Conditional pricing practices (CPPs) allow the terms of sale between a producer and a downstream firm to vary based on whether the downstream firm meets a set of conditions that the producer specifies. The conditions may require a downstream firm to accept minimum quantities or multiple products, to purchase a minimum share of its requirements, or even to deal exclusively with one producer. Payment from the producer to the downstream firm may take the form of a discount at the time of purchase, a rebate paid after a period of time, or marketing support and training. CPPs cover a wide variety of arrangements and are in widespread use throughout many industries.

CPPs have often been challenged in court over the years, but there is no consensus among lawyers, judges, or academics on how they should be analyzed. Fundamentally, adjudication seeks to determine whether a given CPP harms or benefits competition. Under U.S. law, this means determining whether a practice reduces or improves consumer welfare. To a large degree practitioners’ efforts to evaluate this question have rested on two approaches: applying theoretical models of the potential mechanisms behind CPPs or using prior litigated arrangements as precedent. In this article, we consider the effects of CPPs through a third lens: empirical research analyzing a variety of CPPs across several different industries.

Empirical research provides unique insight into understanding the effects of CPPs that is complementary to the insights gained through theoretical analysis and litigated arrangements. Theoretical models predict a wide range of mechanisms through which CPPs may affect welfare, and there may be multiple theoretical models that could be relevant for analyzing any given CPP. Court
cases are selected through the process of litigation and may not be representative of the wider population of such arrangements. Empirical research addresses these limitations, while simultaneously highlighting the wide variety of settings in which CPPs are used. A limitation of the empirical literature, however, is that it cannot necessarily address the full range of potential settings or arrangements that one may ultimately want to analyze. Relatedly, the heterogeneity highlighted in this literature does not necessarily lend itself to a single unifying framework to adjudicate future CPPs.

Some arrangements that can be described as CPPs include: vertical rebates, which can be structured as “loyalty discounts” or “all units discounts” (AUDs); vertical bundling, which includes “full-line forcing” (FLF) contracts and bundled discounts; and exclusive dealing. The term “exclusive dealing” may be used to describe a loyalty discount with a 100 percent market share requirement.

Table 1 presents a selected group of CPPs and the range of industries they cover, based on a review of judicial decisions and empirical research. Vertical rebates have been used, for example, in the truck transmission, microprocessor, and confections industries. Vertical bundling has been employed in markets for video rentals, tape products, and some pharmaceutical products, among others. Exclusive dealing has been used in the video game, smartphone, and auto refrigerant equipment industries. A much richer set of arrangements is employed across many more industries in reality.

A brief review of cases involving CPPs illustrates the difficulties that courts have faced in adjudicating these legal disputes and the concomitant lack of consensus on an appropriate analytical framework. In *LePage’s Inc. v. 3M*, 3M was the dominant player in the market for branded tape products but was facing competitive pressure from private label tape manufacturer LePage’s. 3M responded by entering the private label tape market and offering retailers:

---

1 We refer to a vertical rebate as a loyalty discount if it is conditional on a customer buying a specified share of its overall requirements from the supplier (i.e., a market-share requirement) and an AUD if it is conditional on a quantity requirement.

2 The Third Circuit defines exclusive dealing as “an agreement in which a buyer agrees to purchase certain goods or services only from a particular seller for a certain period of time.” The Third Circuit further clarifies that even though an agreement to deal exclusively is a prerequisite to exclusive dealing, an express exclusivity requirement is not necessary. *ZF Meritor, LLC v. Eaton Corp.*, 696 F.3d 254 (3d Cir. 2012). Some authors also require that an exclusive dealing arrangement include an explicit or implicit threat that the seller will refuse to deal with the buyer unless the buyer accepts the arrangement, an “all-or-nothing” clause. See Benjamin Klein & Andres V. Lerner, *Price-Cost Tests in Antitrust Analysis of Single Product Loyalty Contracts*, 80 Antitrust L.J. 631, 638 n.28 (2016).

3 See supra note 2. An arrangement with a very high, but not 100%, market share requirement can be considered de facto exclusive dealing.

4 *LePage’s Inc. v. 3M*, 324 F.3d 141 (3d Cir. 2003).
discounts on bundles consisting of private label tape and other of its office products. LePage’s could not match this strategy because of its limited product line, and claimed that its rival’s pricing scheme was exclusionary. 3M argued that its conduct was not anticompetitive because it did not sell transparent tape below cost. The Third Circuit rejected 3M’s argument and ruled in favor of LePage’s despite the absence of below-cost pricing. However, the ruling has been criticized for failing to provide sufficiently clear guidance regarding when bundled rebates violate antitrust law.5

The Ninth Circuit adopted a different approach in Cascade Health Solutions v. PeaceHealth.6 There, the plaintiff and the defendant were the only health care providers in Lane County, Oregon. Whereas Cascade Health offered only primary and secondary care, PeaceHealth offered tertiary care as well. PeaceHealth offered insurance companies substantial discounts if they made it their sole provider of all three levels of health services. In response, Cascade Health challenged the practice as exclusionary. In a break with the Third Circuit’s reasoning, the Ninth Circuit determined that the conduct could not be condemned as anticompetitive absent a showing that the defendant had lowered prices below “an appropriate measure of cost.” Using a “discount attribution test,” it ruled in favor of the defendant and reversed the district court’s decision.

The lack of agreement on the correct principles for adjudicating conditional pricing practices applies not only to multiproduct discounts but to single-product loyalty discounts as well. ZF Meritor v. Eaton Corp. was a lawsuit brought against the dominant manufacturer of heavy-duty truck transmissions by a rival firm.7 The contention was that long-term contracts that the defendant signed with the four major truck manufacturers amounted to de facto exclusive dealing. These contracts provided rebates to the truck manufacturers if they satisfied a high minimum-share purchase requirement, treated Eaton’s products preferentially in their sales catalogs, and priced Eaton’s products lower than the plaintiff’s products. The Third Circuit ruled against the defendant after applying a rule-of-reason analysis and declining to employ a price-cost test because it found that price was not the primary method of exclusion.


6 PeaceHealth, 515 F.3d 883.

### TABLE 1: ANALYSES OF CONDITIONAL PRICING PRACTICES

<table>
<thead>
<tr>
<th>Industry</th>
<th>Product Coverage</th>
<th>Nature of Restriction</th>
<th>Downstream Competition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Judicial Decisions:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Truck Transmissions <em>(ZF Meritor, LLC v. Eaton Corp.</em>)</td>
<td>Single</td>
<td>Share</td>
<td>Standard</td>
</tr>
<tr>
<td>Auto Refrigerant Equip <em>(SPX Corp. v. Mastercool USA, Inc.</em>)</td>
<td>Single</td>
<td>Exclusive</td>
<td>Standard</td>
</tr>
<tr>
<td>Tape Products <em>(LePage’s Inc. v. 3M)</em></td>
<td>Multiple</td>
<td>Quantity</td>
<td>Standard</td>
</tr>
<tr>
<td>Boat Engines <em>(Concord Boat Corp. v. Brunswick Corp.)</em></td>
<td>Single</td>
<td>Share</td>
<td>Standard</td>
</tr>
<tr>
<td>Cephalsporins <em>(SmithKline Corp. v. Eli Lilly &amp; Co.)</em></td>
<td>Multiple</td>
<td>Quantity</td>
<td>[1]</td>
</tr>
<tr>
<td>Microprocessors <em>(three Intel cases)</em></td>
<td>Single</td>
<td>Share</td>
<td>Standard</td>
</tr>
<tr>
<td>Hospital Services <em>(Cascade Health Solutions v. PeaceHealth)</em></td>
<td>Multiple</td>
<td>Share</td>
<td>[2]</td>
</tr>
<tr>
<td>Catheters <em>(Southeast Missouri Hospital v. C.R. Bard Inc.)</em></td>
<td>Multiple</td>
<td>Share</td>
<td>[2]</td>
</tr>
<tr>
<td>Airline Reservations <em>(two British Airways cases)</em></td>
<td>Single</td>
<td>Quantity</td>
<td>Standard</td>
</tr>
<tr>
<td>Mobile Phones <em>(Korean Fair Trade Commission fine)</em></td>
<td>Multiple</td>
<td>Share</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>Empirical Research:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confections</td>
<td>Multiple</td>
<td>Quantity</td>
<td>[3]</td>
</tr>
<tr>
<td>Video Rentals</td>
<td>Multiple</td>
<td>Quantity</td>
<td>Standard</td>
</tr>
<tr>
<td>Video Games</td>
<td>Single</td>
<td>Exclusive</td>
<td>[4]</td>
</tr>
<tr>
<td>Smartphones</td>
<td>Single</td>
<td>Exclusive</td>
<td>[5]</td>
</tr>
<tr>
<td>Beer</td>
<td>Multiple</td>
<td>Exclusive</td>
<td>Standard</td>
</tr>
</tbody>
</table>

