be created if entry at the downstream level is difficult and costly, e.g. if there is a limited supply of retailers, at least of comparable quality, or a scarcity of comparably good retail locations. Then again, tying-up the best retailers or locations through long term exclusive dealing provisions would increase distribution costs for newcomers and could thus rule out entry from a potential competitor.

These strategies are part of more general “raising rivals’ costs strategies” which have been informally explored in the U.S. institutional context by Krattenmaker and Salop (1986). Such strategies may be used against actual competitors, to force them out of the market or at least substantially reduce their market shares, as well as against potential ones, to prevent them to enter the market or at least to delay their entry. Exclusive agreements may of course hurt retailers (who may prefer to carry both lines of products, and may also eventually face increased competition if entry does occur), but they can be compensated for this risk by a share of the extra profits generated so long as entry is successfully deterred.

A formal analysis of these strategies has been proposed by Comanor and Frech (1985) and then developed by Mathewson and Winter (1987) and Schwartz (1987), who have recognized the role of incumbent manufacturers’ competition for distributors. More recently, Bernheim and Whinston (1998) have further extended the analysis by considering larger class of contracts (previous works had focused on linear wholesale tariffs). They show that exclusive contracts can again be used to foreclose markets, except if vertical arrangements allow upstream and downstream firms to achieve perfect coordination.

The role of exclusive provisions as entry deterrent has long been contested especially by the so-called Chicago School who have argued using such provisions to deter entry cannot be profitable. Even assuming that exclusive dealing provisions can effectively deter the entry of potential manufacturers, why would distributors agree with such arrangements, thereby foregoing opportunities to deal with more efficient suppliers and to generate more competition among their suppliers? Posner (1976) and Bork (1978) claim that for a retailer to accept an exclusive dealing agreement it should be compensated for the loss of profits that could have been generated using more efficient suppliers: this would then necessarily be an unprofitable strategy for the incumbent manufacturer.

Aghion and Bolton (1987) provide a first answer to the Chicago School critique stress-

ing that an incumbent manufacturer could use part of the extra profit generated to “bribe” the distributors into the agreements. More precisely consider the situation presented in figure 6.

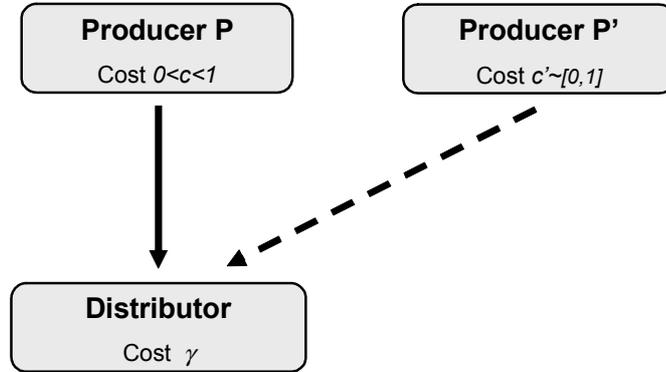


Figure 6: Aghion and Bolton (1987)

An incumbent producer  $P$  has a constant marginal cost of production  $c$  ( $0 < c < 1$ ) and faces a potential entrant  $P'$  whose marginal cost is uniformly distributed over the interval  $[0, 1]$ . To market its product, the manufacturer has to deal with a monopolist distributor  $D$ . The marginal cost of distribution is constant and equal to  $\gamma$  and the final demand is assumed to be inelastic and equal to  $Q = 1$  as long as the retail price is not higher than  $r > c + \gamma$ .

Suppose first that exclusive dealing is banned. The game is then as follows: the potential entrant decides whether to enter or not. The incumbent manufacturer and the entrant (if entry occurs) then simultaneously set their wholesale prices  $w$  and  $w'$ . Finally, the retailer buys from the cheapest manufacturer and resells at price  $r$  on the final market. The entrant will then enter only when it is more efficient than the incumbent ( $c' < c$ , which occurs with probability  $c$ ), sets a price equal to  $c$  and attracts the whole demand. The producers' ( $P$  and  $P'$ ) and the distributor's profits are then respectively:

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

When the entrant is less efficient, entry does not occur and the incumbent producer acting as a monopolist sets a price equal to  $r$  and profits are:

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

The (ex-ante) expected profits for the incumbent producers and the retailer are therefore:

