

The Effects of Vertical Restraints on Output: Evidence from the Beer Industry

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November 17, 2008

Abstract

State regulations affect various aspects of the contractual relationships between alcohol producers, distributors, and retailers. State laws governing the beer industry mandate that brewers grant wholesalers exclusive territories, prohibit exclusive dealing contracts between brewers and wholesalers, and restrict brewers' ability to terminate wholesalers. The welfare consequences of these vertical restraints have been the subject of substantial debate in courts and between economists. The theoretical literature suggests that vertical restraints can align incentive conflicts between manufacturers and retailers and enhance distributor promotional efforts, but can also reduce competition by excluding rivals from access to distribution. The empirical evidence is limited. We analyze the effects of state regulation of vertical restraints on beer consumption, exploiting the variance in "Beer Franchise Acts" over time (1980-2000) and between states. We find that exclusive dealing prohibitions predict a 7-10% increase in beer sales. We also find that mandatory exclusive territories and franchise termination restrictions have smaller but impacts, positive and negative respectively, on beer sales.

Keywords: Exclusive dealing, Vertical Restraints, *Leegin*, Exclusive Territories, Franchise, Termination, Antitrust, Beer, Alcohol

JEL Classifications: D21, D23, D86, G38, K12, K21, L42

[♦] We are grateful for helpful comments from Christopher Adams, Bernie Black, James Cooper, Jerry Ellig, Bruce Kobayashi, Kate Litvak, Geoff Manne, Joanna Shepherd and participants at the George Mason University Levy Workshop and the Southern Economic Association Annual Meeting. We thank Carolyn Abbate, Megan Hall, Christopher Pickens, and Brandy Wagstaff for excellent research assistance.

I. INTRODUCTION

State regulations affect various aspects of the contractual relationships between alcohol producers, distributors, and retailers. An important feature of state regulations governing alcohol distribution is that they generally mandate a “three-tier” distribution system that prohibits vertical integration by producers into the wholesaling or retailing of alcohol. These state laws also typically prevent, limit or require the adoption of a number of “vertical restraints” -- contractual relationships between producers and wholesalers. In the beer industry, for example, these state laws often require brewers to grant wholesalers exclusive territories, prohibit the use of exclusive dealing contracts between brewers and wholesalers, and restrict brewers’ rights to terminate wholesalers. Beer Franchise Acts also uniformly impose significant barriers to entry at the distribution level by authorizing Liquor Control Boards to control the number distributors within the state.¹

The competitive effects of vertical restraints, such as those adopted by brewers and wholesalers in the distribution of beer and other alcoholic beverages, have long been the subject of study and debate by antitrust courts and economists. The Supreme Court recently addressed the issue of one particular form of vertical restraint, minimum resale price maintenance (“RPM”), in *Leegin Creative Leather Products, Inc. v. PSKS, Inc.*² Justice Kennedy’s majority opinion, relying on the existing empirical evidence, overturned the nearly century old per

¹ Virginia law, which is representative, allows the Virginia Liquor Control Board the power to limit the number of wholesaler licensees if an additional license is “detrimental to the interest, morals, safety or welfare of the public.” See VA Code §§ 4.1-222 A.3.

² 127 S. Ct. 2705 (2007). On *Leegin* and its antitrust implications, see Wright (2007).

se prohibition against minimum RPM because the evidence did not demonstrate that the practice “always or almost always reduced output.”³

Justice Breyer’s dissent disagreed that sufficient evidence of RPM’s competitive effects existed to overturn the longstanding status quo in favor of the per se rule. Significantly, Justice Breyer’s dissent calls for more research on vertical restraints and their competitive consequences, asking “how often are harms or benefits likely to occur? How easy is it to separate the beneficial sheep from the antitrust goats? . . . How often, for example, will the benefits to which the Court points occur in practice? . . . [T]he ultimate question is not whether, but how much, ‘free riding’ of this sort takes place.” The answers to these questions have important policy implications not only in terms of whether vertical restraints continue to be analyzed under the rule of reason rather than categorically condemned under the per se rule, but also to what extent antitrust agencies include vertical conduct in their enforcement portfolios.

The Supreme Court is not the only group debating the economics of vertical restraints and their competitive consequences. Economists have long debated the reasons motivating manufacturers to restrain their dealers’ activities.⁴ The theoretical literature generates ambiguous welfare predictions, with some theories predicting vertical contracts improve efficiency and other models suggesting that vertical contracts have pernicious effects. The empirical literature on vertical restraints is sparse, but generally supportive of procompetitive theories. Nonetheless, empirical evidence on the competitive effects of vertical restraints is in high demand because the legality of these practices turns on their demonstrable competitive effects.

³ The Supreme Court overruled the per se rule against maximum RPM ten years earlier in *State Oil v. Khan*, 522 U.S. 3 (1997).

⁴ Telser (1960).

Nowhere is the demand for evidence higher than with respect to non-price vertical restraints such as exclusive dealing contracts. While there is little evidence of their competitive effects, there is ample antitrust litigation in the United States involving allegations that dominant firms use exclusive contracts to harm competition and consumers.⁵ Similar trends exist in Europe where antitrust enforcers have taken an especially strict view of exclusive dealing contracts.⁶ Increasing our understanding of the competitive consequences of exclusive dealing contracts is an important step towards designing appropriate antitrust policy.