“Product coverage” indicates whether the arrangement governs purchases of a single product or requires the purchase of multiple products. “Nature of the restriction” describes the condition that a downstream firm must meet to qualify for payment. “Share” indicates a market share requirement. “Quantity” indicates a minimum (or maximum) quantity requirement used in AUDs, FLF contracts, or other arrangements. “Exclusive” indicates exclusive dealing. “Downstream competition” is noted as “Standard” when downstream firms compete on price. Alternative forms of downstream competition vary by industry and are described as follows:

[3] Retail prices rarely vary across products or time.
[4] Gaming consoles are durable; consumer demand responds to current and expected future prices.
[5] Carriers subsidize the purchase price of a handset when a consumer agrees to a two-year service plan.

† The FTC Intel case has a multiproduct aspect to it.
8 696 F.3d 254 (3d Cir. 2012).
10 324 F.3d 141 (3d Cir. 2003).
11 207 F.3d 1039, 1061 (8th Cir. 2000).
12 821 F.3d 394 (3d Cir. 2016).
15 515 F.3d 883 (9th Cir. 2008).
16 642 F.3d 608 (8th Cir. 2011).
18 Fine levied against Qualcomm. See Press Release, Korea Fair Trade Comm’n, Qualcomm’s Abuse of Market Dominance (July 23, 2009), www.ftc.go.kr/eng/solution/skin/doc.html?fn=d83c42bd9236e343c78a7250d7b2292383b10ca3eb1d83ccaf4e6854dd2&rs=/eng/files/data/re RESULT/files/bbs/2009/.
The outcome was different in *Eisai Inc. v. Sanofi Aventis*.\(^24\) In that case, the defendant offered hospitals a discount on its drug Lovenox if they made 90 percent or more of their total anticoagulant drug purchases from Sanofi. Eisai had exclusive distribution rights to Pfizer’s competing product, Fragmin, and alleged that Sanofi’s conduct bundled customers’ contestable and incontestable demand for Lovenox and amounted to de facto exclusive dealing. Because Eisai’s claims related primarily to the alleged de facto exclusive dealing aspect of Sanofi’s conduct and not to its pricing practices, the Third Circuit analyzed the conduct under the rule of reason rather than applying a price-cost test.\(^{25}\) It concluded that there was no evidence of either restriction of consumer choice or substantial anticompetitive effect and upheld summary judgment in favor of the defendant.\(^{26}\)

One reason for the lack of agreement on the appropriate framework of analysis of CPPs is that there is no consensus in the theoretical literature either. Economists have found both procompetitive and anticompetitive justifications for these arrangements. However, empirical analyses that give more credibility to one theory or another are relatively scarce.

In this article, we provide background regarding the theoretical literature addressing CPPs and review the existing empirical literature. We identify market features that affect the likelihood that a CPP will have an adverse impact on consumer welfare. We find that anticompetitive effects are more likely when CPPs are used by a dominant firm and when buyers have limited capacity to carry multiple products from suppliers. The existence of substitute products or alternative distributors can also influence the effect of conditional pricing on competition. These market characteristics are just a few of the factors that should be considered in analyzing CPPs. Furthermore, the empirical analyses reveal that different arrangements have different exclusionary effects and should be studied in conjunction with the characteristics of the specific markets in which they are used. The wide array of arrangements and market settings precludes broad generalizations and suggests that the effects of conditional pricing can differ case by case, based on the specifics of the CPP and the market.

**I. THEORETICAL BACKGROUND**

Interest in CPPs has generated a large volume of scholarly work, but there is no consensus on their predominant competitive effect or on an appropriate analytical framework to use in a litigation setting. In this section, we review

\(^{25}\) *Id.* at 408–09.
\(^{26}\) *Id.* at 408.
the prevalent points of view on these questions in the theoretical literature, first for single-product and then for multiproduct CPPs.

A. SINGLE-PRODUCT CONDITIONAL PRICING PRACTICES

Benjamin Klein and Andres Lerner view single-product loyalty contracts as a commitment device that allows a seller and a buyer to achieve a mutually beneficial equilibrium off the demand curve. Without commitment, a seller facing a downward-sloping demand curve sells the quantity at which marginal cost equals marginal revenue and charges the price indicated by the demand curve. However, it can do better by writing a contract that offers a lower price only if the buyer agrees to purchase a larger quantity. The seller is better off because it sells a sufficiently larger quantity to offset profit forgone through the lower price. The buyer also benefits because the discount it receives on the units it would purchase absent the contract and the additional units it buys at the discounted price outweighs the negative surplus on units that it values at less than the discounted price. The buyer can move off the demand curve because it is not a final consumer but rather a downstream firm that subsequently resells the product as a component in a different product or service. The Klein-Lerner model assumes that final consumers are unlikely to substitute to a competing product based on a preference for a single component, thus conferring a degree of loyalty on the buyer. The buyer can exploit this loyalty to shift purchases from one seller to another. Sellers compete for these sales-shifting services and compensate the buyer through the loyalty discount.

Despite this procompetitive justification for loyalty contracts, Klein and Lerner acknowledge that such contracts can also be used anticompetitively. In their prescriptive analysis, they distinguish between two types of contract terms: performance and incentive. Performance terms stipulate the conditions that a buyer needs to meet, such as market share, preferential treatment of


28 Klein & Lerner, supra note 2, at 641–47.

29 Id. at 647.

30 For instance, patients will not change the hospital they go to because it does not carry the patient’s preferred brand of blood-clotting drug. Similarly, a truck buyer will not go to a rival manufacturer only because it offers different transmissions. *Id.* at 647.

31 *Id.* at 647–51. The authors assume that any disadvantages to consumers from increases in the list (non-contract) price, by either the seller or its competitor, are outweighed by the benefits from the contract. In order for the contract to be procompetitive, the model must implicitly assume that at least some portion of the discount is passed on to consumers. This need not always be the case (e.g., if consumers are locked in).
certain products, and retail pricing requirements. Incentive terms specify what happens if the buyer does not satisfy the performance requirements: for example, it may forfeit the discount or may even face restricted supply. The authors argue that if a discount is the only incentive mechanism, the contract resembles predatory pricing, and a “discount attribution test” safe harbor can be applied. However, if the loyalty contract includes non-price incentive terms, such as a threat to restrict or terminate supply, or if the list price is much higher than what would prevail absent the contract, the authors recommend a rule-of-reason analysis.

Other scholars recognize that many CPPs resemble both predatory pricing (through discount terms) and exclusive dealing (through exclusivity or near exclusivity requirements), but argue that a rule-of-reason standard better captures the various mechanisms through which CPPs may affect consumer welfare. In a predatory pricing setting, a firm lowers its price below cost, drives equally efficient rivals out of the market, then raises its price to a supracOMPETITIVE level and recoups the profit lost while it was pricing below cost. The mechanisms that harm consumer welfare are the exclusion of rivals and subsequent higher prices. This is why predatory pricing analyses proceed by comparing price to cost and, if price is lower, assessing whether the alleged predator can recoup its “investment.”

