Exclusive Contracts and Vertical Restraints:
Empirical Evidence and Public Policy[1]

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1 Introduction

There is perhaps no aspect of competition policy that is as controversial or has been as inconsistent over time and across jurisdictions as policy towards restraints between upstream firms and their downstream retailers. Moreover, conflicting and changing legal attitudes are mirrored in economic theory. Indeed, theorists have constructed models that lead one to either extol the virtues or rue the consequences of vertical agreements and to advocate either *per se* legality or illegality.[2] In such an ambiguous legal and theoretical environment, the need for an overall empirical assessment seems particularly pressing, and we hope that we will be able to shed some light on this important and controversial subject.

In this chapter, we look at empirical methods that have been used to assess the consequences of vertical restraints, and we survey the findings of empirical studies that have used those methods. As much of the empirical literature has addressed the effect of restraints in the context of exclusive retail relationships, including franchise distribution, we focus almost entirely on such contracts.[3]

The chapter is organized as follows. There are a number of economic models that attempt to explain the rationale behind the various types of vertical restraints. Since those models are reviewed elsewhere in this book, we discuss the principal paradigms only briefly in the next section. An overview of U.S. and E.U. government responses to such contracts follows in section 3.

The heart of the paper, however, is found in section 4. That section contains our review of methods that can be used to assess the consequences of vertical restraints and our survey of empirical findings. The empirical approaches can be grouped into broad classes. The first involves analyses of cross sectional, time series, or panel data on firms or regions, some of which employ a vertical restraint and some of which do not. Those studies range from mainly descriptive to more rigorous econometric analyses. Furthermore, many of them view changes in the legal environment as natural experiments that allow applied researchers to assess the consequences of laws and regulations by examining differential responses of two groups of firms, a treatment group that is affected by the change and a control group that is not.

Whereas the first approach evaluates the actual consequences of changes in the legal environment, a second approach uses event studies to assess market forecasts of those consequences. In particular, share–price information can be used to determine how investors perceive the implications of changes in the law.

[2] A practice is *per se* illegal if it suffices to provide evidence that it exists and it is unnecessary to demonstrate that it damages competition. Under a rule–of–reason approach, in contrast, there is no *a priori* presumption, and the costs and benefits of a practice must be weighed on a case–by–case basis.

[3] For a survey of empirical evidence with a different emphasis and focus, see Cooper et al. (2004).

Finally, a literature is currently emerging in which structural models that involve vertical contracts and restraints on manufacturer/retailer interactions are estimated and used to assess the consequences of current practice and proposed changes. All three methods generate insights into the effects of both privately agreed upon and legally mandated restraints. Only the third, however, can be used to forecast the effects of changes that have not yet occurred.

In the final section, we review the empirical evidence. Moreover, since the empirical regularities that we uncover appear to be strong and consistent across industries and analytical techniques, we also attempt to draw policy implications based on those regularities.

2 Private Motives for Vertical Restraints

Firms are involved in a vertical relationship if they operate at different but complementary levels of the production/distribution chain. All upstream/downstream or input/output relationships are vertical, and any restriction that is imposed by one member of a vertical relationship on the other member of that relationship is a vertical restraint. Authors disagree, however, in that for some, any form of nonlinear–pricing rule constitutes a restraint, whereas in most cases nonlinear prices are excluded. Nonlinear prices do not really constitute a restriction on behavior although some of the incentive effects that nonlinear prices are meant to generate are similar to the incentive effects that are often associated with exclusive dealing. For that reason, in the remainder of this chapter, we focus on the more traditional set of price and non-price vertical restraints. The former refers to resale price maintenance, where, for example, a manufacturer either sets the price or sets a maximum or minimum price that retailers can charge, whereas the latter includes exclusive dealing, exclusive territories, quantity forcing, and tying.

Vertical restraints most often arise in retail settings, with the upstream firm or manufacturer typically restricting its downstream retailers' choices.[4] For example, a manufacturer might limit its retailer's product line or geographic market, or it might set the retail price. Because vertical restraints are observed most often in situations where the downstream firm is a retailer, most of the empirical evidence, and hence our review of that evidence, focuses on that situation as well.

In most western economies, a large fraction of retail sales through independent

[4] Slotting allowances, however, can be interpreted as a form of vertical restraint, a two-part tariff, imposed by retailers (supermarkets) on manufacturers. See also Scherer (2004) on the Toys 'R' Us litigation, which involved a retailer imposing restraints on its suppliers, and Comanor and Rey (2000) for a related theoretical analysis.

retailers is subject to some form of exclusive–dealing clauses. For example, in the U.S., that fraction is over one third.[5] Most of those exclusive–retailing arrangements occur within franchise relationships, which take two basic forms. Traditional franchising involves an upstream manufacturer and a downstream retailer, as in gasoline retailing or car dealerships, whereas, with business–format franchising, production takes place mainly at the retail outlet, e.g., fast food. Many of the studies that we survey focus on one of the types of franchising.[6]

In this section we briefly discuss the economic rationale behind vertical restraints that are voluntarily undertaken. These include efficiency as well as anticompetitive motives. In this discussion, we emphasize how each argument applies to the specific context that we are interested in, namely one that involves a retailer downstream, and thus, in many cases, a franchise relationship. In the next section we examine government responses to the use of restraints, given their potential anticompetitive effects. We also review the reasons why in some cases governments mandate that such restraints be used. More often than not, such constraints restrict the activities of upstream firms. For example, a political jurisdiction might enact a law that requires that wholesalers be given exclusive territories (e.g. for auto or beer distribution).

2.1 Efficiency Reasons for Vertical Restraints

Double Marginalization or the Succession–of–Monopoly Problem

The typical succession–of–monopoly problem arises when an upstream monopolist sells an input to a downstream firm at a price above marginal cost. If the downstream firm also has market power, it is well known that it will choose a price that is higher, and a quantity that is lower, than the price and quantity that would maximize joint profits.[7]

A number of researchers (e.g., Barron and Umbeck (1984), Shepard (1993), and Slade (1998)) discuss the potential effect of double marginalization on prices in traditional franchising where the franchisor sells an input that is resold by franchisees under a fixed–proportion technology. This problem can be overcome by the use of a fixed fee (i.e., a (two–part tariff), which is the standard textbook solution. Indeed, the manufacturer can sell her product to the retailer at marginal cost, the retailer

[5] See U.S. Department of Commerce (1988).

[6] Though some might be tempted to consider individual franchised outlets in a chain to be vertically integrated, franchises are independent businesses under the law. Their operations are, however, subject to numerous restrictions, including typically exclusive dealing and other vertical restraints, which makes this setting perfect for the study of vertical restraints and explains why most of the studies that we have found relate to one form of franchising or another.