Econometrically identifying the competitive effects of vertical restraints is notoriously difficult because one must compare the world with the restraint to the world without the restraint without observing the latter.⁷ We exploit the variation in state contract regulation in the beer market, comparing states where certain contractual practices are allowed to those where the practices are prohibited, in order to estimate the effects of vertical restraints on sales. Specifically, we observe changes in Beer Franchise Acts from 1980-2000 and focus on three important restrictions: (1) prohibitions on exclusive dealing contracts between brewers and wholesalers; (2) mandated exclusive territories for

⁵ See, e.g., *U.S. v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001), *cert.denied*, 534 U.S. 952 (2001); *United States v. Dentsply Int'l, Inc.*, 277 F. Supp. 2d 387 (D. Del. 2003), *rev'd*, 399 F. 3d 181 (3d Cir. 2005); *Conwood Co. v. United States Tobacco Co.*, 290 F. 3d 768 (6th Cir. 2002); *Omega Environ., Inc. v. Gilbarco, Inc.*, 127 F.3d 1157, 1163-64 (9th Cir. 1997); *Virgin Atl. Airways, Ltd v. British Airways PLC*, 257 F.3d 256, 264 (2d Cir. 2001); *R.J. Reynolds Tobacco Co. v. Philip Morris Inc.*, 199 F. Supp. 2d 362 (M.D.N.C. 2002), *aff'd per curiam*, 67 Fed. Appx. 810 (4th Cir. 2003); *Federal Trade Commission v. McCormick* (FTC Dkt. No. C-3939) (2000). (FTC File No. 961-0050); *Coca-Cola Co. v. Harmar Bottling Co.*, 50 Tex. Sup. Ct. J. (October 20, 2006) (No. 03-0737), *rev'g*, 111 S. W. 3d 287 (Tex. App. Texarkana, 2003).

⁶ McChesney (2003) ("the hostility with which European antitrust enforcers pursue companies thought to be using vertical non-price restraints is sometime remarkable.").

⁷ See, e.g. Cooper et al (2005).

wholesalers; and (3) termination restrictions (such as “good cause” requirements) on brewers’ contractual relationships with wholesalers.

In Section II, we summarize the economic literature on vertical restraints, emphasizing exclusive territories, franchise termination restrictions, and exclusive dealing contracts in the alcoholic beverages industry. Section III presents our data, methodology and results. Section IV concludes and discusses the potential policy implications of our findings.

II. THE ECONOMICS OF VERTICAL RESTRAINTS IN THE BEER INDUSTRY

Beer Franchise Acts regulate vertical restraints in a variety of ways. Some states ban exclusive dealing contracts between brewers and wholesalers. Some states also mandate that the brewer grant each wholesaler an exclusive territory. In addition, states also restrict the conditions under which a brewer can terminate a contract with its wholesaler by imposing “good cause” requirements which increase the brewers’ costs of termination. The relationship between these restrictions and beer sales depends on the underlying economics of promotion in the beer industry and the role of vertical restraints in resolving incentive conflicts between brewers and distributors.

Promotional efforts by wholesalers are essential for brewer profitability. Wholesalers are generally responsible for a number of tasks including storing and delivering the brewer’s beer in a manner that maintains the beer’s quality. While brewers advertise on a national and regional basis, wholesalers are typically responsible for providing point-of-sale promotion that may include local advertising and promotion, stocking the beer on store shelves and monitoring the freshness of the product, setting up displays, and obtaining preferential shelf space.

Importantly, brewer and wholesaler incentives with respect to the provision of promotional services are not likely to be perfectly aligned. Brewers will typically want wholesalers to supply more promotional services than they are willing without additional compensation. This is because suppliers receive far greater benefit from the incremental promotional services than do wholesalers. One reason for this incentive conflict is that wholesalers that do not provide promotional services might “free ride” on the promotional effort of rival wholesalers that create additional demand for the brewers’ brand.⁸ Another reason that an incentive conflict exists between brewers and wholesalers with respect to the supply of promotion is because the brewers’ profit margin, like that of most suppliers of differentiated products, greatly exceeds the wholesaler’s. In such circumstances incremental sales may be highly profitable to the brewer, yet distributors will not find it in their interests to supply the promotion necessary to generate otherwise profitable sales. Exacerbating this problem, wholesale promotion of one brand may increase brand-specific sales, but typically at the expense of another brand. Brewers, therefore, must find a way to incentivize retailers to supply the desired level of promotion for their products and can be expected to adopt a variety of vertical contractual restraints designed to assure performance.⁹

The importance of promotional effort on sales in the beer market, combined with the state level variation in which contractual arrangements are prohibited, suggests that the beer market is a suitable laboratory for testing the competing theories.

⁸ Telser (1960).

⁹ Klein and Murphy (1988) were the first to articulate this incentive conflict. Klein and Wright (2007) present a formal model of this incentive conflict and apply the analysis to explain the use of slotting contracts involving manufacturer payment to retailers for promotional shelf space.