Unlike predatory pricing, exclusive dealing can lead to exclusion of rivals without below-cost pricing. Moreover, exclusive dealing can also impair
competition without inducing full exclusion in the market. By restricting rivals’ access to vital inputs or a sufficient customer base, exclusive dealing may effectively raise their costs, forcing them to increase their prices and reducing the competitive constraint they can impose. Similarly, rivals’ ability to compete can be limited if they are relegated to a niche position in the market with limited access to customers. A reduced customer base can also diminish rivals’ incentives to invest and innovate, which in turn may lead to less investment and innovation by the dominant firm. Exclusive dealing requires a different analytical framework than predatory pricing because it can lead to competitive harm in more varied ways. Steven Salop follows this logic to argue that a rule-of-reason standard of adjudication is appropriate because it can account for the various mechanisms through which harm can occur.

While exclusive dealing can induce foreclosure or raise rivals’ costs, this need not automatically translate into consumer harm. For consumer harm to result, the seller employing the arrangement needs to have “power over price.” Such power may not exist if competitors are not significantly disadvantaged by the conduct, if there is sufficient competition from non-foreclosed competitors, or if there are substitute products. Another reason why consumers may not be harmed by exclusive dealing is that such arrangements can induce efficiencies. For example, exclusive dealing can intensify competition among suppliers, provide incentives for better products, service, or increased promotion, or reduce free riding. These procompetitive effects should be accounted for when evaluating the overall competitive effect of exclusive dealing.


Through these effects, exclusive dealing arrangements fit into the “raising rivals’ costs” paradigm. Salop, supra note 36, at 372.

[40] Id. at 382–95 (also discussing other ways exclusive dealing can harm competition).

[41] Id. at 378. Salop also discusses various reasons why the price-cost test can give too many false positives and false negatives, which make it unsuitable as a method to analyze alleged anticompetitive conduct related to CPPs. Id. at 403–17.

[42] Id. at 401–02.

There is also a growing theoretical literature that focuses specifically on the effects of CPPs that are not as restrictive as exclusive dealing.45 This literature has found conditions under which loyalty discounts, among a broader group of vertical practices, can lead to foreclosure.46 However, conditional pricing, and AUDs in particular, need not necessarily reflect an exclusionary motive but may instead provide a more effective way to price discriminate than a menu of two-part tariffs.47 Furthermore, AUDs can mitigate moral hazard and improve efficiency by providing incentives to upstream and downstream firms to make investments that boost both firms’ profits.48 The conditional discount may encourage a retailer to expand output while still compensating the upstream firm for its investment.49 Similarly, upstream firms can use market share discounts to induce selling effort from downstream retailers.50

B. MULTIPRODUCT CONDITIONAL PRICING PRACTICES

Multiproduct CPPs (or bundled discounts) condition a buyer’s discount on its purchase of multiple different products.51 As with single-product CPPs, there is no established consensus on how multiproduct CPPs should be analyzed. Some courts and scholars have recommended using a predatory pricing-based price-cost test.52 Others, however, have pointed out that

45 Although it is often assumed implicitly that loyalty discounts are a weaker, but also cheaper, way of foreclosing rivals than exclusive dealing, the opposite may be true under some circumstances. In particular, loyalty discounts may allow an incumbent firm to achieve a desired level of foreclosure more flexibly but also at a higher cost because it needs to over-compensate buyers that accept the arrangement. Thus, there are situations in which loyalty discounts are preferred to exclusive dealing and can achieve a higher level of foreclosure. Zhijun Chen & Greg Shaffer, Are Market-Share Contracts a Poor Man’s Exclusive Dealing? 4–5 (Discussion Paper No. 44/16, 2016), business.monash.edu/economics/research/publications/eco/4416marketshare.pdf.


48 For example, these investments can take the form of advertising by the upstream firm and in-store promotional effort by the downstream firm.


51 Some authors use the term “bundling” to describe selling packages of multiple units of the same product and the term “tying” for selling packages of different products. Others do not stick to this convention and use “bundling” for selling different products together. See, e.g., OZ SHY, INDUSTRIAL ORGANIZATION: THEORY AND APPLICATIONS 362 (1996).

multiproduct CPPs can have exclusionary effects even without below-cost pricing and are best assessed as forms of tying.53

Tying can have both exclusionary and nonexclusionary rationales and can either increase or decrease consumer welfare. Firms can tie products to attain efficiencies in production stemming from scale economies, to price discriminate, or to achieve greater product differentiation.54 While these exemplify nonexclusionary uses of tying, bundled discounts can also be used anticompetitively in a variety of ways. For instance, a firm with a monopoly in a market for a primary good that also supplies a complementary good in a duopoly market can use tying to extend its monopoly power to the complementary good market by denying scale to its rival.55 A firm can also use tying to strengthen its market power in the primary market by excluding producers of complementary goods, thus making it harder for firms that need access to the complements to compete in the primary market.56 Finally, an incumbent firm may tie its products in an effort to deter the entry of a firm producing a superior good in the complementary market, thus eliminating the threat that the (potential) entrant may eventually challenge the incumbent in the primary market.57

II. EMPIRICAL EVIDENCE

Economic theory suggests that conditional pricing can have both positive and negative effects on competition. In reality, both types of effects are likely to occur simultaneously, so that the net impact of a given CPP becomes an empirical question. Empirical work is also helpful for establishing the means by which CPPs affect consumer welfare. As discussed in the preceding section, below-cost pricing is one mechanism that can lead to rival exclusion, but not the only one. Furthermore, even in the presence of foreclosure, consumer

54 Carlton, Greenlee & Waldman, supra note 53, at 598–601. A firm can differentiate a homogeneous product by tying it to a product over which it has monopoly power. Id. at 601.
55 An important requirement is that the complement can be used without the monopoly good. Otherwise the monopolist can achieve the same or higher profit without tying, i.e., tying is a feasible but not necessarily profitable monopolization strategy. This is an example of the “one monopoly rent” critique. Id. at 601–02 & nn.28–29 (referencing Michael D. Whinston, Tying, Foreclosure, and Exclusion, 80 AM. ECON. REV. 837 (1990)).
56 Id. at 603–04. This can also be seen as an example of raising rivals’ costs.
57 Id. at 604. Carlton, Greenlee, and Waldman examine the conditions under which a bundled discount is likely to be anticompetitive. These include situations in which rivals face economies of scale, the discounting firm has market power, the price of the tied good increases for consumers that do not buy the tying good, and rivals exit or face increased marginal costs because of the bundled discount. Id. at 610–16. Greenlee, Reitman, and Sibley examine the impact of bundled discounts when the adjacent market is perfectly competitive. Greenlee, Reitman & Sibley, supra note 52, at 1138, 1148.
welfare may not be harmed. Thus, empirical work that investigates the net impact and the different mechanisms through which CPPs affect competition can inform both the courts’ general attitude towards these types of arrangements and the particular framework for analyzing their impact.

Although existing case law illustrates the issues raised by CPPs and the methods used to analyze them, it does not necessarily reflect the competitive effects of CPPs in general because of sample selection bias.\(^\text{58}\) For this reason, independent empirical research is essential for shedding light on the impact of these practices. Such inquiries, however, face a variety of challenges, which makes them scarce. First, data are often proprietary and difficult to obtain. Second, when data are available, lack of variation in prices and choice sets often hinders demand estimation. Third, supply-side estimation becomes problematic when agents’ actions are endogenous or difficult to observe. Finally, the extremely wide variety of arrangements and institutional settings makes it difficult to generalize results and extrapolate from one industry or type of arrangement to another.