[7] A full understanding of successive monopoly dates at least to Spengler (1950), although one can find its origins in Cournot's (1838) analysis of complementary products. Greenhut and Ohta (1979) discuss the oligopoly case.

can take his profit downstream, and the manufacturer can then use the franchise fee to extract the downstream surplus. In many traditional franchising setups, however, retailers do not pay franchise fees. Nevertheless, fixed fees can take the form of rental payments. For example, manufacturers (e.g., oil companies) often own retail premises, which they rent to retailers (e.g., service–station operators) at rates that are independent of realized sales and need not equal market rates.

With business-format franchising, in contrast, the amount of inputs sold by franchisors to franchisees is usually small.[8] Nevertheless, despite the lack of input sales by franchisors, a form of double marginalization still occurs due to the reliance on revenue–based royalty payments in franchise contracts. Specifically, royalties represent a tax on output that results in a downward rotation of the demand curve faced by the franchisee who is subjected to this tax. As a result, a franchisee with market power will maximize his profits by choosing a quantity that is below the quantity that the franchisor would prefer and selling it at a price that, once adjusted to include the royalty on sales, is above that which would have been optimal for the franchisor.[9]

To overcome the double–marginalization problem and reduce retail prices, franchisors might want to use some form of vertical restraint. Maximum resale prices is an obvious candidate. Alternatively, franchisors could use a minimum quantity requirement or eliminate royalties on sales altogether and replace them with higher franchise fees. The latter solution corresponds to the standard two-part tariff used in traditional franchising. Finally, a manufacturer who controls the number of stores that sell her product could eliminate the double–marginalization problem by increasing outlet density and thus the intensity of intrabrand competition.[10]

When double marginalization is an issue, the imposition of vertical restraints will not only increase the overall efficiency of the vertical structure but also lead to lower prices for customers. Thus restraints are usually welfare enhancing when used to

[8] For example, Lafontaine (1992) shows that the value of inputs sold by franchisors in the restaurant and fast–food industry averages only about 4.5% of franchisees' sales. Moreover, this percentage represents actual, not required sales. In many cases, franchisees choose to buy from their franchisors because it is more convenient or economical to do so. Thus required sales are even smaller than this percentage suggests. The tendency of business–format franchisors to sell little to their franchisees can be traced in part to the 1971 decision in *Siegel et al. v. Chicken Delight, Inc.* where the court found that requirements that franchisees purchase inputs from their business-format franchisors were a form of tying, given that such franchisors already 'sell' a business format and/or tradename to their franchisees. With the business format or tradename as the tying good, any other input that a franchisor requires that franchisees purchase from him represents a tied sale (see *Siegel et al. v. Chicken Delight, Inc.*, (1971)). Since that decision, business–format franchisors have tended to rely more on approved supplier programs for all but the most critical inputs (see Hunt and Nevin (1975), Klein and Saft (1985) and Lafontaine (1993) for more on the issue of input tying in business–format franchising).

[9] See Blair and Lafontaine (2005) for more on this.

[10] This solution, however, is generally inefficient, since an optimal choice of outlet density does not focus exclusively on elimination of double marginalization.

solve the successive–monopoly problem.

Dealer Services and Free-Riding Issues

Manufacturers who invest in improving retail outlets, promoting retail products, or training outlet managers might worry that dealers will free ride on those investments. For example, dealers might encourage customers who visit their store to switch to a competing brand that has a lower price — thereby making the sale easier — or that has a higher retail margin — thereby making the sale privately more profitable. Exclusive dealing resolves this problem by making it impossible for the dealer to propose an alternative brand to his customers. In such a context, exclusive dealing is a mechanism that enables manufacturers to protect their investments against potential dealer opportunism. Furthermore, in its absence, potentially profitable investments might not be undertaken.

Alternatively, dealer services at the point of sale can enhance the demand for a manufacturer's or a franchisor's product.[11] For example, Dunkin Donuts implemented a policy that requires franchisees to discard donuts that are no longer fresh.[12] Franchisees, who are residual claimants on their own unit's profits after the payment of royalties to their franchisor, obtain a benefit from the value of the brand thus generated. However, they do not fully internalize the benefit that is associated with their own decisions, as some of their customers with positive experiences will patronize other units of the same chain rather than returning to their unit in the future. In contrast, franchisees bear the full cost of the policy. As a result, they will tend to provide a quality that is too low from the perspective of the franchisor. Furthermore, the problem worsens as the fraction of repeat business that franchisees face falls.[13] Marvel and McCafferty (1984) suggest that resale price maintenance can be used to insure that retailers will provide product–quality–certification services.

In some cases the quality problem can take the form of a dealer or franchisee

[11] The welfare effects of vertical restraints that are meant to ensure the provision of dealer services are less clear, however, if consumers do not all value the services equivalently (see notably Spence (1975) on this issue).

[12] Similarly, from its early days McDonald's implemented policies related to QSC, or Quality, Service, and Cleanliness, to try to ensure a positive customer experience to those frequenting a McDonald's anywhere in the world and thus encourage them to visit other McDonald's restaurants in the future.

[13] See e.g. Brickley (1999) and Blair and Lafontaine (2005) for more on this. Note that if the retailer was not an independent business but instead was part of a vertically integrated structure, he would not necessarily bare the cost of higher service level in the unit. If paid a salary that does not depend on retail profits, there would be no reason for the retailer to free ride. A different type of incentive problem would occur, however, if service provision entailed costly effort on the part of the retailer. If monitoring the provision of this effort was costly, then the retailer who was not paid based on retail profit would have every incentive to shirk, as per the traditional principal–agent problem. The solution to this problem is to make the retailer a residual claimant, in which case the free-riding problem resurfaces.

wanting to use lower quality inputs in the production process.[14] This type of free riding can be resolved with input–purchase requirements (tying) or approved–supplier programs as long as defection from such programs is not too difficult to detect.

In general, not only do dealers have incentives to free ride on the value of the brand and put in too little effort, a vertical externality, they also have incentives to free ride on services offered by other dealers, a horizontal externality. If service is important to the sale of a manufacturer's product, she will need to ensure that dealers provide it. Telser (1960) argued that minimum price restraints could solve this incentive problem by preventing retailers from competing on price and leading them to compete instead on quality or customer service.[15] Klein and Murphy (1988), instead proposed that manufacturers could use vertical restraints such as minimum resale prices or exclusive territories to ensure that their dealers earn above normal returns, which would mean that those dealer would have something to lose if their contracts were terminated. Such rent, in combination with ongoing quality or service monitoring and the threat of termination, would entice the dealers to provide the desired level of quality or service. In either case, since the quality and service levels in question are valued by customers — if it were otherwise manufacturers would not value them — quantities sold and hence consumer satisfaction should be enhanced.[16]

