CHAPTER 5

COMPETITIVE DISCOUNTS AND ANTITRUST POLICY

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5.1. Introduction

This chapter deals with a broad class of quasi-exclusive, vertical agreements in which a seller conditions price discounts on the specified quantity or share of a product line that the buyer commits to purchase from the seller. We refer to such agreements as "quantity commitment discounts" (QCDs), though they are often referred to as "loyalty discounts," as they appear to exchange price concessions for a buyer's loyalty to a particular brand. Both economic theory and the law recognize that in some cases pricing and business practices of sellers may harm or weaken rivals and might also reduce social welfare. The classic example is predatory pricing, in which a seller temporarily prices below incremental cost with the explicit goal of driving rivals from the market.[1] Common and typically procompetitive business practices designed to increase sales—including forms of quantity-related discounts, nonlinear pricing, and various vertical restrictions on distributors—similarly might in certain circumstances harm competition by harming competitors (see, e.g., Schwartz and Vincent 2008; Wilson 1993).

Of particular concern to the current US Department of Justice (DOJ) are "contracts that reference rivals" (CRR) in which the terms of one seller's procurement contracts with downstream buyers implicitly or explicitly condition on the terms that apply to

[1] For a more detailed discussion, see Kenneth Elzinga and David Mills, "Predatory Pricing," in this *Handbook*.

rivals.[2] Exclusive dealing arrangements, where a buyer agrees to purchase all of a particular product from a single seller, can be viewed as a limiting case of CRRs. More generally, a seller may condition discounts from list prices on a buyer's agreement to promote the seller's products more prominently than certain competitors' or to not promote them at all.[3] While such practices are known to have procompetitive benefits, if widely practiced by a dominant seller the cumulative effect of such practices might be to weaken competition by impairing rivals' ability to compete in the market.

The ambiguity and difficulty inherent in attempts to balance pro- and anticompetitive effects of common pricing practices is, in our view, the great challenge of antitrust enforcement. The bedrock proposition—that harms to rivals does not imply harm to competition—does not extend to governing this core component of the economic activity. It is recognized that lax enforcement can harm competition, but so can overly aggressive enforcement that protects competitors at the expense of vigorous competition. Further, absent clear standards defining the bounds of illegal conduct the mere threat of antitrust liability may dampen rivalry among firms, with resulting harm to the competitive process and, ultimately, consumers.[4] An increasing reliance on economic analysis in antitrust matters has resulted in a movement towards fewer per se illegality rules; however, per se illegality rules have not been replaced with broad safe harbors (Kobayahi and Muris 2012).

As our discussion in section 5.2 indicates, law and policy have not evolved to yield clear standards for judging QCDs and indeed have taken divergent paths. In section 5.3 we cover the basic economics of QCDs, showing that they are a natural outcome of sales-promoting competition by differentiated sellers and are typically mutually beneficial for participating buyers and sellers. In section 5.4 we evaluate the circumstances when QCDs may cause harm to competition. We demonstrate that QCD agreements that would arise absent an ability or intent to exclude rivals might nevertheless do so, and might also cause ancillary harm to competition. In section 5.5 we then assess the various means of testing for potential harm. We discuss interpretations of the so-called *attribution test* and its flaws as well as other indicators of potential harm.

[2] Scott-Morton (2012) concludes that CRRs, such as market share discounts, "have the potential to harm consumers and competition, particularly—but not always—when they involve firms with market power. CRRs have thus been, and will continue to be, the subject of antitrust scrutiny, both at the government [*sic*] and in private litigation." See Scott-Morton (2012) p. 3. Salop (1986) p. 265 discusses conditions under which pricing practices such as most-favored-nation (MFN) and meeting competition clauses (MCC) may have anticompetitive implications.

[3] For example, in *J.B.D.L. Corp. et al. v. Wyeth-Ayerst Laboratories, Inc., et al.* (6th Cir. 2007), Wyeth's contracts with pharmacy benefit managers granted discounts on its Premarin conjugated estrogen product in exchange for exclusive placement of Premarin in pharmacy benefit managers' core formulary.

[4] The degree of difficulty in evaluating pricing practices is underscored by the fact that private plaintiffs in the United States can bring claims of anticompetitive exclusion against their rivals under the Section 4 of the Clayton Act, which provides for treble damages and one-way fee-shifting in favor of plaintiffs (Clayton Antitrust Act of 1914, Pub. L. 63-212, 38 Stat. 730, codified at 15 U.S.C. §§12-27, 29 U.S.C. §§52-53). If the threshold to survive a motion to dismiss is that economic analysis is needed to assess the effects of a firm's pricing practices on its rivals, then firms face the prospect to having to settle such claims or risk treble damages and the legal costs of both parties. For relevant discussions, see Easterbrook (1984); Kauper and Snyder (1991).

Our concluding remarks in section 5.6 follow most directly from two main points. First, QCDs virtually always have a clear procompetitive rationale. Second, while economic theory shows that under certain conditions the intent and effect of commitment discounts could be to harm competition, these same theories provide little guidance in identifying situations where harm actually occurs. Further, few if any past cases provide convincing evidence of competitive harm, and no evidence of outright exclusion to our knowledge. In our view, the ubiquity of procompetitive or competitively neutral reasons for QCDs, combined with the lack of reliable tests or filters that would identify anticompetitive conduct, support our overall conclusion that QCDs should be viewed as *presumptively legal*. Our views contrast, therefore, with current US policy whereby a broad range of single-firm pricing practices are typically judged under a *rule of reason* analysis.

5.2. Legal and Policy Context

The number of actual judgments evaluating claims of anticompetitive exclusion have not converged on a standard. Noteworthy is the Third Circuit's 2004 decision in *Lepage's,* upholding a jury verdict that 3M's bundled quantity discounts violated Section 2 based on the standard that 3M's actions made it "very difficult or impossible for competitors to engage in fair competition."[5] The *Lepage's* decision has proven controversial because the court did not provide an objective standard of competitive harm and neglected to show that plaintiff LePage's was unable to profitably compete in the sale of its private-label transparent tape against 3M's bundled discounts. When arguing that the US Supreme Court should not grant certiorari in *LePage's*, the US solicitor general described the case law as underdeveloped and pointed out that the lack of systematic assessment of alternative standards by lower courts failed to establish bases for determining how standards would be applied.[6]

[5] See *LePage's v. 3M*, 324 F3d 141 (3d Cir 2003) (en banc), cert. denied 124 S Ct 2932 (2004). LePage's claimed that 3M set target quantities for individual LePage's distributors such that it was impractical for the distributors to meet the targets and retain LePage's as a supplier. See Brief for Respondents in Opposition at 5, 3M v. LePage's, 2003 WL 22428377, at *1 (2003) (No. 02-1865).

[6] The US government stated:

> The court of appeals focused exclusively on petitioner's proposed below-cost sales standard, Pet. App. 7a–8a, and the meager case law addressing bundled rebates offers little assistance in determining how alternative standards might work in practice. Because the courts below did not attempt to apply alternative standards to the facts, their decisions offer little to illuminate such potentially significant questions as whether an equally efficient supplier of private label tape could profitably have matched 3M's discounts and rebates; whether lowered prices resulting from the bundled discounts would have increased quantities of tape purchased by an amount sufficient to make the lowering of prices profitable, even if LePage's had matched the discounts; and whether 3M's "discounts" and "rebates" actually resulted in reduced prices for 3M's customers, as 3M contends, or whether the net result was a price increase structured to discourage trade with LePage's, as LePage's apparently claims.

The courts have not been consistent in selecting and applying standards when evaluating QCDs. In *Concord Boat Corp. v. Brunswick Corp.*, Brunswick—a producer of stern-drive boat engines—offered discounts to boat manufacturers who would commit to purchase at least 60% of their engines from Brunswick, which naturally reduced purchases from rival engine producers among participating buyers.[7] In *Concord Boat* the court applied a cost-based standard. The court in *SmithKline Corp. v. Eli Lilly & Co.* held that Lilly's loyalty discounts on a bundle of antibiotics would have excluded an "equally efficient" producer.[8] Meanwhile, in *Masimo Corp. v. Tyco Health Care Group* the court sustained a jury's verdict that Tyco's share-based discounts on a single product—pulse oximetry sensors purchased by hospitals—violated Section 2 by maintaining Tyco's monopoly power.[9] In *Eli Lilly* and in *Tyco*, as in other cases where liability was not found, the courts sought to establish whether the defendant's contracts were exclusionary in the sense that a hypothetical equally efficient rival could not profitably compete against them. Intel's agreements with computer manufacturers such as Dell or Hewlett Packard were alleged to condition discounts for Intel processors on the share of total processor purchases that a buyer would commit to purchase from Intel—an implicit reference to Intel's sole major rival, AMD.[10] Intel's practices generated challenges by the EU, Korea, and US Federal Trade Commission,[11] as well as a flow of private antitrust suits by allegedly excluded rivals, but no well-defined standard.[12] Finally, and most recently, is the Supreme Court's refusal in April 2013 to review *Eaton v. Meritor*. Despite above-cost pricing of its heavy-duty transmissions, Eaton was found guilty of illegal monopolization by the Third Circuit because of other terms of the long-term contracts Eaton formed with heavy-duty truck manufacturers.[13]

Rf. Brief for the United States as Amicus Curiae, *3M Company v. LePage's Incorporated*, No 02-1865, p. 18 (footnote omitted).

[7] See *Concord Boat Corp. v. Brunswick Corp.,* 207 F.3d 1039 (8th Cir. 2000). The discounts were 1% for purchases accounting for 60% of total purchases, 2% for purchases accounting for 70% of total purchases, and 3% for purchases accounting for 80% of total purchases.