Despite these challenges, economists have made progress in empirically assessing the impact of CPPs. Earlier work primarily consists of “reduced-form” analyses. But more recently researchers have used “structural” models, which allow one to conduct counterfactual experiments and study more closely the mechanisms that affect consumer welfare.\(^\text{59}\) There have been empirical studies of the effects of CPPs, including loyalty discounts, AUDs, and exclusive dealing. We organize the discussion of these studies by industry and other market features that have implications for the competitive effects of CPPs.

\[^{58}\text{That certain instances of conditional pricing end up in court suggests that these cases may be more likely to be anticompetitive, because plaintiffs expend the effort to litigate. Possible selection bias from relying on litigated cases is discussed in Pauline M. Ippolito, Resale Price Maintenance: Empirical Evidence from Litigation, 34 J.L. & Econ. 263, 264–65 (1991). Sample selection bias is an issue independent of whether courts reach the correct conclusion about alleged anticompetitive effects. There is a tradeoff between maximizing the probability that courts adjudicate a given practice correctly and having predictable and easily implementable, albeit more frequently incorrect, court decisions. A thorough evaluation of this tradeoff is beyond the scope of this article.}\]

\[^{59}\text{Structural models typically specify the behavior for both firms and consumers. If these behavioral models are correct, the researcher can estimate parameters of the objective functions of firms and consumers that are robust to policy changes. Knowledge of these “primitives” allows the researcher to conduct counterfactual analyses; thus, one can change a particular feature of the world and predict what market outcomes will be. The parameters estimated in reduced-form models may lack policy robustness and need not reveal anything about agents’ objective functions, ruling out the ability to explore counterfactual simulations. However, reduced-form analyses do not require explicit behavioral models of agents in the market.}\]
A. Confections and Beer

Confections and beer are traditional food and beverage manufacturing industries. New product introductions are relatively infrequent, but there are plenty of imperfect substitutes. In the studies we consider, CPPs are offered by dominant firms, and there is evidence that the arrangements may foreclose rivals under certain conditions. However, the estimated impact on consumer welfare is positive in the case of confections and negative but small in the case of beer.

1. Confections

Christopher Conlon and Julie Holland Mortimer study the efficiency and foreclosure effects of an AUD used by the dominant firm in the vending channel of the confections industry. The main upstream players are Mars, Nestle, and Hershey. The dominant firm, Mars, offers a per-unit rebate on the total quantity purchased in a given fiscal quarter. To qualify for the rebate, a vending operator needs to meet or exceed a quarterly purchase target customized for that vendor, which applies to the total across all varieties of Mars candy; it must also satisfy a facing requirement, which specifies that it carry at least six Mars products in each vending machine.

The effect of the AUD on firm profits and consumer utility is theoretically ambiguous. On one hand, the AUD requirements can induce the retailer to restock its vending machines more frequently and reduce the likelihood of a product stocking out. The increased level of effort increases consumer welfare because it ensures customers can buy their top choice of candy. The AUD also mitigates downstream moral hazard, which occurs when the retailer lacks the incentive to exert the level of effort optimal for the manufacturer. For example, if a Mars product is out of stock and customers are forced to substitute to a competing product with a higher margin, the retailer will not restock. This leaves Mars worse off and the retailer and the competing manufacturer better off. The AUD rebate effectively increases the retailer’s margin on the Mars products, creating an incentive for it to restock more frequently.

---

60 Conlon & Mortimer, supra note 19, at 1–2.
61 Id. at 12, 41 tbl.1.
62 Id. at 11.
63 A stockout occurs when no units of a product remain available for purchase. When the vendor restocks a machine, it replenishes all products, not just the ones that the firm offering the AUD manufactures, Id. at 3.
64 The increased level of retailer effort tends to increase the profits of the dominant manufacturer, whose products are likely to stock out first, and decrease the profits of competing manufacturers. However, this may not be true under all circumstances. If the initial frequency of restocking is so low that Mars, Hershey, and Nestle products all stock out between visits, then an increase in the level of retailer effort can increase the profits of all upstream firms. Conlon and Mortimer provide evidence that this does not occur in the market they study, so that increased
On the other hand, AUDs can also have anticompetitive effects. The rebate, quantity threshold, and facing requirement can induce a retailer to replace Hershey or Nestle products with Mars candy bars. Such foreclosure reduces the profits of Mars’s competitors, but the impact on consumers is unclear. Whether consumer welfare increases or decreases depends on whether consumers like the Mars product(s) better than the Nestle or Hershey products that are displaced.

An important feature of the setting, as it relates to the impact of the AUD on consumer welfare, is that downstream prices are the same across products and rarely vary over time. The reasons for the lack of pricing variation are technical difficulties in providing change and the fact that service contracts sometimes require the vendor to commit to a price structure over a multi-year period. Thus, the AUD can affect consumer welfare through product availability and assortment, but not through retail prices.

To assess the impact on consumer welfare and firm profits, Conlon and Mortimer combine a model of demand for different candy bars and a model of restocking. The demand model estimates consumer preferences for different products, while the restocking model estimates the optimal time between restocking visits for the retailer, weighing the cost of a visit against the benefits of extra sales from avoiding a stockout. The authors focus on a representative vending machine carrying five base candy products of the seven supplied and estimate the optimal level of retailer effort and the optimal assortment choice for the last two candy products under different vertical payment structures.

Based on this model, the authors analyze the welfare impact of the AUD. Absent the AUD, the retailer’s optimal assortment is to carry two Hershey products, Reese’s Peanut Butter Cups and Payday, in addition to the five base products. The motivating factor is that even though demand for the Hershey products is slightly lower than for the Mars replacement products, the profit margin on the Hershey products is higher. When Mars offers the AUD, the combination of the per-unit rebate, the quantity threshold, and the facing requirement induces the retailer to increase its restocking frequency and to stock two Mars products (Three Musketeers and Milky Way) instead of Hershey products. Mars can induce a similar effect with an unconditional discount, but this approach is not as profitable.
products in the last two slots. This increases the profits realized by the retailer and Mars, but decreases Hershey’s and Nestle’s profits.\textsuperscript{70} The impact on Hershey’s bottom line is especially stark because it loses distribution for two products. Further analysis reveals that as long as the marginal cost per candy bar is above 13 cents, there is no price above marginal cost that Hershey can charge in the presence of the AUD that would convince the retailer to carry its products.\textsuperscript{71} Furthermore, Hershey has no incentive to offer an AUD of its own because this will only decrease its profits in the event that the retailer accepts it.\textsuperscript{72} Thus, there is evidence of foreclosure.\textsuperscript{73}

Despite the presence of foreclosure, the authors find that consumers are not harmed by the AUD. Retail prices are assumed to be fixed, so consumer welfare is affected only by the increased level of effort and by the changed assortment. While more retailer effort has an unambiguously positive effect for consumers (by decreasing the number of stockouts and thus increasing availability), the effect of changes in product assortment can be either positive or negative. In the Conlon and Mortimer setting, consumers are better off when the retailer carries Three Musketeers and Milky Way (Mars products) than when it carries Reese’s and Payday (Hershey products) and maintains the same restocking frequency.\textsuperscript{74} Thus, the estimate of the overall effect of Mars’s AUD on consumer welfare is positive.\textsuperscript{75}

2. Beer

The beer industry is another traditional manufacturing industry dominated by a small number of major producers and many smaller ones. Products are differentiated, but there are many close substitutes. The market is characterized by a three-tier vertical structure composed of brewers, distributors, and retailers.\textsuperscript{76} Some of the largest brewers, such as Anheuser-Busch and Miller,  

\begin{itemize}
  \item \textsuperscript{70} Id. at 25.
  \item \textsuperscript{71} Id. at 27 & 45 tbl.10.
  \item \textsuperscript{72} Id. at 23.
  \item These analyses assume that wholesale prices remain unchanged in the counterfactual world without the AUD. While all three firms can adjust their prices in real life, such adjustments make finding an equilibrium a very difficult problem computationally. The authors conduct an additional analysis in which Hershey’s and Nestle’s wholesale prices are fixed, but Mars’s is not. In this case, Mars lowers its price to undercut Hershey and ensure that the retailer carries two Mars products in the last slots. Once again, Hershey is foreclosed, since it cannot offer a price above marginal cost that would induce the retailer to carry its products. Id. at 28–29 & 45 tbl.12.
  \item \textsuperscript{74} Id. at 44 tbl.9.
  \item \textsuperscript{75} Price-cost tests are not designed to shed light on product availability and consumer preferences, which in this case determine the effect of conditional pricing on consumer surplus. Therefore, a price-cost test would be uninformative about the competitive impact of the AUD in this setting.
  \item \textsuperscript{76} In most states, owning firms across different tiers is either expressly prohibited or restricted. See, e.g., Chen, supra note 23, at 49 n.16; Asker, \textit{Diagnosing Foreclosure}, supra note 23, at 379.
\end{itemize}
enter into exclusive agreements with their distributors. The effects of these arrangements are studied in three articles. Tim Sass summarizes the theoretical literature on exclusive dealing and uses reduced-form analyses to determine which theory best describes the observed market outcomes. Using structural models, Chia-Wen Chen and John Asker study the welfare effects of exclusive dealing and analyze whether such arrangements lead to foreclosure of rivals.