Dealer Ex-ante Investment Incentives

A related but different dealer–incentive issue arises in situations where the manufacturer wants the dealer to invest *ex ante* in specific facilities or human capital in order for him to provide better service to consumers. Unless the dealer can be assured that his investments are fully protected, however, he will choose to underinvest or not invest at all. A vertical restraint such as an exclusive territory can provide the guarantee that the dealer needs.[17] While the exclusivity of the territory might give

[14] Input–substitution problems in vertical structures can take a different form. Specifically, downstream firms that do not operate under fixed–proportion technologies have incentives to adjust the quantity of inputs that they use away from a high–priced input that is sold by an upstream monopolist towards inputs that are obtained from competitive suppliers. This possibility has been used to explain, for example, why monopolists might vertically integrate (see, e.g., Warren–Boulton (1974)). Instead, the monopolist could tie the purchase of the products provided by the competitive industries to its own, requiring efficient ratios of inputs (see Blair and Kaserman (1978)). We do not pursue this possibility further because the most of the retail situations that we are concerned with entail relatively fixed proportions. Moreover, none of the empirical studies that we have uncovered examine cases where tying is used in industries with variable proportions.

[15] Thus Telser (1960) assumed that dealers would not just pocket the increased profits resulting from the lack of price competition, but instead would spend them on increased quality or service, and that the increased quality and service they would choose would be the ones desired by the manufacturer.

[16] See also Goldberg (1984) and Meese (2004) for more on these and related arguments.

[17] For this solution to work, the upstream firm must be able to verify downstream investment and to terminate the contract if it is unsatisfactory.

the dealer some market power, consumers benefit from the resulting investment and thus the restraint can have positive welfare effects.

Price Discrimination

A number of authors have shown that vertical restraints such as tying, exclusive dealing and refusals to deal can be used by manufacturers to enforce price–discrimination schemes (see e.g. Burstein (1960), Perry (1980), and Chen and Ross (1993) on each of these respectively). Of course the welfare implications of vertical restraints in this context, as for price discrimination generally, are ambiguous, as are the expected effects on observed quantities.

2.2 Anticompetitive Reasons for Vertical Restraints

Vertical restraints are often viewed with suspicion because comparable horizontal practices are frowned upon. For example, resale price maintenance is vertical price fixing, exclusive territories can create monopoly power, and exclusive dealing can inhibit entry. Nevertheless, as we have just seen, real efficiencies can be associated with these restraints. However, competitive harm can also result for reasons that we now discuss.

Dealer Cartels and Monopolization

The arguments that explain how certain types of vertical restraints can facilitate dealer cartels or monopoly power are straightforward. In particular, a manufacturer that imposes a minimum price for her product can help a dealer cartel enforce the monopoly price (see e.g. Ornstein (1985)). Similarly, exclusive territories, if they are large enough, can insulate retailers from competition by eliminating nearby competitors as well as preventing entry. The main issue that these arguments raise, however, is why manufacturers would find it in their own best interest to impose such restraints. If upstream firms have no market power, they will be indifferent to the imposition of restraints and might agree to adopt them to satisfy dealers. However, brand differentiation and the use of trademarks usually confer some market power on upstream firms. Another answer that appears in the literature involves a beneficial reduction in interbrand competition, a type of argument to which we now turn.

Strategic Delegation

The idea that upstream firms can soften the intensity with which they compete by delegating the pricing decision to independent retailers is by now well understood. The models in this case focus on interbrand competition across vertical structures. Rey and Stiglitz (1995), for example, show that, when manufacturers compete di-

rectly with each other (when they set retail prices themselves), the resulting Nash–equilibrium prices are lower than joint–profit–maximizing prices. If, however, retailers have some market power, and if manufacturers delegate the pricing decision to their retailers, the equilibrium prices that result will be higher than in the former situation. A softening of competition occurs because prices are normally strategic complements (i.e., price reaction functions normally slope up). An increase in a manufacturer's wholesale price is therefore associated not only with higher own-dealer prices but also with higher competitor retail prices. Furthermore, with two–part tariffs, equilibrium prices will not exceed monopoly prices.[18]

The above argument is premised on the assumption that retailers or distributors have market power. The assignment of exclusive territories is one (but not the only) way of insuring that this is so. It also relies on the assumption of price competition at the retail level, which is apt to be valid in the current context. However, if downstream firms engage in quantity competition, delegation will not benefit the vertical chain.[19]

Foreclosure and Raising Rival's Costs

The main worry of antitrust authorities in the U.S. and the E.U. when it comes to vertical restraints is the possibility that their use will foreclose entry by competitors at some level of the vertical chain. In the context of relationships involving a retailer, such as the ones that we are concerned with here, a manufacturer that establishes an exclusive retail network (i.e., exclusive dealing) that involves most retailers, might prevent her competitors from gaining access to customers at a reasonable cost, if at all. This in turn could prevent entry of potential competitors or perhaps even lead to rivals exiting the upstream industry (see, e.g., Krattenmaker and Salop (1986), Aghion and Bolton (1987) and Comanor and Rey (2000)). This argument requires that entry into retailing be costly due to, for example, economies of scale or a scarcity of good locations.

Exclusive dealing, which has sometimes been referred to as vertical integration by contract, is the form of restraint for which foreclosure arguments are most frequently made. In addition, when there are few uses for an input, tying can foreclose entry of firms in the tied goods industry.

In the end, if vertical restraints are used to lessen competition at some level of the vertical structure through foreclosing or disadvantaging rivals, prices to consumers should be higher and quantities sold smaller than they would be in the absence of such restraints.

[18] In the absence of fixed fees, delegation can still lead to higher upstream profits but is not guaranteed to do so.

[19] This is true because quantities are strategic substitutes.

Aftermarkets

A final anticompetitive motive for imposing vertical restraints involves the creation of monopoly power, not in the market for the manufacturer's product, but in a related market.[20] This rationale is often invoked as a motive for tying of say parts and service to the purchase of a machine or the purchase of paper to that of a copier. According to this argument, although consumers have many brands to choose from in the primary market, due to the tie, they have no choice in the aftermarket (e.g., in the service market). Indeed, consumers are locked in *ex post*, and monopoly power can be exploited in the aftermarket.

A problem with this argument is that, if consumers are forward looking, they will anticipate super–competitive prices in the tied market and will demand compensation in the form of lower prices in the primary market. Nevertheless, in a world of imperfect consumer information, this anticompetitive motive for tying persists.[21]

3 Public Policy Toward Vertical Restraints

As noted earlier, legal policies towards vertical restraints have been inconsistent, not only over time within a jurisdiction but also across jurisdictions. To illustrate the legal ambiguity, consider the history of the U.S. Department of Justice's (DOJ's) position towards vertical restraints (VR). Until the 1940s, most restraints on distribution were upheld as lawful.[22] By the mid 1960s, however, this lax attitude had given way to a much more aggressive stance whereby virtually every restraint had become suspect and many had become *per se* illegal. This new harsh view, however, was itself short lived. Indeed, a second reversal in attitude, which surfaced in the 1977 *Sylvania* Supreme Court decision, culminated in the publication of the 1985 Vertical Restraints Guidelines.[23] Those Guidelines, which were extremely lenient towards most forms of restraints, were controversial from the outset. In particular, both the U.S. Congress and the National Association of Attorneys General (NAAG) denounced them, and one of the first acts of the new Clinton administration was to rescind them.[24] Since that time, they have not been replaced, and there is no formal vertical–policy guidance in

[20] This is a form of leveraging.