A. FRANCHISE TERMINATION RESTRICTIONS

Beer Franchise Acts typically impose significant limits on a brewer's ability to terminate wholesalers distributing its products. A discussion of the potential economic effects of franchise termination restrictions must begin with an understanding of the role of termination provisions in franchising contracts. The modern economic analysis of contracts begins with recognition of the costs associated with contractual specification result in incomplete contracts. It is now well recognized in the law and economics literature that contractual incompleteness does not merely result from the mere ink costs of writing down additional terms, but also measurement costs and the rent dissipating search and negotiation costs associated with identifying and negotiating contract terms for all potential contingencies. The franchise contract, like all incomplete contracts, generates the potential for ex post opportunism that arises because franchisees share the costs of failing to deliver jointly profitable services.¹⁰

Transactors can be expected to adopt contractual arrangements that minimize the possibility of future holdup. While contractual terms can facilitate performance by increasing the returns from supplying the desired service or reducing the gains from cheating on the agreement, contractual specification alone is generally insufficient to assure performance because it is impossible, or at least prohibitively costly, to fully specify a legally enforceable agreement documenting each element of performance. Klein and Leffler (1981) demonstrate that a key feature of contract terms in facilitating performance is to create sufficient franchisee rents so the threat of termination by the franchisor generates sufficient incentive to supply the desired behavior. The self-enforcement mechanism, as discussed in Klein and Leffler (1981) and Klein and Murphy

¹⁰ See, e.g. Rubin (1978) and Klein (1980).

(1988), requires the franchisor to monitor franchisee behavior and terminate the franchisee for nonperformance. The important distinction is that the threat of termination, and not the threat of litigation to enforce the contract terms, produces the incentive to perform.

The role of broad franchise termination rights in this contractual environment is to limit holdup problems by giving broad discretion to franchisors to terminate non-performing franchisees. Theoretically, broad termination rights assure contractual performance by lowering the cost of self-enforcement and thereby improve outcomes for both the franchisor and franchisee. More restrictive termination rights also prevent brewers from adapting quickly to changes in market conditions and consumer preferences because they are locked in to dealing with particular wholesalers even if such relationships are inefficient or become inefficient over time. The higher costs of distribution associated with these inefficiencies can be expected to be passed on to consumers in the form of higher prices and reduced output. However, broad franchise termination rights also raise the possibility that franchisors expropriate the returns from a franchisee's investment in market discovery and development by terminating contracts in those markets that turn out to be unexpectedly profitable, allowing the franchisor to service the markets itself without having to split revenues with a franchisee or to resell the franchise at better terms. Concerns over cream-skimming of this type motivated the passage of franchise termination restrictions in the early 1970s, including specific franchise termination restrictions in Beer Franchise Acts.

Many states have some form of a franchise protection law, which makes it extraordinarily difficult for suppliers to terminate their contractual relationships with wholesalers. These laws typically prohibit the termination of wholesalers except for "just cause," and set up elaborate administrative processes for proving

“just cause.” Provisions under Virginia law dealing with contracts between wineries and wholesalers are illustrative:¹¹

Notwithstanding the terms, provisions or conditions of any agreement, no winery shall unilaterally amend, cancel, terminate or refuse to renew any agreement, or unilateral cause a wholesaler to resign from an agreement, unless the winery has first [required notice to terminate] and good cause exists for the amendment¹²

The code defines “good cause” to include revocation of a wholesaler’s license; bankruptcy or receivership of the wholesaler; assignment for the benefit of creditors of the wholesaler’s assets; or failure of the wholesaler “to substantially comply” with a “reasonable and material requirement imposed upon him in writing”.¹³ Further, the law provides “Good cause shall not be construed to exist without a finding of material deficiency for which the wholesaler is responsible in any case in which good cause is alleged to exist based on circumstance not specifically set forth [as above].”¹⁴

In cases where an alcohol producer wishes to terminate, and has grounds that it believes satisfy the “good cause” requirement, it typically still must provide the wholesaler with advance notice and time to cure. Further, a wholesaler may invoke the state regulatory authority to determine whether a producer has met the requisite good cause showing for termination.¹⁵ Franchise

¹¹ The provisions for contracts between beer suppliers and wholesalers are nearly identical. See VA Code § § 4.01-506-507.

¹² VA Code § 4.1-406

¹³ *Id.*

¹⁴ *Id.*

¹⁵ See, e.g., NCGSA § 18B-1205(b),(c) (allowing wholesalers and wineries to ask the Alcoholic Beverage Commission to determine (1) whether a wholesaler adequately has cured the conditions that led to termination by the winery; or (2) whether a winery wishing to terminate a distribution agreement has established good cause); VA Code §§ 4.1-404 (D); 4.1-504(D) (allows that a beer or wine supplier to request a hearing before the Board of Alcohol Control to determine if the wholesaler adequately cured or the supplier has shown good cause for termination).

termination laws also typically allow wholesalers to sell their right to distribute a suppliers' beer without that suppliers' approval.