Sass organizes the rationales for using exclusive dealing into three types: to align distributors’ incentives with those of the upstream firm; to foreclose rivals; or to dampen competition among producers. Each of these rationales leads to predictions about the effect of exclusivity on prices and output, which the author evaluates using data from a survey of 391 U.S. beer distributors. Reduced-form analyses indicate that exclusive dealing tends to increase the prices charged by the implementing brewers and distributors, as well as total quantity sold. At the same time, there is no evidence that exclusivity increases the prices of rival brewers and distributors. These results suggest that efficiency-enhancing motives are an important rationale for the use of exclusive dealing in this industry.

John Asker provides further evidence on the effects of exclusive dealing in the market for beer. He focuses on the greater Chicago area, in which the exclusive contracts used by Anheuser-Busch and some other upstream firms raised concerns about the potential foreclosure of rival brewers. Combining a model of consumer demand for beer and a supply-side model of brewer profit maximization, Asker calculates brewer and distributor marginal costs.

---

77 Perhaps the most famous campaign to boost a company’s number of exclusive distributors is Anheuser-Busch’s “100% share of mind.” This campaign was started in 1997 and offered distributors discounts, extended credit, and marketing support in exchange for carrying only Anheuser-Busch products. See, e.g., Sass, supra note 23, at 211 & n.9; Asker, Diagnosing Foreclosure, supra note 23, at 376 & n.3.

78 Sass, supra note 23.

79 Chen, supra note 23; Asker, Diagnosing Foreclosure, supra note 23; Asker, Measuring Cost Advantages, supra note 23.

80 Sass, supra note 23, at 204–08.
81 Id. at 214.
82 Id. at 204, 218–19.
83 Id. at 219.
84 Id. at 216, 221–22. Sass’s analysis does not include a formal evaluation of the impact of exclusive dealing on consumer welfare. The findings suggest an efficiency-enhancing motivation, but it is unclear whether the net effect of higher prices (if higher wholesale prices are passed on to consumers) and increased quantity will be positive or negative.

85 Asker, Diagnosing Foreclosure, supra note 23, at 375. The period under study is 1994.
86 For details on the model and its estimation, see id. at 385–92, 398–400. Distributors in the model are “passive” in that it is not them, but brewers, that set the prices charged to retailers. This feature of the model is supported by the fact that brewers provide strong guidelines to distributors about preferred wholesale prices. Id. at 379, 386–87.
The results show that brewers that use exclusive dealing enjoy both a cost and a service advantage over their rivals. These advantages can stem from investments that the brewers make in their exclusive distributors or from two types of foreclosure: cost-based or promotion-based. The article develops tests for each type of foreclosure. The idea behind the test for cost-based foreclosure is to compare the distribution costs of brewers that do not employ exclusives, in markets with and without exclusive distributors. Assuming distribution costs are identically distributed across markets (in the statistical sense), if foreclosure occurs, these brewers will face higher costs of distribution on average in markets with exclusives. Specifically, they will not be able to access the most cost-efficient distributors. By contrast, this will not necessarily be the case if brewers use exclusive arrangements to protect investments they have made in their distributors. The test for promotion-based foreclosure is based on the same reasoning. Once implemented, the two tests indicate that cost and promotional advantages are not caused by exclusivity-induced foreclosure and support the conclusion that exclusive beer distribution in metropolitan settings should not raise antitrust concerns.

Asker also conducts two counterfactual analyses in which exclusive dealing is banned. In the first, the cost advantage from using exclusive dealers is attributed entirely to additional brewer investment in the distributor. A ban on exclusives in such a case eliminates the cost benefits brewers enjoyed by using exclusive dealers. As a result, Anheuser-Busch’s and Miller’s prices to distributors and retailers increase. These increases are passed on to consumers. Overall, Asker estimates that the ban would lead to a 20 percent decrease in consumer welfare, retailer profits, and total brewer profits. In the second counterfactual, the cost advantage is attributed entirely to foreclosure. Removing exclusive dealing leads to lower costs for brewers that do not use exclusives, increasing consumer surplus, retailer profits, and brewer profits by 40 percent. The results indicate the potential benefits that an intervention by an antitrust authority can bring if foreclosure is present. However, given that

---

87 Cost-based foreclosure occurs if a rival cannot access low-cost distributors because of the exclusive arrangement, while promotion-based foreclosure occurs if a rival cannot access the distributors most adept at selling its product.

88 The distribution of distributor costs will be truncated from the left. Id. at 381.

89 Id. Brewers may use exclusives both to foreclose rivals and to protect their investments in their distributors. Even if this is the case, it will not affect the underlying logic of the proposed foreclosure tests because they focus on the distributors used by brewers that do not use exclusive contracts.

90 Id. at 400–01, 405–06.

91 Asker, Measuring Cost Advantages, supra note 23, at 40–41.

92 Id. at 43.

93 Id.
the test results provide no support for the foreclosure hypothesis, the author concludes that the most likely outcome of an intervention is a welfare loss.94

Chia-Wen Chen offers additional insights into the impact of exclusive dealing by examining the effect of Anheuser-Busch’s exclusive arrangements on microbrewers’ entry decisions in northern California markets.95 This setting allows her to consider foreclosure effects in both metropolitan and rural areas, which complements Asker’s results.96

Chen’s analysis uses a model of consumer demand for beer combined with a model of a microbrewer’s decision to enter a market, which depends on the expected demand for its product and on the entry decisions of other microbrewers.97 The demand and entry models recover the impact of exclusivity on the fixed cost and probability of entry. The results highlight two facts. First, the interdependence of firms’ entry decisions is important. There are substantial spillover effects of entry into a market: the more microbrewers there are in a market, the easier it is for others to enter, and the harder it is for another firm to deter entry.98 Strategic interactions are also important because they affect the estimates of the impact of Anheuser-Busch’s exclusive arrangements. Chen finds that if strategic interactions are not taken into consideration, there are no estimated foreclosure effects from exclusivity. However, when such interactions are accounted for, the results provide a more nuanced picture: foreclosure is present in rural areas, outside of the Bay Area and Sacramento counties.99 Where a foreclosure effect is present, exclusivity decreases the probability of a specialty beer producer’s entry by six percentage points—a substantial effect given a base entry probability of 28 percent.100 A possible reason for the presence of this effect is that there are relatively fewer distributors in rural counties compared to metropolitan areas.101

94 Id.
95 Chen, supra note 23, at 47. The period under study is April 2006 to April 2008. Id. at 50. Each store that sells beer is considered a separate market. Id. at 56.
96 Foreclosure in this setting occurs if a microbrewer cannot obtain distribution at a particular store because of exclusive dealing. This definition differs from Asker’s, which focuses on the cost-efficiency or marketing aptitude of distributors.
97 Id. at 48, 51–58 (detailing the model and its estimation). The article studies only the entry decisions of specialty brewers. The large national brewers enter essentially all markets. Id. at 51.
98 Id. at 60.
99 Id. at 60–61.
100 Id. at 61.
101 Thus, the existence of a foreclosure effect does not contradict Asker’s article, which finds no foreclosure in greater Chicago. In that area, it seems that the relative abundance of distributors helps prevent foreclosure. In particular, even though Anheuser-Busch uses eight and Miller uses five exclusive distributors, there are 29 other distributors to serve the rest of the brewers. Asker, Diagnosing Foreclosure, supra note 23, at 394 tbl.1.
Despite finding foreclosure in some areas, Chen concludes that foreclosing rivals is not the main motivation behind the use of exclusive distributors.\textsuperscript{102} Counterfactual simulations show that banning exclusivity does not have a big impact on entry behavior because at most one additional brewer enters a market.\textsuperscript{103} Furthermore, the consumer welfare benefit of the expanded product variety is negligible. Even if all specialty beers are stocked, the potential increase in consumer welfare remains fairly inconsequential.\textsuperscript{104} The likely reason for such a limited impact is the presence of many substitute products and the fact that many of the specialty brewers are fringe firms that cater to a small segment of the market. Moreover, as small players in the market, microbreweries have minimal impact on equilibrium prices.\textsuperscript{105} Finally, demand substitution estimates indicate that by foreclosing a specialty brewer, Anheuser-Busch can sell at most 31 additional six-packs per store per quarter, a negligible amount for a firm of its size.\textsuperscript{106} Such a strategy to increase sales seems inefficient. Together with the rest of the results, this suggests that foreclosure is more likely to be a side effect rather than the main rationale for using exclusive dealing, and suggests an efficiency-inducing motivation.