[21] See for example MacKie-Mason (2004) for more on this.

[22] Resale price maintenance was an exception, as it was declared a *per se* violation of Section 1 of the Sherman Act by the Supreme Court in its 1911 *Dr. Miles Medical Co.* decision.

[23] *Continental T.V., Inc. v. GTE Sylvania, Inc.*

[24] Assistant Attorney General Anne Bingaman (1993) stated in her speech that rescinded the Guidelines that "These Guidelines seem so throughly to discount the anti–competitive potential of vertical intrabrand restraints and so easily assume their efficiency–enhancing potential as to predetermine the conclusion against enforcement action in almost every case. I am simply not willing to sign on to that balance."

the U.S.[25]

Changing legal attitudes towards vertical restraints have not been the exclusive domain of the United States. In particular, prior to enacting its Vertical Restraints Guidelines in 1999, the E.U. attitude was governed by what seemed like a blanket prohibition on vertical agreements that restrict competition,[26] combined with numerous bloc exemptions for particular types of agreements, including franchise agreements. In practice, those bloc exemptions created a very inflexible system that led firms to adopt standardized contractual terms. The new guidelines provide more flexibility as they follow an approach that is closer to rule of reason.

The discussion of motives should make it clear that vertical restraints, both price and nonprice, can enhance efficiency in some circumstances and distort competition in others. This is sometimes given as the reason why government policy towards vertical issues has been so variable.[27] However, horizontal agreements and mergers can also give rise to both efficiency gains and competitive distortions. To illustrate, when two firms in the same product market merge, there can be a tradeoff between lower costs due to economies of scale and increased market power due to higher concentration. Hence, one cannot say *a priori* if product prices will rise or fall. Nevertheless, economists and lawyers are less apt to disagree about horizontal issues.

In addition to inconsistencies in overall policy towards restraints, there are differences in the legal treatment of different types of restraints. Indeed, in most countries, vertical price restraints are treated much more harshly than nonprice restraints. In particular, resale price maintenance is often *per se* illegal, whereas most nonprice restraints are governed by a rule–of–reason standard. This is despite the fact that, from an economic perspective, nonprice and price restraints are often substitute methods of achieving a given objective, and that the achievement of that objective might or might not harm consumers.[28] The fairly harsh treatment of vertical price restraints is sometimes said to occur because it is wrongly associated with horizontal price fixing, which is *per se* illegal in most jurisdictions.

The U.S. has employed a rule–of–reason approach to most nonprice vertical restraints since the late 1970s.[29] Specifically, in *Continental T.V., Inc. v. GTE Sylvania, Inc.*, the Supreme Court found that though specific vertical restrictions can have anticompetitive effects, there had been no showing that in general vertical restrictions have a "pernicious effect on competition" or that they lack "any redeeming

[25] The NAAG, however, published its own VR Guidelines in 1995.

[26] Under article 81 of the Treaty of Rome.

[27] See, e.g., Pitofsky (1997).

[28] See Blair and Kaserman (1983) and Mathewson and Winter (1984) on the substitutability of different forms of vertical restraints.

[29] One exception is tying arrangements, which are treated under a modified *per se* rule.

value." The Court therefore concluded that such restrictions should be judged under a rule–of–reason.

In applying this approach to vertical restraints, the courts have usually stressed horizontal anticompetitive effects. Indeed, the two factors that are emphasized in assessing the potential anticompetitive effects are collusion and exclusion at one level or another of the vertical chain. On the former, it is often claimed, for example, that upstream collusion is facilitated when exclusive–dealing arrangements are widespread downstream since their presence eliminates buyer competition. This in turn reduces the incentives of sellers to undercut one another to try to entice buyers to switch. As for exclusion, it can also result from exclusive–dealing arrangements, since new upstream competitors can face difficulties in reaching customers when most retailers are involved in exclusive deals with upstream firms. Similarly, new downstream competitors can have difficulty obtaining supplies under such circumstances. This, in turn, makes entry at either level less likely.

The emphasis on horizontal consequences of nonprice restraints might be surprising given that, with or without horizontal considerations, the effects of VR are usually ambiguous. However, it is reasonable to assume that VRs are more apt to be harmful when markets, particularly upstream markets, are highly concentrated. Indeed, when this is not the case, vigorous interbrand competition tends to offset restraints on intrabrand competition.

In the E.U., the rule–of–reason approach came somewhat later, after the publication of the Commission Guidelines on Vertical Restraints in 1999. Prior to that time, as we noted earlier, E.U. policy was somewhat contradictory. In the 21st century, however, policies towards VR in the two jurisdictions have converged to a substantial degree as the E.U. has adopted a position that is closer to the U.S.[30]

In our discussion so far, we have assumed that VR have been voluntarily undertaken by the parties to the contract and that the role of the competition authority is to monitor those contracts. However, not all vertical restraints come from within vertical relationships. Indeed, it is not uncommon for jurisdictions, particularly states in the U.S., to enact laws that restrict either downstream or upstream behavior. An example of the former is the passage of a law that requires exclusive sales territories in distribution,[31] whereas an example of the latter is a law that limits the franchisor's ability to terminate a franchise without "good cause." It is difficult to explain such laws in economic terms, and, in practice, the pressure for adoption often comes from

[30] One exception is the harsher treatment of exclusive territories in the E.U., particularly if those territories are drawn along national borders.

[31] For example, some states have laws that require the use of exclusive territories in the distribution of beer, whereas others forbid the use of ET, and still others have adopted no restrictions (see Sass and Saurman (1993)).

lobbying groups such as associations of dealers.[32] Furthermore, as with positions on voluntarily chosen vertical restraints, policies towards mandatory adoption of restraints have been variable and inconsistent.

Finally, whereas vertical restraints have at times been treated harshly by the law, at the same time vertically integrated firms have been able to engage in similar practices with impunity (see Katz (1989) on this).