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

Consider now what happens if the distributor has signed an exclusive dealing agreement with the incumbent manufacturer. Confirming the Chicago School argument, such an agreement cannot simply consist of a commitment to deal exclusively with the incumbent even when a more efficient producer is active since the retailer would never be willing to accept such an agreement. However, Aghion and Bolton (1987) solve this problem by assuming that by signing an exclusive dealing agreement the distributor accepts to pay a compensation to the incumbent in case it decides to deal with the entrant. An exclusive dealing contract thus consists of a wholesale price  $w$  at which the retailer can buy from the incumbent manufacturer and of a penalty  $p$  to be paid to the incumbent if the retailer decides to break the exclusivity agreement and deal with the entrant. This now means that the distributor will accept to deal with the entrant only if  $w' + p \leq w$ . The alternative producer will thus enter when  $c' \leq w - p$ . Given that the entrant will charge a price equal to the price offered by the incumbent minus the penalty ( $w' = w - p$ ), the retailer's profit if it has accepted the exclusive dealing offer  $(w, p)$  is simply  $\pi_D = r - w - \gamma$ . The incumbent manufacturer's maximization program is therefore:

$$\max_{(w,p)} [(w - p)p + (1 - w + p)(w - c)] \text{ s.t. } r - w - \gamma \geq c(r - c - \gamma),$$

The solution of this program is then

$$w^* = r - \gamma - c(r - c - \gamma) \text{ and } p^* = w^* - \frac{c}{2} = (1 - c)(r - c - \gamma) + \frac{c}{2}.$$

The incumbent's expected profit under this exclusive dealing agreement is thus:

$$\pi_P^{ED} = (1 - c)(r - c - \gamma) + \frac{c^2}{4} = \pi_P^* + \frac{c^2}{4}.$$

This shows that entry can be at least partially prevented (entry occurs when the entrant is much more efficient than the incumbent,  $c' \leq \frac{c}{2}$ ) although the entrant is more efficient than the incumbent manufacturer. This is achieved through the provision for liquidation damages that allow the retailer to break the exclusive dealing agreement by paying a penalty to the incumbent manufacturer. In order to enter the market, the entrant will have to compensate the retailer for exactly the amount of this penalty and

everything happens as if the damages were paid directly by the entrant. When entry occurs, the damages thus increase the joint profit of the pair  $P - D$  who can then share this increase in joint profit through the wholesale price. Exclusive dealing is thus an attractive option for both the incumbent manufacturer and the retailer because it allows them to extract some of the profit that the entrant could generate in case of entry.

More recently, Rasmusen, Ramseyer and Wiley (1991) have shown that exclusive dealing provisions can be used to deter entry of more efficient competitors, even in the absence of “rent-extraction”, that is, using simple contracts without liquidation damage that would have no effect in the Aghion and Bolton (1987) framework. Their argument rely on a poor coordination among distributors and on the assumption that entry is viable only if the entrant is able to sell its products to a minimum number of consumers (for example because of large fixed costs of entry). The idea is that if the incumbent can convince a sufficient number of retailers to enter in an exclusive dealing agreement entry would become unprofitable for the rival. This can be done by sharing with the retailers that enter the agreement the extra rent that they can then gain from dealing with the remaining retailers who have no alternative supplier. If offers are made simultaneously to all retailers, there must then exist an equilibrium in which all retailers accept the exclusive dealing agreement: because one retailer alone would never buy a large enough quantity to make entry viable for the rival supplier, it has no incentive to deviate and reject the exclusive deal. Segal and Whinston (2000) have shown that if offers cannot be discriminatory, the equilibrium suggested by Rasmusen, Ramseyer and Wiley (1991) is not coalition-proof. However, when discrimination is possible (i.e. when the manufacturer can make different offers to different retailers), the existence of a perfect coalition-proof equilibrium can be restored. In this case, the “exclusion equilibrium” is not based on a lack of coordination between retailers but simply on the externality that distributors accepting the exclusivity deal create on the remaining retailers. These two models actually suppose that the downstream firms are the final buyers of the good: this implicitly assumes that the retailers then resell on independent markets, that is, act as local monopolists. Fumagalli and Motta (2002) extend this analysis and allow for competition between retailers. They then show that exclusive dealing cannot occur in equilibrium if competition between the retailers is fierce enough. Consider for instance the extreme in which retailers are identical

and compete in prices on the final market. If all its rivals have accepted the exclusive deal offered by the incumbent, a retailer would now have a strong incentive to deal with the alternative supplier: because the entrant is more efficient, it would attract all the consumers and this would make entry viable. This suggest that exclusive dealing can be profitable only if intrabrand competition is limited.