Economists studying the welfare implications of franchise termination laws in the alcoholic beverage industry and elsewhere have consistently found that the restrictions reduce output and other measures of welfare, suggesting that the primary role of broad termination rights are to facilitate self-enforcement and assure contractual performance.¹⁶

B. EXCLUSIVE TERRITORIES AND EXCLUSIVE DEALING CONTRACTS

Exclusive territories are one obvious contractual mechanism that brewers can use to increase wholesaler incentives to provide sales-generating promotional effort because they allow wholesalers to internalize a greater fraction of the fruits of those efforts. Sass and Saurman (1993) find that states with mandatory exclusive territories are associated with both higher prices and higher output, consistent with a correlation between exclusive territories and the greater provision of demand-enhancing promotional services.¹⁷

Exclusive dealing contracts in these circumstances may prevent distributors from appropriating the direct investments of a brewer to promote rival brands (Marvel 1982), using manufacturers paid-for promotion to sell rival products, or under-supplying the sales-generating effort the brewer has bargained for (Klein 2003; Klein and Lerner 2007).¹⁸ The economics literature has

¹⁶ See, e.g., Brickley, Dark & Weisbach (1991a), Beales & Muris (1995) (examining state regulation of termination restrictions), Marvel (1995) (examining FTC regulation of gasoline franchising), Smith (1982) (examining state regulation of automobile dealers), and most recently, Klick, Kobayashi, and Ribstein (2006) (examining the impact of state franchise termination, choice of law, and choice of forum provisions on employment in franchise industries).

¹⁷ See also Culbertson and Bradford (1991) and Jordan and Jaffee (1987).

¹⁸ A recent Federal Trade Commission Comment on California's Proposed Franchise Act to the California State Senate recommended that California reject the Act, which would ban the use of exclusive dealing and impose restrictions on brewer termination of wholesalers, on precisely

long recognized the role of exclusive dealing in preventing dealer free-riding on manufacturer investments (Marvel 1982). This procompetitive explanation has also been incorporated into antitrust analysis of exclusive dealing. Recently, economists have expanded our understanding of the role of exclusive dealing contracts in facilitating dealer supply of promotional services by solving a broader set of free-riding problems (Klein and Murphy 1988; Klein and Lerner 2007; Klein and Murphy 2008). These theories collectively predict that exclusive dealing is paramount to solving a pervasive incentive conflict with respect to dealer supply of promotional services by reducing dealer incentives to free-ride on manufacturer compensation arrangements. Because these theories predict the greater provision of promotional services, they predict that exclusive dealing contracts will be associated with greater output and conversely, that a ban on exclusives would reduce output.

There are a number of anticompetitive theories of exclusive dealing contracts. The raising rivals' cost literature, which has attracted the attention of antitrust authorities and courts in both the United States and European Union over the past two decades, focuses on the possibility that exclusive contracts will deprive rivals of the opportunity to compete for customers and achieve minimum efficient scale. Under some well-known conditions, this form of contractual exclusion may also lead to higher prices and reduced output (Krattenmaker and Salop 1986; Aghion and Bolton 1987; Rasmussen et al. 1991; Bernheim and Whinston 1998; Whinston 2000).¹⁹ These models predict that dominant firms' use of exclusive dealing contracts with downstream distributors

these grounds. The letter concludes that the Act "is likely to reduce wholesalers' incentives to provide important demand-enhancing services and is likely to reduce competition among wholesalers to carry brewers' brands." Federal Trade Commission Comment on Proposed Beer Franchise Act (August 24, 2005). For a survey of the exclusive dealing literature and antitrust implications, see Abbott and Wright (2009).

¹⁹ Cooper et al. (2005) discuss the ambiguous welfare effects of these models in greater detail.

will lead to consumer welfare losses associated with higher retail beer prices and lower output. Conversely, the related foreclosure theories of exclusive dealing predict that a prohibition on exclusive dealing contracts in the beer market would lead to increased beer sales.

A second class of anticompetitive exclusive dealing models involves “strategic delegation.” In general, these models consider the use of non-linear vertical contracts to influence competition between sellers. These models consider the potential for various vertical restraints to generate a “competition-dampening effect” (Rey and Stiglitz 1995; Lin 1990; Slade 1998). These theoretical findings are fragile. For example, the results generally disappear if wholesale prices are unobservable to rivals and are sensitive to the form of competition assumed (e.g. Cournot or Bertrand). In our setting, the common thread of these models is that exclusive dealing restricts interbrand competition by reducing the perceived elasticity of demand for suppliers’ products.²⁰ The intuition this result is that a downstream monopolist has less incentive to pass through a wholesale price reduction than non-exclusive retailers and exclusive territories allow sellers to credibly commit to higher wholesale prices and “soften” retail competition. This effect generates an upward tension on retail prices which may or may not be offset by retail competition. When combined with exclusive dealing contracts, retail prices can increase (Lin 1990; O’Brien and Shaffer 1997). Like foreclosure theories, the “competition dampening” theories of exclusive dealing predict higher prices and reduced output, and conversely that a ban would result in increased output.

The mandatory provision of exclusive territories to distributors imposed by many Beer Franchise Acts exposes a tension between the procompetitive and

²⁰ The strategic agency literature implies a similar role for the use of exclusive territories, though this implication is inconsistent with evidence that exclusive territories increase consumption.

anticompetitive theories of exclusive dealing. The procompetitive theories suggest that exclusive dealing's output-increasing effect should be at its strongest in states mandating exclusive territories. This is because brewers cannot discipline distributor free-riding in these states by adding a rival distributor to the territory. This problem is exacerbated in the presence of franchise termination restrictions. Thus, brewers have greater incentives to solve promotional incentive conflicts with exclusive dealing contracts and other mechanisms designed to prevent distributor free-riding on the brewers' compensation mechanism by promoting rival products within the territory.²¹ Thus, the "free-riding" and contractual assurance theories of exclusive dealing predict negative coefficients on the exclusive dealing prohibition and interaction with mandatory exclusive territories.