4 Empirical Evaluation of Vertical Restraints

It is important to develop a sound theoretical basis for a consistent public policy regarding exclusive contracts. Unfortunately, economic theorists and policy makers do not agree amongst themselves on the most important consequences of vertical contracts. Fortunately, however, one need not rely solely on theory to determine the consequences of VR. Indeed, the world is a laboratory that is constantly offering experiments that can be analyzed by applied researchers. In this section we indicate how data can be used to assess the consequences of VR, and we discuss some of the many pitfalls that the applied researcher can encounter. In addition, we attempt to summarize what this body of research has found. Unfortunately, like the theory, the empirical evidence is somewhat fragmented. However, it is our belief that with further work, empirical analyses will be able to provide much needed guidance to policy makers and the courts. Our first goal, then, is to encourage further empirical work in this area.

Most econometric analyses of exclusive contracts examine *incidence*, that is researchers seek to determine the circumstances under which various sorts of restrictive agreements are reached by parties to a contract.[33] Our objective, by contrast, is to determine both the private profitability and the social desirability of vertical restraints, whether privately agreed upon or legally mandated. Thus our focus will be on the *consequences* of restrictive agreements. In particular, we discuss methods of assessing the effects of VR on price, consumption, and other measures of consumer well being, and on profits and other measures of firm value.

4.1 Methods of Assessment

In this subsection, we discuss various empirical approaches to the assessment of the effects of vertical restraints. For simplicity, we focus our discussion on the effects of vertical restrictions on price. It should be clear, however, that the principles presented

[32] See e.g. Smith II (1982) for a discussion of this issue.
[33] See Lafontaine and Slade (1997) for a survey of those studies.

here would remain the same if other variables of interest, such as output or profit, were used instead of price.

The most straightforward way to evaluate the effects of restrictive agreements is to present some persuasive descriptive statistics. For example, one can compile information on retail prices in regions where a restrictive agreement is banned and compare them to prices in regions where the agreement is allowed. Descriptive statistics are useful in so far as they convince the reader that there is an empirical regularity that should be explained. The obvious problem, however, is that there can be many explanations for that regularity. For this reason, most researchers combine descriptive statistics with econometric analysis. In what follows we describe several different econometric approaches to the problem.

Cross–Section, Time–Series, and Panel Estimation

The simplest econometric analysis of vertical restraints involves performing a multivariate regression on a cross section of firms or retail establishments. For example, one might look at retail prices across establishments that are and are not subject to a particular restraint. Although attention is focused on the coefficient of a dummy variable that indicates whether the restraint is employed, the regression typically includes a number of supply, demand, and policy variables that also affect price.

The problem with this sort of analysis is that the use of a restraint is endogenous to the relationship. Indeed, in the absence of legal restrictions, the upstream firm will choose a set of restraints that maximizes its profit, and there are many unobservable characteristics of the franchisor and franchisee that can affect both retail price and the choice of restraints. For example, exclusive dealing might occur in situations in which upstream firms must make substantial investments, and since those investments can influence retail cost and/or demand, they can also influence price. Under those circumstances, the relationships that are uncovered are correlations, not causalities. Moreover, the endogeneity problem is exacerbated by the fact that it is usually difficult to find instruments that are correlated with the use of a restriction but do not affect the dependent variable. To make matters worse, in the absence of nonsuspect instruments, it is impossible to perform a formal assessment of the validity of any instruments.

To circumvent this problem, researchers have looked at, for example, cross sections of regions that ban and do not ban particular restraints. Since the ban comes from outside the vertical relationship, it is often thought to be exogenous. Nevertheless, although the endogeneity problem is lessened in this situation, it is not eliminated. To illustrate, suppose that it is discovered that prices are higher in regions where resale price maintenance is allowed. One is tempted to conclude that RPM causes

higher prices. However, it is also possible that RPM is not banned in areas in which both up and downstream firms have substantial market power and the potential for double marginalization is therefore greater. Under those circumstances, the causality runs from high prices to tolerance towards RPM.

If the underlying factors that affect both the use of a restraint and the dependent variable are time invariant, the above problem can be overcome through the use of panel data. In particular, with panel data, one can use a fixed–effects estimator that removes the influence of the time–invariant unobserved regional, brand, or outlet characteristics that cause the endogeneity problem. With this procedure, however, the effect of a restraint is identified solely through time–series variation. In other words, one is essentially assessing how changes in the use of a restraint lead to changes in prices, and there may be little time–series variation in use. Furthermore, if the unobservable characteristics vary over time, the endogeneity problem is not solved. With panel data, it is tempting to use lagged endogenous variables as instruments in the hopes that they are predetermined. This hope will be thwarted, however, if both observed and unobserved variables are serially correlated.

Another approach is to look at a single time series of prices that includes periods before and after a legally mandated change such as the banning of a restraint. The problem with this approach is that many things change over time, and, although it is tempting to attribute any significant price movement to the legal change, this attribution might not be valid.

Natural Experiments

It is rare that laws are modified simply to enable economists to collect data in order to evaluate the effects of vertical restraints. In other words, in vertical markets, we rarely have access to designed experiments. Nevertheless, many legal changes can be thought of as natural experiments.[34] In fact, much of our earlier discussion is concerned with how natural experiments can be used to assess restrictive agreements. Nevertheless, we reserve the term natural experiment to denote analyses that involve i) an exogenous policy change, ii) a group of observations that is affected by the change (the treatment group) and iii) a group that is not affected (the control group). Furthermore, the differential response of those two groups to the change is used to identify the effect of a restraint.

Formally, suppose that n brands of a product, $i = 1, \ldots, n$, are sold in two regions, $j = 1, 2$, in two time periods, $t = 1, 2$, and that period one occurs before and period two occurs after a change in the law. A linear regression equation for price can be

[34] The term natural experiment is not particularly illuminating in that there is nothing particularly natural about changes in the law. Nevertheless, we follow the labor and public–finance literature in using the term.

written as

$$p_{it}^j = \alpha_i + \delta^j + \gamma^j D_2 + \beta^T X_{it} + u_{it}^j, \tag{1}$$

where D_2 is a dummy variable that equals one in period two, X_{it} is a vector of observed brand, chain, and cost characteristics, and u_{it}^j is a zero–mean random variable. The change in the price of brand i in region j, is then

$$\Delta_i^j = p_{i2}^j - p_{i1}^j = \gamma^j + \beta^T (X_{i2} - X_{i1}) + u_{i2}^j - u_{i1}^j, \tag{2}$$

and the expected difference in the price difference across regions, DD, is

$$DD = E(\Delta_i^1 - \Delta_i^2) = \gamma^1 - \gamma^2. \tag{3}$$

Furthermore, as long as the error, u_{it}^j, is uncorrelated with the observed characteristics, X_{it}, the difference–in–difference estimator of the effect of the change in the law is unbiased.[35]

More generally, with obvious modifications one can include regional variables, X_{it}^j, in equation (1). In that case, the difference-in-difference estimator in equation (3) will no longer be constant but will depend on changes in those variables.