[8] *SmithKline Corp. v. Eli Lilly & Co.,* 427 F. Supp. 1089 (E.D. Pa. 1976), affirmed 575 F.2d 1056 (3d Cir. 1978).

[9] *Masimo Corp. v. Tyco Health Care Group, L.P.*, No. CV 02-4770 MRP, 2006 WL 1236666, at *13 (C.D. Cal. Mar. 22, 2006).

[10] For discussion and analysis of the antitrust claims relating to Intel's use of loyalty discounts, see Wright (2011).

[11] See, e.g., "*Antitrust: Commission imposes fine of €1.06 bn on Intel for abuse of dominant position; orders Intel to cease illegal practices*," European Union press release (May 13, 2009), http://europa.eu/rapid/press-release_IP-09-745_en.htm?locale=en; *Statement of Chairman Leibowitz and Commissioner Rosch In the Matter of Intel Corporation, Docket No., 9341*, Federal Trade Commission (December 16, 2009), http://www.ftc.gov/os/adjpro/d9341/091216intelchairstatement.pdf.

[12] Other antitrust cases alleging anticompetitive exclusion include *Ortho Diagnostics Sys. Inc., v. Abbott Lab, Inc.,* 920 F. Supp. 455 (S.D.N.Y. 1996); *Virgin Atlantic Airways Ltd. v. British Airways PLC,* 69 F. Supp. 2d 571 (S.D.N.Y. 1999), aff'd 257 F.3d 256 (2d Cir. 2001); *Applied Medical Resources Corp. v. Ethicon Endo-Surgery (Johnson & Johnson)*, 03-CV-1329 (C.D. Cal. 2006).

[13] See *Eaton Corporation v. ZF Meritor LLC and Meritor Transmission Corporation*, cert. denied, 133 S. Ct. 2025 (2013).

Given the lack of clear standards for evaluating QCDs and lack of guidance to businesses, the US Department of Justice (DOJ) in 2008 issued a detailed report clarifying its positions on liability for single-firm conduct (US Department of Justice 2008). The DOJ cited a number of potential benefits related to QCDs, including economies of scale and scope, promotional incentives for retailers, inducing customers to try new products, customer convenience, and price discrimination based on differences in customer demand elasticities.[14] The DOJ report recommended a fairly high liability threshold for conduct with demonstrated procompetitive benefits and potential anticompetitive harms: for conduct to be actionable, harms would have to be "disproportionate" to benefits.

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The 2008 DOJ report also attempted to provide more detailed guidance based on tests. For example, though above-cost net prices may in theory exclude, the DOJ report as well as the 2007 Antitrust Modernization Commission (AMC) recommended that discounting practices that pass the so-called attribution test should be viewed as per se legal with no further inquiry into possible effects. Thus, in the case of bundled QCDs—like those featured in *LePage's*—where a subset of a discounting seller's products are contestable by rivals, all the discounts on noncontestable elements of the bundle are attributed to (subtracted from) the price of contestable units. A "net price" above incremental cost would be viewed as lawful, which is inconsistent with the recent *Eaton* decision. By this rule, a finding that the net price is below incremental cost would suggest that discounts might be unprofitable to the seller absent some other motive, which might include exclusion. As we discuss in section 5.5 below, even this safe harbor is fairly narrow, however, as the attribution test is known to produce "false positives," and we provide several additional reasons why this is so. One may further object that even in combination with other (noisy) signals of competitive effects, reliance on tests risks exposing innocent contracting practices to antitrust scrutiny and possible litigation, and may blunt sellers' incentives to engage in more aggressive and procompetitive discounting practices.

The 2008 DOJ report's recommendations, however, were formally withdrawn in 2009. Assistant Attorney General for Antitrust Christine Varney commented as follows:

> [T]he disproportionality test reflected an excessive concern with the risks of over-deterrence and a resulting preference for an overly lenient approach to enforcement. The failing of this approach is that it effectively straightjacketed antitrust enforcers and courts from redressing monopolistic abuses, thereby allowing all but the most bold and predatory conduct to go unpunished and undeterred. (Varney 2009, pp. 8–9).

The withdrawal of the DOJ 2008 policy guidelines, as indicated, underscores the absence of a standard for determining whether any particular discounting practice merits

[14] US Department of Justice (2008). See also similar discussion in Antitrust Modernization Commission 2007. Some observers argue that the widespread use of QCDs in situations where anticompetitive intent "makes no economic sense" indicates that some such benefits must exist (e.g., efficiencies or lower costs). See Jacobson and Weick (2012).

antitrust scrutiny or liability. Current DOJ policies as reflected in its *United Regional Health Care System* move yet further from a common standard, by requiring sellers to tailor their discounts to the specific capabilities of particular rivals.[15]

Other efforts following *LePage's* have been made to define standards or tests that would distinguish instances in which QCDs might be anticompetitive.[16] Noting that the possible anticompetitive impact from QCDs almost always relies on the existence of rivals' scale economies, some suggest that initial inquiries focus on whether a seller's contracts deny the benefits of scale to affected rivals (see, e.g., Carlton and Waldman 2008). Accordingly, demonstration of rivals' scale economies might be considered a necessary condition for a successful complaint of exclusion. The challenge herein is that various economies are difficult to quantify and it is even more difficult to ascertain whether a particular discounting practice prevents their realization. Moreover, reliance on evidence of rivals' scale economies requires a discounting seller to calculate the impact of its contracts on rivals' costs and profits, and to refrain from discounts that might harm them. Here we agree with Areeda and Hovenkamp (2008) that such attempts to find a middle approach would make a contracting seller "trustee for another firm's economies of scale," holding "a price umbrella over its rivals" even if rivals' technologies were somehow known, with the clear danger of dampening competition (Areeda and Hovenkamp 2007, par. 749b at 249).

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5.3. Basic Economics of Quantity Commitment Discounts

In this section we explain how quantity commitment contracts and associated discounts from "list" prices are natural outcomes of the competitive process, as sellers seek to increase sales.[17] These increases in sales naturally occur at the expense of rivals. Key to what follows is that the typical seller does not face perfectly elastic demand for its product. As a result, almost all sellers in modern wholesale and retail markets have some control over the prices they charge—they do not simply "take" prices as given but instead have pricing strategies in which chosen prices exceed incremental costs. Simple linear pricing ("here's my price, buy what you want") leaves unrealized gains from trade and, therefore, establishes incentives for buyers and sellers to devise ways to unlock them.

[15] Competitive Impact Statement filed by the US Department of Justice, *United States of America and State of Texas v United Regional Health Care System*, United States District Court for the Northern District of Texas, February 25, 2011, http://www.justice.gov/atr/cases/f267600/267653.pdf.

[16] These efforts are discussed in US Department of Justice (2008).

[17] The discussion that follows is based on Murphy and Topel (2011a, 2011b).

5.3.1. Mutual Gains from Quantity Commitment Discounts

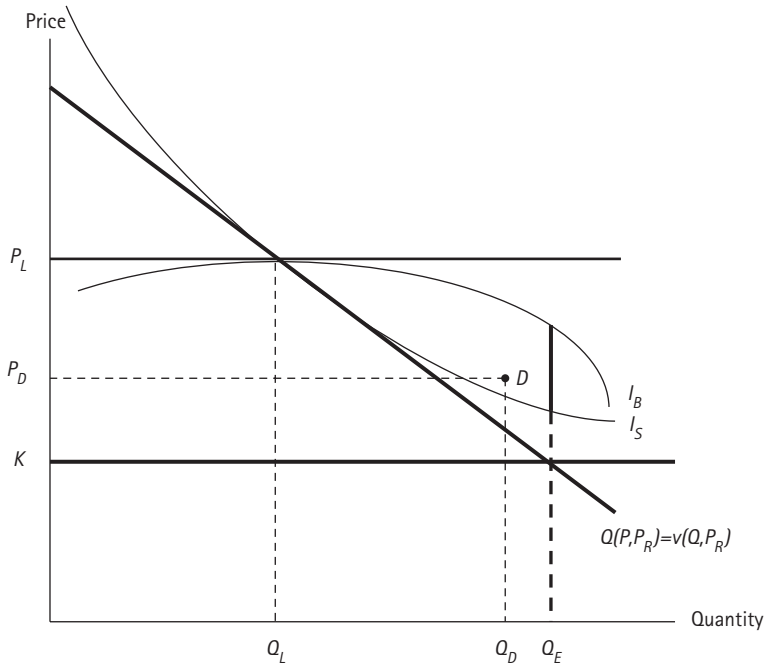
Assume that seller *S* produces a differentiated product within a category of close substitutes also produced by rival(s) *R*. For the situations we have in mind, a buyer (*B)* will typically be a downstream business that uses the products of *S* and *R* as inputs or resells them. For example, Intel (*S*) is a producer of processors purchased by OEMs (*B*) as components for personal computers, but rival AMD makes processors that are close substitutes for at least some of the Intel line. Most large OEMs purchase processors from both Intel and AMD. Similarly, Johnson & Johnson (J&J) produces a line of endoscopic surgical tools purchased by hospitals, but rival Tyco also produces a full line of tools, while smaller, more specialized, manufacturers produce substitutes for various elements of the J&J and Tyco lines. Most hospitals purchase from multiple vendors. And grocery stores typically stock beverage lines produced by both Coke and Pepsi, who compete for scarce shelf space and other promotional advantages.