Both classes of anticompetitive theories predict that the exclusive dealing contracts have greater anticompetitive potential in states that mandate exclusive territories. Recall that the basic economic intuition of competition dampening is that non-linear contracts can be used to soften competition at the retail level when exclusive territories. This intuition can be illustrated formally following the approach of following Slade (1998), Lin (1990), and Rey and Stiglitz (1995), who consider symmetric duopolists (brewers) who produce differentiated products, q_i , $i = 1, 2$, at constant marginal cost c . The products are substitutes and, and retail demand for beer is given by

$$q_i = h(p_i, p_j), i = 1, 2, j = 2, 1$$

²¹ See Klein and Murphy (1988). Brewers are free to voluntarily adopt exclusive territories in states that do not mandate them. This suggests that if such contracts are profit-maximizing, mandatory exclusive territory laws should have little marginal effect on output and that distributor free-riding incentives would also be invariant to such laws. However, Sass and Saurman (1996) find that mandatory exclusive territories do induce greater promotional effort resulting in higher prices and output.

$$h_i = \partial h / \partial p_i < 0 \text{ and } h_j = \partial h / \partial p_j < 0$$

where p_i is the price of brewer i 's retail product and the brewer sells beer to retailers at a wholesale price, w_i , and the retailer selects the retail price, p_i .²² In a two-stage game where brewers offer contracts to retailers (including exclusive dealing contracts) and then retailers play a price game in the second stage after observing these contracts, brewer and retail markups are:

$$R_M = \frac{p_i - w_i}{p_i} = \frac{-1}{\varepsilon_{ii}}, \text{ and } B_M = \frac{p_i - c}{p_i} = \frac{-1}{\varepsilon_{ii} + \varepsilon_{ij} r_{ji}},$$

where $\varepsilon_{ii} = (\partial q_i / \partial p_i)(p_i / q_i)$, $\varepsilon_{ij} = (\partial q_i / \partial p_j)(p_j / q_i)$, and r_{ji} is the elasticity of the rival-reaction function, $(\partial p_j / \partial p_i)(p_i / p_j)$. The key to the competition dampening effect on brewer markups is the assumption underlying the sign of r_{ji} , which represents the strategic effect of a price change on sales, which is positive when the conventional assumption is made that prices are strategic complements. Specifically, when $r_{ji} < 1$ and $\varepsilon_{ij} < |\varepsilon_{ii}|$, brewers' markups are higher than the vertically integrated case but lower than the monopoly case. While wholesale prices are higher under these conditions, the theoretical impact on retail prices is ambiguous because the upward pressure on retail prices is potentially mitigated by an offsetting increase in downstream competition when one combines exclusive territories with exclusive dealing.

Similar logic applies to foreclosure-based theories. If exclusive territory states are associated with a smaller total number of distributors, it follows that

²² Our illustration of the competition dampening effect in the strategic agency literature proceeds with a few simplifying assumptions. Following Slade (1998) and Lin (1990), and consistent with the use of linear contracts in the industry, we ignore two-part tariffs and franchise fees. Further, we consider the case of brewers offering exclusive contracts to downstream firms responsible for setting retail prices. In the conventional three-tier distribution system, retailers rather than wholesalers carry out this function. This two-tier model, however, is sufficient to illustrate the strategic effects identified by this literature without loss of generality.

foreclosure of a sufficient share of these distributors to deprive a rival from the opportunity to compete for efficient scale will be easier and less costly in those states. In other words, these theories predict that the anticompetitive potential of exclusive dealing is greatest when combined with exclusive territories. Thus, the foreclosure theories predict that the coefficient on exclusive dealing prohibitions and the interaction with exclusive territories will both be positive.

Existing empirical evidence of the competitive effects of exclusive dealing contracts on output is scarce. Heide et al. (1998) find that the incidence of exclusive dealing was correlated with the presence of “free-ridable” investments. Asker (2004) and Sass (2005) examine the welfare consequences of exclusive dealing in the beer market by observing the effect of exclusive dealing on total market output, as well as the output and prices of rival distributors, concluding that exclusive dealing is output increasing and does not generate foreclosure.

Our study is closest to Sass (2005) and Asker (2004). Sass (2005) examines how exclusive distributors differ from their non-exclusive counterparts employing detailed survey data. Asker (2004) offers a structural analysis of exclusive dealing contracts in the Chicago beer market in 1994. Both authors find that exclusive dealing is efficiency enhancing and unrelated to foreclosure. Our analysis is also related to Sass and Saurman (1993, 1996), who examine the impact of mandatory exclusive territory laws on beer sales. The enactment of various Beer Franchise Act restrictions across states and over time thus provides a real world experiment in which competing and potentially co-existing exclusive dealing theories may be tested with the results in exclusive and non-exclusive territory states serving as lower and upper bounds on our estimates, respectively. We now turn to our analysis of the net effect of exclusive dealing prohibitions on beer sales.