A difference–in–difference estimator does not require a paired sample. For example, in equation (1), i might index establishments rather than brands, and the number of establishments might differ in the two regions. Furthermore, with either paired or non-paired samples, it is not necessary to estimate a regression equation. Assuming no region-specific changes, one can simply difference the prices in each region, average the differences across brands or establishments, and calculate the difference in those averages. That number gives the magnitude of the effect. Its statistical significance can be obtained by dividing the estimate by its standard error.[36]

Event Studies

We have been concerned thus far with evaluating the realized consequences of changes in public policy towards vertical restraints. One can also estimate forecasts of the effects of those changes on firm value. The tool that is commonly used to perform that evaluation is the event study, which requires that the firms that are used in the analysis be publicly traded.

An event study is based on the assumption that stock markets are efficient and that share prices reflect all currently available information. In other words, it is assumed that the current price equals the expected value that accrues to the holder of the

[35] In the short run, one can assume that the characteristics are predetermined.

[36] Formulas for tests of differences in means under various assumptions about the two populations can be found in Walpole and Myers (1972, p. 242).

share — the expected discounted stream of capital gains and dividends — where expectations are formed efficiently and rationally. With efficient markets, when a 'surprise' occurs, the associated change in the share price is the expected value of the change in that flow.[37]

It is common to base an event study on the Sharpe (1963) market model that relates the return on asset i in period t, R_{it}, to the market return, R_{mt}, where the market return is the return on a broadly based portfolio of traded assets,[38]

$$R_{it} = \alpha_i + \beta_i R_{mt} + u_{it}, \quad i = 1, \ldots, n, \quad t = 1, \ldots, T. \tag{4}$$

When assessing an event such as the enactment of a law, it is important that the event be a 'surprise.' Unfortunately, when, for example, a final bill is passed, there might be little news in the event. For this reason, it is common to partition an event into a number of subevents in the hopes that the evolution of the news can be captured. To illustrate, the sequence of subevents might be

- *Legislation proposed*
- *Subcommittee formed*
- *Bill made public*
- *Bill passed by one body*
- *Bill passed by 2nd body*
- *Compromise bill negotiated*
- *Final bill passed*

In order to evaluate the subevents, the market model can be augmented to include a series of dummy variables, $D_{st}, s = 1, \ldots, S$, with $D_{st} = 1$ if subevent s occurred in period t and zero otherwise,

$$R_{it} = \alpha_i + \beta_i R_{mt} + \sum_s \gamma_{si} D_{st} + u_{it}. \tag{5}$$

When there is a large number of firms in the sample, instead of estimating the $S \times n$ matrix of coefficients, γ_{si}, it is common to collapse the matrix by assuming that the coefficients are functions of firm characteristics. This practice yields a parsimonious but at the same time flexible specification.

Equation (5) can be estimated as a system of seemingly unrelated regressions (SUR). The estimated effects, $\hat{\gamma}_{si}$, can then be summed across subevents to find the overall effect of the event for each firm or group of firms and averaged across firms

[37] See MacKinlay (1997) for a general discussion of the use of event studies in economics and finance.

[38] The market model can be augmented to include other financial and nonfinancial assets, as in the APT model of Ross (1967).

or groups to find the average effect. Finally, the standard errors of each estimate can be calculated using well known formulas.[39]

Structural Models

The econometric methods that we have discussed thus far involve estimating reduced–form equations. In particular, there is no way to recover the structural parameters that characterize tastes and technology from such models. This is not a criticism in itself, but it does mean that certain types of analysis cannot be performed. In particular, it is not possible to use reduced-form equations to forecast the consequences of changes in policy *ex ante*.[40]

Although it is now common to estimate structural econometric models to evaluate changes in horizontal–market structure such as mergers and divestitures,[41] it has not been common to use such models to assess vertical issues. Nevertheless, structural models are beginning to emerge, and there are both costs and benefits to employing such models.

The principal benefits are twofold. First, one can evaluate changes in the law before they occur by performing simulations that are based on models that have been estimated using pre–change data (see, for example, Brenkers and Verboven (2004), who evaluate the removal of exclusivity and selectivity practices in European automobile distribution). This benefit is particularly important as it is much more costly to rescind a mistaken policy after firms have adjusted to the change than it is to change the policy *ex ante*.

Second, in some cases, estimation of a structural model facilitates the solution of the identification problem in the sense that it forces the researcher to specify all of the equations in the system and to justify exclusion restrictions. This can be analogous to the use of full–information maximum–likelihood techniques to estimate structural supply/demand models, which does not require instruments from outside of the model. However, it is more common to estimate complex structural models by GMM, which usually requires the use of additional instruments (see, e.g., Mortimer (2004)).

The principal costs are also twofold. First, the construction of a structural model requires one to make strong assumptions concerning market equilibrium. This requirement is particularly demanding in the vertical case because, not only must one specify the games played among firms at the same level of the vertical structure (e.g., the manufacturers), but also one must specify how firms within a vertical structure interact (e.g., a manufacturer and her affiliated retailers). Unfortunately, given the

[39] See, e.g., Campbell, Lo, and MacKinley (1997, chapter 4).
[40] This is just another example of the Lucas (1976) critique.
[41] See, e.g., Hausman, Leonard, and Zona (1994), Nevo (2000), and Pinkse and Slade (2004).

lack of agreement among theorists as to these issues, it is often difficult for empiricists to specify this information *a priori*. However, misspecifying the equilibrium leads to biased estimates of the structural parameters and, thus, to inaccurate forecasts of the effects of policy changes.

Second, it is always difficult to forecast changes in costs that result from a change in the structure of the market or the legal environment.[42] This issue is particularly troubling, however, in the vertical case because many cost changes relate to the type of motivational and informational issues (i.e., agency costs) that are central to the decisions firms make about vertical structure. Nevertheless, in spite of the difficulties that are inherent in such exercises, we feel that this area of research is particularly promising and that the use of structural models will grow in the years ahead.

4.2 Empirical Findings

The results of studies that have examined the effects of vertical restraints on market outcomes are summarized in Tables 1 through 3. As in earlier sections of this chapter, we stress situations in which downstream firms are exclusive wholesalers or retailers. However, due to the paucity of empirical work on consequences, we also discuss some research that involves common agency (e.g., distilled spirits and glassware).

Most of the studies that are listed in the tables are concerned with the standard set of restraints that we enumerated in section 2. However, we also include studies that evaluate restrictions on the ability of the upstream firm to terminate the franchise agreement. Those requirements, which we label termination restrictions in the table, are usually imposed by regional governments in response to perceptions of unfair treatment of retailers by manufacturers. In other words, they are restrictions that are often indirectly imposed on upstream firms by downstream firms through the intervention of regional authorities, which are often states.