In each of these examples, within-buyer competition between *S* and *R* means that increased purchases from *S* reduce purchases from *R,* and conversely. Stepping back, we should recognize that even if *S* had no rivals, it would want to use QCDs to realize additional gains from trade with buyers. When *S* does have rivals, the sales gained from QCDs may be a combination of additional purchases by buyers and buyers shifting purchases from rivals to *S*. To feature the issue of potential exclusion, we focus on the case where the seller *S* has a rival *R* and assume that incremental purchases from *S* result in a one-for-one substitution in purchases from *R*.[18] This assumption is appropriate in some settings, such as when hospitals procure supplies or HMO pharmacies procure drugs targeted at particular ailments. The fact that these buyers purchase substitute products from multiple vendors implies a within-buyer demand for variety. For example, within a hospital some surgeons may have a strong preference for a particular manufacturer's surgical tools while other surgeons are more willing to substitute, and some HMO members with a particular ailment may be better served by one type of drug within a class of therapeutic equivalents. In other cases the assumption of exact one-for-substitution is less compelling, such as when a retailer resells multiple brands of substitute goods to final consumers.

Figure 5.1 illustrates the incentive to discount in this environment. We assume for now that buyers are identical and that demand curve $Q(P;P_R)$ represents the quantities that representative buyer *B* wishes to purchase from *S* at various hypothetical prices *P*, holding constant the prices charged by the rival seller, P_R.[19] Equivalently, at any quantity

[18] We only require that *S* and *R* provide substitutes, though the one-for-one substitution is a good representation in many important cases. Whether one or the other brand of surgical tool is used does not materially affect the number of surgeries. Displacement is likely to be less than one-for-one in the grocery store example of Coke and Pepsi.

[19] If *R* produces a differentiated product, we interpret P_R as its optimal Bertrand price given P_L. With many rivals who are undifferentiated from each other we interpret P_R as equal to rivals' marginal cost.



The non-contract price and quantity are PL > K and QL. With a quantity commitment contract buyer and seller may achieve mutual gains at combinations like D that lie above IS and below IB. The efficient quantity is QE where v(QE,PR) = K.

FIGURE **5.1**

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Q the same curve represents B's willingness to pay for an additional unit, $v(Q;P_R)$. With these demand conditions a seller that charges a single "list" price P_L for all units will set price above marginal cost ($P_L > K$) and sell quantity $Q_L = Q(P_L,P_R)$.[20] The seller earns a profit of $\Pi_L = [P_L - K]Q_L$.

With price above marginal cost it is obvious that seller S would gain if buyer B were to purchase more than Q_L at the same price. But B is unwilling to do so: the meaning of the demand curve is that B wishes to purchase exactly Q_L units at price P_L—each additional unit beyond Q_L is worth less than P_L to the buyer. Even so, there is a set of prices $P < P_L$ and quantities $Q > Q_L$ where *both* B and S would be better off. To find these mutually advantageous combinations we draw two "indifference curves," I_S (for the seller) and I_B (for the buyer). Curve I_S represents the set of all price-quantity pairs that yield to S the same profit as combination (P_L,Q_L), equal to $\Pi_L = [P_L - K]Q_L$.[21] By construction, curve I_S touches (is tangent to) B's demand curve at (P_L,Q_L) but otherwise lies everywhere above the demand curve—S would accept lower prices, but only in exchange for

[20] The familiar solution is to set price so that marginal revenue is equal to marginal cost. We do not show the marginal revenue curve in figure 5.1 in order to reduce clutter.

[21] The formula for the combinations on indifference curve I_S is $P = K+\Pi_L/Q$.

greater quantity increments than are available along the demand curve.[22] It follows that all price-quantity combinations above the curve I_S yield greater profits.

Similarly, indifference curve I_B is the set of combinations that yield to B the same consumer surplus as (P_L, Q_L). By construction I_B is tangent to the horizontal line P_L at the point where the demand curve crosses P_L, but otherwise lies everywhere below P_L—if given the choice of any quantity at price P_L the buyer would choose Q_L, but would be willing to purchase more if compensated by a sufficiently lower price, and so on. The buyer prefers all price-quantity pairs below I_B to combinations on it as they yield greater consumer surplus. Since B's indifference curve is tangent to the horizontal line at P_L and S's indifference curve is tangent to B's downward-sloping demand curve, there will always be mutually beneficial gains to trade available with the property that $P < P_L$ and $Q > Q_L$.

The area below I_B and above I_S is the set of price-quantity pairs that are mutually preferred to the stand-alone price and quantity. Ignoring income effects, the quantity that maximizes the joint surplus of B and S for a given rival's price is Q_E where the buyer's marginal value is equal to the seller's marginal cost, $v(Q_E, P_R) = K$, so the "contract curve" of price-quantity pairs that maximize joint gains is vertical at Q_E. But full efficiency need not be achieved for discounting to be mutually beneficial. All pairs like $D = (P_D, Q_D)$ in the shaded region involve the buyer paying a *discounted* unit price $P_D < P_L$ in exchange for a *commitment* to purchase sufficiently more units than at the stand-alone price $(Q_D > Q_L)$—and correspondingly fewer from R. Note that the buyer's ability to commit is necessary to achieve this mutually beneficial outcome: At the discounted price P_D an uncommitted buyer would choose to purchase less than Q_D along the demand curve, at which S's profit would be less than Π_L. Therefore, realization of mutual gains requires a contract, explicit or implicit, between buyer and seller. The contract commits the buyer to purchase a larger quantity in exchange for the seller's commitment to an appropriately large discount from the "list" (uncommitted) price P_L.[23] As we show later, there are many ways to achieve this commitment including nonlinear pricing, bundling, and loyalty discounts, all of which fall under our definition of QCDs.

Importantly, the quantity commitment and associated price discount illustrated in figure 5.1 need not be initiated or designed by the seller. As indicated by figure 5.1, both parties stand to gain, and it is just as reasonable that the moving party is the buyer, who offers to purchase more in exchange for a negotiated discount. In practice, with heterogeneous buyers the size and location of the "football" area of mutual gain is uncertain and buyer specific—but both parties know it is there and that they would prefer to be in it. There is a deal to be made. In many cases these gains are the foundation

[22] In drawing figure 5.1 we have assumed that all buyers are the same, with identical demand curves. Then I_S must be tangent to D. If buyers are heterogeneous then I_S need not be tangent to any particular buyer's demand curve, but this does not affect the following analysis.

[23] Given this need for a buyer's commitment to purchase more than it would otherwise (and hence less from S's rivals), it is not surprising that some buyers might complain ex post that they are being "forced" to buy more from S than they would like. In a sense, this forcing is true. Without the contract, however, they would not get the discount.

for buyer-seller negotiations, be they between Intel and Dell for a favorable deal on processors, or between a grocery chain and Coke over the placement of beverages on shelves. In other cases, such as in *Concord Boat*, a seller may announce a common pricing schedule that offers explicit discounts in exchange for specified quantity or share commitments.

This analysis has important implications for antitrust policies that target contracted discounts and quantity commitments. It says that in *any* situation where the uncommitted price would exceed marginal cost—which for practical purposes means always—there are mutual gains for a buyer and a seller from an agreement that offers a discount in exchange for a buyer's commitment to purchase more. Put differently, absent transactions costs or barriers to contracting, *simple linear pricing is not an equilibrium outcome of the competitive process*. As a business practice subject to antitrust scrutiny, therefore, QCDs *always* have a procompetitive justification even if, in some circumstances, they might also have an exclusionary impact—whether intentional or ancillary—as explained below.

5.3.2. Competition and the Division of Gains between Buyers and Sellers

All combinations like *D* in figure 5.1 increase the joint surplus of *S* and *B*, while reducing purchases from rival(s) *R*. These gains exist because the stand-alone price exceeds marginal cost. The division of these gains depends on the relative bargaining powers of the two parties and the nature of competition from rivals, but without further structure it is not possible to say more than that linear pricing is not an equilibrium outcome when contracts are feasible, and that both parties stand to gain from the deal.

If the parties realize the entire potential surplus, then the outcome will be on the vertical contract curve at the jointly efficient quantity Q_E. This is not the end of the story, however, because figure 5.1 is drawn under the assumption that *S*'s chosen list price and the competing offers by rivals are unaffected by commitment contracts. Assume for the moment that rivals are perfectly competitive with constant cost, so they do not offer competing contracts and P_R is fixed. There are two reasons that P_L will not be the same as the price that *S* would charge in the absence of contracts. First, so long as some buyers purchase at the list price and others through contracts, the opportunity to purchase through a commitment contract leads to sorting of buyers. For example, if there are fixed costs of negotiating and enforcing contracts then large buyers will be more likely to purchase through contracts. If small, noncontract buyers are more elastic demanders—they are more willing to substitute *R* for *S*—then this would tend to reduce the list price; and conversely if noncontract buyers are predominantly inelastic demanders.

Second, with contract and noncontract customers seller *S* is likely to set a list price higher than the price that would maximize profits from noncontract buyers alone. To see this, let $\overline{P}$ be the price that would maximize *S*'s profits from noncontract buyers.