Comanor and Rey (2000) also show that exclusive dealing can occur and prevent efficient entry even without “rent-extraction.” Their argument relies instead in the idea that entry of a new competitor at one stage (either at the upstream or downstream stage) not only introduces or reinforces competition at that stage but also triggers or reinforces competition at the other stage. This is then likely to result in a decrease in the joint profit of the incumbent firms who then have an incentive to prevent entry in order to protect their rents. Consider for instance the extension of the Aghion and Bolton (1987) framework to allow potential entry at both stages as illustrated by figure 7.

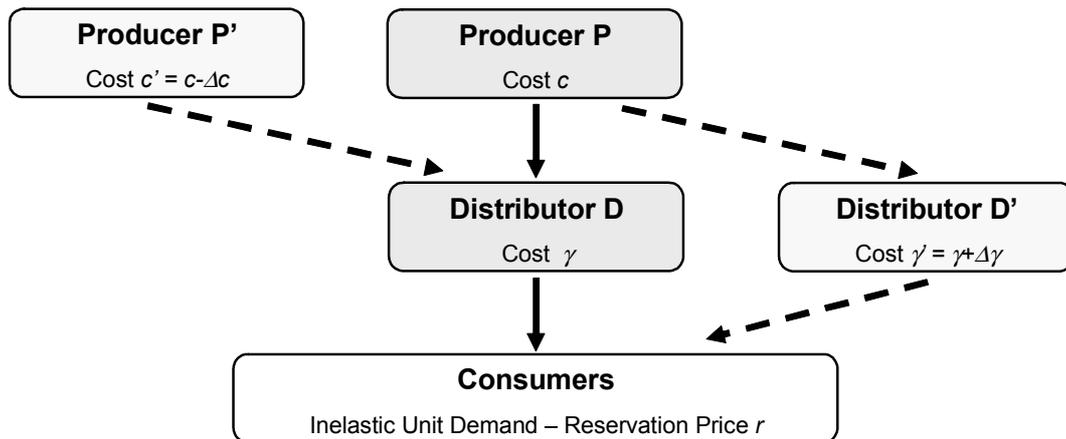


Figure 7: Comanor and Rey (2000)

An incumbent producer  $P$  has a constant marginal cost of production  $c$  and markets its product through an incumbent distributor  $D$  with constant marginal cost of distribution  $\gamma$ . The final demand is assumed to be inelastic and equal to  $Q = 1$  as long as the retail price is not higher than  $r > c + \gamma$ . If the two firms act as monopolists at their respective stages, the distributor sells at price  $r$  and the two firms can share the corresponding profit

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

Suppose now that the retailer has access to a more efficient manufacturer who produces at cost  $c' = c - \Delta c$  and that the incumbent producer has access to an alternative distributor (or can set-up its own distribution network) who is however less efficient than the incumbent retailer and faces a marginal cost of distribution equal to  $\gamma' = \gamma + \Delta\gamma$ . Assume finally that the alternative supplier does not have access to the alternative distributor.<sup>37</sup> This means that three vertical structures can be created (also only at most two are likely to coexist). Assume that all three are viable, that is,  $c + \gamma' \leq r$ .

In the absence of any pre-commitment between the two incumbents, the incumbent distributor will switch and deal with the more efficient producer. This leaves the incumbent manufacturer with no other choice than to deal with the alternative retailer. Entry at the upstream level thus not only generate competition between the two producers, but also triggers competition between two vertical structures: the efficient pair  $P' - D$  with cost  $c + \gamma - \Delta c$  faces competition from the less efficient pair  $P - D'$  with cost  $c + \gamma + \Delta\gamma$ . Bertrand competition between producers will thus lead to a wholesale price equal to  $c$ , while competition between the two vertical structures leads to a retail price equal to  $c + \gamma + \Delta\gamma$ . In equilibrium, only the most efficient structure ( $P' - D$ ) is active and the equilibrium profits are then:

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

The important result here is that the joint profits of the incumbent firms are now lower than in the absence of the alternative firms:

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

Hence the two incumbents would prefer to enter in an exclusive dealing arrangement thereby ruling out any entry. Note that this is true even when the incumbent producer  $P$  has all the bargaining power vis-à-vis the incumbent distributor  $D$  (and thus  $\pi_D^* = 0$ ) in which case  $D$  would a priori be eager to promote upstream competition. However, because the joint profits would be higher under the exclusive dealing agreement,  $P$  can always convince  $D$  by offering a compensating reduction in wholesale price.

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<sup>37</sup>It would be equivalent to assume that the producer  $P'$  can set its own retail network but that because it has just entered the market and is not necessarily well informed, it would face retail costs that would make that vertical structure non-viable (for instance, retailing cost  $\gamma''$  would be such that  $c' + \gamma'' > r$ ).