It is possible to draw some conclusions from the analyses of AUDs in the confections industry and exclusive dealing in the beer industry. First, CPPs can lead to foreclosure of rivals, but need not cause substantial (or any) harm to consumers. Second, the dimensions on which consumer welfare can be affected are retail prices, product availability, and product variety. Third, foreclosure is more likely when there are fewer distributors available. Thus, even though Hershey is foreclosed by Mars’s AUD from accessing a particular retailer, it may be able to find other distributors in the same area. Fourth, the existence of many close substitutes attenuates the effect of changes in product variety and availability on consumer welfare. For instance, in Conlon and Mortimer’s article, the change in product variety actually benefits consumers, while in Chen’s article the exclusion of specialty beers decreases consumer surplus only minimally.

\textsuperscript{102} Chen, supra note 23, at 62.
\textsuperscript{103} Id.
\textsuperscript{104} Id. In particular, a ban on exclusives will lead to a $15 increase in consumer surplus per store per quarter. The potential increase if all specialty brewers are stocked at a given store is $510 per store per quarter. These results assume exclusive dealing has no procompetitive effects. If it does, banning exclusive dealing may increase consumer welfare less or may even decrease it. Id. at 62.
\textsuperscript{105} Id. at 62, 56, 57 tbl.5.
\textsuperscript{106} Id. at 62.
B. VIDEO RENTALS

The movie industry differs from traditional manufacturing industries in that the product is an information good. Having “consumed” the content of the product, a consumer does not need to obtain it again. This feature forces producers to continually update their products. Given this constant “churn,” firms are only as good as their last few products. As their product lines change, firms face different incentives to use conditional pricing.

The use of a “full-line force” (FLF) contract in the video rental industry and its welfare impacts are the focus of two articles by Justin Ho, Katherine Ho, and Julie Holland Mortimer. The wide spread of the Internet and advances in information technology in the late 1990s, which facilitated tracking transactions from a distance, allowed movie distributors to offer rental stores two new contract types, revenue sharing (RS) and FLF, in addition to traditional linear pricing. RS and FLF contracts are similar, in that they offer lower up-front prices per tape in exchange for a portion of the revenue and a commitment to buy a minimum (or a maximum) number of tapes. The difference between the two arrangements is that an FLF contract offers more generous per-tape prices and revenue-sharing terms in exchange for the rental store’s agreeing to carry all movies that the distributor releases over a year. This bundling feature, together with the minimum and maximum purchase requirements, is what makes an FLF contract a form of conditional pricing.

The authors estimate a flexible demand system and a model of retailers’ choices of titles and vertical arrangements and use these to analyze the competitive effects of an FLF contract. Theoretically, there are three potential effects. An efficiency effect occurs when an FLF contract allows a rental store to keep a higher level of inventory of a given title, increasing its availability to consumers. A market coverage effect is observed when a store signs an FLF contract with a distributor and carries more titles from that distributor than it

---

107 Ho, Ho & Mortimer, Video Rental Industry, supra note 20, at 687.
108 Id.; Ho, Ho & Mortimer, Welfare Impacts, supra note 20, at 468.
109 Ho, Ho & Mortimer, Video Rental Industry, supra note 20, at 690. Minimum and maximum purchase requirements specify the number of tapes a rental store must purchase to satisfy the contract. Such quantity requirements have similar effects as resale price maintenance (RPM). In particular, under certain conditions, a seller can use a minimum purchase requirement to achieve the effect of a maximum RPM, or a maximum purchase requirement to achieve the effect of a minimum RPM. See, e.g., Tirole, supra note 47, at 171.
110 The authors provide substantial details about the model and its estimation. Ho, Ho & Mortimer, Video Rental Industry, supra note 20, at 697–712. The article also analyzes the distributors’ decisions to offer FLF contracts and finds that, for all but one distributor, their real-world decisions are profit-maximizing. Id. at 716–18. The same authors also discuss the welfare implications of using FLF contracts. Ho, Ho & Mortimer, Welfare Impacts, supra note 20, at 491–96.
would otherwise. Finally, a leverage effect is present if a rental store drops titles from one distributor when it enters into an FLF contract with another.111

The findings indicate that FLF contracts have a positive effect on consumer surplus.112 First, the results indicate that the leverage effect is negligible; the number of titles that a rental store takes from competing distributors barely changes when it signs an FLF contract.113 This is not obvious and is perhaps a bit surprising because one might expect the costs of holding the tapes of the additional movies taken under the FLF contract to force rental stores to drop titles by rival distributors. However, the empirical evidence suggests that the advantageous terms of the FLF contract generate savings that stores use to purchase additional titles from competing distributors.114 Second, the article finds that the market coverage effect is substantial.115 The bundling aspect of the FLF contract induces stores to carry more movies by an FLF distributor than they would otherwise. The effect is bigger for relatively “weak” film distributors because stores carry many of the stronger distributors’ titles even without an FLF contract.116 The negligible leverage effect and the strong market coverage effect expand the assortment of titles, which increases consumer surplus.117

Third, the analysis also finds that there is a positive efficiency effect, driven by the fact that lower upfront per-tape prices ameliorate the double marginalization problem.118 The impact of this efficiency effect is particularly large for titles that a store would have taken under linear pricing in the absence of an

111 Ho, Ho & Mortimer, Welfare Impacts, supra note 20, at 470–71.
112 We focus on the impact on consumer surplus because it is the measurement relevant for antitrust analysis under U.S. law. However, the effect on total welfare can be negative if the profit losses to a distributor are larger than the gains to rental stores and consumers. This can happen if the distributors that do not offer FLF contracts in the real world offered FLF contracts in a counterfactual scenario. In such a case, the losses from lower upfront tape prices may outweigh the gains from selling more titles. Id. at 496.
113 Id. at 493–95.
114 Id. at 495.
115 Id. at 493.
116 Indeed, it is these relatively weak distributors that benefit from offering FLF contracts. The stronger movie distributors do not benefit and do not offer FLF contracts in the real world. See Ho, Ho & Mortimer, Video Rental Industry, supra note 20, at 716.
117 The effect on consumer surplus is nevertheless constrained by the fact that rental stores are predicted to carry the most popular titles even without FLF contracts. Thus, the additional movies that stores take as a result of the FLF contract tend to cater to smaller audiences with idiosyncratic preferences, which contributes only marginally to the estimate of overall consumer surplus. Ho, Ho & Mortimer, Welfare Impacts, supra note 20, at 496.
118 Id. at 470, 480, 495. Double marginalization occurs when an upstream firm sells inputs to a downstream firm with a markup and the downstream firm charges final consumers a markup as well. This is suboptimal for the upstream firm because the downstream firm purchases fewer inputs compared to what a vertically integrated firm would choose.
FLF contract. Furthermore, the efficiency effect under an FLF contract is much larger than what revenue-sharing terms can achieve, because stores purchase the most popular titles under linear pricing to avoid sharing the revenue. The increased holdings of inventories induced by an FLF contract improve the availability of products, which further increases consumer surplus.