Now consider a small increase in the list price above this level. This price increase has only a second-order (approximately zero) impact on the profits earned from noncontract buyers because (by assumption) $\overline{P}$ was set to maximize profits in that segment. But for contract buyers the price increase makes the buyer's alternative of purchasing at the list price less attractive—indifference curve I_B in figure 5.1 shifts upward as the list price is increased, allowing *S* to earn greater profits from contract buyers.[24]

It follows that the seller would want to set $P_L > \bar{P}$. The strength of this incentive to raise the list price clearly depends on the relative numbers of contract and noncontract buyers because raising the list price by more than a "small" amount reduces profits among noncontract buyers. If the number of contract buyers is small relative to noncontract buyers, then the incentive to raise the price will also be small, and conversely. Both contract and noncontract customers of *S* are worse off than if *S* did not increase its list price, and some may be worse off than if commitment contracts were impossible. But it is difficult to argue that this feature of commitment contracts is anticompetitive—it is instead an example of first-degree price discrimination that allows *S* to extract more of the gains from trade. Nor are rivals harmed by the higher list and contract price—they sell more than they would otherwise, though possibly less than they would in the absence of commitment contracts.[25]

In most real-world cases *S* faces a differentiated rival, *R*, whose price P_R also exceeds marginal cost. Because of this wedge, *R* would also gain by offering a discount to increase sales at *S*'s expense. This means that *B*'s alternatives are improved by "competition for the contract" among differentiated rivals, *S* and *R*. Assuming that *S* wins this competition, its contracts with buyers must nevertheless offer as much consumer surplus as *R*'s best offers, which must yield at least as much profit to *R* as simply selling fewer units at its own list price P_R. This competition improves *B*'s alternative as well as its bargaining position with *S*, while the reduction in demand for *R* will generally reduce *R*'s list price. Both of these effects of competition benefit buyers.[26]

The effect on *R*'s list price can be very important. For example, in their analysis of exclusive dealing Klein and Murphy (2008) showed that if *S* and *R* initially compete with linear prices each would often have the unilateral incentive to offer the buyer, on an all-or-nothing basis, an exclusive contract at a price below the equilibrium linear price, since that allows them to capture more sales at a lower price. However, once the two

[24] When rival *R* also offers a commitment contract discount, a buyer has two alternatives to *S*'s contract: (1) enter a commitment contract with *R* and pay list for *S*'s good, or (2) contract with neither and pay list for both. In either case the alternative is to pay list for *S*'s good, so raising the list price makes the rival's offer less attractive.

[25] An extreme example: suppose buyers are identical, all contract with *S*, and all bargaining power resides with *S*. Then *S* will increase P_L to the level that drives quantity demanded in figure 5.1 to zero. The contract leaves buyers indifferent between purchasing the efficient quantity Q_E via contract and doing without *S*'s good entirely—*S*'s contract and list price replicate perfect first-degree price discrimination and capture all the gains from trade. Consumers of *S* (and rivals) are harmed relative to a world without contracts, but (as in any case of perfect price discrimination) efficiency is enhanced.

[26] Klein and Murphy (2008, 2011) and Zenger (2010) analyze "competition for the contract" in the case of exclusive dealing and illustrate how such competition benefits consumers.

sellers compete for the exclusive contract, the resulting prices will often be lower and consumer welfare higher than they would be under linear pricing. Under these conditions *B*'s outside opportunities are enhanced by the use of QCDs and consumers benefit more than the static analysis in figure 5.1 would imply.

5.3.3. Loyalty Discounts and Other Forms of Quantity Commitment

The contract described above has a very particular form: buyer *B* commits to purchase a specified quantity and seller *S* commits to supply those units at a discounted price $P_D < P_L$, where P_L is the noncontract or "list" price.

Within this class of agreements, we define a *loyalty discount* as a contract in which *B* receives a discount from the list price in exchange for *B*'s commitment to devote a given *share* (*s*) of its purchases in category *C* to the products of *S*. The resulting nonlinear pricing schedule may have one or several steps that result in larger discounts for greater shares. Such commitments may be individually negotiated between the seller and a particular buyer, so that different buyers may have different deals, or they may be outcomes along a single pricing schedule announced by *S* in which buyers may choose different price-share combinations. Or both may occur.[27] At the extreme, a share commitment of 100% by buyer *B* is a negotiated exclusive supply contract. Note, however, that a 100% share commitment is less restrictive than oft-analyzed *exclusive dealing* contracts, which would specify that *S* will be the exclusive supplier to *B* under all circumstances for the duration of the contract. Here, even a 100% commitment may be abandoned by *B* at any time, albeit by paying a higher price.

Why would a buyer and seller prefer to specify a share of purchases instead of a particular quantity? There are at least two major reasons. The first is heterogeneity among buyers. In our analysis above, we assumed that a buyer's increased purchases from *S* resulted in a one-for-one reduction in purchases from *R*, which is a reasonable characterization in many procurement settings. Then any contract specifying a quantity that *B* will purchase *is* a share contract. Specifying contracts in terms of shares is especially useful when a seller supplies hundreds or even thousands of buyers of different sizes, and separately negotiated contracts are not cost effective. For example, J&J supplies endoscopic surgical tools to thousands of hospitals and clinics in the United States. In figure 5.1 the existence of a mutual gain from contractual discounts does not depend on the size of the buyer; all can gain from such arrangements. A simple and cost-effective way of achieving these gains is for J&J to offer discounts from the list price depending on

[27] For example, J&J's pricing schedule for its endoscopic surgical tools offers greater discounts in exchange for greater share commitments from buyer hospitals. Any small or large hospital can avail the schedule, but many chains and group purchasing organizations (GPOs) negotiate separate deals, typically with still larger discounts and share commitments.

a hospital's committed share of J&J tools. This contract is independent of scale, allowing small and large hospitals to benefit from the same share-based schedule of discounts.[28]

The second reason is demand uncertainty. When demand for the final product sold by the buyer is highly uncertain, it is inefficient to write an enforceable contract that specifies how much should be purchased in each state of the world. For example, suppose Intel's contract with Lenovo specified a particular quantity of processors that Lenovo must purchase to qualify for a discount. If demand for Lenovo's personal computers turns out to be unexpectedly low, then the quantity threshold to qualify for a discount should be reduced, which means that such contracts must be state contingent and verifiable. But such a state-contingent contract with an individual buyer would be nearly identical to a share contract, so long as total purchases within a product category (here, processors) are a good summary measure of the state of demand for a particular brand. Then a share contract achieves the goal of exploiting gains from trade, but with lower negotiation and monitoring costs (see, e.g., Dana and Spier 2001).

In other circumstances a commitment contract specifies neither a particular quantity nor a share threshold, but rather favorable promotion or placement of a seller's goods or other advantages that will increase sales. The challenged conduct in *Brand Name Drugs*[29] was that drug manufacturers entered into agreements with large mail-order pharmacies such as Medco and Caremark that granted particular drugs preferred promotional status within a class of "therapeutic equivalents." In exchange, the pharmacy received a discount from the list price of the favored drug.[30] For example, Medco might have a contract granting favorable treatment to Glaxo's antiulcer drug Zantac: if Medco received a prescription for other drugs within this class—the main rival drug at the time was Tagamet—Medco pharmacists would ask the prescribing physician to switch the patient to Zantac. Unusually for lawsuits challenging such practices, plaintiffs in *Brand Name Drugs* were not rival manufacturers (who had their own deals with other buyers, and were defendants) but rather brick-and-mortar drug stores that paid higher wholesale prices because they were unable to duplicate such promotional advantages.[31] Similarly, food and beverage manufacturers negotiate with grocery stores for favorable placement

[28] In the case of hospital procurement, hospitals and clinics typically purchase through "group purchasing organizations" (GPOs) that contract with manufacturers on behalf of member hospitals. The GPOs typically negotiate share-based commitment contracts and discounts with manufacturers, which are natural outcomes that can be applied to large and small members.

[29] *In re: Brand Name Prescription Drug Antitrust Litigation*, Case No. 94 C 897 MDL 997 (U.S. District Court, Northern District of Illinois, Eastern Division 1996).

[30] As mentioned earlier, similarly in *J.B.D.L. Corp. v. Wyeth-Ayerst Laboratories*, 485 F. 3d 880 (6th Cir. 2007) defendant Wyeth offered discounts (rebates) to PBMs in exchange for placing Wyeth's conjugated estrogen product Premarin in the PBM's "Core Formulary." Wyeth's discounts and contract provisions were found legal.

[31] Mail order pharmacies supplied mainly drugs for chronic ailments, used over long periods. So there was time to contact the prescribing physician between receipt of a new prescription and when it must be filled. Walk-in pharmacies had less ability and incentive to do this, because a smaller share of their sales was in switchable categories and because patients were typically waiting.

or amounts of shelf space, in exchange for discounts on wholesale prices (see Klein and Murphy 2008, 2011).

5.4. Potential Harm to Competition

Much of the economics literature on nonlinear pricing and related vertical restrictions is concerned with the possibility of anticompetitive effects, mainly as a result of "exclusion" or "foreclosure" of rivals. These analyses implicate a variety of factors such as economies of scale, capacity constraints, and cost conditions.[32] They also account for various characteristics of the practices in question: (i) whether the seller uses customer-specific quantity or share thresholds, (ii) whether discounts are on a single product, a product line, or are based on "bundles" of multiple products, and (iii) whether discounts are applied to all purchases ("first unit" discounts) or only to marginal purchases above the relevant threshold.

It is important that any sense of anticompetitive exclusion of rival sellers due to quantity-commitment contracts must refer to factors that prevent rivals from effectively competing in the *market* as opposed to competing for particular buyers (Elhauge and Wickelgren 2012). Contracts that prevent or restrict a rival's ability to sell to some buyers for a period of time, but do not impair the rival's ability to compete—that is, do not drive the rival from the market or raise its marginal costs—do not impinge the rival's ability to discipline market prices, including the prices paid by buyers who do not purchase from the rival and the terms that *S* must offer to buyers in order to induce them to sign a QCD.

The main issues are easily illustrated in the context of the model presented above. Because the products of a contracting seller and its rivals are demand substitutes within buyers, it is clear that one seller's commitment contracts must reduce the demand for rivals' goods compared to a world without such contracts. Some rivals may be excluded and the terms that are offered must be competitive with those offered by the rival. For example, let rivals be perfectly competitive with rising supply price. Then the reduction in residual demand caused by *S*'s contracts will reduce the price rivals receive and the quantity they sell. Rivals' profits are then lower, and high-cost producers may exit the market.