More recently, Marx and Shaffer (2004) have shown that the increase in retailers' bargaining power might lead to retailers' securing upfront payments from the manufacturer ("slotting allowances") and that this type of vertical contracts might be exclusionary, leading to fewer choice for the consumers. In particular they look at a standard intra-brand competition model similar to O'Brien and Shaffer (1992) but now assuming that the retailers make take-it-or-leave-it offers to the producer. If the offers were made by the manufacturer, the joint-profit maximization would be achieved using two-part tariffs, through: (i) a wholesale price above cost to compensate for the impact of intrabrand competition and maintain monopoly retail prices; and (ii) fixed fees used to recover any retail margin. But when instead the offers are made by the retailers and can include both an upfront fee  $U$  paid when the contract is signed and a fixed fee  $F$  paid when the retailer actually buys the product from the manufacturer, as well as a wholesale price  $w$ , the manufacturer is always excluded from the shelves of at least one retailer. This goes against the intuition of standard common agency models (such as Bernheim and Whinston (1985)) which predicts joint-profit maximization.

Suppose for instance that there exist two retailers – say  $A$  and  $B$  – to distribute the manufacturer's product. The marginal costs of production and distribution are constant and equal to  $c$  and  $\gamma$  respectively and there are no fixed costs. Denote by  $\Pi_i^M$  ( $i = A, B$ ) the industry maximizing profit when only retailer  $i$  is active and assume that retailer  $A$  is the dominant retailer, that is,  $\Pi_A^M \geq \Pi_B^M$ .

Let us first understand why common agency cannot occur in equilibrium. If common agency is to arise in equilibrium, the manufacturer must be indifferent between accepting both offers and accepting one offer only, otherwise the other retailer could increase its upfront payment. But if the manufacturer accepts to deal exclusively with retailer  $i$ , that retailer would earn more than in the common agency situation. Therefore in equilibrium the manufacturer and retailer  $i$  get together less than if the manufacturer were to deal exclusively with retailer  $i$ , and thus exclusion is profitable.

Conversely, there always exists an equilibrium in which the weaker retailer,  $B$ , is excluded. Suppose that retailer  $A$  requests a wholesale price equal to cost,  $c$ , and an upfront payment of  $\Pi_A^M - \Pi_B^M$  from the manufacturer, and accepts in exchange to pay, if it actually buys the product, a fixed fee equal to  $\Pi_A^M$ . If the manufacturer accepts that offer only,

it earns  $\Pi_B^M$ , while  $A$  earns  $\Pi_A^M - \Pi_B^M$  and  $B$  is excluded. Obviously, the manufacturer cannot do better by dealing exclusively with retailer  $B$ . And if the manufacturer accepted both offers  $A$  would decide to remain inactive since retail competition would drive its revenue below  $\Pi_A^M$ , so that the manufacturer would again de facto deal only with retailer  $B$  and thus cannot get more than  $\Pi_B^M - (\Pi_A^M - \Pi_B^M) < \Pi_B^M$ . In other words, accepting to pay a large fixed fee if it eventually buys from the manufacturer allows the dominant retailer to enforce exclusive dealing: if the manufacturer accept both contracts, the dominant would then decide not to purchase because its flow profit would no longer cover the fixed fee.

If the retailers could offer make offers contingent on exclusive dealing or common agency (as in Bernheim and Whinston (1998)), exclusion would however be unlikely to occur in equilibrium. Rey et al. (2005) show for example that with contingent three-part tariffs (that include as above upfront payments and fixed fees conditional on buying), non-exclusionary equilibria always exist and can even sustain the industry monopoly outcome. In this case, upfront payments (“slotting allowances”) always occur whenever retailers have some bargaining power, but the welfare effect of such three-part tariffs is unclear: on the one hand they lead to the higher prices than those that standard two-part tariffs would generate, but on the other hand they ensure that consumers can find the product on both retailers’ shelves. The global effect will more likely to be positive when intrabrand competition is strong because exclusionary equilibria are more likely.