A more detailed look at the FLF contract reveals the different mechanisms through which its terms affect consumer welfare. The bundling aspect is the main factor driving the market coverage effect. By forcing a store to forgo taking a title under linear pricing, bundling also strengthens the efficiency effect. The lower upfront price, the revenue-sharing terms, and the minimum purchase requirement also induce firms to buy larger inventories. Finally, the bundling term strengthens the leverage effect, while the lower upfront price and revenue sharing weaken it.

Aside from the terms of the FLF contracts, there are a few other factors that determine their overall competitive effect. First, movie distributors introduced the FLF contract to augment existing pricing options available to rental stores rather than to replace them. As long as rental stores can obtain the same linear prices, the additional vertical pricing option likely benefits rental stores and final consumers. Furthermore, linear prices can “discipline” the terms of the FLF contract because stores can choose linear pricing if they are not satisfied with their terms. Second, one of the factors driving the negligible leverage effect is the low cost of holding inventory. The authors explain that a store effectively faces no capacity constraints because it can display titles spine-forwards or put additional tapes in a storage room. If this were not so, the cost of storage would be higher, possibly giving rise to a leverage effect that could harm consumers. Last, the lack of anticompetitive effect, together with the fact that non-dominant distributors offer FLF contracts, rein-

---

119 This is true because the drop in the upfront price is much larger under linear pricing than under RS. Id. at 469, 495.
120 Id. at 495.
121 Id. at 496. The authors assume that retailers do not re-optimize their rental prices when they adopt an FLF contract. This assumption rules out impacts on consumer surplus through the retail price channel. Id. at 492 & n.24.
122 Id. at 472.
123 Id. at 472, 474–75.
124 Of course it is also possible that distributors simultaneously introduce an FLF contract and raise linear prices to force rental stores to accept the FLF contract. Such a strategy can have anticompetitive effects. A similar situation is analyzed by Greenlee, Reitman, and Sibley, supra note 52.
125 Ho, Ho & Mortimer, Video Rental Industry, supra note 20, at 691.
126 Id. at 696.
forces the idea that such contracts are less likely to harm competition when used by weaker, rather than dominant, players.

C. OCEAN SHIPPING

Ocean shipping differs from all other industries considered in this article because it enjoys partial exemption from antitrust laws. In particular, ocean carriers are allowed to participate in legal cartels, called “conferences,” and to engage in price and quantity fixing.\textsuperscript{127} The impact of the conferences’ preferred form of pricing, dual-rate loyalty contracts, is analyzed by Pedro Marin and Richard Sicotte.\textsuperscript{128} Under this form of conditional pricing, a cartel offers its customers a lower rate for shipping services as long as they do not use the services of non-cartel carriers. If customers do not satisfy the exclusivity requirement, they must pay the higher, non-contract rate.\textsuperscript{129}

The use of dual-rate contracts was the focus of a protracted legal and legislative battle that lasted from the late 1950s to the early 1960s. Proponents of the contracts argued that they allowed carriers to provide stable rates and regular shipping services of high quality. Opponents, on the other hand, claimed that the main purpose of the contracts was to deter entry and augment cartel members’ market power.\textsuperscript{130}

The authors identify seven court actions and legislative developments that affected the likelihood of the dual-rate contracts remaining legal. If the purpose of the contracts was to prevent entry and raise rates without providing a substantial benefit to customers, any event that casts doubt on the continuing legality of dual-rate contracts should harm the financial prospects of cartel members and improve them for customers (i.e., exporting firms). This in turn should be reflected in these firms’ stock returns. The authors conduct an event study and confirm that the stock indexes of ocean shippers and net exporting industries moved in opposite directions during the seven selected periods.\textsuperscript{131} This leads them to conclude that loyalty contracts enhanced market power but did not lead to efficiencies that were passed on to customers.\textsuperscript{132} Even though


\textsuperscript{128} \textit{Id.} at 193, 197.

\textsuperscript{129} In some cases, customers that break the contract must pay even larger damages. \textit{Id.} at 197.

\textsuperscript{130} \textit{Id.} at 198.

\textsuperscript{131} \textit{Id.} at 205–08. The authors focus on net exporting industries because they surmise that a decrease in rates brought about by a ban on dual-rate contracts should benefit exporting firms but harm importing firms, thus benefiting the industry on net. \textit{Id.} at 202.

\textsuperscript{132} The authors conduct a similar analysis with net importing industries, whose stock indexes should move in the same direction as those of the ocean shippers. It provides weaker support for the hypothesis that loyalty contracts are used for exclusionary purposes. The authors speculate
these results may not currently apply to the ocean shipping industry because the legal framework has been amended since the 1960s, they provide evidence of the potential negative effect of conditional pricing on competition in an industry that enjoys some protection from antitrust laws.\textsuperscript{133}

D. SMARTPHONES AND VIDEO GAMES

Network effects are a distinctive feature of the mobile telecommunications and video games industries.\textsuperscript{134} This characteristic encourages rivals to compete for larger customer bases. The competition for customers can be a motivating factor in firms’ decisions to use conditional pricing.

1. Smartphones

Michael Sinkinson analyzes the competitive effects of exclusive contracts in the telecommunications industry.\textsuperscript{135} His study focuses on the agreement between AT&T and Apple for exclusivity for the first-generation iPhone, which attracted a lot of attention when it was announced in 2007. Opponents of the deal were concerned that it would lead to higher prices and limited choice for consumers, while proponents claimed that it would encourage wireless carriers to innovate.\textsuperscript{136}

Sinkinson builds a model in which exclusivity allows a carrier to differentiate the handset-network bundles it offers consumers not only through the quality of wireless service but also through product variety.\textsuperscript{137} This additional differentiation may allow a carrier to charge a higher markup. Furthermore, if prices are strategic complements, the higher price on the differentiated bundle leads to higher prices on all other bundles in equilibrium.\textsuperscript{138} This effect is known as “softening of price competition.” If demand for handsets is less sensitive to price than demand for wireless service, softened price competition

that a possible reason for this is that the largest firms in net importing industries drive movements in the industry indexes and are also large exporters who might benefit from abolishing dual-rate contracts. \textit{Id.} at 210.

\textsuperscript{133} Cartel members can coordinate their actions and achieve the outcome of a much larger firm or even a monopolist. \textit{See, e.g.}, \textit{Tirole, supra} note 47, at 240. Thus, it may be possible to extend the results for the ocean shipping industry to other industries dominated by a single large firm under certain conditions.

\textsuperscript{134} \textit{See, e.g., id.} at 404–09. Positive network externalities, or network effects, exist when a good or service becomes more valuable as more people use it.

\textsuperscript{135} Sinkinson, \textit{supra} note 22, at 1.

\textsuperscript{136} \textit{Id.} at 2–3.