The exit of some high-cost rivals is not, however, anticompetitive. Indeed, the resulting fall in the price charged by rivals will tighten the competitive constraint on *S* even though *S*'s market share is increased by the QCD. Nor will economic efficiency be reduced—absent commitment contracts by *S*, those sellers would be viable only because *S* priced above marginal cost, which distorts buyers' choices away from *S*. Commitment contracts

[32] In an environment with simultaneous contracting, where buyers face costs of switching sellers and at least one seller is financially constrained, a ban on below-cost pricing is sufficient to prevent exclusion. See Ordover and Shaffer 2007. When negotiations between a buyer and sellers are sequential, below-cost pricing has no effect on consumer welfare. See Marx and Shaffer (2008).

reduce this distortion. The same is true if *S* faces differentiated rivals, some of which are more efficient than others. Some sellers may be driven from the market by *S*'s commitment contracts because demand for their products is reduced. Others are forced to reduce their prices (which benefits buyers) and earn lower profits. But this harm to competitors is not harm to competition. The same effects on rivals would be induced by any action by *S* that encourages buyers to purchase more of its product, such as an across-the-board price cut.

Things can be different in the presence of fixed costs or economies of scale causing declining marginal costs, and some form of scale economy is a common element of models that generate welfare-reducing exclusion.[33] To (again) keep things simple suppose that *S* competes with a single differentiated rival, *R*. Let *R*'s technology have constant marginal cost for output above a minimum efficient scale (MES) but infinite marginal cost for lower rates of output; an economy of scale. Absent commitment contracts, *S* and *R* would set Bertrand prices above marginal cost and divide the market, so long as in the resulting equilibrium *R* operates above MES. But as above this leaves unexploited gains from trade. So assume that buyers and *S* pursue these gains, resulting in QCD contracts with some buyers and a reduction in the residual demand for *R*. *R* will be driven from the market if its best response to *S*'s contracts pushes its sales below MES. Consumers and social welfare will be harmed, while *S* captures the market and earns "monopoly" profits. There is harm to competition.

In this example, the welfare-reducing impact of *S*'s contracts is ancillary to their true purpose, which is to increase sales and unlock gains from trade. *S*'s conduct would have been the same if exclusion of *R* were impossible—that is, in the complete absence of scale economies. But change the example just slightly; assume that absent intent to exclude *R*, *S*'s contracts would leave just enough residual demand for *R* to operate above MES. If *S* is aware of *R*'s tenuous participation, it can exclude *R* by negotiating slightly higher quantity commitments and/or slightly more contracts with buyers.[34] Then *S*'s conduct is (slightly) different than if exclusion were impossible. Its monopoly is gained as a result of *intentional* exclusion, not merely a competitive effort to increase sales and unlock gains from trade.

These examples illustrate the central quandary of antitrust policy in dealing with quantity commitment discounts, including their share-based variant. We have demonstrated that such contracts are part of the competitive process and would be commonly used by buyers and sellers even if exclusion of rival sellers were impossible. In certain circumstances specifically involving rivals' scale economies, these contracts could, in theory, harm competition by excluding rivals or raising their costs. Even if harm to competition could be demonstrated by some test, however, if this harm is ancillary to contract competition it is difficult to argue that a contracting seller should face

[33] In the presence of scale economies in production, Segal and Whinston (2000b) show that exclusive contracts can prevent entry if a sufficient number of buyers agree to exclusive contracts. However, if buyers can breach the exclusive contracts and pay expectation damages, the contracts cannot prevent entry (Simpson and Wickelgren (2007)).

[34] Similarly, if *R* would operate just above MES in the absence of contracts, then *S* might offer contracts even if they would not be profitable in the absence of an ability to exclude *R*.

antitrust liability for the outcome, or even that the seller's contracting practices should be enjoined ex post. And how does one prove that anticompetitive effects are *not* ancillary to normal competition? Further, what exactly would be illegal—commitment contracts themselves, so that certain sellers in certain circumstances may not offer them, or the act of having too many or too aggressive contracts?

It is clear that in some circumstances the *intent* of QCD contracts could be to harm competition. But given that QCDs are by definition intended to increase *S*'s sales and therefore reduce *R*'s sales, it is difficult if not impossible to reliably identify intent from *S*'s contracting practices. If QCD contracts are to be judged by a rule of reason, then courts and antitrust authorities must be armed with analytical tools that can distinguish exclusionary intent from the intent to simply win sales from rivals, and businesses must be able to reliably predict when their conduct will run afoul of the law or be exposed to costly antitrust scrutiny.[35] One possibility is to infer intent from the data and conduct: similar to pricing below cost in the analysis of predation, certain conduct might be profitable only if its purpose is to exclude rivals and harm competition. Our view is that such fine distinctions are nearly impossible in practice, as explained below.

5.4.1. Implicit or Explicit Bundling

Consider a simple QCD contract in which a particular buyer commits to maintain its category purchases of *S*'s product above some designated quantity, Q_D, in exchange for a discounted price P_D.[36] We aren't concerned with situations where the discounted price itself is below marginal cost, so we assume $P_D > K$, as implied by figure 5.1. Since we are analyzing competition for the business of a single buyer, we can ignore scale economies for the moment. It is then clear that an equally efficient (identical cost and value) rival cannot be excluded from competing for the entirety of Q_D at a price above its marginal cost. It follows that in order for a contract to prevent a rival from competing for the business of a particular buyer there must be some fraction of *S*'s sales to the buyer that are (effectively) not "at risk" or are noncontestable—that is, that the rival cannot capture.[37] This can occur for two closely related reasons.

First, in the case of "single-product" commitment contracts, the fact that the buyer purchases a mixture of products from *S* and from rivals implies within-buyer heterogeneity of brand preferences—a demand for variety represented by downward-sloping

[35] Further, the economic literature on game-theoretic models of firm behavior has provided little in the way of guidance for antitrust law. See Kobayashi and Muris (2012).

[36] To translate this analysis into a share contract, simply normalize the buyer's total purchases to unity, so Q_D is the share of total purchases that come from *S*.

[37] Some have argued that the necessity of having some units that are not "at risk" means that single-product discounting practices should be per se legal, because all units are evidently at risk and anticompetitive impact is impossible. Our analysis in the following paragraphs shows that this argument is not quite correct, but per se legality is probably a good rule because anticompetitive impact would be nearly impossible to establish in the case of single-product QCDs.

demand in figure 5.1. As explained above, for all commitment contracts that we know of, the "buyer" is better described as a purchasing agent or middleman for a group of final purchasers or users. For example, a hospital that purchases J&J surgical tools acts as a purchasing agent for staff surgeons who use them. Then a subset of surgeons in a hospital may have a strong preference for J&J's brand of tools and be unwilling to switch, which affects the hospital's purchasing mix. Similarly, Intel's processors may be particularly well suited to a subset of an OEM's product line, so those units are more difficult for a rival to displace than other marginal units. Then one might argue that a committed buyer purchases an *implicit bundle* of "contestable" and "noncontestable" units, even if all units purchased from *S* are physically identical.

The second circumstance is actual heterogeneity of the units used to calculate the threshold quantity or share. For example, J&J's share contracts for "endoscopic tools" encompass a variety of instruments used in that type of surgery, and some rivals only produce substitutes for a subset of the line.[38] Then J&J's contracts are closer to an *explicit bundle* of heterogeneous products that are physically and economically distinct on the supply side, only some of which may be "contestable" by a particular rival. Taking things one step further, J&J's customers can avail further discounts on endoscopic tools by achieving an additional threshold on purchases of J&J's popular line of sutures—an entirely different product line that is also discounted—which means that J&J offers an explicit bundle of commitment contracts.[39] Similarly in *Lepage's*, 3M's discounts were conditioned on quantity thresholds for a range of 3M products, not simply its Scotch brand of transparent tape, a private-label version of which was sold by plaintiff Lepage's.

5.5. Potential Tests for Harm to Competition

5.5.1. The Attribution Test for Exclusion

Some form of bundling—either explicit or implicit—is necessary for *S*'s commitment contracts to exclude a hypothetical equally efficient rival from competing for the business of a particular buyer, *B*. To see this, assume that Q^N of *B*'s committed purchases

[38] Bundles are very common in the procurement of medical supplies, where GPOs negotiate commitment contracts on behalf of member hospitals that include multiple product categories.

[39] Why would a seller offer a bundle of commitment contracts in which discounts on product *X* are partially conditioned on purchases of product *Y*? One answer is a form of selection or price discrimination in which willingness to substitute in many product categories is a buyer-specific trait. Then those most willing to substitute receive bigger discounts in exchange for larger quantity commitments in the bundled categories. Further, if buyers have heterogeneous tastes for elements of the bundles offered by competing sellers, then bundles are better substitutes than are individual products. Then competition in bundles may be more aggressive, benefiting buyers.

from *S* are "noncontestable" in that they cannot be displaced by rival *R*—either because some users cannot reasonably be induced to switch or because *R* does not produce the products in Q^N and cannot form an implicit or explicit joint bid with other sellers that do. On these units a buyer purchasing on the discount contract pays a discount from the list price, $P_D^N = P_L^N - d^N$. We assume that the remaining Q^C of *B*'s committed purchases are "contestable" by *R* and we denote *S*'s discounted price for these units by P_D^C.[40] We then ask: under what conditions would *S*'s contract exclude an equally efficient rival from profitably competing for the contestable units, Q^C?