III. THE EFFECTS OF VERTICAL RESTRAINTS ON BEER CONSUMPTION

To examine the effects of state-level regulation in the beer market, we use data on beer sales for the period 1980-2000 from the National Institute on Alcohol Abuse and Alcoholism, part of the National Institutes of Health.²³ Our dependent variable is measured as the annual state per capita (based on the state population ages 14 and older) sales of beer denominated in gallons of ethanol. During our sample period, the average state had per capita sales of beer equivalent to 1.3 gallons of ethanol or 347 twelve ounce beers.²⁴ Our primary regressors of interest are those capturing the state level regulations discussed above, specifically: 1) mandatory exclusive territories for distributors; 2) prohibitions on exclusive dealing agreements between manufacturers and distributors; 3) the interaction between mandatory exclusive territories and exclusive dealing prohibitions; 4) reliance on a two-tiered distribution model (as opposed to the more common three-tiered model); and 5) restrictions on manufacturer termination rights with regard to its dealings with distributors.

In addition to examining the effect of state regulations, we also include a number of state level controls. The most important of these controls is the tax levied on beer by state and federal authorities. Policy makers use taxes to influence alcohol consumption and the policy goals that motivate taxing decisions may also influence decisions regarding the regulation of market structure, so it is necessary to control for beer taxes to avoid an omitted variables bias in estimating the treatment effects of our regulation variables. We also

²³ Available at

<http://www.niaaa.nih.gov/Resources/DatabaseResources/QuickFacts/AlcoholSales/consum03.htm>

²⁴ Beer in the US generally contains 4 percent alcohol by volume, so a standard 12 ounce beer contains 0.00375 gallons of ethanol.

include a number of state level demographic controls that might affect beer sales.²⁵ Descriptive statistics are available in Table 1.

We estimate the following general regression:

$$beer_{st} = \alpha \cdot ET_{st} + \beta \cdot noED_{st} + \delta ET_{st} * noED_{st} + \phi \cdot Tier2_{st} + \varphi \cdot Term_{st} + \gamma \cdot tax_{st} + \Theta \chi_{st} + \lambda_s + \tau_t$$

where ET equals one if state s mandates exclusive territories during year t (0 otherwise), $noED$ equals one if state s prohibits exclusive dealing arrangements during year t (0 otherwise), the interactive term takes the value of one only if state s both mandates exclusive territories and prohibits exclusive dealing arrangements during year t (takes the value of 0 otherwise), $Tier2$ takes the value of one if state s mandated a two tier system (as opposed to a three tier system) during year t (0 otherwise), and $Term$ takes the value of one if state s requires good cause (or more) for a manufacturer to be able to terminate its relationship with a distributor during year t . The tax term represents the total federal and state tax levied (in real terms) on a gallon of beer during year t , and χ captures the state level demographic controls. The regressions all include time invariant state fixed effects and year effects that are common to all states, thus ours is a standard difference-in-difference design.

In Table 2 (column 1), we present our most basic regression in which we do not include the state demographic controls. Consistent with the free rider hypothesis, as well as existing empirical evidence, we find that when states mandate exclusive territories, beer sales increase and the effect is statistically

²⁵ We examined the effects of many other demographic controls in addition to those presented here, including the effects of religious affiliation, age composition of the population, male to female ratios, as well as many others. These additional controls have no effect on the coefficients of interest in our analysis. Results including these controls are available upon request.

significant at the 5 percent level.²⁶ Our coefficient implies that beer sales increase by about 3 percent when exclusive territories are mandated. Our exclusive dealing coefficient is consistent with the anticompetitive theories of these arrangements. Specifically, we find when states prohibit these arrangements, beer sales increase by about 12 percent, and the effect is statistically significant at the 1 percent level. Our interaction effect suggests that sales decline when states adopt both exclusive territory mandates and exclusive dealing provisions, leading to an aggregate change in sales of 12 percent, as opposed to the 15 percent implied by the two coefficients taken separately. This interaction effect is statistically significant at the 10 percent level. Two tier systems appear to be associated with higher beer sales (statistically significant at the 10 percent level), and restrictions on manufacturer termination rights are associated with lower beer sales (statistically significant at the 5 percent level).

In column 2 of Table 2, we present results where we control for state level demographic changes, and we find largely the same story as described above, while gaining some precision in our estimates of the effects of regulation of vertical restraints on beer consumption.

One concern with our results is that they suffer from an omitted variables bias if states adopt these regulations in response to patterns in beer sales. For example, if states with a high incidence of drinking problems are more likely to mandate exclusive territories (perhaps so regulatory control is simpler as state authorities can monitor fewer distributors), our confidence in a causal inference on the basis of our coefficients would be low. To better control for this

²⁶ If we allow for standard errors to be clustered at the state level, as suggested by Bertrand, Duflo, and Mullainathan (2004) to control for autocorrelation, none of our coefficients are statistically significant. However, if we use Newey-West heteroskedastic and autocorrelation consistent standard errors, another reasonable approach to mitigate serial correlation problems, our results are similar to those presented here in terms of p values.

possibility, we present estimates in Table 3 that control for sales of wine and hard liquor as a proxy for unobservable drinking propensities across states. These forms of alcohol are not affected by our regulatory variables but they could help to capture the effect of any general drinking issues present in a state that could lead a state to enact regulations in the beer market. When we control for the sale of other forms of alcohol, our results are largely unchanged, though we again gain some precision in our estimates.