Other types of vertical restraints can be used to deter entry: generally speaking vertical restraints that modify the partners’ attitudes, in particular towards their competitors are likely to have this impact. Hence incumbent firms can use these restraints to commit themselves to a tough attitude in the event of entry. For example, it has been argued that long-term exclusive dealing provisions, which tie distributors to a given brand, induce them to engage in fiercer competition if competing products appear. Similarly, exclusive territories may be used to induce a tougher response in the event of geographically limited entry: in the absence of such arrangements, if a new competitor enters in a given area, an already well-established manufacturer might be reluctant to engage in a price war, which would also affect neighboring areas. By contrast, an independent retailer with an exclusive right on this particular area would not take into account the impact on the

local price cut on neighboring areas, and thus would be likely to engage in a tougher competition with the local entrant.<sup>38</sup>

## 4 Implications for competition policy towards vertical restraints

The first lesson that can be drawn from this analysis is that no simple conclusion can be derived on whether any particular type of vertical restraint is pro- or anti-competitive. Both price (e.g. resale price maintenance) and non-price (e.g. exclusive dealing or territories) may either increase or decrease economic welfare: what really matters is not the restraints used but the context in which it is used and the goal that it is supposed to achieve.

Decisions taken by all firms - a manufacturer and its retailer - within a vertical structure affect the profits of all firms in that structure as well as the economic welfare. Because each firm is likely to ignore the impact of its decisions on other firms profits, each individual will usually fail to maximize the aggregate profits of the vertical structure. Provisions that increase coordination within the vertical structure will therefore restore the efficiency of that structure and this will happen in different ways. Firstly, coordination can be achieved by granting to the manufacturer the right to set the retail prices or specify the level of services offered by the distributors. Vertical restraints such as two part-tariffs can make the distributor feel the full effect of its decisions by making its profits equal to the aggregate profits of the vertical structure (up to a constant). Finally, when they are spillover effects between retailers, vertical restraints such as territorial or customer restrictions can eliminate intra-brand competition and thereby remove the externality. Typically, different combinations of vertical restraints may be used to deal with a particular combination of problems.

If the impact on the aggregate profits of the vertical structure is positive, the impact on economic welfare or consumer surplus is not always so clear-cut. For example, provisions that eliminate double marginalization will reduce the retail price, hence economic welfare increases since both profits and consumer surplus increase. On the other hand, the choice

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<sup>38</sup>See Rey and Stiglitz (1995) for a formalization of this idea.

of retail service that maximizes profit does not necessarily maximize consumer or total surplus.

Our review of the literature has also highlighted several ways in which vertical restraints can be used strategically to impede or even entirely eliminate the benefit of inter-brand competition on consumers and social welfare. This means that, from a theoretical point of view, the optimal policy towards vertical restraints cannot be one such that some particular provisions are deemed illegal *per se* while some others are always acceptable. *Per se* rules may however be desirable if for example they significantly reduce transaction costs and legal uncertainty, as compared with a case-by-case treatment by courts or competition authorities.

The economic analysis does not only stress the complexity of the evaluation of the effects of vertical restraints; it also identifies some ideas on the likely impact of vertical restraints that may provide some guidelines for competition authorities. In particular, the market structure and more specifically the extent of inter-brand competition from other manufacturers and retailers is a crucial factor in the analysis of the effects of vertical restraints. For example, when inter-brand competition is limited, firms and consumers are less likely to agree on the services that should be provided to consumers: this is because firms will tailor their services to attract marginal consumers, who are then likely to be different from the average infra-marginal consumer. In this case, improving vertical coordination may well decrease total surplus. However, when the vertical structure faces strong competition from other suppliers, consumers buying a given brand are likely to be more homogenous, and the vertical is thus more likely to make choices that benefit all consumers. Hence, if the market structure – level of concentration, conditions of entry, dynamics, etc. – ensures a vigorous competition among rival vertical structures, vertical restraints are unlikely to harm economic efficiency or reduce competition. Conversely, in less competitive markets the risk is much greater that vertical restraints can be used to reduce competition or otherwise reduce economic efficiency. Likewise, the strategic impact of vertical restraints on inter-brand competition critically depends on the structure of the market and on the nature of upstream and downstream competition.

Competition policy should thus focus on the extent of inter-brand competition and on the role by alternative distribution systems (e.g. hard discount versus more conventional

channels) rather than on intra-brand competition only. Even when vertical restraints eliminate intra-brand competition, if there is sufficient competition from other structures this will not decrease economic welfare since the structure will be unable to exercise market power. In a similar vein, the strategic impact of vertical restraints on inter-brand competition critically depends on the structure of the market and on the nature of upstream and downstream competition.

Finally, vertical restraints (especially price restraints) might have anti-competitive effects even though there is strong inter-brand competition. In particular, price restraints might facilitate full cartellization of the market if the two vertical structures are not independent and the manufacturers deal with the same retailers. Complete analysis of such markets with intricate relationships between producers and distributors is however complicated and more research needs to be carried out to understand the impact of vertical restraints in such situations.

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