We assume that "equally efficient rival" means that *B* values the contestable units of *S* and *R* comparably, and that the sellers have identical marginal cost *K* of supplying these units. Interpreting the bundled contract literally for the moment, assume that if *B* purchases the contestable units from *R* it loses its discounts and must pay *S* the list price P_L^N for the noncontestable good. With these assumptions, *R*'s lowest feasible offer to supply the contestable units is a price equal to marginal cost, which would reduce *B*'s costs of purchasing the contestable units by $[P_D^C - K]Q^C$. But by purchasing from *R* the buyer sacrifices discounts on the noncontestable goods, so it isn't enough to simply undercut *S*'s price. *R*'s offer must also offset the buyer's loss of surplus on those purchases, denoted L^N. So *R* can profitably compete if $[P_D^C - K]Q^C - L^N \geq 0$, which we write on a per-unit basis as

$$P_D^C - \frac{L^N}{Q^C} \geq K. \tag{5.1}$$

The left side of inequality (5.1) is the highest price that *B* will find attractive, which must exceed *R*'s marginal cost in order to be feasible. This bound is below *S*'s contract price because *B* must be compensated for sacrificing discounts on noncontestable purchases.

Equation (5.1) is not yet in usable form because we haven't specified L^N, the lost surplus on noncontestable units if the buyer purchases contestable units from *R*. Figure 5.2 shows this loss of surplus. Absent a contract and discount d^N we assume that the buyer chooses quantity $\bar{Q}^N$ on the demand curve, but the discount may require a quantity commitment that is off the demand curve, $Q^N > \bar{Q}^N$. The buyer's loss of surplus is the difference in shaded areas:

$$\begin{aligned} L^N &= L_1 + L_2 - L_3 \\ &= d^N Q^N - (L_3 + L_4) \\ &= d^N Q^N - \frac{1}{2}[P_L^N - v^N][Q^N - \bar{Q}^N], \end{aligned}$$

[40] This setup is consistent with either explicit or implicit bundling if Q^N represents units of a separate product from Q^C. If the latter, Q^N represents units of a single product that are noncontestable by *R* due to buyer preferences for variety.

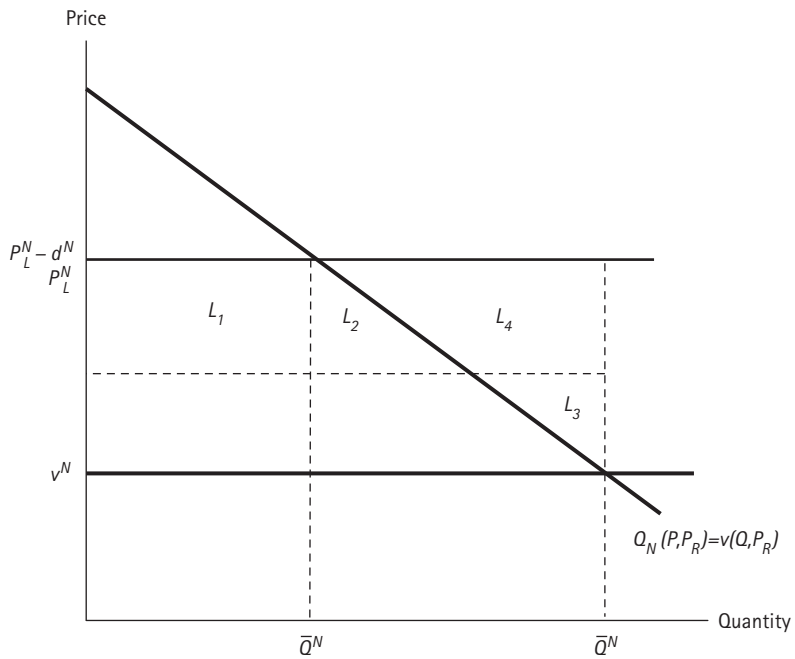
where we have assumed that demand is approximately linear over the relevant range. If the contract sets Q^N efficiently then $v^N = K^N$ and condition (5.1) becomes

$$P_D^C - \frac{Q^N}{Q^C}\left[d^N - \frac{1}{2}m^N\eta^N\right] \geq K, \tag{5.2}$$

where $m^N = P_L^N - K^N$ is *S*'s list price markup on noncontestable units and $\eta^N = [Q^N - \bar{Q}^N]/Q^N$ is the percentage reduction in *B*'s purchases when the discount is removed.

Equation (5.2) is the condition that determines whether an "equally efficient" rival can profitably compete for the contestable units, given our maintained assumptions that a noncompliant buyer loses the full amount of the discount d^N specified in the contract and that Q^C and Q^N are known. As indicated above, if practiced with many buyers and if *R* requires sufficient scale of operations in order to effectively compete, the cumulative effect of such agreements could be to exclude *R* from effectively competing in the *market*, not just from selling to an individual buyer or buyers.

But even with these (extreme) assumptions, condition (5.2) is difficult to apply as a test of exclusion because it is generally unknown how much less a buyer would purchase



The non-contract price and quantity are PL > K and QL. With a quantity commitment contract buyer and seller may achieve mutual gains at combinations like D that lie above IS and below IB. The efficient quantity is QE where v(QE,PR) = K.

FIGURE 5.2

in the counterfactual where discounts are removed, η^N. One possibility is simply to ignore the buyer's ability to mitigate the lost discounts by assuming $\eta^N = 0$; the buyer will purchase the same quantity of noncontestable units from *S* regardless of price. This yields the so-called *attribution test*:

$$P_D^C - d^N \frac{Q^N}{Q^C} \geq K. \tag{5.3}$$

The left-hand side of (5.3) is the upper bound on offers from *R* that would be acceptable to a buyer that does not mitigate forgone discounts. It is typically interpreted as a "net" price for the contestable units, having "attributed" discounts granted on the noncontestable units to the contestable ones.[41] Failure to satisfy (5.3) is interpreted as evidence that an equally efficient seller of the contestable units cannot profitably compete against *S*'s contract. Notwithstanding other flaws that we discuss below, comparison of (5.3) to (5.2) indicates that the attribution test is too likely to indicate exclusion. By assuming away mitigation, it overstates the compensation that a rival must provide to offset lost discounts.

A second interpretation of the attribution test is that it determines whether a contracting seller is pricing the contestable units "below cost" to exclude equally efficient rivals. This is a form of the common "profit sacrifice" test. This may at first appear to be the same question addressed by condition (5.2), but it is not. On this interpretation, a contracting seller is "pricing below cost" if discounts would be unprofitable but for their ability to exclude, similar to predatory pricing. Discounts will be profitable in the sense that incremental revenues exceed incremental cost if the discounted price on contestable units covers incremental cost *and* any loss of profit, $\Delta\Pi^N$, from selling the noncontestable units at a discount. This yields a condition similar to (5.1):

$$P_D^C - \frac{\Delta\Pi^N}{Q^C} \geq K. \tag{5.4}$$

In condition (5.1) the discounted price is offset by the reduction in buyer's surplus when discounts are removed on noncontestable purchases, L^N. This loss is always positive because the buyer is harmed by a higher price. In contrast, the offset in (5.4) is the sacrifice in profit by *S* from selling noncontestable units at a discounted price. This "sacrifice"

[41] Equation (3) can be evaluated under two cases. First, if all units are contestable, then the ratio, Q^N/Q^C, in the left-hand side approaches zero and the equation reduces to a test of whether price is above incremental cost. Second, if all the discounts should be applied to the contestable units, then Q^N/Q^C approaches one and the equation reduces to a test of whether net price, after full attribution, is above incremental cost.

need not even be positive because the discount increases sales of the noncontestable good. Indeed, if the list price for noncontract purchases is near a profit maximum this effect will be about zero, and if discounts on the noncontestable good are profitable, as in figure 5.1, then the offset is negative. For both of these cases, (5.4) is automatically satisfied. More generally $L^N > \Delta\Pi^N$ and some algebra establishes that discounts are profitable if

$$P_D^C - \frac{Q^N}{Q^C}\left[d^N - m^N\eta^N\right] \geq K. \tag{5.5}$$

Condition (5.5) is in the same form as the "exclusion" condition (5.2). But inspection of (5.2) indicates that the buyer's mitigation of lost discounts gets smaller weight (1/2) in condition (5.2) than in condition (5.5) for the reasons just stated. Since $m^N > 0$ and $\eta^N > 0$, equation (5.5) implies that discounts that pass the attribution test are always profitable, but profitable discounts may fail the attribution test. Indeed, profitable discounts are likely to fail, especially when list prices are close to the stand-alone profit-maximizing price where $d^N - m^N\eta^N \approx 0$. Unlike the usual analyses of predation—which involve temporary sacrifice of profit by pricing below cost—this analysis means that QCD contracts that are profitable in the absence of any possibility of "exclusion" may nevertheless exclude an equally efficient rival from competing for a buyer's business. Discounts that "exclude" and discounts that sacrifice profits are different things.[42]

As above, if we assume that buyers do not mitigate forgone discounts by purchasing less or switching to alternatives suppliers $\left(\eta^N = 0\right)$, then (5.5) also reduces to the attribution test (5.3). Only then are discounts that "exclude" an equally efficient rival equivalent to a seller sacrificing profits by setting a "net price" for contestable units below marginal cost. Note that in either (5.2) or (5.5) the conditions are satisfied if all units are contestable $\left(Q^N = 0\right)$. Hence our point that some form of implicit or explicit bundling is essential if an equally efficient rival is to be "excluded" from competing for a buyer's business.[43] We return to this point below in the context of "single-product" QCDs and the possibility of inferring harm to competition.

[42] A related interpretation of (5) and (2) is that exclusion can be "cheap" for a seller with substantive margins on the noncontestable good, because discounts from the profit-maximizing price are attractive to buyers and are compensated by greater sales. Further, a seller satisfying (5) may nevertheless be sacrificing profits if smaller discounts and/or quantity commitments would be profit maximizing, but somewhat larger discounts and commitments are chosen in order to exclude.

[43] We have assumed that all contestable units from *S* and rivals are perfect substitutes. If they aren't then *B*'s demand for *S*'s version of the contestable units is downward sloping—a taste for variety—and some units will be more costly for *R* to capture, as if more units are noncontestable. We think this strains the definition of "equally efficient" because it implies that *R* cannot reproduce some attributes of *S*'s product that buyers value.