\textsuperscript{138} In game theory, players’ actions (usually choice of price or quantity) are strategic complements if an increase by one player leads the other players to increase their strategic variable as well. \textit{See, e.g., Tirole, supra} note 47, at 207–08.
for wireless service can increase a carrier’s profits sufficiently to compensate the handset manufacturer for the forgone opportunity to sell to other wireless carriers.\textsuperscript{139}

The author estimates a model of consumer demand that accounts for the durable nature of the good and uses it to simulate counterfactual scenarios and measure the effects of exclusivity.\textsuperscript{140} The first analysis calculates AT&T’s and Verizon’s willingness to pay for the exclusive contract by comparing each firm’s profits when it obtains exclusive rights to sell the iPhone to its profits when its rival obtains the exclusive rights.\textsuperscript{141} The outcome is that AT&T has higher willingness to pay only after equilibrium price adjustments are taken into account, which underscores the importance of modeling the equilibrium price changes. The results are driven by the fact that AT&T offers lower quality service than Verizon, and without the iPhone it attracts fewer customers and has to cut its monthly service fees.\textsuperscript{142} At the same time, Verizon’s higher quality network insulates it from price competition and makes it less dependent on the iPhone in the counterfactual. Thus, exclusivity raises retail prices and limits consumer choices, which decreases consumer welfare. Restricting choice by making the iPhone available on only one carrier harms consumers that switch to AT&T to get the iPhone by forcing them to pay early termination fees (if they are on a two-year contract) and by reducing the quality of their network (if they switch from a carrier with a higher-quality network). Non-AT&T consumers who would have purchased the iPhone from their carrier absent the exclusive deal are also harmed by being constrained to using a less preferred handset.\textsuperscript{143}

Another counterfactual reveals that manufacturers of Android-based smartphones would make approximately $1.4 billion less in profits if the iPhone were available on all carriers.\textsuperscript{144} This demonstrates that the exclusive contract between AT&T and Apple created strong incentives for entry into the smartphone market. The article does not estimate the net welfare effect of exclusivity because the change in the likelihood of entry brought about by the exclusive contract cannot be estimated given the available data.\textsuperscript{145} The counterfactual analyses, however, demonstrate that exclusivity can generate

\textsuperscript{139} Sinkinson, supra note 22, at 2–4.
\textsuperscript{140} Id. at 4, 16–25 (detailing the model and its estimation).
\textsuperscript{141} Id. at 25.
\textsuperscript{142} Id. at 25–26.
\textsuperscript{143} The exclusive dealing arrangement between Apple and AT&T can be seen as a way to raise rivals’ costs by foreclosing their access to an important input, which limits their ability to differentiate the network-handset bundles they offer. However, the existence of substitute handsets and the ability of the other carriers to differentiate their offerings through exclusive contracts of their own limits the impact of AT&T’s exclusivity.
\textsuperscript{144} Id. at 26–27.
\textsuperscript{145} Id. at 3 n.10.
powerful competing forces by restricting choice and softening price competition, which harms consumers in a static setting, and by creating entry and innovation incentives, which benefit consumers in a dynamic setting.\textsuperscript{146}

2. Video Games and Consoles

Robin Lee conducts another study of the effects of exclusivity in an industry with network effects—video games.\textsuperscript{147} The industry is comprised of console manufacturers, which produce the platforms needed to play games; developers, which create games; and publishers, which bring games to market.\textsuperscript{148} A title can become exclusive to a particular console as a result of vertical integration, a contract, or a voluntary decision by the developer.\textsuperscript{149} The author focuses specifically on the industry’s sixth generation, during which Sony released PlayStation 2 (PS2), the successor to the highly successful PlayStation, while Nintendo and Microsoft entered the market a year later with their own platforms, Game Cube (GC) and Xbox (XB).\textsuperscript{150} This setting allows the author to empirically analyze the possible pro- and anticompetitive effects of exclusivity. In the context of the video game industry, theory predicts that exclusive arrangements can limit consumer choice and lead to entry deterrence and rival foreclosure but also that they can encourage investment, solve coordination problems, and help entrants gain a foothold in an established industry.\textsuperscript{151}

The author estimates a model of dynamic consumer demand for both video games and consoles that takes into account the fact that consumers are forward looking and platforms are durable goods; and a model of hardware adoption by software developers that weighs the costs and benefits of exclusivity and multihoming.\textsuperscript{152} Modeling both sides of the market allows agents to react to past and future actions of other agents, which is an important feature of consumer and firm behavior. Based on these models, the author analyzes the set of market outcomes that would have been obtained absent exclusive arrangements. The counterfactuals indicate that a ban on exclusives benefits the incumbent firm at the expense of entrants, while also increasing consumer

\textsuperscript{146} Id. at 29.
\textsuperscript{147} Lee, supra note 21, at 2960.
\textsuperscript{148} Id. at 2965.
\textsuperscript{149} Video games created by a vertically integrated entity are called “first-party” titles, while those produced by independent developers are called “third-party” titles. In some cases, the console manufacturer and the developer sign a contract that makes a title exclusive to the particular console in exchange for financing. In other cases, the developer voluntarily makes the title exclusive if the “porting” costs of making the title compatible with other platforms (“multihoming”) exceed the benefits of reaching a wider audience. Id.
\textsuperscript{150} Id. at 2966. Over that year Sony sold 5 million PS2 consoles.
\textsuperscript{151} Id. at 2961.
\textsuperscript{152} Id. at 2969–83 (detailing the model and its estimation).
surplus. Hardware and software sales increase by 7 percent and 58 percent, respectively, both driven by higher PS2 and lower GC and XB sales of consoles and titles. Consumer welfare increases by $1.5 billion.154

Two facts are driving the counterfactual results. First, in the real world GC and XB have a higher-quality stock of exclusive titles than PS2.155 As a result, PS2 benefits more by gaining access to its rivals’ exclusive titles than by retaining exclusivity over its own. Second, as the incumbent, PS2 has a larger installed base, which attracts developers that want to reach a wider audience.156 As almost all hit titles become available for PS2 following the ban on exclusives, the incentive to purchase competing consoles disappears. The two factors together lead to a large increase in sales of PS2 consoles and titles at the expense of GC and XB. The same mechanisms also drive the gains in consumer surplus. PS2 owners get access to a much wider range of hit titles, while most consumers who own multiple platforms can play their preferred games on PS2 without needing to purchase additional consoles.157

The telecommunications and video game industries illustrate how firms can use exclusivity to differentiate themselves and expand their customer base. In particular, exclusive arrangements can lead to higher prices and limit choice, while also creating entry incentives and helping entrants compete against an incumbent. Evaluating the impact of such conduct is particularly challenging because it requires weighing short-term harm against possible long-term benefits to consumers.

III. CONCLUSION

The reviewed empirical articles demonstrate the range of competitive effects that CPPs can have. FLF contracts are estimated to have a positive effect on consumer welfare in the video rental industry. In the confections industry, AUDs can have exclusionary effects, but they also motivate the downstream firm to exert more effort and may benefit consumers through better availabil-

---

153 Id. at 2992–94 & tbl.8. We focus on the results from the counterfactual in which all titles are free to re-optimize the set of consoles to support. In addition, Lee considers two other counterfactuals as well: one in which PS2 loses its exclusive titles while GC and XB keep theirs; and another in which all titles are forced to be compatible with all consoles. In all three counterfactuals, banning exclusives increases consumer welfare.

154 Id.

155 Id. at 2993.

156 Id at 2962.

157 The counterfactual analysis is “partial,” which means that the quality and set of products are kept fixed and that platform manufacturers are not strategic. Modeling all these decisions is computationally infeasible, but the author conducts robustness checks in which he varies the price of consoles, the quality of first-party titles, and the magnitude of the porting costs. The results indicate that the prohibition of exclusives is still detrimental to entrants and beneficial to consumers, although consumer welfare gains are substantially diminished in some cases. Id. at 2994–95.
ity and variety of products. Exclusive dealing can similarly foreclose rivals in the beer industry, but only in rural areas where there are presumably fewer available distributors. Despite the presence of foreclosure, this conduct has only a very small negative impact on consumer welfare and is likely to have an important efficiency-inducing motivation. The impact of exclusivity is more difficult to evaluate in the video game and smartphone industries because it leads to short-run consumer harm while simultaneously creating entry incentives that can have beneficial effects in the long run. Finally, loyalty discounts can have anticompetitive effects as suggested by the case of ocean shipping.

The reviewed articles reveal not only the variety of possible competitive effects, but also the importance of the specific form of the arrangement at issue and the particular market characteristics in influencing these effects. CPPs are more likely to be anticompetitive when dominant firms employ them, when market features force firms to drop competitors’ products to comply with the arrangement, and when substitute products or alternative distributors are not widely available. This list of characteristics that affect the likelihood and degree to which CPPs can have anticompetitive effects is by no means exhaustive. Rather, it points out only some of the market features that should be considered when evaluating the impact of conditional pricing. Although the wide variety of arrangements and the diversity of market characteristics makes reaching general conclusions about the competitive effects of CPPs very challenging, the agencies and courts would do well to draw on the findings of the existing empirical work.