Finally, since our primary focus is on public policy, we also consider studies that evaluate divorcement. Divorcement is a legally imposed restriction on the type of contract that can be written between up and downstream firms. In particular, retail outlets can be owned by either the manufacturer or the dealer and they can also be operated by either party. To illustrate, gasoline service stations can be owned and operated by the oil company (CC), owned by the oil company but operated by an independent dealer (CD), or owned and operated by independent dealers (DD).[43] We call the prohibition of CC contracts divorcement type I and prohibition of CD

[42] In fact, this issue is often ignored by researchers who perform horizontal–merger simulations. However, it is relatively straightforward to estimate a cost function that allows one to assess economies of scale and scope, and changes therein, in that context.

[43] There is clearly a fourth case, DC, but it is never observed in practice.

contracts divorcement type II.

Table 1 contains a list of articles where the entries are organized by method of analysis. This table shows that cross-sectional and panel analyses have been the most popular forms of assessment. Nevertheless, the other econometric methods have also been used.

Most importantly, once one considers that the table was constructed to include studies that assess the consequences of all types of vertical restraints and legal restrictions on vertical contracts, it highlights how very few studies there really are in each category and in total.[44] One can contrast this paucity with the very large number of theoretical articles that have been written on the subject as well as the multiplicity of retail and service industries that have used the restraints. We did, indeed, search broadly and believe that the data in Table 1 provide an accurate depiction of the state of empirical research on this topic.[45] Clearly, much more work is needed in this area.

Tables 2 and 3 present the same set of studies as Table 1. However, in this case, they are organized by type of restraint and by whether that restraint was adopted voluntarily or was forced upon the vertical structure. Specifically, table 2 shows those studies that focus on privately imposed vertical restraints, whereas table 3 contains assessments of mandated vertical restraints, where, for example, the government intervenes and requires that retailers be granted exclusive territories or imposes rules governing termination.[46]

In both tables, the last three columns show the outcome variable under scrutiny (Variable (Y) in the table), the direction of the estimated effect of the restraint on that variable (Effect (Y)), and the conclusion that is reached in the paper concerning the consequence of the restraint for consumer wellbeing (Effect (W)). For example, if the variable under scrutiny is consumption, a + in the next–to–last column means that the use of the restraint was associated with larger consumption, whereas a + in the last column indicates that consumers are better off as a consequence.

In performing this exercise, we looked at the overall effect of the restraint. This means that if, for example, the restraint is estimated to result in higher prices and increased consumption, we indicate that it was good for consumers,[47] whereas if only higher prices resulted, we indicate that it was bad. Unfortunately, when only the effect on prices was examined by a study, there is some ambiguity in the findings.

[44] A related literature that assesses incidence also exists, but those studies are outside the scope of this chapter.

[45] In this vein, we would appreciate any help identifying studies we may have missed.

[46] Note that the restraints studied in table 3 were imposed by a government. If instead they had been prohibited by a government, the study would appear in table 1.

[47] The combination of higher prices and increased consumption is usually interpreted as being due to increased provision of services, which are costly to provide but are valued by consumers.

In particular, although we classify higher prices by themselves as bad, they can be good if they result from higher quality services.

Given the small number of available studies, it is difficult to make definitive claims about robust empirical regularities. This is particularly true in light of the limitations of the various econometric approaches (particularly the identification problem) and the ambiguity in interpreting price effects by themselves. There is also an ambiguity in interpreting a restraint's effect on the number of franchises or dealerships by themselves, since there may have been too many or too few outlets to begin with.[48]

Nevertheless, the results are quite striking. Indeed, table 2 shows that, in all but three cases, privately imposed vertical restraints benefit consumers or at least do not harm them. The three exceptions are studies that show that particular restraints are associated with higher prices, and we have already discussed the difficulties associated with interpreting price effects.[49] Ignoring price effects, the table indicates that voluntarily adopted restraints are associated with lower costs, greater consumption, higher stock returns, and better chances of survival.

Table 3, in contrast shows that, when restraints are mandated by the government, they systematically reduce consumer welfare or at least do not improve it. It appears that, when dealers or consumer groups convince the government to 'redress' the unfair treatment that they allege to be suffering, the consequences are higher prices, higher costs, shorter hours of operation, and lower consumption as well as lower upstream profits.[50]

In general then, the empirical evidence leads one to conclude that consumer well being tends to be congruent with manufacturer profits, at least with respect to the voluntary adoption of vertical restraints. When the government intervenes and forces firms to adopt (or discontinue the use of) vertical restraints, in contrast, it tends to make consumers worse off. Moreover, this is true even when the pressure for the intervention comes from consumers themselves. When the pressure comes from downstream firms, intervention tends to lead to dealer entrenchment and the inability of manufacturers to use restraints as incentive devices.

[48] A larger number of outlets is associated not only with lower transport costs, a plus, but also with higher prices due to duplication of fixed costs and lower demand per outlet, a minus

[49] For example, Slade (2000) finds that beer prices are higher in tied houses than independent establishments, where tied houses operate under an exclusive–purchasing agreement with a brewer. One could argue that the two groups of pubs have very different characteristics, and that pubs do not really sell beer. Instead they sell 'an evening in the pub.' On the other hand, economic models can explain the finding without resorting to this interpretation. For example, since pubs are geographically separated, once in the pub, customers only compare the prices of the brands that are offered. If independent houses carry more brands, price elasticities are apt to be larger in absolute value and markups are apt to be lower in those houses.

[50] The increase in license values that is found by one study indicates that any benefit to upstream firms accrues to the original (not the current) holder of the license.

We conclude that while there are clearly limitations to the set of available studies in terms of techniques used, industry coverage, and ability to interpret the findings, the empirical evidence is consistent and convincing. Taken at face value, tables 2 and 3 indicate that vertical restraints in manufacturer/retailer settings are publically desirable when privately desirable, and thus government intervention is not warranted in those situations. This is not to say that their use should never be questioned, but the presumption should not be that they are detrimental to consumers. The current rule–of–reason approach, combined with "safe harbors" for manufacturers with low market shares, seem more than justified based on this evidence. Furthermore, mandated restraints tend to be welfare decreasing, and hence government policies that are aimed at helping dealers and consumers tend to be misguided, counterproductive, and inconsistent with the goals of competition policy.

5 Conclusions

While different theoretical models often yield diametrically opposed predictions as to the welfare effects of vertical restraints, we find that in the setting that we focus on, namely manufacturer/retailer or franchisor/franchisee relationships, the empirical evidence concerning the effects of vertical restraints on consumer wellbeing is surprisingly consistent. Specifically, it appears that when manufacturers choose to impose such restraints, not only do they make themselves better off, but they also typically allow consumers to benefit from higher quality products and better service provision. In contrast, when restraints and contract limitations are imposed on manufacturers via government intervention, often in response to dealer pressure due to perceptions of uneven bargaining power between manufacturers and dealers, the effect is typically to reduce consumer well being as prices increase and service levels fall. Moreover, although the law usually discriminates between price and nonprice restraints, treating the former more harshly, our conclusions regarding efficiency hold for both classes.