5.5.2. The Attribution Test and Liability Thresholds

The attribution test is the first leg of the 2007 AMC's three-part test for identifying discounting practices that may violate Section 2 of the Sherman Act:

> Courts should adopt a three-part test to determine whether bundled discounts or rebates violate Section 2 of the Sherman Act. To prove a violation of Section 2, a plaintiff should be required to show each one of the following elements (as well as other elements of a Section 2 claim): (1) *after allocating all discounts and rebates attributable to the entire bundle of products to the competitive product, the defendant sold the competitive product below its incremental cost for the competitive product*; (2) the defendant is likely to recoup these short-term losses; and (3) the bundled discount or rebate program has had or is likely to have an adverse effect on competition. (See, e.g., Antitrust Modernization Commission 2007; emphasis added)

Rather than an "exclusion test" in the sense of (5.1) and (5.2), these requirements are basically a rule-of-reason test for predatory pricing. Here, a price "below its incremental cost" is determined by the logic of (5.5) with the additional assumption that $\eta^N = 0$, resulting in the attribution test (5.3) rather than a simple comparison of unit price and cost. The "each one" requirement means that contracts passing any one of the three tests would enjoy safe harbor from antitrust liability. Thus the AMC requirements at least appear to provide clear rules and, hopefully, a filter that might reliably identify anticompetitive conduct without itself dampening competition.

The AMC requirements are similar to the position of the DOJ in its 2008 Section 2 guidelines, which would also grant safe harbor to discounts passing the attribution ("discount-allocation") test:

> The Department believes that, when actual or probable harm to competition is shown, bundled discounting by a monopolist that falls outside the discount-allocation safe harbor should be illegal only when (1) it has no procompetitive benefits, or (2) if there are procompetitive benefits, the discount produces harms substantially disproportionate to those benefits. (US Department of Justice 2008)

AQ: You are referring to number (1) in the above passage, not equation (5.1), correct?

We regard condition (1) above as moot because, as we explained in subsection 5.3.1, virtually all QCD practices have a procompetitive benefit. The DOJ threshold for illegality of discounts failing the attribution test in condition (2) is higher than that of the AMC, requiring not simply that harm is likely (AMC: "has had or is likely to have an adverse effect on competition") but that the harm be both demonstrable ("produces") and disproportionate to benefits.

5.5.3. Flaws with the Attribution Test, and Its Potential Uses

The attribution test is superficially attractive because it appears to determine whether a seller's discounts are unprofitable, which might indicate predation. Further, comparison of (5.5) and (5.2) indicates that unprofitable discounts would exclude an equally efficient rival under the assumptions commonly used, that is, no mitigation. But the test suffers from a number of major flaws, each of which tends to bias the test toward failure, and so toward the exposure of procompetitive or competitively neutral discounting practices to antitrust scrutiny and litigation. These flaws derive from the inability of contract and sales data available in litigation to reliably estimate (i) the relative quantities that are non-contestable by rivals (Q^N/Q^C) and (ii) the "but-for" terms of trade between buyer and seller that would exist in the absence of the observed contract, particularly the magnitude of discounts on noncontestable units that a buyer would lose by switching its business to a rival (d^N).

As a threshold matter, it is worth emphasizing that the attribution test is meant to provide evidence that an *equally efficient* rival would be excluded from competing for a buyer's business. The catalyst for this inquiry is typically a complaint by a particular rival that alleges exclusion, so it is sensible to ask whether there is direct evidence that the defendant's contracts actually exclude the plaintiff—that is, that customers would purchase substantially more of the plaintiff's product but for the defendant's contracts. For example, among buyers that do not purchase under the defendant's contracts, is the plaintiff's share materially higher? If not, then it is difficult to argue that the plaintiff is equally efficient in the sense of producing goods that can replace the defendant's sales, or that defendant's contracts are the cause of the plaintiff's poor performance.

We have already noted the test's implicit assumption that buyers do not mitigate the impact of loss of discounts $(\eta^N = 0)$, or equivalently that the cost of the discounts to *S* are not reduced by the enhanced sales of noncontestable units generated by the discounts. Whether the test is interpreted as an indicator of exclusion as in (5.2) or below-cost pricing as in (5.5), this omission means that the test will generate false positives, suggesting anticompetitive impact or conduct when there is none. Put differently, if a seller's contracts pass the attribution test then discounting practices are almost certainly "above cost" in the sense of (5.5). And while above-cost contracts may nevertheless exclude, or even be intended to exclude, there is clear danger that litigating profitable discounting practices would have a chilling effect on competition. The AMC's safe harbor for such contracts is therefore warranted, though in our view, too many contracts would be left exposed. We are also concerned that existence of such a "guideline" will encourage sellers to satisfy it, avoiding more aggressive discounts and commitments that would otherwise enhance competition and benefit consumers. Even with the AMC safe harbor, a useful refinement would be to require evidence that

a seller actually is sacrificing profit on the noncontestable good, that is, that the bracketed term in (5.5) is positive. And of course, if a reliable estimate of η^N is available, it should be used. For example, if there are substantial sales at list price one might presume that the list price is profit maximizing. Then one can infer that the bracketed term is nonpositive, at least for small discounts.

Our discussion to this point has assumed that the relative quantities of "noncontestable" and "contestable" sales (Q^N/Q^C) are known or accurately estimated, but this is rarely the case. The issue of reliably specifying Q^N/Q^C is especially problematic in the case of single-product QCDs. As explained above, the existence of such contracts generally implies a buyer-specific taste for variety (downward-sloping demand for a brand) within a product category. Then some units are more difficult to contest than others and the contract specifies an implicit bundle. Yet the very notion of "noncontestable" units in the single-product case strains the definition of an equally efficient rival. "Equally efficient" cannot simply mean "equal marginal cost" regardless of how users view the rival's product—to qualify as equally efficient in an economic sense, the rival must also offer equal value to consumers. If so, then all units should be viewed as contestable in the single product case, and we have already seen that if $Q^N = 0$, the attribution test is automatically satisfied so long as *total* sales are profitable. And even if we accept for the sake of argument that some units might not be easily contested, there is no scientifically reliable method for determining the relative number of noncontestable units—in *Concord Boat*, how many engines "must" a buyer have purchased from Brunswick?[44] We conclude that $Q^N = 0$ is the practically correct assumption for single-product QCDs, in which case (5.3) simply asks if price is above cost and the usual analysis of predation can follow. We then agree with Areeda and Hovenkamp (2007) that single-product QCDs should enjoy per se legal status so long as price exceeds a reasonable measure of incremental cost (Areeda and Hovenkamp 2012, chap. 17).

A particularly vivid example of misapplying the "equally efficient" concept in defining contestable shares is provided by the DOJ's recent application of the attribution test in *United Regional Health Care* (2011). United Regional is the largest hospital in Wichita Falls, Texas, and it has entered into QCD contracts with a number of private insurers. The DOJ calculated that noncontract buyers Blue Cross, Blue Shield and Medicare purchased only 10% of units within contestable categories from rival hospital Kell West, because "many patients are likely to choose care at United Regional even for services that competing providers offer."[45] So the DOJ assumed that 90% of products offered

[44] The record in *Concord Boat* indicated that two previously compliant buyers switched all their purchases to rival sellers, indicating that all units were contestable, at least for those buyers.

[45] Competitive Impact Statement filed by the U.S. Department of Justice, *United States of America and State of Texas v United Regional Health Care System*, United States District Court for the Northern District of Texas, February 25, 2011, p. 16. It is noteworthy that "foreclosure" in the government's view applies to a rival (Kell West) that has participated in the alleged market since 1999. The DOJ's brief goes so far as to calculate how much more profitable Kell West would be if it were to capture some of the business that currently goes to United.

by *both* United Regional and Kell West were, in fact, noncontestable because consumers would not purchase them from Kell West regardless of discounts. Then discounts received on all purchases were subtracted from the 10% that Kell West could allegedly contest, and it should come as no surprise that United's discounts were found to "fail" the attribution test. The clear implication of the DOJ's analysis is that a seller must tailor its discounts to accommodate the capabilities of its rivals, including lack of acceptance of rivals' products by consumers. There could hardly be a better example of protecting competitors instead of competition.

Things are only slightly more promising in the case of explicit bundles of physically distinct products. In many cases, a particular plaintiff who complains of exclusion may produce only a small portion of the product lines that led to the seller's discount policy, so the "Q^C" for that particular rival actually *is* small. In suits challenging J&J's bundled loyalty discounts on endoscopic tools and sutures, small manufacturers that did not produce sutures and could replace only a small fraction of the J&J endoscopic line (mainly tools called trocars) alleged that they could not profitably overcome the discounts that buyers might lose on all other purchases from J&J. Applied to what a *single* rival could displace, condition (5.3) would likely fail. But the Q^C relevant for antitrust scrutiny is the number of units open to competition from all rivals, not simply a one-off test of whether a buyer would be willing to switch a portion of its purchases to one rival holding constant all other purchases. Narrowly specialized plaintiffs should not enjoy preferred status in making antitrust claims, just as plaintiffs that do not meet consumer acceptance should not. In *J&J* the entire lines of endoscopic tools and sutures were subject to competition from another full-line supplier (Tyco), as well as from combinations of several specialized sellers.[46] Then competition in the presence of QCD contracts is "bundle-to-bundle"—including the possibility that buyers or their agents may create virtual bundles from combinations of sellers, including the plaintiff. Then it is proper to think of all or almost all units as contestable, so $Q^N = 0$ even if a particular rival can only replace a small portion of a buyer's purchases from *S*. As in the single-product case the question becomes whether the "price" of the entire bundle exceeds its cost, so the usual predation analysis can be applied to the bundle as a whole.