In column 2 of Table 3, we include controls for dynamic effects within the beer market that could be biasing our estimates of the effects of beer regulations. Specifically, the rational addiction model of alcohol consumption (Becker and Murphy 1988; Becker, Grossman, and Murphy, 1991) suggests that current consumption does not just depend on current tax rates; it also depends on past tax rates and the expected future rate, as rational individuals will lower current consumption if they believe the cost of continued consumption will be relatively high. That is, because the current consumption of addictive goods induces continued consumption of those goods, individuals will consider both the current and future costs of consumption (or, in some reduced form, the capitalized cost of total consumption). Further, because of the addictive properties of the good, a low cost in the previous period implies more consumption in the current period. This suggests, as spelled out in Becker, Grossman, and Murphy, that the coefficients on the current tax rate of an addictive good, as well as the one period lag and lead tax rates, should all be negative. We also control for the existence of a state mandate requiring the coverage of addiction treatment by insurers to capture these rational addiction effects, as suggested in Klick and Stratmann (2006). When we control for these dynamic effects, our primary results do not change. Incidentally, we find support for the rational addiction theory of beer consumption, with all of our tax

variables generating negative coefficients, and they are jointly significant ($F = 22.26$; $p = 0.000$). Further, as found in Klick and Stratmann (2006), we find that beer consumption increases when states require insurers to provide addiction coverage.

In Table 4, we investigate whether our results regarding exclusive territories differ by whether a state has a two or three tier distribution system. We can not perform the same exercise for the prohibition against exclusive dealing because no state in the sample period adopted a prohibition when a two tier system was in place. As shown in Table 4, it appears as though the positive effect of exclusive territories on beer sales is larger in three tier systems than it is in two tier systems. However, the difference between the effects across systems is not statistically significant ($p > 0.50$).

IV. CONCLUSION

State-level Beer Franchise Acts regulate vertical restraints between brewers and wholesalers. In particular, we study the impact of state laws limiting brewers' ability to terminate wholesalers, requiring that brewers grant wholesalers exclusive territories, and prohibiting exclusive dealing contracts. We find that Beer Franchise Act termination restrictions lead to reduced consumption.²⁷ We also find that mandatory exclusive territories increase sales. Both of these findings are consistent with the few previous studies in the literature.

Our most important result is the finding that the prohibition on exclusive dealing contracts in the beer market is associated with an economically and statistically significant increase in sales. This result provides prima facie evidence exclusive dealing contracts harmed competition by excluding rival

²⁷ This finding is consistent with Klick, Kobayashi, and Ribstein (2006), Muris and Beales (1994), and Brickley, Dark, and Weisbach (1991).

brewers. However, there are a number of potential alternative explanations for this result that we will attempt to address in future research. One potential explanation is that the exclusion of smaller brewers, unable to achieve efficient distribution, is attributable to the combination of exclusive dealing contracts and Beer Franchise Acts' restrictions on entry from new distributors which might profitably serve the excluded brewers. While there is not sufficient variation between states with respect to entry restrictions to allow direct testing of this explanation, we are currently collecting data that would allow us to test whether exclusive dealing prohibitions disproportionately increase the sales of previously excluded small brewers who are now able to obtain efficient distribution.

Our findings contrast with the conventional wisdom on vertical restraints, documented by Lafontaine & Slade's (2005), that coercive imposition of restraints or limits on vertical contractual relationships harms welfare while voluntary adoption of restraints is welfare-increasing. While we do find that franchise termination restrictions are likely to reduce welfare, we provide evidence that both mandatory exclusive territories and prohibitions on exclusive dealing contracts increase sales.

The competition policy implication of our exclusive dealing result is relatively straightforward because antitrust policy seeks primarily to increase output. As discussed, an output test is necessary to assess the competitive effects of the exclusive dealing prohibitions because both procompetitive and anticompetitive theories predict increased prices. While we find that exclusive dealing contracts are associated with lower levels of output, and thus possibly generate anticompetitive exclusion, several caveats are warranted in terms of drawing policy implications from our results. The first is that our findings are consistent with a rule of reason analysis of exclusive dealing contracts that requires a fact-specific analysis of the competitive impact of the conduct. Second,

the unique and complex regulatory structure of the beer market, and in particular barriers to wholesale entry, suggests caution in generalizing our results to welfare predictions of exclusive dealing contracts in other product markets.

Regulation of the beer market involves numerous policy concerns in addition to the consumer welfare effects at the heart of antitrust law. Indeed, Beer Franchise Acts designed to minimize brewer control over the retail distribution of beer arose from concerns about excessive consumption after Prohibition. To the contrary, we show that exclusive dealing prohibitions lead to significantly increased beer consumption. While these laws may improve local efficiency as beer consumption increases, previous studies have positively linked increased drinking with suicide (Markowitz, Chatterji, Kaestner, and Dave, 2004), automobile fatalities (Levitt and Porter 2001), sexually transmitted diseases (Chesson 2000), child abuse (Markowitz and Grossman 2000), spousal abuse (Markowitz 2000) and a host of other social problems. However, it is unlikely that exclusive dealing prohibitions are the optimal policy instrument to address these problems. Perhaps more important, we have also identified exclusive dealing prohibitions as a potentially important instrument for studies of the effect of alcohol.