The evidence thus supports the conclusion that in these markets, manufacturer and consumer interests are apt to be aligned, while interference in the market is accomplished at the expense of consumers (and of course manufacturers). This is probably true because manufacturers have every incentive to develop lean and efficient distribution systems to reach ultimate consumers, which entails imposing vertical restraints on retailers when such restraints enhance dealer services and efficiency more generally, and encouraging retailer competition by eschewing restraints when such competition yields lower distribution and sales costs.

The consistency of the findings from these empirical studies is not surprising *ex post*. Indeed, the retail markets that we examine are relatively competitive, and up-

stream firms face many problems in providing their wholesalers and retailers with appropriate incentives. Given the informational and motivational constraints that they face, they have had to devise ways to circumvent those problems in order to achieve lower costs and increased sales. Moreover, it seems unlikely that public agencies could come up with more efficient ways of achieving the same objectives.

While much more empirical evidence is needed before we can draw final conclusions, and in particular before we can rule out the possibility that vertical restraints lead to foreclosure or anti–competitive behavior more generally, the empirical evidence suggests that in fact a fairly relaxed antitrust attitude towards restraints may well be warranted. Even more so, it is clear from the evidence that the notion that governments should impose restraints on manufacturers in order to protect their dealers and consumers should be viewed with skepticism by all those who believe that the role of the government should be to intervene in situations where market failures are of such magnitudes that the inevitable costs of intervention are warranted.

Finally, while we find the evidence compelling, it is clearly not sufficient. In particular, some of the studies yield negative or ambiguous effects from restraints. Further empirical work might reveal more systematically the sets of circumstances under which particular restraints tend to be undersiable (see e.g. Gilligan (1986) for an attempt along these lines). Moreover, the studies discussed here focus on relationships involving retailers. However, there is also a need to understand the effects of restraints in other contexts. We believe that empirical work is especially promising in this regard, and hope that it will provide guidance for future theoretical and competition–policy developments.

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Table 1: Empirical Assessment of Effects of Vertical Contracts by Method of Assessment

Type of Analysis	Author	Year	Industry	Restraint
Descriptive				
	Jordan and Jaffee	1987	Beer Distribution	Exclusive Territories
	Hanssen	2000	Movie Distribution	Block Booking
Cross Sectional				
	Smith II	1982	Auto Distribution	Various
	Hass–Wilson	1987	Contact Lenses	Tying
	Brickley, Dark, and Weisbach	1991	Several	Termination Restrictions
	Azoulay and Shane	2001	Several	Exclusive Territories
	Blass and Carlton	2001	Gasoline Retailing	Divorcement (I)
	Sass	2004	Beer Distribution	Exclusive Dealing
Time Series				
	Sass and Saurman	1996	Beer Distribution	Exclusive Territories
Panel				
	Ornstein and Hanssens	1987	Distilled Spirits	Resale Price Maintanance
	Culbertson and Bradford	1991	Beer Distribution	Exclusive Territories
	Sass and Saurman	1993	Beer Distribution	Exclusive Territories
	Slade	2000	Beer Distribution	Exclusive Dealing
	Vita	2000	Gasoline Retailing	Divorcement (I)
	Barron, Taylor, and Umbeck	2004	Gasoline Retailing	Sourcing Restrictions
Natural Experiment				
	Barron and Umbeck	1984	Gasoline Retailing	Divorcement (I)
	Ippolito and Overstreet	1996	Glassware	Resale Price Maintanance
	Slade	1998	Beer Retailing	Divorcement (II)
Event Study				
	Gilligan	1986	Many	Resale Price Maintanance
	Brickley, Dark, and Weisbach	1991	Many	Termination Restrictions
	Ippolito and Overstreet	1996	Glassware	Resale Price Maintanance
Structural				
	Asker	2004	Beer Distribution	Exclusive Dealing
	Brenkers and Verboven	2004	Auto Distribution	Exclusive Territories

Block booking is a form of tying.
Divorcement (I) means company operation of retail outlets prohibited.
Divorcement (II) means company ownership of retail outlets prohibited.

Table 2: Empirical Assessment of Effects of Voluntary Vertical Restraints

Author	Year	Industry	Variable (Y)	Effect (Y)	Effect (W)
Exclusive Dealing					
Slade	2000	Beer Retailing	Price	+	-
Asker	2004	Beer Dist	Cost	-	+
Sass	2004	Beer Dist	Price	+	+
			Consumption	+	
Exclusive Territories					
Jordan and Jaffee	1987	Beer Dist	Price	+	-
Sass and Saurman	1993	Beer Dist	Price	+	+
			Consumption	+	
Sass and Saurman	1996	Beer Dist	Consumption	+	+
Azoulay and Shane	2001	Several	Survival	+	+
Brenkers and Verboven	2004	Auto Distribution	Price	+	-
Tying					
Hanssen	2000	Movie Dist	Consumption	+	+
RPM					
Gilligan	1986	Many	Stock Returns	Mixed	Ambiguous
Ippolito and Overstreel	1996	Glassware	Consumption	+	+
			Stock Returns	+	
Sourcing Restrictions					
Barron, Taylor, and Umbeck	2004	Gasoline	Price	-	+

Effect (Y) denotes the effect on the dependent variable.
Effect (W) denotes the effect on consumer wellbeing.
RPM denotes resale price maintenance.
Sourcing restrictions are limitations on downstream input purchases.

Table 3: Empirical Assessment of Effects of Mandated Vertical Restraints

Author	Year	Industry	Variable (Y)	Effect (Y)	Effect (W)
Exclusive Territories					
Smith II	1982	Auto Distribution	# of Dealerships	-	Ambiguous
Culbertson and Bradford	1991	Beer Distribution	Price	+	-
Tying					
Hass–Wilson	1987	Contact Lenses	Price	+	-
RPM					
Ornstein and Hanssens	1987	Spirits	Price	+	-
			License Values	+	
			Consumption	-	
Termination Restrictions					
Smith II	1982	Auto Distribution	# of Dealerships	+	Ambiguous
Brickley, et. al.	1991	Several	Stock Returns	-	-
Dealer Licensing					
Smith II	1982	Auto Distribution	Price	+	-
			Consumption	-	
			# of Dealerships	-	
Divorcement					
Barron, and Umbeck	1984	Gasoline	Price	+	-
			Hours	-	
Slade	1998	Beer Retailing	Price	+	-
Vita	2000	Gasoline	Price	+	-
Blass and Carlton	2001	Gasoline	Cost	+	-

Effect (Y) denotes the effect on the dependent variable.
Effect (W) denotes the effect on consumer wellbeing.
RPM denotes resale price maintenance.
Dealer licensing i a form of entry restriction.