These arguments narrow the cases where $Q^N > 0$ down to those where (*a*) the QCD contract consists of an explicit bundle of physically distinct products and (*b*) no rival or rivals produce reasonable substitutes for some elements of the bundle. Inspection of (5.3) indicates that failure to pass the test is more likely when relative number of units that might be contested by a plaintiff is small (Q^N/Q^C is large). Hence allegedly excluded plaintiffs emphasize that a committed buyer wishing to purchase a small amount "Q^C" of their products must forgo discounts on all its purchases from the discounting seller. But applying the test in this way makes no sense, because *any* discrete discount—say a

[46] Tyco and J&J engaged in bundle-to-bundle competition, and each offered loyalty discounts. In recognition of this, J&J ultimately "carved out" smaller suppliers from share calculations, which were then based only on purchases from "full-line" suppliers of surgical inputs—J&J and Tyco.

10% discount if *S*'s share exceeds 80%—will fail the test when the number of contested units is sufficiently small, as demonstrated by the DOJ's analysis in *United Regional Health Care*. In other words, the Q^C in equation (5.3) must account for the best offer the plaintiff might make, which for an "equally efficient" rival is to supply all of the contestable units. In addition, if *S*'s contract specifies a share threshold of (say) 80% to qualify for discounts, that leaves 20% "headroom" for which any rival may compete without triggering *any* loss of discounts. To the extent that those units are also contestable by the plaintiff but are now supplied by other rivals, the contracting sellers' discounts are not binding on the plaintiff's ability to sell more. And even if those units are not *directly* contestable by the plaintiff—say because they are products the plaintiff doesn't make—the buyer could still purchase the full amount of headroom from the plaintiff if the units now supplied by others are substitutes for products supplied by *S*.

The general principle should be to judge what sales the rival can profitably compete for using its most effective strategy (e.g., competing for all the sales in the headroom to avoid a loss of discounts or competing for all contestable units in order to spread any loss of discounts over as many units as possible). When the rival can profitably compete for all contestable sales to a given buyer, even if the rival could not compete for smaller quantities, we should conclude that the rival is not foreclosed. This principle also applies to the time dimension of the shift in sales. The question is whether the rival has the ability to compete for the sales, not whether it would be profitable to win those sales on a temporary basis. For example, if the rival must win 100 units annually in order to make matching the loss of discounts profitable, a conclusion that the buyer could switch 80 units in year one, 150 units in year two and 200 units in year three would mean the seller would not be excluded at any reasonable discount rate, even though the shift in sales would not be profitable on the basis of year one alone.

A second issue is measuring the loss of discounts that the buyer would suffer, that is, how much more a buyer would have to pay if it wished to purchase less than its committed quantity or share from *S*. In a naive application of (5.3), the discount d^N is the difference between the "list price" of noncontestable units, P_L^N, and the agreed-upon commitment price written in a contract—the *assumption* being that if a buyer wished to purchase less than the committed amount it would actually pay the list price. But contract prices and quantities are often the result of direct negotiations between seller and buyer, and contracts often have short durations. Thus Intel's negotiations with individual OEMs resulted in buyer-specific agreements and associated percentage discounts from Intel's menu of list prices for processors. If innovations or aggressive pricing by AMD caused an OEM to want more of AMD's processors, its next round of negotiations with Intel could specify a smaller Intel volume or share and, perhaps, a smaller discount from the list price benchmark. But the OEM would generally not pay the list price, which is to say that the "d^N" contained in a particular contract is just a convenient way of specifying the price that will be paid for the indicated quantity or share relative to a benchmark, and it overstates what would be lost if the OEM wished to purchase less from Intel. Notwithstanding its other flaws, then, proper application of (5.3) (or other variants) requires the trier of fact to estimate the outcome of individual negotiations,

and how much "d^N" would actually *change* if a buyer wished to purchase less from the defendant.[47] Some information on this might be available from econometric study of changes in contracts over time, or by comparing contracts negotiated by different buyers, which will keep the economics experts busy. But these sources are unlikely to replicate the needed conceptual experiment, which is to ask: "what if a particular buyer wants to purchase less than the amount specified in its current contract?"

While the case of bundling discrete products makes measuring the relative volume of noncontestable and contestable units, Q^N/Q^C, somewhat easier, it exacerbates the problem of measuring the loss of profits from discounting and/or the buyer's ability to mitigate. In the case of single-product QCD, the noncontestable units are a subset of all units purchased, so it might be reasonable to assume that the demand for them is inelastic at the list price because the seller is unable to price them separately. However, when the uncontestable units are sold as a separate product on a stand-alone basis, the list price is likely to be closer to the profit-maximizing price for the seller. As we discussed above, under these conditions, the profit sacrifice from a discount is likely to be small or may even be negative. Similarly, buyers will be able to mitigate their loss by purchasing less of the uncontestable product according to equation (5.2).

The attribution test presumes that failure to satisfy (5.3) is evidence that the seller is forgoing current profits—it is pricing below cost. Putting aside obviously benign examples of below-cost pricing such as promoting new products, driving future scale economies, or balancing incentives in two-sided markets, the fact is that a bundled pricing scheme that fails the attribution test is consistent with both profit maximization and enhanced efficiency. For example, bundled contracts are often forms of self-sorting price discrimination in which the list price is paid by relatively inelastic demanders who are less willing to substitute. In such circumstances providing enhanced discounts to more price-sensitive customers can increase sales and social surplus. The relevant question to ask when assessing whether contracts reflect "below cost" pricing is whether the seller has sacrificed profit relative to a but-for world without QCDs, in which case the seller's price would not, in general, be the list price charged to noncontract buyers. In most reasonable cases it will be lower, which means the attribution test would be heavily biased against a defendant seller.[48]

[47] The point remains relevant in cases where a seller offers a pricing schedule that may be availed by any buyer—which saves on transactions costs. Individual buyers may negotiate separate off-schedule deals and "carve-outs" for particular purchases. For example, in procurement of medical supplies for hospitals standard pricing schedules of manufacturers are negotiated through GPOs. In *J&J*, individual hospitals negotiated quantity carve-outs for particular surgeons who insisted on using a particular rival's product, and large hospitals and chains often negotiated separate contracts with larger discounts or smaller commitments. Then the generally available pricing schedule is a sort of starting point for buyer-seller negotiations rather than a constraint.

[48] The failure of the attribution test in situations where exclusion is not possible and bundled discounts are used to price discriminate was noted by AMC commissioners Carlton and Garza, who stated their concern that the test would subject innocent pricing schemes to undue scrutiny. In these situations, incremental revenue is not properly calculated in the Commission's recommendation, which is the point of our examples. See Antitrust Modernization Commission (2007) p. 99.

These failures of the attribution test are not isolated or contrived examples. If used as anything but a safe harbor, it is certain that the test would implicate common and procompetitive pricing and procurement practices and, at least, subject those practices to further antitrust scrutiny. This type of bias no doubt motivated the AMC's (2007) and DOJ's (2008) recommendation that contracts passing the attribution test be given unambiguous safe harbor. But even this narrow exemption is evidently too lenient and specific for the current DOJ, which eschewed such safe harbors in its withdrawal of the 2008 DOJ report and has provided no other guidance beyond the notion that "contracts that reference rivals" are of particular concern. As far as we can tell, these concerns are based on theoretical possibilities rather than compelling evidence of anticompetitive effects. The DOJ's failure to endorse the attribution test as a safe harbor is particularly troubling in light of the fact that it is essentially a predation test for below-cost pricing that is heavily biased in favor of a positive finding. If pricing that is demonstrably above cost is not immune, the implication is that QCDs will face scrutiny and litigation in situations where even allegations of predation would not be deemed credible. Given the clear consumer benefits that flow from firms competing aggressively for sales, we believe it is a mistake to condemn discounting practices that are profitable and hence that firms would employ absent any intent or ability to exclude rivals. In this light, we regard the DOJ's withdrawal of safe harbor status for above-cost single-product and bundled discount schemes as a serious policy error.

5.5.4. Other Indicators of Potential Competitive Harm

Beyond the attribution test, the AMC suggested two other necessary conditions for antitrust liability. Condition (2) is that "the defendant is likely to recoup these short-term losses" and condition (3) is that "the bundled discount or rebate program has had or is likely to have an adverse effect on competition" (see Antitrust Modernization Commission 2007). Our analysis above demonstrated that all of these conditions can be satisfied by nonpredatory and profitable QCDs that would be utilized in the absence of a possibility to exclude. In considering the efficacy of this and similar policies, the consequent efficiency loss that would be caused by condemning procompetitive discounts might be acceptable if it could be demonstrated that real-world discounting practices of the type being challenged have caused material harm to competition. But convincing examples of such harm are conspicuous by their absence. If we judge potential antitrust policies themselves by a rule-of-reason balancing of harms and benefits, it is difficult to make a case that the AMC filter or any other that we know of is useful for inferring liability. At the same time, the theoretical possibility of harm makes per se legality of all QCDs an unattractive policy—paraphrasing Potter Stewart's inability to state a legal threshold for pornography, "we'll know it when we see it." In the end, the DOJ's (2008) disproportionality standard may be the best we can do.

5.6. Concluding Remarks

Antitrust policy should put a heavy evidentiary burden on plaintiffs to demonstrate clear anticompetitive effects that clearly outweigh procompetitive benefits of challenged contracts. In this sense, our views are close to the DOJ's 2008 disproportionality standard, and are perhaps more stringent. For this class of conduct at least, the DOJ's 2009 decision to abandon the disproportionality standard was a mistake that has muddied the waters for effective antitrust policy, and likely itself reduced competition.

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