Table 1
Summary Statistics

Variable	Description	Mean	SD	Source
Beer	Beer sales per state resident age 14 and older (measured in gallons of ethanol)	1.329	0.229	NIH
Wine	Wine sales per state resident age 14 and older (measured in gallons of ethanol)	0.313	0.168	NIH
Liquor	Hard liquor sales per state resident 14 and older (measured in gallons of ethanol)	0.827	0.364	NIH
Exclusive Territory	= 1 if exclusive territories mandated	0.524	0.500	Collected by authors
No Exclusive Dealing	= 1 if exclusive dealing is prohibited	0.379	0.485	Collected by authors
ET*NoED	= 1 if exclusive territories mandated and exclusive dealing is prohibited	0.272	0.445	Collected by authors
Tier 2	= 1 if state mandates a two tier distribution system for beer	0.188	0.391	Collected by authors
Exclusive Territory & Tier 2	= 1 if state mandates exclusive territories and a two tier distribution system	0.031	0.173	Collected by authors
Exclusive Territory & Tier 3	= 1 if state mandates exclusive territories and a three tier distribution system	0.472	0.499	Collected by authors
Termination Restriction	= 1 if state requires good cause for manufacturer to terminate relationship with distributor/retailer	0.638	0.481	Collected by authors
Tax	Federal and state tax on a gallon of beer measured in 1982 dollars	0.513	0.189	Beer Institute
Female Labor Participation	Labor force participation rate of women	58.264	5.198	BLS
Unemployment	Unemployment rate	6.052	2.195	BLS
Income	Per capita income adjusted for inflation (in 100s of dollars)	140.318	24.192	BEA
Rural	Percent of state population living in rural area	31.072	14.591	Census
Black	Percent of state population that is black	9.643	9.218	Census
MHP	= 1 if state requires insurers to cover substance abuse treatments under a mental health parity law	0.100	0.300	NCSL

NIH: National Institutes of Health

BLS: Bureau of Labor Statistics

BEA: Bureau of Economic Analysis

Census: U.S. Census Bureau

NCSL: National Conference of State Legislatures

Table 2
Effect of Vertical Restraints Regulations on Beer Sales
(Robust Standard Errors in Parentheses)

	Beer	
Exclusive Territory	0.039** (0.017)	0.041*** (0.015)
No Exclusive Dealing	0.156*** (0.025)	0.136*** (0.023)
ET*NoED	-0.038* (0.023)	-0.047** (0.020)
Tier 2	0.028* (0.017)	0.024 (0.016)
Termination Restriction	-0.026** (0.012)	-0.023* (0.012)
Tax	-0.504*** (0.053)	-0.451*** (0.050)
Female Labor Participation	--	0.002 (0.001)
Unemployment	--	-0.012*** (0.002)
Income	--	0.001*** (0.000)
Rural	--	0.002 (0.002)
Black	--	-0.016** (0.007)
State Effects	Yes	Yes
Year Effects	Yes	Yes
R ²	0.943	0.949

Note: Data cover period 1980-2000. The dependent variable is the per capita (state population 14 years and older) sales of beer measured in gallons of ethanol.

Table 3
Effect of Vertical Restraints Regulations on Beer Sales — Robustness Checks
(Robust Standard Errors in Parentheses)

	Beer	
Exclusive Territory	0.029** (0.014)	0.023 (0.014)
No Exclusive Dealing	0.118*** (0.021)	0.116*** (0.021)
ET*NoED	-0.052*** (0.019)	-0.050*** (0.017)
Tier 2	0.013 (0.015)	0.011 (0.015)
Termination Restriction	-0.018 (0.011)	-0.007 (0.011)
Tax _t	-0.392*** (0.051)	-0.073 (0.179)
Tax _{t-1}	--	-0.115 (0.079)
Tax _{t+1}	--	-0.201 (0.150)
MHP	--	0.026** (0.011)
Wine	0.062 (0.066)	0.055 (0.066)
Liquor	0.267*** (0.044)	0.238*** (0.047)
State Effects	Yes	Yes
Year Effects	Yes	Yes
R ²	0.953	0.959

Note: Data cover period 1980-2000. The dependent variable is the per capita (state population 14 years and older) sales of beer measured in gallons of ethanol. Both regressions additionally include all the covariates found in Table 3, generating similar coefficients. These results are available upon request.

Tax variables are jointly significant in column 2 ($F = 22.26$; $p = 0.000$)

Table 4
Effect of Vertical Restraints Regulations on Beer Sales — Effects by Tier
(Robust Standard Errors in Parentheses)

	Beer	
Exclusive Territory & Tier 2	0.027 (0.024)	0.011 (0.020)
Exclusive Territory & Tier 3	0.043** (0.021)	0.026 (0.017)
No Exclusive Dealing	0.160*** (0.027)	0.119*** (0.022)
ET*NoED	-0.042 (0.026)	-0.054*** (0.020)
Tier 2	0.033 (0.020)	0.015 (0.018)
Termination Restriction	-0.027** (0.013)	-0.007 (0.012)
State Effects	Yes	Yes
Year Effects	Yes	Yes
R ²	0.943	0.959

Note: Data cover period 1980-2000. The dependent variable is the per capita (state population 14 years and older) sales of beer measured in gallons of ethanol. No state adopted a no exclusive dealing law in conjunction with a two tier distribution system. The regression in column 1 contains no additional covariates other than the tax variable. The regression in column 2 contains all of the covariates from Table 3. These results are available upon request.

Column 1: ET variables are jointly significant ($F = 2.32$; $p = 0.099$) and are not significantly different from each other ($F = 0.29$; $p = 0.590$)

Column 2: ET variables are not jointly significant ($F = 1.26$; $p = 0.284$) and are not significantly different from each other ($F = 0.40$; $p = 0.526$)

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